

OCTANE2™ Workstation Owner's Guide

Document Number 007-4207-001

CONTRIBUTORS

Written by Alan Stein

Production by Karen Jacobson

Illustrated by Kwong Liew and Dan Young

Engineering contributions by Lauro Manalac, Mark Heuchert, Steve Moffitt, Manuel Arreola, Bob Sanders, Ron Berthiaume, Jim Pagura, Charles Alexander, Natalia Gabrea, Jesse Barker, Jim Miller, Michael Wright, Frank Demcak, Dale Ah Tye, Rob Lastiri, Tom Shou, Tim Gordon, Roger Zanders, Patrice Lagrange, and many others on the Octane2 Engineering and Business Team

Cover design by Sarah Bolles, Sarah Bolles Design, and Dany Galgani, SGI Technical Publications

© 2000, Silicon Graphics, Inc.— All Rights Reserved

The contents of this document may not be copied or duplicated in any form, in whole or in part, without the prior written permission of Silicon Graphics, Inc.

LIMITED AND RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure by the Government is subject to restrictions as set forth in the Rights in Data clause at FAR 52.227-14 and/or in similar or successor clauses in the FAR, or in the DOD, DOE, or NASA FAR Supplements. Unpublished rights reserved under the Copyright Laws of the United States.

Contractor/manufacture is Silicon Graphics, Inc., 2011 N. Shoreline Blvd., Mountain View, CA 94043-1389.

Silicon Graphics, IRIS, and IRIX are registered trademarks and SGI, the SGI logo, OCTANE2, VPro, IRIX Interactive Desktop, Power Fortran Accelerator, IRIS InSight, and StereoView are trademarks of Silicon Graphics, Inc. ADAT is a registered trademark of Alesis Corporation. Centronics is a registered trademark of Centronics Data Computer Corporation. Envi-ro-tech is a trademark of TECHSPRAY. Macintosh is a registered trademark of Apple Computer, Inc. NFS is a trademark of Sun Microsystems, Inc. PS/2 is a registered trademark of International Business Machines Corporation. Netscape is a trademark of Netscape Communications Corporation. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company, Ltd. Sony is a trademark of Sony Electronics Inc.

OCTANE2™ Workstation Owner's Guide
Document Number 007-4207-001



For regulatory and compliance information, go to Appendix C.

OCTANE2™ Workstation Owner's Guide
Document Number 007-4207-001

OCTANE2™ Workstation Owner's Guide
Document Number 007-4207-001

Contents

List of Figures xiii

List of Tables xxi

About This Guide xxiii

Software and System Administration Information xxiv

Product Support xxiv

Reader Comments xxiv

1. **Getting Started** 1
 - Getting Acquainted 1
 - Front View 3
 - Back View 4
 - Checking Your Shipment 5
 - Lifting the Octane2 Workstation 6
 - Organizing Your Setup Process 7
 - Installing Optional Components 7
 - Setting Up the Octane2 Workstation 8
 - Locking the Octane2 Workstation 18
 - Logging In to the Octane2 Workstation 21
 - Using the IRIX Interactive Desktop 22
 - The IRIX Interactive Desktop and Its Icons 22
 - The Toolchest 23
 - System Manager 23
 - Online Documentation 23
 - InfoSearch 23
 - The Console Window 24

- Shutting Down and Powering Off the Octane2 Workstation 25
 - Using the Power Button to Shut Down and Power Off 25
 - Using the Toolchest to Shut Down 27
 - Using the Toolchest to Restart 29
- 2. Installing and Removing the CPU and Memory 31**
 - Preparing the Workstation 32
 - Attaching the Wrist Strap 35
 - Removing the System Module 36
 - Removing and Replacing the CPU 41
 - Removing the CPU 41
 - Replacing the CPU/Processor 44
 - Installing and Removing Memory 47
 - About Memory 47
 - Locating the DIMMs on the System Module 49
 - Removing the DIMM Bracket 50
 - Removing Memory 51
 - Installing Memory 52
 - Reinstalling the System Module 53
 - Powering On the Octane2 Workstation 58
 - Verifying Memory Installation 60
- 3. Installing and Removing the Power Supply 61**
 - Preparing the Workstation 62
 - Removing the PCI Module 64
 - Removing the Power Supply 64
 - Installing the Power Supply 66
 - Powering On the Octane2 Workstation 68
- 4. Installing and Removing PCI Boards 69**
 - About the PCI Module and Boards 70
 - Preparing the Workstation 72
 - Attaching the Wrist Strap 74
 - Removing the PCI Module 75
 - Opening the PCI Module 78

	Identifying a PCI Slot	79
	Installing a PCI Board	80
	Opening the I/O Door for Extra-Long Connectors	84
	Removing a PCI Board	89
	Opening the I/O Door for Extra-Long Connectors	94
	Installing the PCI Module	100
	Powering On the Octane2 Workstation	104
	Verifying the PCI Board Installation	105
5.	Installing and Removing XIO Boards	107
	About the XIO Tri-Module and XIO Boards	108
	Preparing the Workstation	110
	Attaching the Wrist Strap	112
	Compression Connector Caution	113
	Removing the XIO Tri-Module	114
	Removing an Option Board or Blank Panel	118
	Installing an Option Board or Blank Panel	121
	Reinstalling the XIO Tri-Module	124
	Powering On the Octane2 Workstation	127
	Verifying the Option Board Installation	128
6.	Installing and Removing External Devices	129
	About SCSI Buses and Devices	130
	Installing External SCSI Devices	131
	Assigning a SCSI Address on an External Device	132
	Setting the SCSI Address on an External Device	133
	About Cables	134
	Shutting Down and Powering Off the System	135
	Preparing a SCSI Device for Cabling	136
	Cabling the Devices	137
	Connecting SCSI Devices	139

- Powering On the Octane2 Workstation 142
 - Testing an External Device 143
 - Cleaning DAT or DLT Drives 146
 - Formatting a Floppy Disk from an External Drive 146
- Installing Serial Devices 147
 - About Serial Ports 147
 - Installing the Serial Device 148
 - Configuring the Device 150
- Installing Audio Devices 150
 - Installing the Microphone 151
 - Installing the Speakers and Headphones 152
 - About Analog Line Level Audio 154
 - About Coaxial Digital Audio 155
 - About the Optical Digital Port and Cable 155
- Replacing the Keyboard or Mouse 156
- Powering On the Octane2 Workstation 157
- 7. Installing and Removing Internal Drives and Front Module Parts 159**
 - Installing and Removing Internal Drives 160
 - About Internal Drives 160
 - Shutting Down and Powering Off the System 161
 - Removing the Bezel 162
 - Installing Secondary (Option) Internal Drives 165
 - Removing the Blank Panel 168
 - Removing Internal Secondary (Option) Drives 170
 - Replacing a Blank Panel 171
 - Replacing the System Drive 173
 - Testing an Internal Drive 176
 - Removing and Replacing the Light Module 177

- Removing and Replacing the Frontplane Module 180
 - Attaching the Wrist Strap 180
 - Preparing the Workstation to Remove the Frontplane Module 181
 - Removing the Frontplane Module 183
 - Removing and Reinstalling the System Identification Module 185
 - Installing the Frontplane Module 186
- Removing and Replacing the System Fan 187
 - Removing the System Fan 188
 - Replacing the System Fan 189
- Removing and Replacing the Plastics: Top and Base 190
 - Removing and Replacing the Top Cover 190
 - Removing and Installing the Base 192
 - Reinstalling the Bezel 195
 - Reinstalling the Lockbar 196
 - Powering On the Octane2 Workstation 197
- 8. Troubleshooting 199**
 - Using the LEDs on the Lightbar 199
 - Using the NMI Button 203
 - Accessing the System Maintenance Menu 204
 - Running Diagnostic Tests 205
 - Power-On Tests 205
 - Confidence Tests 205
 - IDE Tests 206
 - Recovering From a System Crash 207
 - Disabling the System Maintenance Password 211
 - Enabling the System Maintenance Password 213
 - System Does Not Power Off 215
 - Returning Parts 216
- A. Care and Cleaning of Compression Connectors 217**
 - Storing and Handling the Compression Connector 218
 - Cleaning a Compression Connector 219

- B. Technical Specifications 221**
 - Port Pinout Assignments 221
 - Audio Ports 222
 - Microphone Port 222
 - Speaker Port Pinout 223
 - Analog Line Level Port Pinout 224
 - Coaxial Digital Port Pinout 224
 - Optical Digital Port Pinout 225
 - SCSI Port 226
 - Ethernet 10-Base-T/100-Base-T Port 228
 - Parallel Port 229
 - Keyboard and Mouse Ports 230
 - Serial Ports 231
 - Serial Cables and Adapters 233
 - Printer/Dumb Terminal Serial Cable 233
 - PC Modem Serial Cable 234
 - Serial Port Adapter Cables 235
 - VPro Graphics Board I/O Ports 237
 - Monitor Port 237
 - StereoView Port 240
 - Genlock Port 241
 - Swap Ready Port 241
 - Physical Environment Specifications 242
 - Microphone Specifications 243
 - Speaker Specifications 243
 - Headphone Specifications 244
 - Analog Line Level Audio Specifications 244
 - PCI Module Power Specifications 244
- C. Regulatory Information 247**
 - Manufacturer's Regulatory Declarations 247
 - CMN Number 247
 - Manufacturer's Declaration of Conformity 248
 - Upgrade Regulatory Labels 248

Class A	249
Electromagnetic Emissions	250
Radio and Television Interference	251
Shielded Cables	252
Electrostatic Discharge	252
Class B	253
Electromagnetic Emissions	254
Shielded Cables	255
Electrostatic Discharge	255
Glossary	257
Index	275

List of Figures

Figure 1-1	Front View of the Octane2 Workstation	3
Figure 1-2	Back View of the Octane2 Workstation	4
Figure 1-3	Octane2 Components	5
Figure 1-4	Lifting the Octane2 Workstation	6
Figure 1-5	Attaching the Keyboard and Mouse Cables	8
Figure 1-6	Attaching the Ethernet Cable	9
Figure 1-7	Attaching the Speaker-to-Speaker Cable	10
Figure 1-8	Attaching the Speaker and Power Cable to the Active Speaker	11
Figure 1-9	Connecting the Speaker and Power Cables	12
Figure 1-10	Attaching the Microphone	13
Figure 1-11	Connecting the Monitor and Power Cables	14
Figure 1-12	Connecting the Monitor and Power Cables to an Electrical Outlet	15
Figure 1-13	Powering On the Monitor	16
Figure 1-14	Powering On the Speakers	16
Figure 1-15	Powering On the Octane2 Workstation	17
Figure 1-16	Locating the Lockbar Slot	18
Figure 1-17	Inserting the Lockbar	19
Figure 1-18	Powering On the Octane2 Workstation	20
Figure 1-19	Login Screen	21
Figure 1-20	Peripheral Icons	22
Figure 1-21	Toolchest Menu	23
Figure 1-22	Console Window	24
Figure 1-23	Powering Off the Octane2 Workstation	25
Figure 1-24	System Shutdown Notifier	26
Figure 1-25	Power Button and Reset Button	26
Figure 1-26	Shutdown Caution Message	27
Figure 1-27	Restart System Option	28

Figure 1-28	System Shutdown Notifier	28
Figure 1-29	Restart Notifier	29
Figure 1-30	System Shutdown Notifier	30
Figure 1-31	Power Off/Restart Notifier	30
Figure 1-32	Restart Notifier	30
Figure 2-1	Powering Off the Octane2 Workstation	32
Figure 2-2	Removing the Lockbar	33
Figure 2-3	Removing the Cables from the System Module	34
Figure 2-4	Attaching the Wrist Strap to the Chassis	35
Figure 2-5	Loosening the System Module Screws	36
Figure 2-6	Releasing the System Module from the Frontplane	37
Figure 2-7	Removing the System Module from the Chassis	38
Figure 2-8	Locating the Compression Connectors	39
Figure 2-9	Bristled Pad on Compression Connector	39
Figure 2-10	Placing the Compression Cap on the Compression Connector	40
Figure 2-11	Removing a Single Processor	41
Figure 2-12	Lifting a Single Processor from the System Module	42
Figure 2-13	Lifting a Dual Processor from the System Module	43
Figure 2-14	Viewing the Connectors on the Underside of the CPU	44
Figure 2-15	Installing a Single Processor	45
Figure 2-16	Installing a Dual Processor	46
Figure 2-17	Identifying DIMM Sockets and DIMM Banks	48
Figure 2-18	Locating DIMMs on the System Module (DIMM bracket not installed)	49
Figure 2-19	Removing the DIMM bracket	50
Figure 2-20	Removing a DIMM	51
Figure 2-21	Locating the Notches on a DIMM	52
Figure 2-22	Removing the Compression Connector Cap	53
Figure 2-23	Supporting the System Module	54
Figure 2-24	Locking the System Module to the Frontplane	55
Figure 2-25	Tightening the System Module Screws	56
Figure 2-26	Reconnecting Cables to the System Module	57
Figure 2-27	Powering On the Octane2 Workstation	58

Figure 2-28	Installing the Lockbar	59
Figure 3-1	Powering Off the Octane2 Workstation	62
Figure 3-2	Unplugging the Power Cable	63
Figure 3-3	Loosening the Power Supply Screws	64
Figure 3-4	Removing the Power Supply	65
Figure 3-5	Plugging In the Power Cable	66
Figure 3-6	Sliding In the New Power Supply	66
Figure 3-7	Inserting and Tightening the Screws	67
Figure 3-8	Powering On the Octane2 Workstation	68
Figure 4-1	Workstation without the Optional PCI Module	70
Figure 4-2	Workstation with the Optional PCI Module	71
Figure 4-3	Powering Off the Octane2 Workstation	72
Figure 4-4	Removing the Cables from the PCI Module	73
Figure 4-5	Attaching the Wrist Strap to the Chassis	74
Figure 4-6	Removing the Screws From the PCI Module	75
Figure 4-7	Opening the Release Lever	75
Figure 4-8	Removing the PCI Module	76
Figure 4-9	Identifying the Compression Connector on the PCI Module	76
Figure 4-10	Installing a Cap on the Compression Connector	77
Figure 4-11	Loosening the Screws on the PCI Module	78
Figure 4-12	Opening and Removing the PCI Module Door	78
Figure 4-13	Identifying PCI Slots	79
Figure 4-14	Removing the Blank I/O Panel Screw	80
Figure 4-15	Removing the Blank I/O Panel	81
Figure 4-16	Inserting a PCI Board into the PCI Module	81
Figure 4-17	Inserting the Board Screw	82
Figure 4-18	Placing the Door on the PCI Module	82
Figure 4-19	Tightening the I/O Door Screws	83
Figure 4-20	Removing the I/O Panel Screws	84
Figure 4-21	Removing the I/O Door Screws	85
Figure 4-22	Opening the I/O Door	85
Figure 4-23	Inserting a PCI Board with an Extra-long Connector	86
Figure 4-24	Closing the I/O Door	86

Figure 4-25	Reinstalling the I/O Door Screws	87
Figure 4-26	Reinstalling the I/O Panel Screws	87
Figure 4-27	Reinstalling the PCI Module Door, as shown in Figure 4-28.	88
Figure 4-28	Tightening the PCI Module Door Screws	88
Figure 4-29	Removing the PCI Board Screw	89
Figure 4-30	Extracting the PCI Board	90
Figure 4-31	Inserting the I/O Door Screws	91
Figure 4-32	Inserting the I/O Blank Panel	91
Figure 4-33	Attaching the Blank Panel to the I/O Door	92
Figure 4-34	Reinstalling the PCI Module Door	92
Figure 4-35	Replacing the Screws of the PCI Module Door	93
Figure 4-36	Removing the I/O Panel Screws	94
Figure 4-37	Removing the I/O Door Screws	94
Figure 4-38	Opening the I/O Door	95
Figure 4-39	Removing a PCI Board	96
Figure 4-40	Closing the I/O Door	97
Figure 4-41	Inserting the I/O Door Screws	97
Figure 4-42	Inserting the I/O Blank Panel	98
Figure 4-43	Attaching the Blank Panel to the I/O Door	98
Figure 4-44	Reinstalling the PCI Module Door	99
Figure 4-45	Tightening the PCI Module Door Screws	99
Figure 4-46	Removing the Screws from the Blank Panel	100
Figure 4-47	Removing the Blank Panel	101
Figure 4-48	Removing the Cap from the Compression Connector	101
Figure 4-49	Installing the PCI Module	102
Figure 4-50	Closing the Release Lever	102
Figure 4-51	Tightening the PCI Screws	103
Figure 4-52	Installing the PCI Cables	103
Figure 4-53	Replacing the Power Cord and Turning On the Workstation	104
Figure 5-1	Locating the XIO Tri-Module	108
Figure 5-2	XIO Tri-Module with VPro Graphics Board I/O Ports	109
Figure 5-3	Powering Off the Octane2 Workstation	110
Figure 5-4	Removing the Monitor Cable	111

-
- Figure 5-5** Attaching the Wrist Strap 112
- Figure 5-6** Identifying the Compression Connector 113
- Figure 5-7** Removing the XIO Tri-Module Screws 114
- Figure 5-8** Releasing the XIO Tri-Module 115
- Figure 5-9** Removing the XIO Tri-Module 115
- Figure 5-10** Placing the XIO Tri-Module on Its Side 116
- Figure 5-11** Placing a Cap on the XIO Compression Connector 117
- Figure 5-12** Identifying the Slots Used by an XIO Option Board 118
- Figure 5-13** Placing the Cap on the XIO Compression Connector 119
- Figure 5-14** Removing the Screws from the Blank Panel 120
- Figure 5-15** Removing the Blank Panel 120
- Figure 5-16** Installing the Screws 122
- Figure 5-17** Removing the Cap from the XIO Board Compression Connector 123
- Figure 5-18** Inserting the XIO Tri-Module 125
- Figure 5-19** Tightening the XIO Tri-Module Screws 125
- Figure 5-20** Reconnecting the Monitor Cable 126
- Figure 5-21** Powering On the Octane2 Workstation 127
- Figure 6-1** Manually Setting the SCSI Address 133
- Figure 6-2** Powering Off the Octane2 Workstation 135
- Figure 6-3** Removing the Terminator from the Last Device on the Daisy Chain 136
- Figure 6-4** Using the Correct Cables between Devices and/or the Octane2 Workstation 137
- Figure 6-5** Comparing Speed of Daisy-Chained Devices 138
- Figure 6-6** Connecting an External SCSI Device to the Octane2 Workstation 139
- Figure 6-7** Daisy-Chaining an External SCSI Device to Another External SCSI Device 140
- Figure 6-8** Connecting the Terminator and Power Cable to an External Device 141
- Figure 6-9** Powering On the Octane2 Workstation 142
- Figure 6-10** Turning On External Devices and the Octane2 Workstation 143
- Figure 6-11** Identifying the CD-ROM Icon 144
- Figure 6-12** Locating the Serial Ports on the System Module 148
- Figure 6-13** Plugging In the Serial Cable 149
- Figure 6-14** Audio Ports on the System Module 150

Figure 6-15	Installing the Microphone	151
Figure 6-16	Setting Up the Speakers	152
Figure 6-17	Attaching the Speaker Cables to the Active Speaker	153
Figure 6-18	Attaching the Speaker Cables to the Octane2 Workstation	154
Figure 6-19	Disconnecting the Mouse and Keyboard	156
Figure 6-20	Powering On the Octane2 Workstation	157
Figure 7-1	Powering Off the Octane2 Workstation and Monitor	161
Figure 7-2	Locating the Lockbar on the Front of the Octane2 Workstation	162
Figure 7-3	Unlocking and Removing the Lockbar	163
Figure 7-4	Pressing the Bezel Release Buttons	163
Figure 7-5	Removing the Bezel	164
Figure 7-6	Identifying the Secondary (Option) Drive Bays	165
Figure 7-7	Inserting a Secondary (Option) Internal Drive	166
Figure 7-8	Locking the Secondary (Option) Drive	167
Figure 7-9	Opening the Bezel Door	168
Figure 7-10	Releasing the Blank Panel	169
Figure 7-11	Lifting the Drive Handle to Unlock the Drive	170
Figure 7-12	Sliding Out the Secondary (Option) Drive	171
Figure 7-13	Replacing the Blank Panel	172
Figure 7-14	Locating the System Drive	173
Figure 7-15	Unlocking the System Drive	174
Figure 7-16	Removing the System Drive	174
Figure 7-17	Inserting the New Drive	175
Figure 7-18	Locking the System Drive	176
Figure 7-19	Locating the Light Module	177
Figure 7-20	Removing the Light Module	178
Figure 7-21	Inserting the Light Module	179
Figure 7-22	Attaching the Wrist Strap	180
Figure 7-23	Loosening the Captive Screws on the Frontplane Module	183
Figure 7-24	Placing the Frontplane Module Face Down on a Clean Surface	184
Figure 7-25	Sliding Out the System Identification Module	185
Figure 7-26	Tightening the Captive Screws on the Frontplane Module	186
Figure 7-27	Releasing the System Fan from the Back of the Drive Bay	188

Figure 7-28	Removing the Fan From the Back of the Drive Bay	189
Figure 7-29	Placing the Fan on the Back of the Drive Bay	189
Figure 7-30	Releasing the Plastic Top Cover	190
Figure 7-31	Sliding the Front Cover Forward	191
Figure 7-32	Locating the Release Slots	192
Figure 7-33	Releasing the Plastic Base	193
Figure 7-34	Sliding the Chassis Backward	193
Figure 7-35	Lifting the Octane2 Workstation off the Plastic Base	194
Figure 7-36	Reinstalling the Bezel	195
Figure 7-37	Replacing the Lockbar	196
Figure 7-38	Powering on the Octane2 Workstation	197
Figure 8-1	Lightbar LEDs - Front of Octane2, Diagnostic Chart #1	200
Figure 8-2	Lightbar LEDs - Front of Octane2, Diagnostic Chart #2	201
Figure 8-3	Lightbar LEDs - Front of Octane2, Diagnostic Chart #3	202
Figure 8-4	Locating the NMI Button	203
Figure 8-5	Start Notifier	204
Figure 8-6	Start Notifier	206
Figure 8-7	Pressing the Reset Button	207
Figure 8-8	Start Notifier	208
Figure 8-9	System Recovery Menu	208
Figure 8-10	Removing the Jumper for Disabling the Password	212
Figure 8-11	Removing the Jumper to Enable the Password	214
Figure 8-12	Power Button and Reset Button	215
Figure A-1	Identifying the Bristled Pad on a Compression Connector	217
Figure A-2	Spraying the Compression Connector	220

List of Tables

Table 6-1	Comparison of Ultra and Fast, Wide and Narrow SCSI Rates	130
Table 6-2	Bus Rate + Operating Mode = Data Burst Rates	130
Table 6-3	Maximum Combined Cable Length	134
Table 6-4	Additional References on External SCSI Devices	145
Table 6-5	Serial Port Assignment	148
Table B-1	Microphone Port Pinout	222
Table B-2	Speaker/Headphone Port Pinout	223
Table B-3	Speaker Power Port Pinout	223
Table B-4	SCSI Port Pinout	226
Table B-5	Ethernet 10-BASE-T/100-BASE-T Port Pinout	228
Table B-6	Parallel Port Pinout	229
Table B-7	Keyboard and Mouse Port Pinout	230
Table B-8	Serial Port Pinout - PC-Compatible	231
Table B-9	Serial Port Pinout - Macintosh-Compatible	232
Table B-10	Printer/Dumb Terminal Cable Pinout	233
Table B-11	PC Modem Cable Pinout	234
Table B-12	Female DB9 to Female MiniDIN8 Adapter Cable Pinout	235
Table B-13	Female DB9 to Female DB9 Adapter Cable Pinout	236
Table B-14	20-Inch Monitor Pinout	237
Table B-15	DDC-Enabled Monitor Pinout	238
Table B-16	VPro Graphics Board Scan Rates	239
Table B-17	StereoView Pinout Assignments	240
Table B-18	Genlock Pinout Assignments	241
Table B-19	Swap Ready Pinout Assignments	241
Table B-20	Physical Environment Specifications	242
Table B-21	Microphone Specifications	243
Table B-22	Speaker Specifications	243

Table B-23	Headphone Specifications	244
Table B-24	Analog Line Level Specifications	244
Table B-25	PCI Module Power Specifications	244
Table C-1	FCC Declaration of Conformance	249
Table C-2	FCC Declaration of Conformance	253

About This Guide

Welcome to the Silicon Graphics OCTANE2 workstation with VPro graphics!

The Octane2 workstation provides you with dramatically fast state-of-the art graphics capabilities and massive computer power in a desktop system. With a crossbar-based symmetric multiprocessing architecture, the Octane2 workstation allows you to visualize and manipulate three-dimensional images, simulate large data sets, interact with three-dimensional models, and perform many other advanced functions. The Octane2 workstation's large memory capacity (up to 8 GB), high sustainable memory bandwidth, multiprocessor capability, and high-speed networking provide you with the optimal computing environment.

This guide shows you how to install, diagnose and repair your system. You'll learn to:

- Set up your workstation
- Access online information
- Install and remove internal parts
- Install and remove peripherals
- Diagnose hardware problems
- Order replacement parts

This guide also provides:

- Technical specifications
- Regulatory information

This guide is provided for all Octane2 users and SGI technical support staff. Most of the hardware tasks are relatively simple and require no previous computer knowledge. A few tasks are lengthy; they are easier to perform if you have some computer hardware experience.

Software and System Administration Information

For complete information on installing software, see the online *Personal System Administration Guide*. It is located on your desktop in Toolchest > Help > Online Books. For more advanced information, see the online *IRIX Admin: Software Installation & Licensing Guide*. For system administration information, see the SGI_Admin section of the online bookshelf.

It's always a good idea to back up your system. For instructions on backing up your system, see the online *Personal System Administration Guide*.

Product Support

The Octane2 workstation is designed for user maintenance and repair without the help of a trained technician. For product support information, contact your SGI subsidiary or authorized distributor.

SGI provides a comprehensive range of product support for its products. If you are in North America, contact the Technical Assistance Center at 1.800.800.4SGI or your authorized service provider. If you are outside North America, contact the SGI subsidiary or authorized distributor in your country.

Reader Comments

If you have comments about the technical accuracy, content, or organization of this document, please contact SGI. Be sure to include the title and part number of the document with your comments. The part number for this document is printed on the front or back cover. You can contact SGI in any of the following ways:

- Send electronic mail to the following address: techpubs@sgi.com

- Send a facsimile to the attention of “Technical Publications” at fax number 1.650.932.0801
- Use the Suggestion Box form on the Technical Publications Library World Wide Web page: <http://techpubs.sgi.com>
- Call the Technical Publications Group through the Technical Assistance Center at 1.800.800.4SGI.
- Send mail to: Technical Publications, Silicon Graphics, Inc., 1600 Amphitheatre Pkwy., M/S 535, Mountain View, California, 94043-1351.

We value your comments and will respond to them promptly.

Getting Started

This chapter shows you how to set up your Octane2 workstation. The following topics are covered:

- “Getting Acquainted” on page 1
- “Lifting the Octane2 Workstation” on page 6
- “Installing Optional Components” on page 7
- “Setting Up the Octane2 Workstation” on page 8
- “Locking the Octane2 Workstation” on page 18
- “Logging In to the Octane2 Workstation” on page 21
- “Using the IRIX Interactive Desktop” on page 22
- “Shutting Down and Powering Off the Octane2 Workstation” on page 25

Getting Acquainted

To get familiar with your Octane2 workstation, see the following:

- Figure 1-1, Figure 1-2, and Figure 1-3 on pages 3-5, which show the front, back, and parts of the workstation.
- System Manager > Toolchest > System > System Manager, for information on Octane2 hardware and software.
- “About This System,” in Toolchest > System > System Manager, for your system serial number, IP address, operating system, and so on.

- *Octane2 Hardware Central*, an online information resource containing user tips, technical information, cable pinouts, human factors guidelines, and so on.

You can access *Octane2 Hardware Central* from Netscape or from the Toolchest.

- In the Netscape location window enter:
`file:/usr/share/Insight/library/SGI_bookshelves/SGI_EndUser/books/Octane2_HWCnt1/index.html`
- Choose Toolchest > Help > InfoSearch, and type **Octane2 Hardware Central** (You cannot access *Octane2 Hardware Central* from the Online Books path).

If *Octane2 Hardware Central* is not currently installed on your system disk, reinstall it as follows:

1. Place the IRIX 6.5 Foundation 2 CD in your CD-ROM drive, or access it over the network.
2. Choose Toolchest > System > Software Manager.
3. Enter the location of the IRIX Foundation 2 CD, then click the *Lookup* button.
4. Click *Customize Installation*.
5. Click the *Hardware Owner's Guide* sub-folder.
6. Find *Octane2 Hardware Central*, then click on the install checkbox.

A red checkmark appears.

Note: Clicking *Octane2 Workstation Owner's Guide* causes a conflict. To resolve this conflict, place the IRIX 6.5x overlay CD2 in your CD-ROM drive.

7. Click the Software Manager *Start* button to install *Octane2 Hardware Central*.

When the installation is complete, a message says:

Installation and removals were successful, you can continue with installation or quit now.

8. Click the *OK* button in the message window.
9. Choose File menu > Exit to quit the Software Manager.

Front View

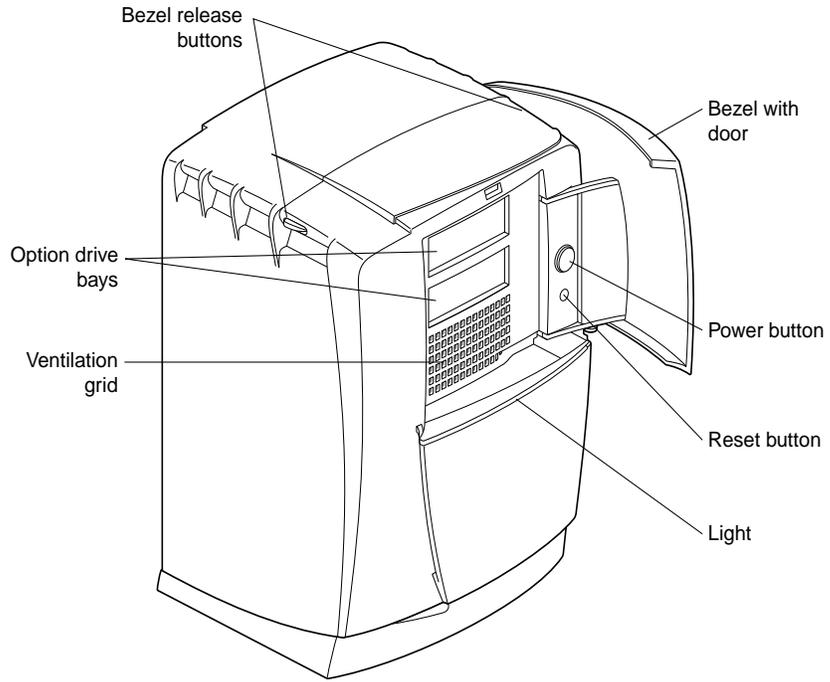


Figure 1-1 Front View of the Octane2 Workstation

Back View

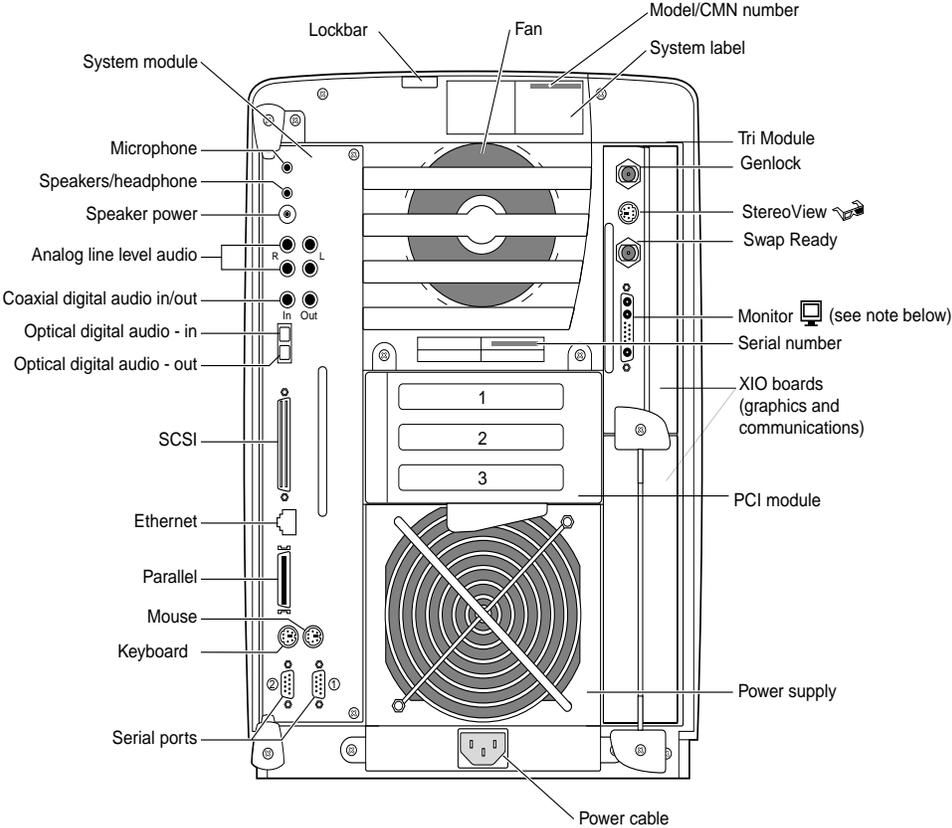


Figure 1-2 Back View of the Octane2 Workstation

Checking Your Shipment

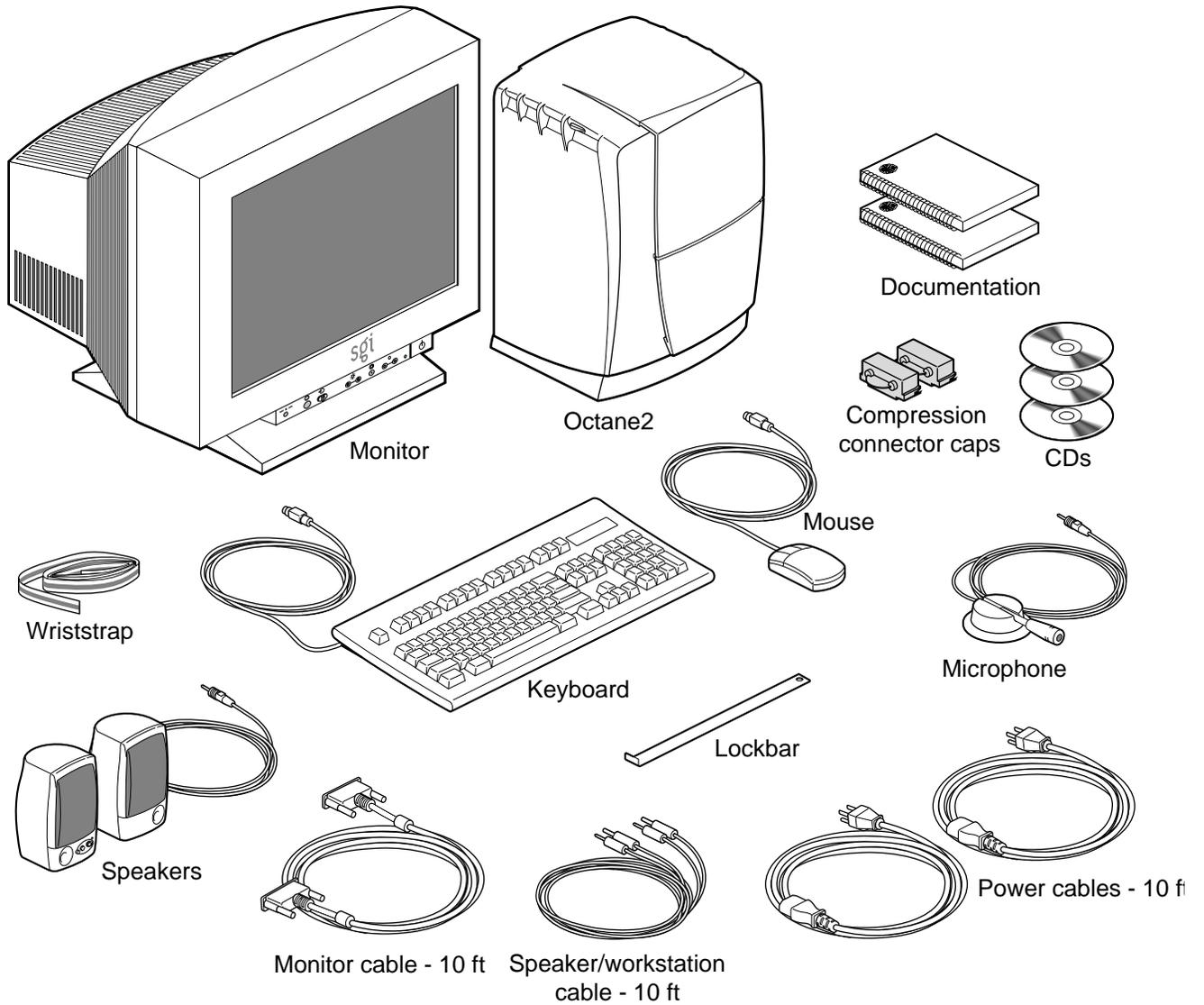


Figure 1-3 Octane2 Components

Lifting the Octane2 Workstation

Lifting the Octane2 workstation requires two people. Lift the workstation by the air vents at the top of the chassis, as shown in Figure 1-4.

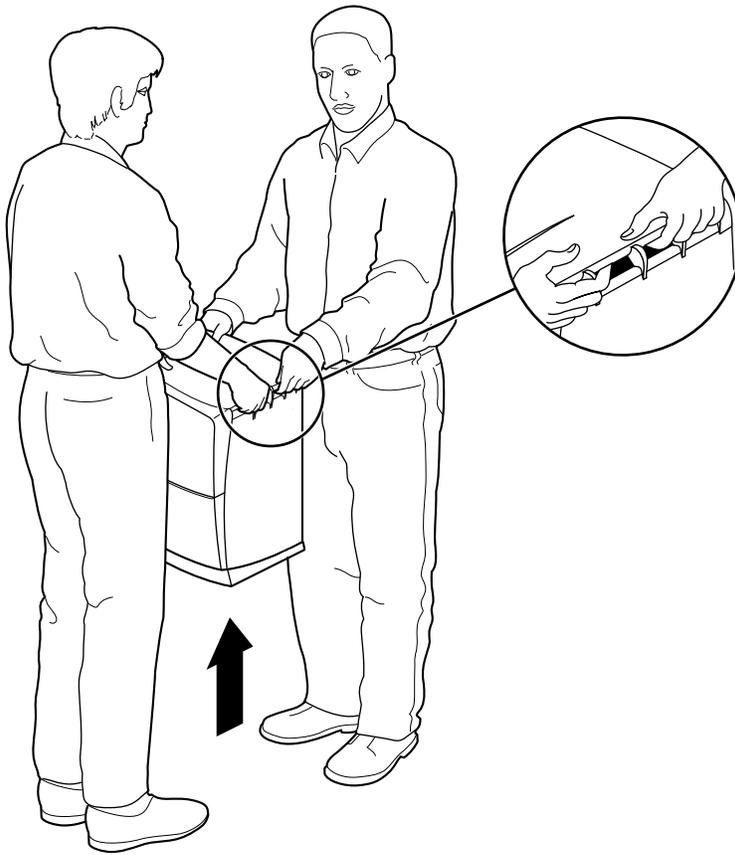


Figure 1-4 Lifting the Octane2 Workstation

Organizing Your Setup Process

If you have no additional components, memory, or peripherals to install, use the setup poster or the setup procedures (starting on page 8) to set up your Octane2 workstation.

Installing Optional Components

If you have optional components or peripherals, install them before you follow the setup procedures, so you do not have to remove and reinstall cables.

Note the following:

- To install additional memory, see Chapter 2, “Installing and Removing the CPU and Memory.”
- To install PCI boards and the PCI module, see Chapter 4, “Installing and Removing PCI Boards.”
- To install XIO option boards, see the option board installation manual included with the XIO option board, or Chapter 5, “Installing and Removing XIO Boards.”
- To install external peripherals or devices, see Chapter 6, “Installing and Removing External Devices,” which includes:
 - SCSI devices
 - Serial devices
 - Audio devices
- To install drives (internal peripherals), see Chapter 7, “Installing and Removing Internal Drives and Front Module Parts.”

After you install all optional components, use the setup poster or see “Setting Up the Octane2 Workstation” on page 8.

Setting Up the Octane2 Workstation

Human factors guidelines for setting up your Octane2 workstation are in *Octane2 Hardware Central*. You can access this information by choosing Toolchest > Help > Online Books > SGI End User.

To set up the Octane2 workstation, follow these steps:

1. Attach the keyboard and mouse cables, as shown in Figure 1-5.

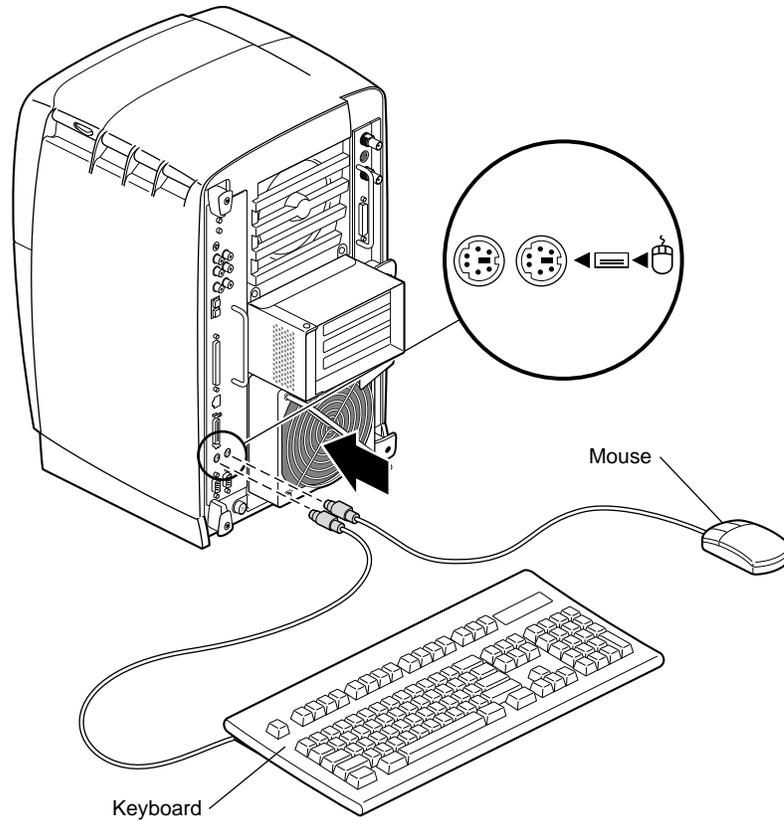


Figure 1-5 Attaching the Keyboard and Mouse Cables

2. Attach the Ethernet cable to the Ethernet port, as shown in Figure 1-6.

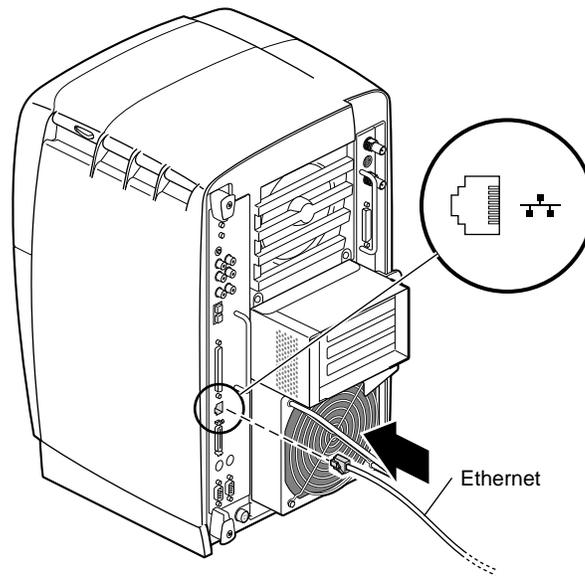


Figure 1-6 Attaching the Ethernet Cable

3. Place the speakers on either side of the monitor, as shown in Figure 1-7.
4. Connect the left (passive) speaker to the right (active) speaker. Use the port labeled L.

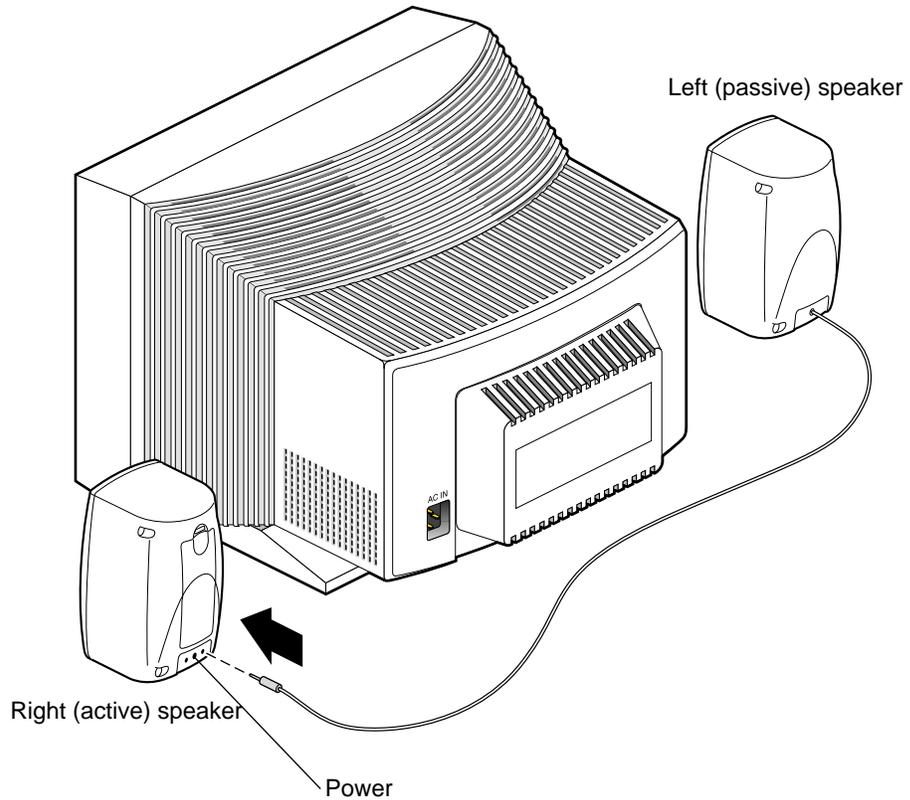


Figure 1-7 Attaching the Speaker-to-Speaker Cable

5. Connect the speaker/workstation cables (the cable with two connectors on each end) to the active speaker, as shown in Figure 1-8.

The connectors cannot be installed incorrectly because they are different sizes: male/male on one end, female/male on the other.

- Connect the female connector to the power (middle) port on the back of the right (active) speaker.
- Connect its paired male connector to the R port on the back of the right (active) speaker.

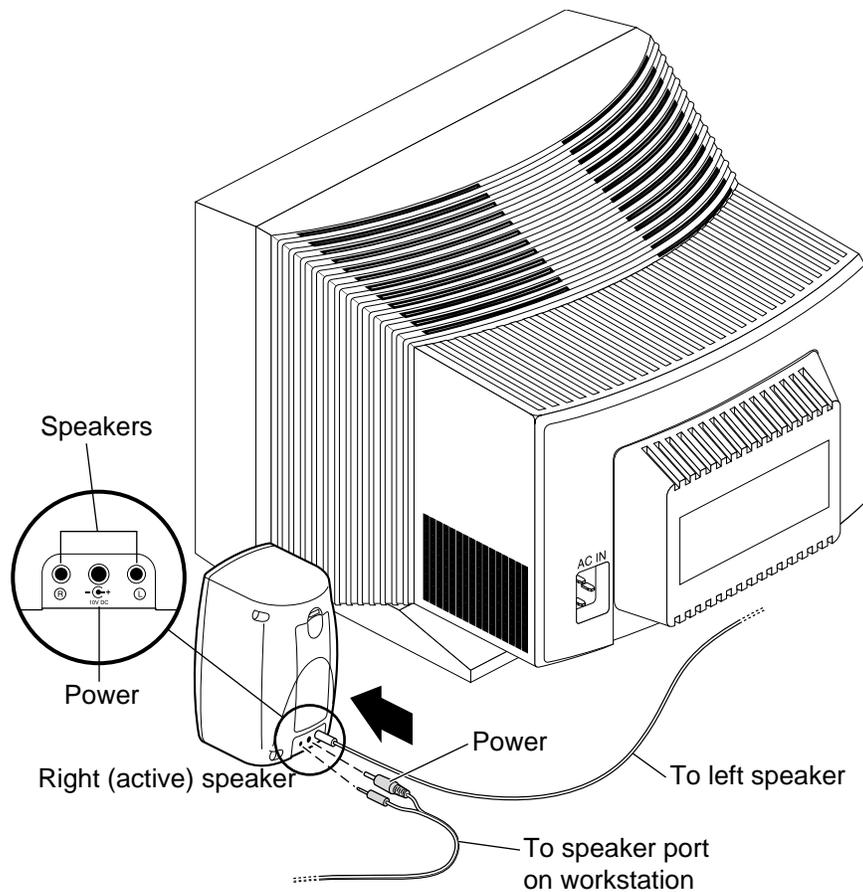


Figure 1-8 Attaching the Speaker and Power Cable to the Active Speaker

6. Connect the active speaker to your workstation, using the cable with two male connectors on the end, as shown in Figure 1-9.
 - Connect the smaller male connector to the speaker power port.
 - Attach the larger male connector to the speaker port.

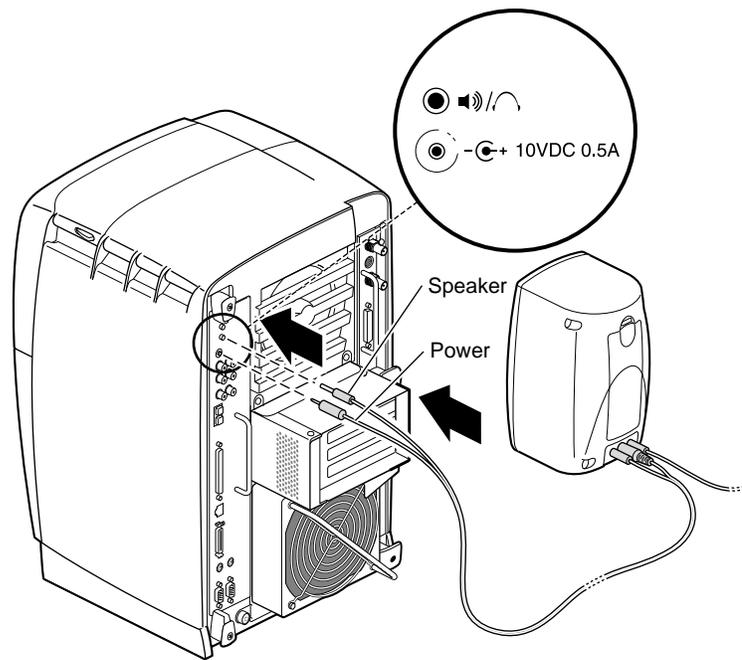


Figure 1-9 Connecting the Speaker and Power Cables

7. Set up the microphone, as shown in Figure 1-10.
 - Place the microphone cord through the slot in the microphone base.
 - Slide the microphone back until it is firmly connected to its base.
 - Place the microphone and base on the center-top area of the monitor.
 - Place the microphone cable over the back of the monitor.

Attach the cable to the microphone port on your workstation.

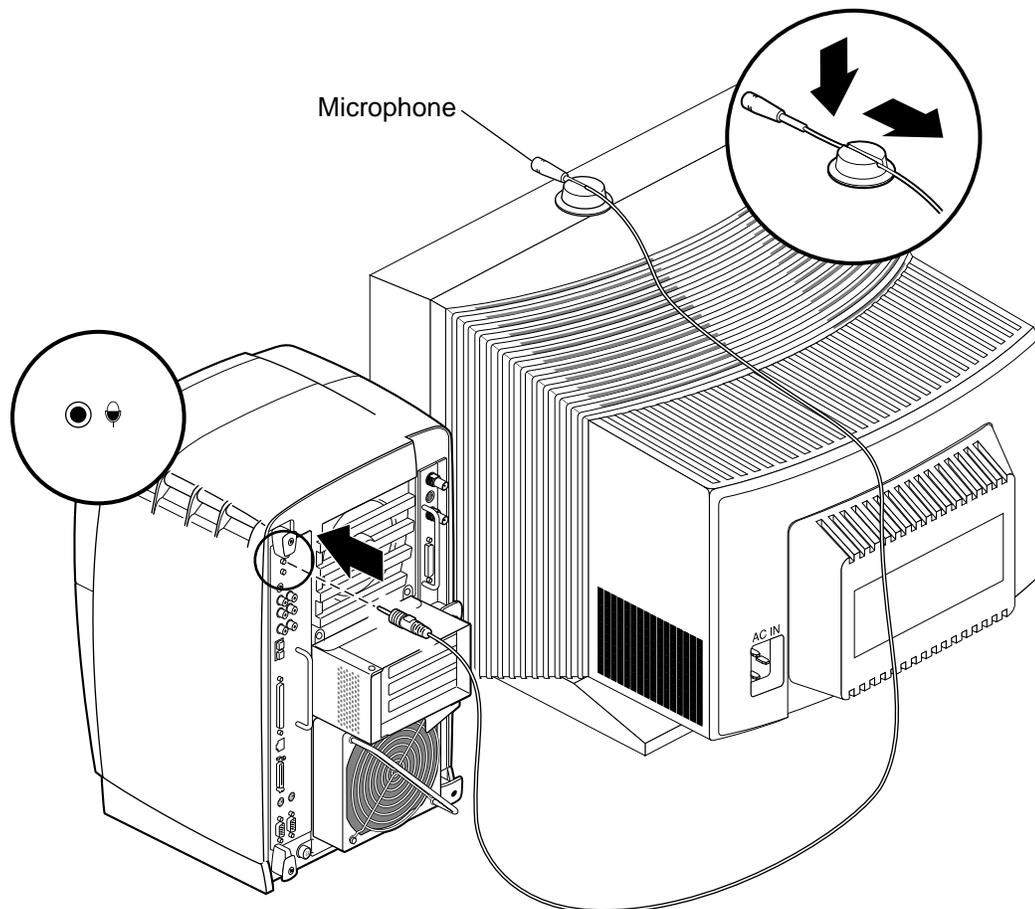


Figure 1-10 Attaching the Microphone

8. Connect the monitor and power cables, as shown in Figure 1-11.
 - Connect the monitor-to-graphics cable (A) to the monitor.
 - Connect the monitor-to-graphics cable (B) to the monitor connector on the back of your workstation.
 - Connect the monitor power cable (C) to the monitor.
 - Connect the Octane2 power cable (D) to the back of your workstation.

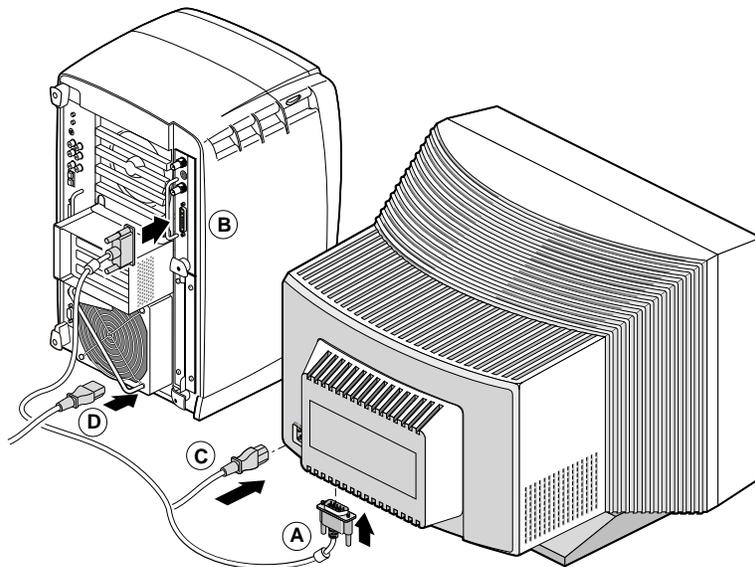


Figure 1-11 Connecting the Monitor and Power Cables

9. Connect the power cables from your workstation and monitor to an electrical outlet, as shown in Figure 1-12.

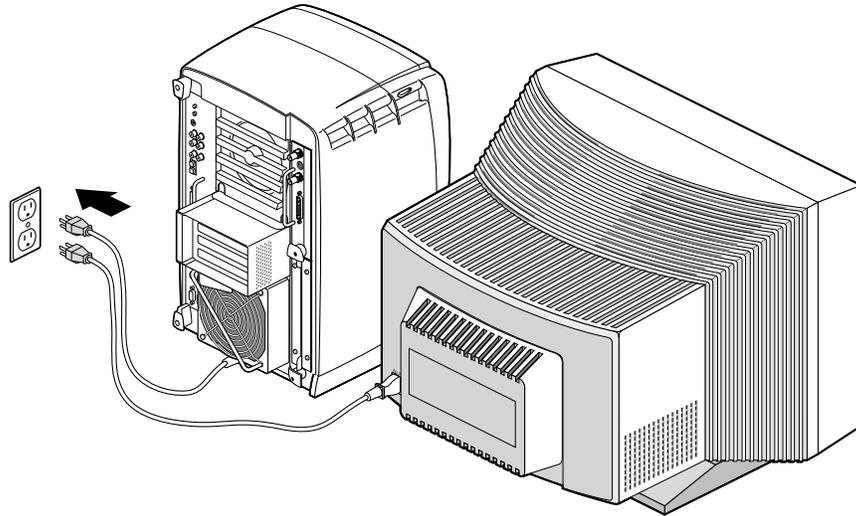


Figure 1-12 Connecting the Monitor and Power Cables to an Electrical Outlet

10. Press the power button on your monitor, as shown in Figure 1-13.

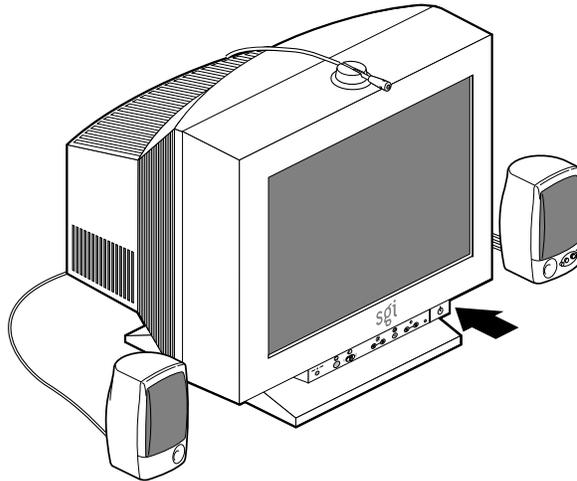


Figure 1-13 Powering On the Monitor

11. Press the power button on the active speaker, as shown in Figure 1-14.
If you are installing the lockbar, see “Locking the Octane2 Workstation” on page 18.
If you are not installing the lockbar, proceed to the next step.

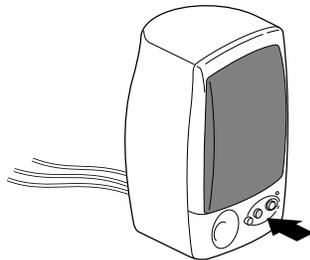


Figure 1-14 Powering On the Speakers

12. Press the power button on your workstation, as shown in Figure 1-15.

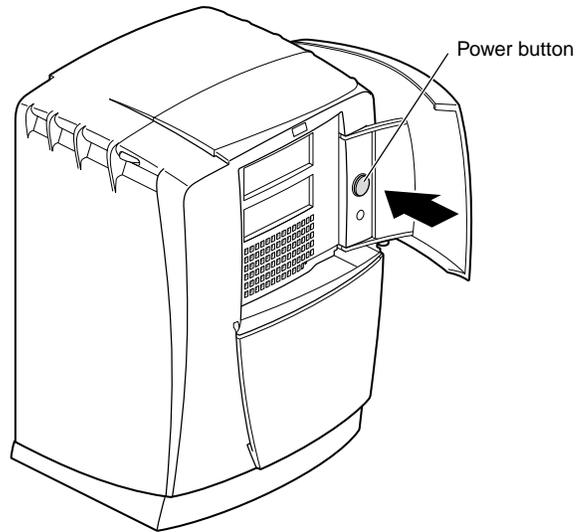


Figure 1-15 Powering On the Octane2 Workstation

You just completed your workstation setup. Now you are ready to log in. See “Logging In to the Octane2 Workstation” on page 21.

Locking the Octane2 Workstation

The lockbar locks the bezel and system module to the chassis. Locking the bezel prevents the option and system drives from being removed. Locking the system module prevents the memory (DIMMs) and processor (CPU) from being removed.

The lockbar slot is located behind your workstation's front door.

1. Open the door of your workstation.
2. Locate the lockbar slot, as shown in Figure 1-16.

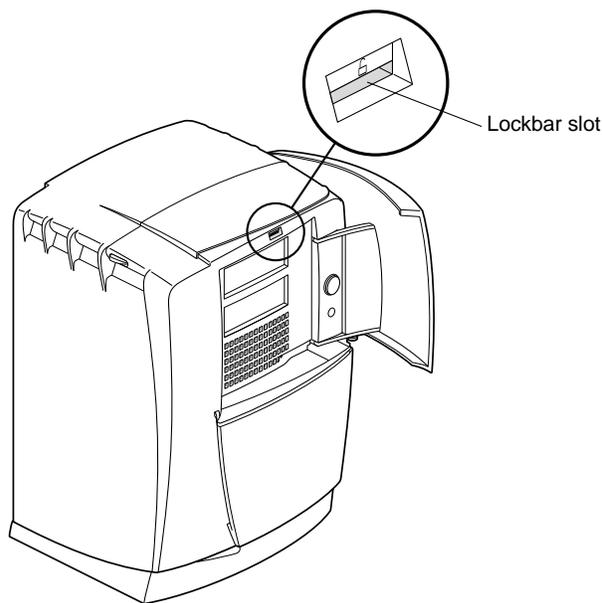


Figure 1-16 Locating the Lockbar Slot

3. Slide in the lockbar (A), as shown in Figure 1-17.
4. Secure it with a lock (B).
5. Close the door.

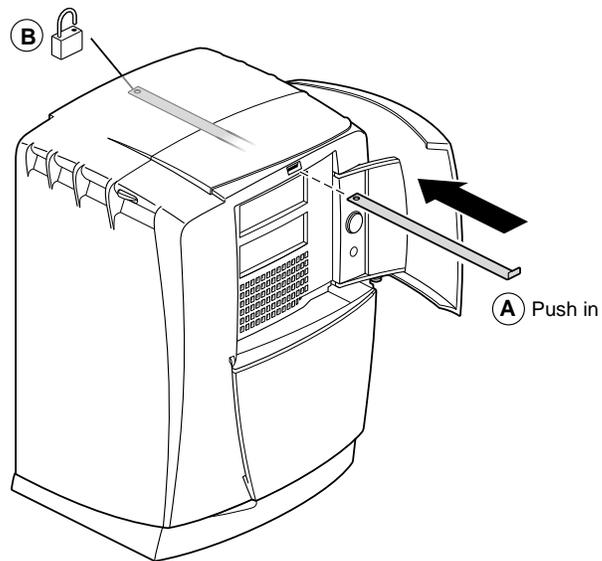


Figure 1-17 Inserting the Lockbar

6. Power on your workstation, as shown in Figure 1-18.

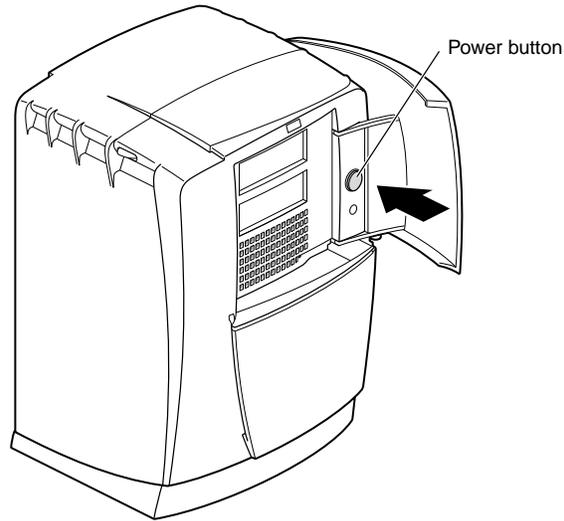


Figure 1-18 Powering On the Octane2 Workstation

You just completed your workstation setup. Now you are ready to log in.

Logging In to the Octane2 Workstation

If your system is booting for the first time, you see a login screen similar to the example shown in Figure 1-19.



Figure 1-19 Login Screen

If you have a login account, an icon with your login name appears. Double-click the icon.

If you do not have a login account, double-click *EZsetup*, then follow the instructions for creating a personal login account and setting up the networking software.

After creating a personal login account and setting up the networking software, you can create a personal work area and begin communicating with other users on your network.

Using the IRIX Interactive Desktop

Now you are ready to use the IRIX Interactive Desktop.

The IRIX Interactive Desktop and Its Icons

By default, several icons appear on your desktop: a folder icon representing your home directory, a dumpster icon, and icons for any peripherals you installed, as shown in the examples in Figure 1-20.

The peripheral icons show the current state of the respective devices. For example, if you insert a music CD into the compact disc player, the icon changes. When you double-click the icon, it opens CD Player, a utility that allows you to play music from a compact disc.



Figure 1-20 Peripheral Icons

The Toolchest

The Toolchest, located at the top left corner of your screen, provides access to system functions, applications, hardware and software information, and documentation, as shown in Figure 1-21.

Note: For a complete description of the Toolchest, choose Toolchest > Help > InfoSearch, and type **Desktop Users Guide**.



Figure 1-21 Toolchest Menu

System Manager

Click Toolchest > System > System Manager to display the System Manager, which shows your workstation's hardware and software information.

Online Documentation

Click Toolchest > Help to display the library of online documentation. If your workstation is turned off and you cannot access online documentation, this printed guide contains all the information you need. You can also access this guide and most manuals, man pages, and release notes in the Technical Publications Library at <http://techpubs.sgi.com/library>, and through InfoSearch, as described in the next section.

InfoSearch

Click Toolchest > Help > InfoSearch and type the name of the desired book or topic to search online books, man pages, and release notes that cover end user, developer, and system administrator information. With InfoSearch, you can also access *Octane2 Hardware Central* and the online version of this guide, as described earlier in this chapter.

The Console Window

The small box next to the Toolchest is the Console window, as shown in Figure 1-22. It appears as a small box because it is minimized. You can open it to its full size by clicking it. Many system error messages appear in this window.



Figure 1-22 Console Window

If you click in the Console window, the IRIX shell appears, where you can type IRIX commands. For information on IRIX commands, choose Toolchest > Help > Online Books > SGI_End User > Desktop Users Guide > Using IRIX Commands.

Shutting Down and Powering Off the Octane2 Workstation

There are two ways to shut down and power off your workstation:

- Press the power button to shut down the system software and power off.
- Choose Toolchest > System > Shut Down System to shut down the system software and return to the System Maintenance menu or power off.

Using the Power Button to Shut Down and Power Off

To use the power button to power off your workstation, follow the instructions below.

1. Open the door on the front of your workstation.
2. Press the power button, as shown in Figure 1-23.

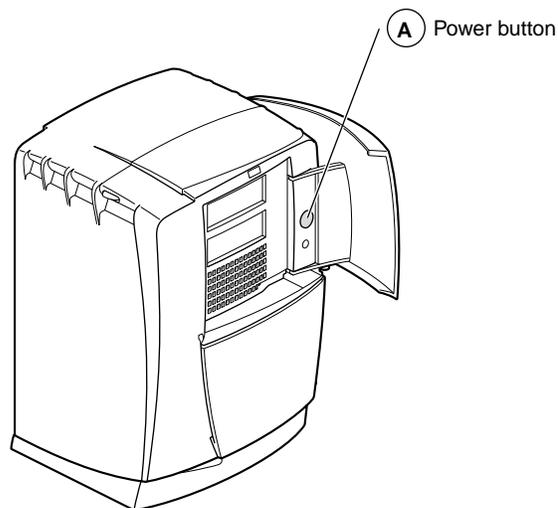


Figure 1-23 Powering Off the Octane2 Workstation

Within a few seconds, a shutdown notifier appears, as shown in Figure 1-24. Within a minute, the system powers off automatically.



Figure 1-24 System Shutdown Notifier

3. Turn off your monitor by pressing the monitor power button.

If your system does not power off and you do not see any activity for several minutes, follow the next step.

4. Press the power button again.

Note: If you press the power button a second time, the system should power off immediately, but this method does not perform a clean shutdown. Avoid using this method unless the system does not respond for several minutes after initially pressing the power button.

If pressing the power button a second time does not work, use a pencil or pen to press the reset button, shown in Figure 1-25. If the system still fails to power off, unplug the power cable from the back of your workstation and contact your service provider.

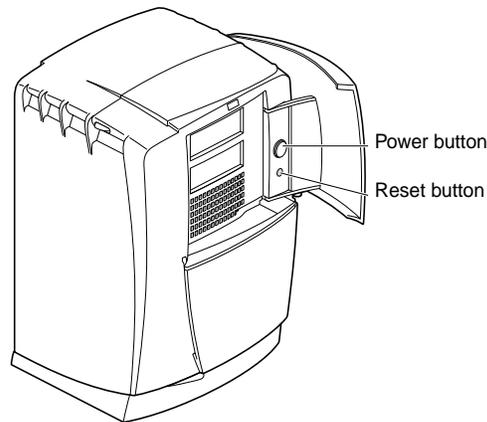


Figure 1-25 Power Button and Reset Button

Using the Toolchest to Shut Down

If you are logged in with your root password, you can use the System menu in the Toolchest to shut down your system.

1. Choose Toolchest > System > System Shutdown.

After a few seconds a shutdown caution message appears, as shown in Figure 1-26.

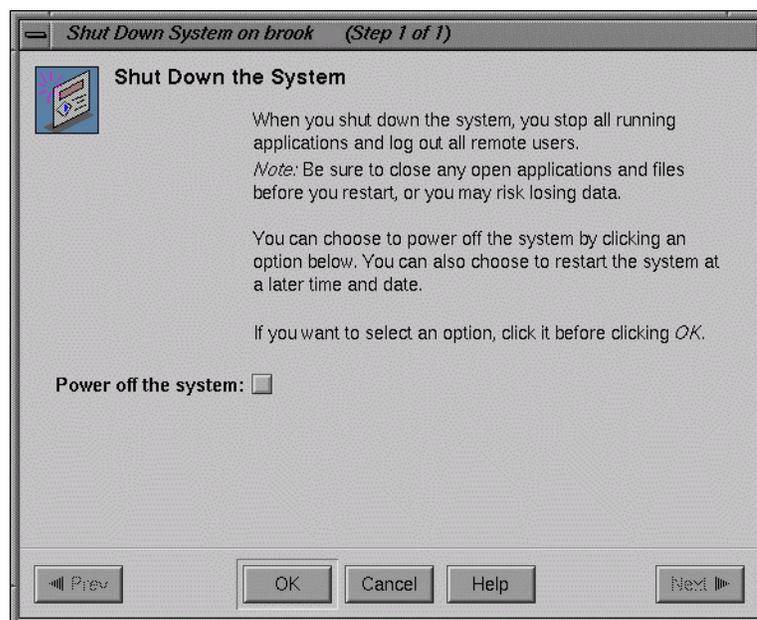


Figure 1-26 Shutdown Caution Message

2. Click the *Power Off the System* check box.

The *Restart the system* option appears. At this point, you can shut down and power off the system or restart it at the designated time, as shown in Figure 1-27.

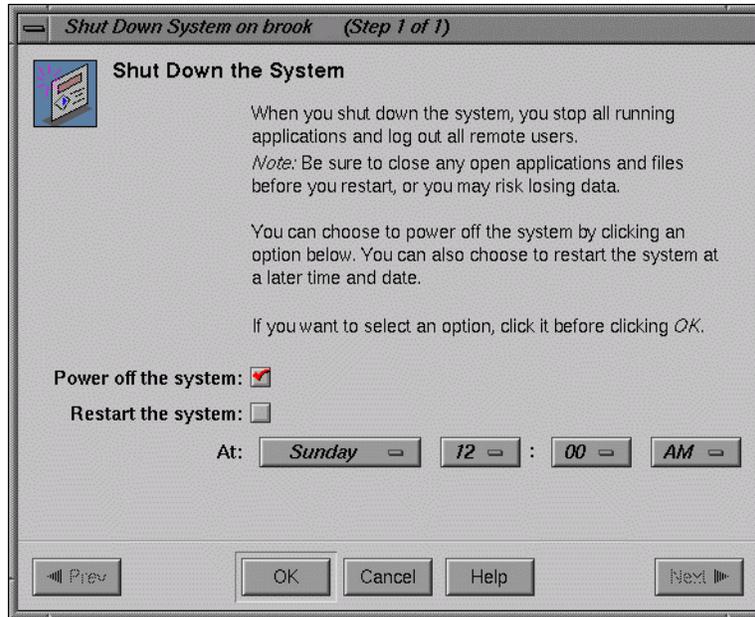


Figure 1-27 Restart System Option

3. Click *OK* to shut down and power off the system.

The shutdown notifier appears, as shown in Figure 1-28. After a few seconds, the system powers off.



Figure 1-28 System Shutdown Notifier

Using the Toolchest to Restart

If you are logged in with your root password, you can use the System menu in the Toolchest to restart.

1. Choose Toolchest > System > Restart.

After a few seconds the restart notifier appears, as shown in Figure 1-29.

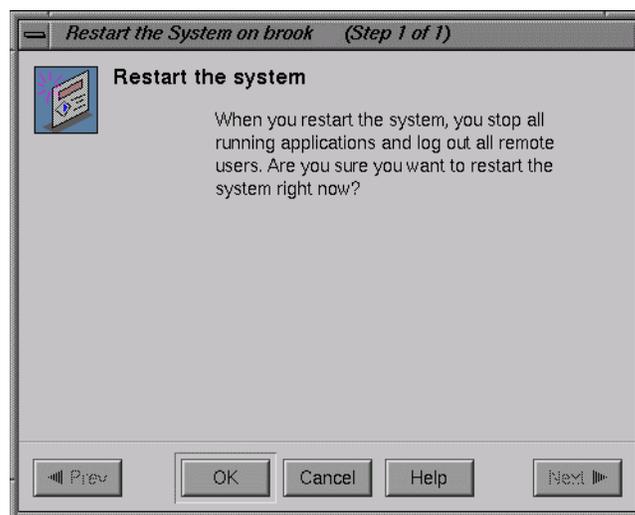


Figure 1-29 Restart Notifier

2. Click *OK* in the restart notifier.

The shutdown notifier appears, as shown in Figure 1-30.



Figure 1-30 System Shutdown Notifier

After a brief delay, the power off/restart notifier appears, as shown in Figure 1-31.

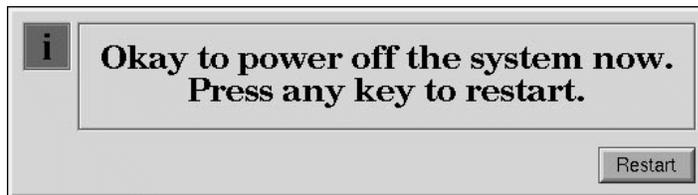


Figure 1-31 Power Off/Restart Notifier

3. Click *Restart* in the power off/restart notifier.

The restart notifier informs you that the system is coming up (restarting), as shown in Figure 1-32.



Figure 1-32 Restart Notifier

Installing and Removing the CPU and Memory

This chapter shows you how to remove and install both the central processor unit (CPU) and memory (DIMMs), which are located in the same area of your workstation. The following topics are covered:

- “Preparing the Workstation” on page 32
- “Removing the System Module” on page 36
- “Removing and Replacing the CPU” on page 41
- “Installing and Removing Memory” on page 47
- “Reinstalling the System Module” on page 53
- “Powering On the Octane2 Workstation” on page 58
- “Verifying Memory Installation” on page 60

Preparing the Workstation

To prepare your workstation for installation or removal of a CPU or memory, follow these steps:

1. Open the cover and press the power button (see A in Figure 2-1) to power off your workstation.
2. Unplug the power cable (B) from the electrical outlet and from your workstation.
3. Press the monitor power switch (C) to turn off your monitor.

Wait 5 minutes before removing the system module.

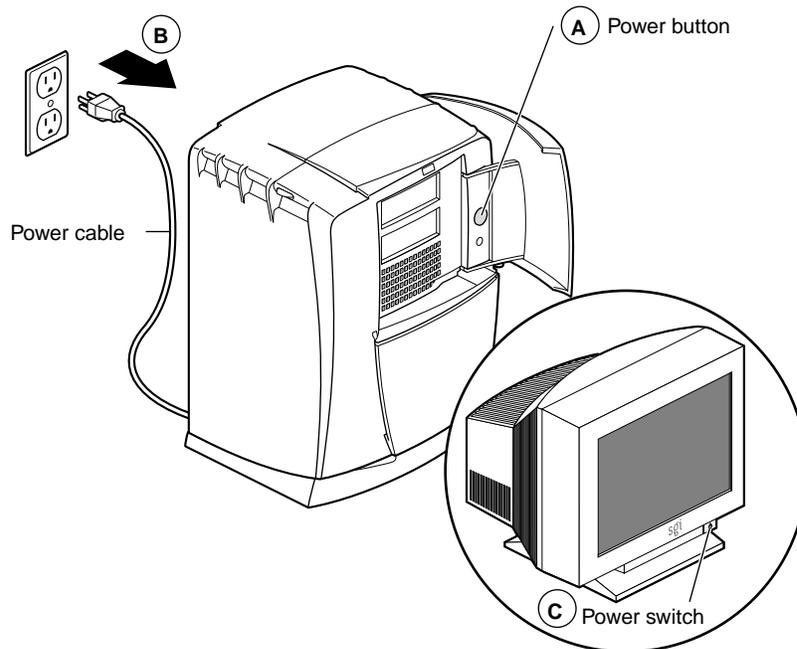


Figure 2-1 Powering Off the Octane2 Workstation



Warning: The heat sinks on the CPU and system module get very hot. Wait 5 minutes after powering off your workstation before you remove the system module. Test before touching the CPU or heat sinks.

4. If your system has a lockbar installed remove it (a lockbar locks the system module and bezel to the chassis).
 - Unlock the lock (see A in Figure 2-2) at the back of your workstation.
 - Pull the lockbar (B) out of your workstation.

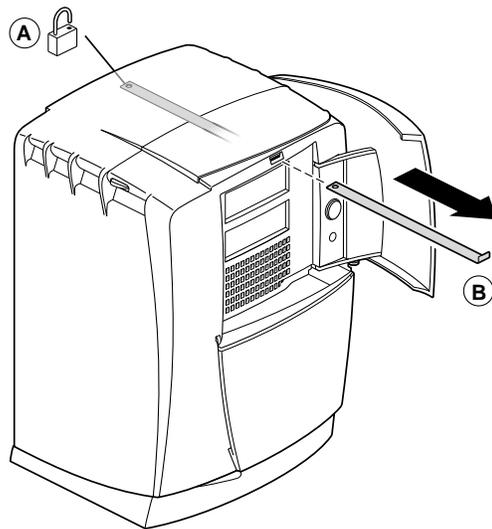


Figure 2-2 Removing the Lockbar

5. Face the rear of your workstation.
6. Remove the cables attached to the system module, as shown in Figure 2-3.

Note: For illustration purposes, the optional PCI module is shown installed. For a description of the PCI module, go to Chapter 4, “Installing and Removing PCI Boards.”

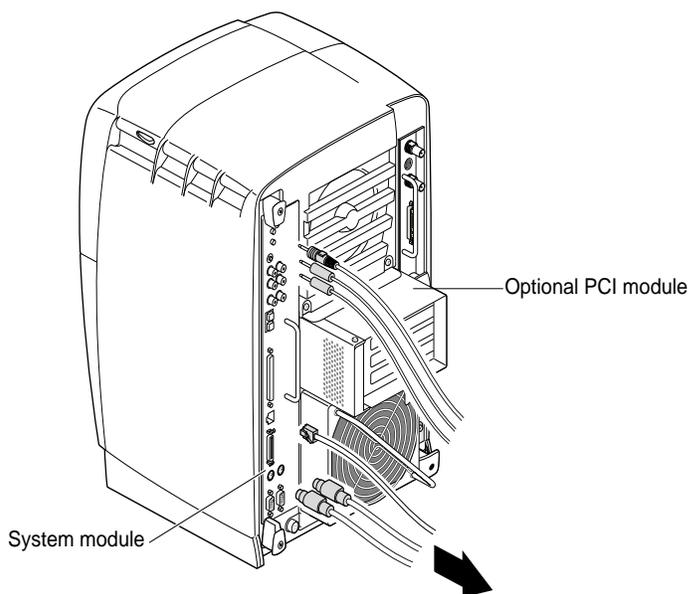


Figure 2-3 Removing the Cables from the System Module

Attaching the Wrist Strap

Caution: The components inside your workstation are extremely sensitive to static electricity. Always wear the wrist strap when you replace parts inside your workstation.

1. Unroll the first two folds of the band (see A in Figure 2-4).
2. Wrap the exposed adhesive side firmly around your wrist (B), unroll the rest of the band, then peel the liner from the copper foil at the opposite end.
3. Attach the copper foil to any exposed electrical ground, such as a metal part of the workstation (C).

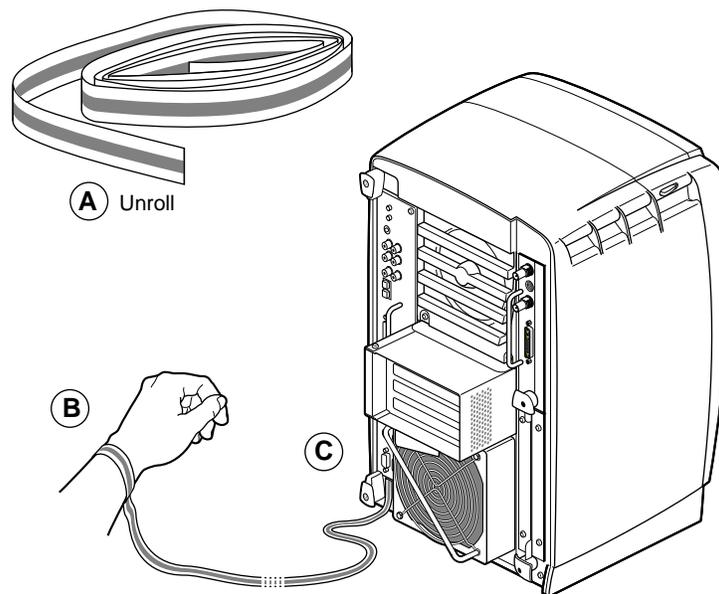


Figure 2-4 Attaching the Wrist Strap to the Chassis

Removing the System Module

1. Use the provided Phillips screwdriver to loosen the two captive screws that secure the sliding handles to the workstation, as shown in Figure 2-5.

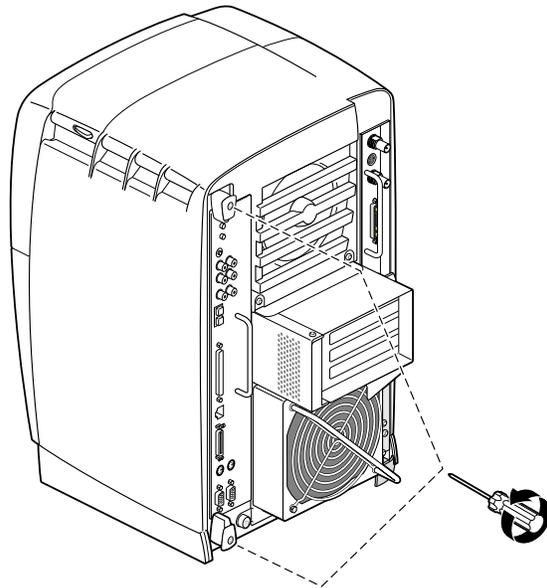


Figure 2-5 Loosening the System Module Screws



Warning: The heat sinks on the CPU and system module get very hot. Wait 5 minutes after powering off your workstation before you remove the system module. Test before touching the CPU or heat sinks.

After powering off your workstation, attaching the wrist strap, and waiting five minutes for the heat sinks to cool, you can remove the system module.

2. Pull both sliding handles simultaneously until they are completely extended, as shown in Figure 2-6.

This action releases the system module from the workstation.

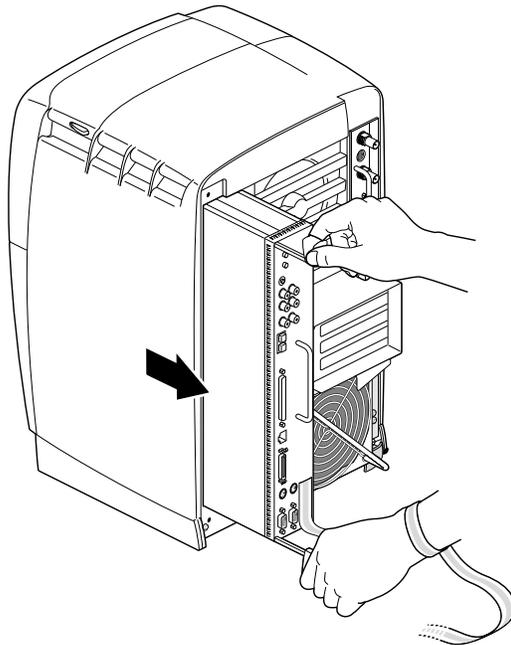


Figure 2-6 Releasing the System Module from the Frontplane

3. Pull the system module from the chassis by grasping the immovable handle with your left hand and bracing your right hand against the top of the workstation, as shown in Figure 2-7.
Support the bottom of the module as you pull it out.
4. Place the system module on a dry, antistatic surface (such as your desktop) with the CPU and DIMMs facing up.

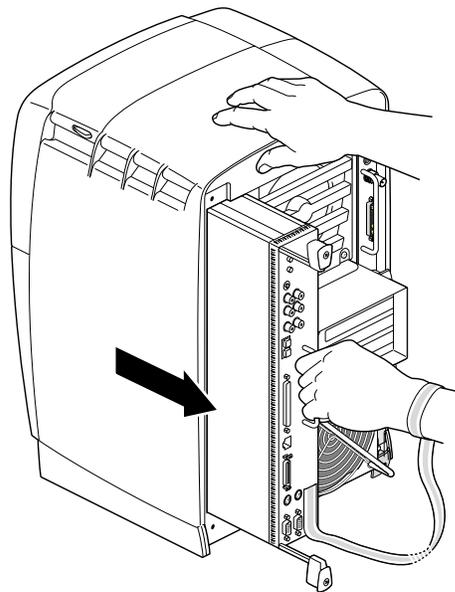


Figure 2-7 Removing the System Module from the Chassis

Caution: When you remove the system module from the chassis, do not touch the two compression connectors at the back of the system module, as shown in Figure 2-8. The gold bristled pad on each compression connector is very delicate and easily damaged (see Figure 2-9). Before you remove the system module, read Appendix A, “Care and Cleaning of Compression Connectors.”

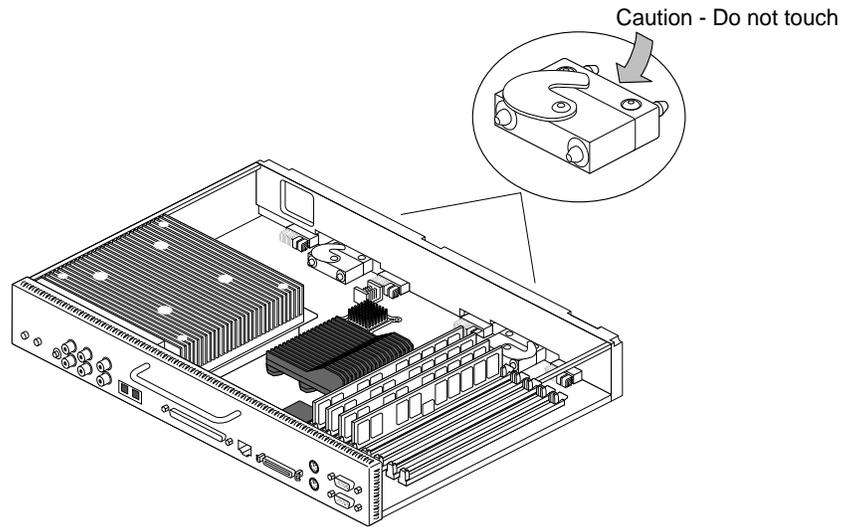


Figure 2-8 Locating the Compression Connectors

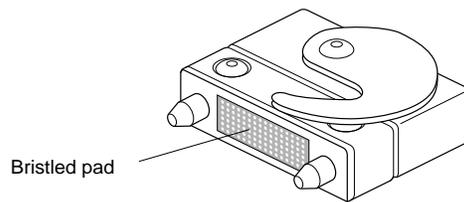


Figure 2-9 Bristled Pad on Compression Connector

5. Place a cap on each compression connector on the back of the system module, as shown in Figure 2-10 (compression connector caps are included with your workstation.)

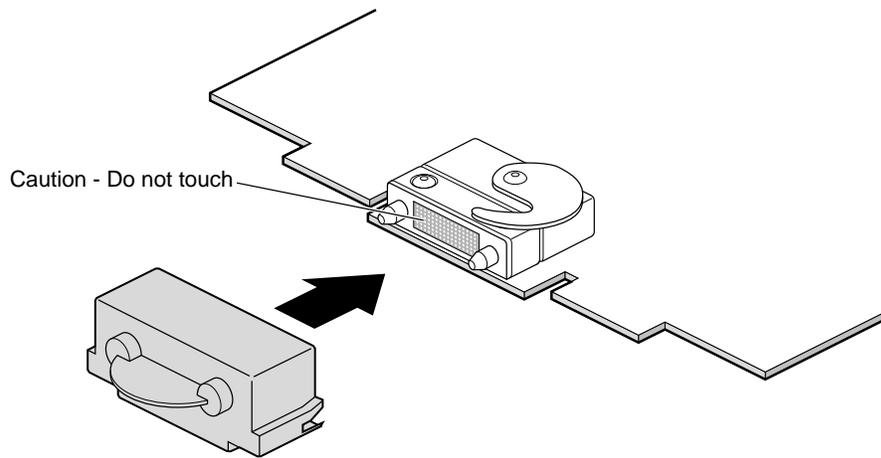


Figure 2-10 Placing the Compression Cap on the Compression Connector



Warning: The heat sinks on the CPU and system module get very hot. Wait 5 minutes before touching them, and then test before touching them.

Removing and Replacing the CPU

Your workstation has either a single CPU or a dual CPU installed. Following are instructions for removing and replacing each type of CPU. Follow the same instructions for CPUs of different speeds.

Removing the CPU

To remove a CPU, power off your workstation, wait 5 minutes to allow the heat sinks to cool, and attach the wrist strap. Then remove the system module, as described earlier in this chapter, beginning on page 36, and follow these steps.

1. Loosen the four captive slotted screws holding the CPU in place, as shown in Figure 2-11 (the dual processor has six captive screws).

Caution: Do not remove the four inner screws (not slotted) that hold the heat sink to the CPU.

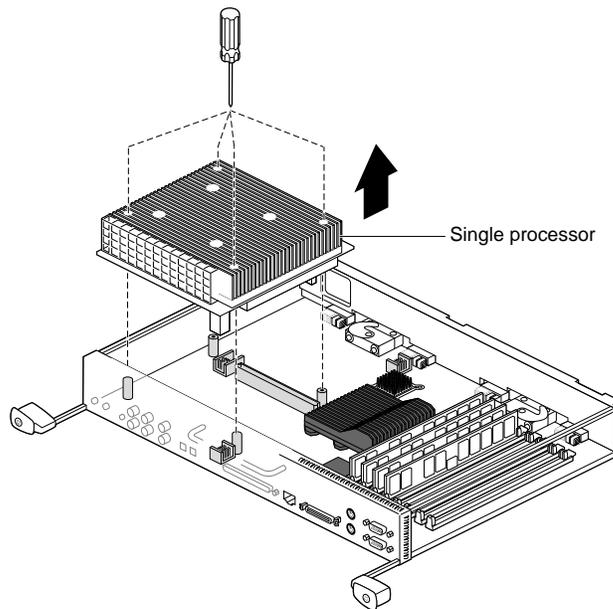


Figure 2-11 Removing a Single Processor

2. To release a single processor, slide your fingers under its edge closest to the back of the module, then push up to release it, as shown in Figure 2-12. You may need to use two hands to lift it out.

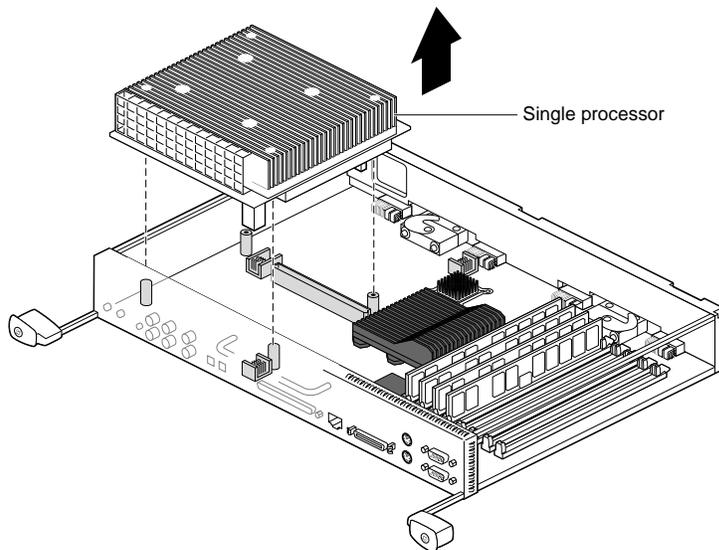


Figure 2-12 Lifting a Single Processor from the System Module

If you have a dual processor, slide your fingers under the side bar of the system module and under the processor, then push up to release it, as shown in Figure 2-13. After releasing the dual processor, lift it out of the system module.

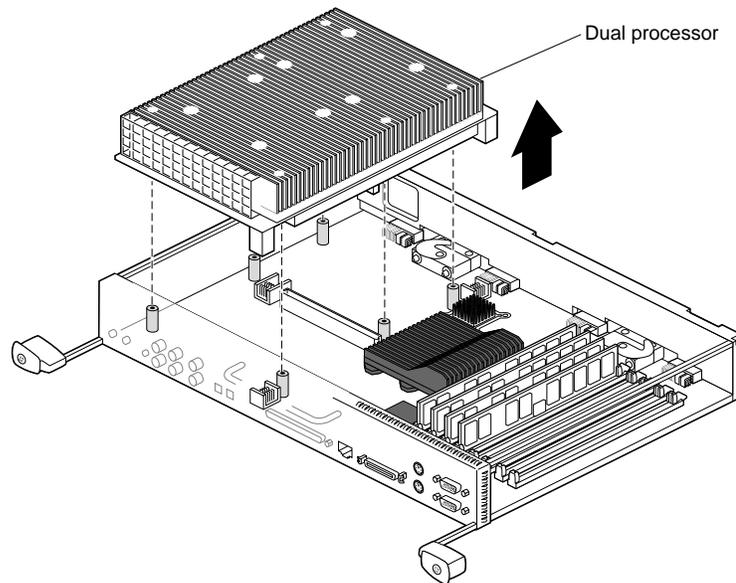


Figure 2-13 Lifting a Dual Processor from the System Module

Replacing the CPU/Processor

To install a new CPU, power off your workstation, wait 5 minutes to allow the heat sinks to cool, and attach the wriststrap. Then remove the system module and the currently installed CPU, as described earlier in this chapter, and follow these steps:

1. Turn over the CPU to find the connectors on the base, as shown in Figure Figure 2-14.
2. Align the connectors with the connectors on the system board.

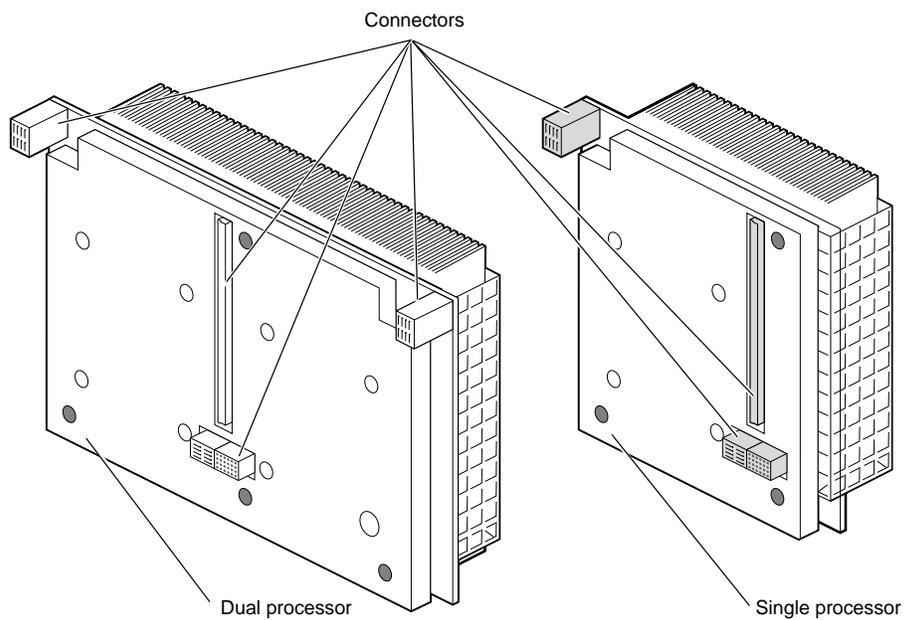


Figure 2-14 Viewing the Connectors on the Underside of the CPU

3. If you are installing a single processor, place it on the side of the system module closest to the panel of connectors, as shown in Figure 2-15.
4. Lower the CPU onto the standoffs and connectors.
5. Tighten the four captive screws to the standoffs (the dual processor has six captive screws).

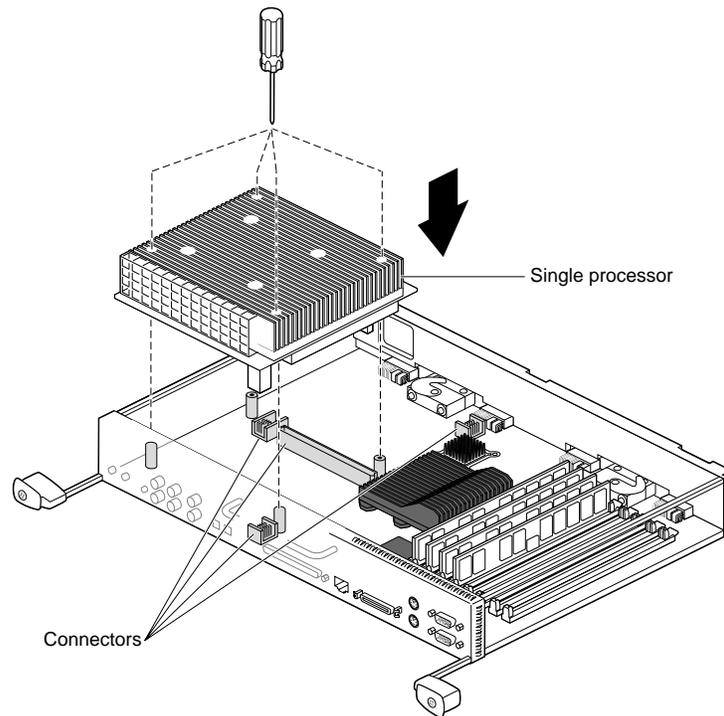


Figure 2-15 Installing a Single Processor

Figure 2-16 shows a dual processor installation.

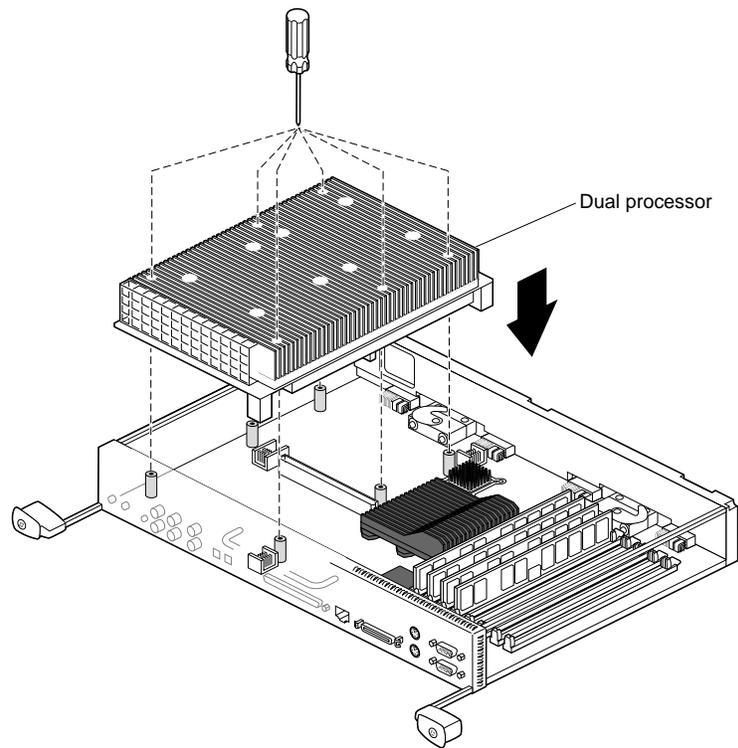


Figure 2-16 Installing a Dual Processor

You are finished replacing the CPU and are ready to reinstall the system module.

Go to “Reinstalling the System Module” on page 53.

Installing and Removing Memory

To install or remove memory, you must power off the workstation, wait 5 minutes to allow the heat sinks to cool, and attach the wrist strap. Then remove the system module. Follow the instructions for “Preparing the Workstation” on page 32 through, “Removing the System Module.” Then return to this page.

Caution: Dual inline memory modules (DIMMs) are extremely sensitive to static electricity. Handle the DIMMs carefully and wear the wrist strap to avoid the flow of static electricity.

About Memory

The Octane2 workstation has four DIMM banks with two DIMM sockets in each of the banks. Before you install the two 1 GB DIMMs, review the following information:

- Bank 1 (sockets 1 and 2) must always be filled.
- The highest density DIMMs must be installed in Bank 1, while lower density DIMMs must be installed in the remaining banks by order of their size (highest density first).
- Banks must be filled sequentially; when Bank 1 is full, fill Bank 2. Do not skip banks.
- Each bank must be empty, or contain two DIMMs, one in each of the two sockets.
- Capacity refers to the number of megabytes or gigabytes of memory in a DIMM: 32, 64, 128, or 256 MB, and so on, or 1 GB.
 - Minimum memory capacity is 64 MB (2 x 32 MB DIMM).
 - Maximum memory capacity is 8 GB (8 x 1 GB DIMM).
 - Minimum memory configuration is 64 MB in a bank (2 x 32 MB DIMM).
 - Maximum configuration is 2 GB in a bank (2 x 1 GB DIMM).

Figure 2-17 shows the four Octane2 DIMM banks, with two DIMM sockets in each bank.

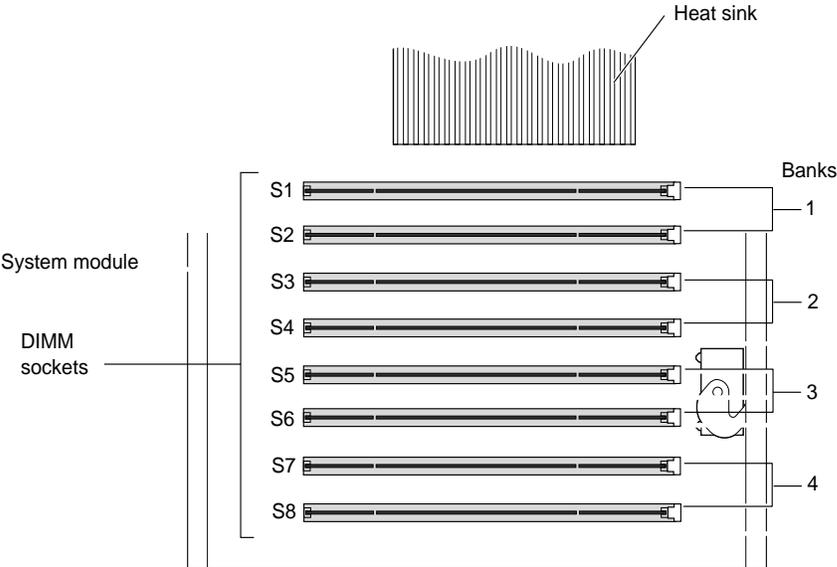


Figure 2-17 Identifying DIMM Sockets and DIMM Banks

Locating the DIMMs on the System Module

If you did not power off your workstation, wait 5 minutes to allow the heat sinks to cool, attach the wrist strap, and remove the system module, follow the instructions for preparing your workstation beginning on page 32.

With the system module lying on a flat, dry, antistatic surface, locate the DIMM banks and sockets, as shown in Figure 2-17 and Figure 2-18.

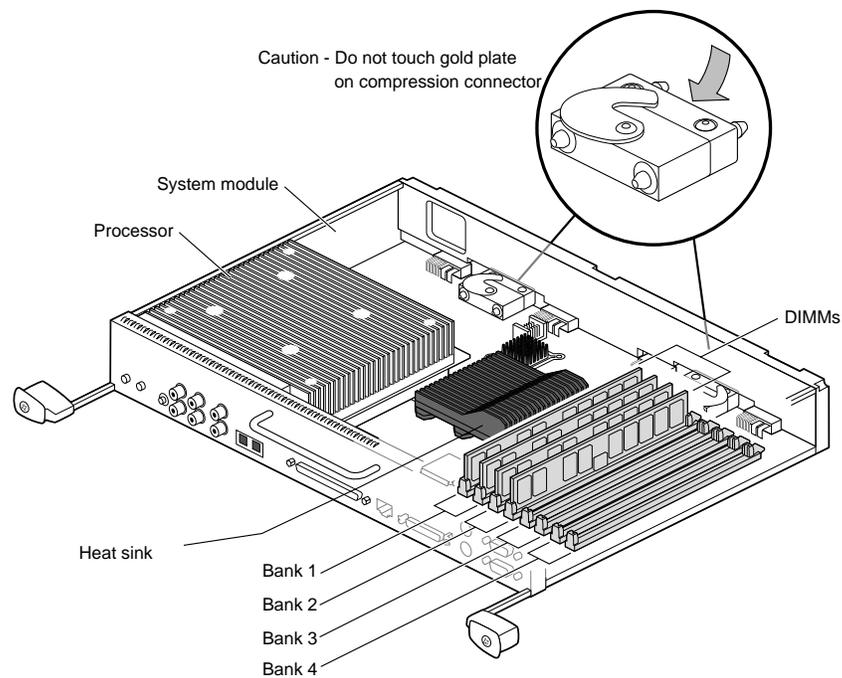


Figure 2-18 Locating DIMMs on the System Module (DIMM bracket not installed)

Removing the DIMM Bracket

If a DIMM bracket is not installed (see Figure 2-18), skip this section. If a DIMM bracket is installed, as shown in Figure 2-19, you must remove it as follows:

1. Remove the DIMM bracket from the rail by pushing it toward the heat sink (see the warning on page 32), and bowing the bracket upward, as shown in Figure 2-19.
2. Slide the bracket off the heat sink.

Caution: Memory modules are extremely sensitive to static electricity. Handle the modules carefully, and wear the wrist strap.

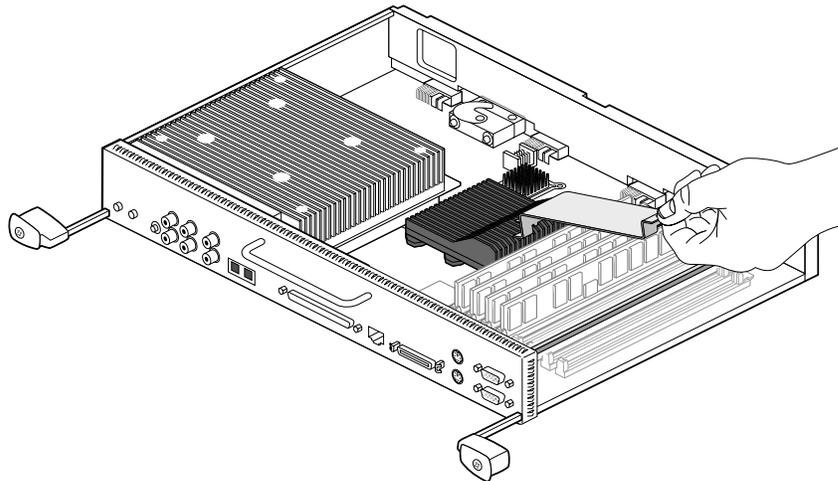


Figure 2-19 Removing the DIMM bracket

Note: The DIMM bracket is *not* required for normal operation of your workstation. It was installed in your workstation to protect the DIMMs during shipping. Store the DIMM bracket in a safe place. If you need to ship your workstation, reinstall the bracket to protect the DIMMs.

Removing Memory

Memory modules are extremely sensitive to static electricity. Handle the modules carefully, and wear the wrist strap while removing them.

1. Locate the DIMMs you want to remove.

Caution: Do not touch the connector near the DIMM removal levers.

2. Remove the DIMMs.

- Press down on the latch at the end of the DIMM socket (see A in Figure 2-20). The DIMM partially ejects from the socket.
- Remove the DIMM (B).

Note: Both sockets in a DIMM bank must be either empty or populated. If you are removing one DIMM and not replacing it immediately, also remove the other DIMM in the bank and replace it when you install a new DIMM.

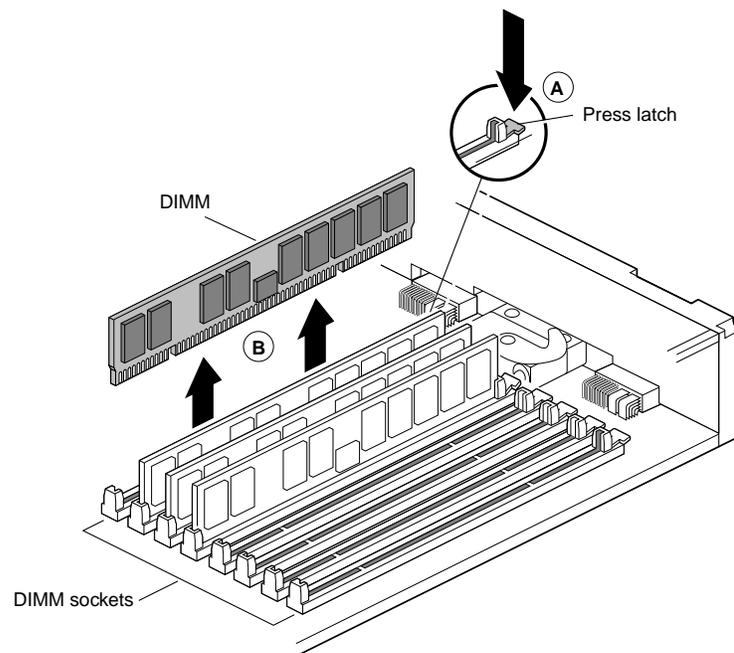


Figure 2-20 Removing a DIMM

Installing Memory

If you did not power off your workstation, wait 5 minutes to allow the heat sinks to cool, attach the wrist strap, and remove the system module, follow the instructions for preparing your workstation beginning on page 36. Then follow these steps:

1. Insert the DIMM into the socket, gently but firmly.
You hear a click as it is seated, and the latch on the end of the socket moves up.
DIMMs are notched on the bottom, as shown in Figure 2-21, so that they cannot be inserted incorrectly.
2. Check to be sure both sockets in the bank are full. DIMMs must be installed in pairs.

You are finished installing memory and are ready to reinstall the system module.

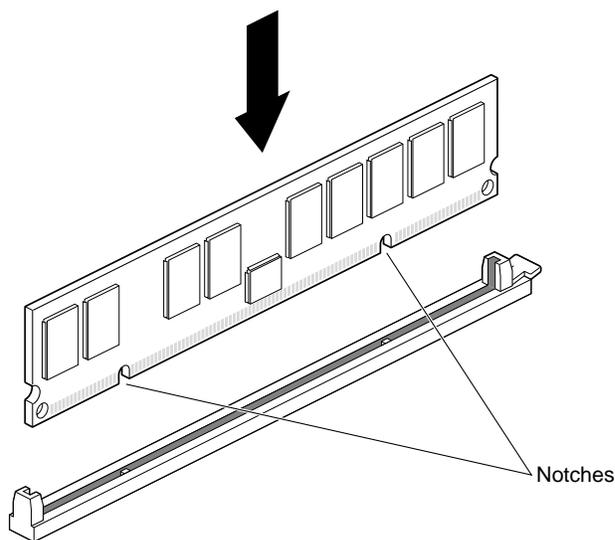


Figure 2-21 Locating the Notches on a DIMM

Reinstalling the System Module

1. Remove the caps on the compression connectors on the back of the system module, as shown in Figure 2-22. Do not touch the system module compression connectors as you lift the module into the workstation.

Caution: Do not insert the system module into the workstation unless the power cable is unplugged from the electrical socket. If you insert the system module into the Octane2 workstation with the power cable connected to an electrical socket, the workstation will be damaged.

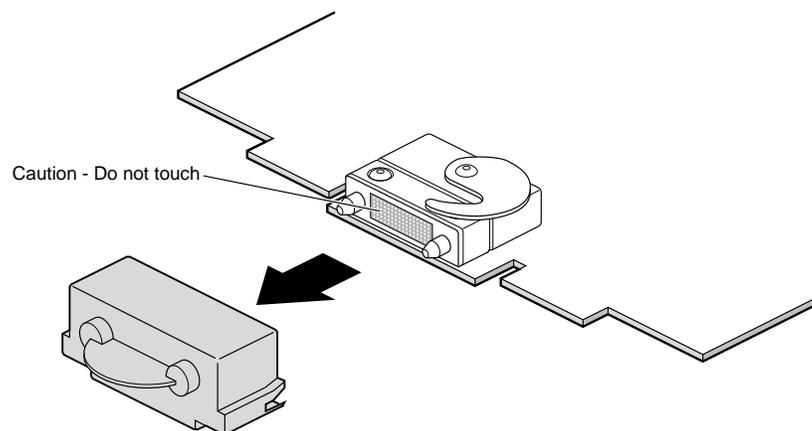


Figure 2-22 Removing the Compression Connector Cap

2. Grasp the system module by its immovable handle and support it with one hand as you slide it into the chassis, as shown in Figure 2-23. Then push the system module completely into the chassis (both sliding handles protrude).

The system module stops when it is slightly out of the chassis.

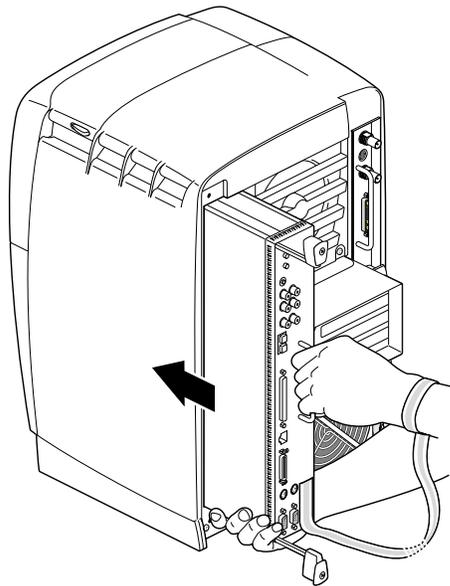


Figure 2-23 Supporting the System Module

3. Push both sliding handles simultaneously to connect the system module to the workstation, as shown in Figure 2-24. Then push firmly on the sliding handles to completely lock the system module to the workstation.

The system module is fully seated and locked to the workstation when it is flush with the chassis and the sliding handles are completely recessed.

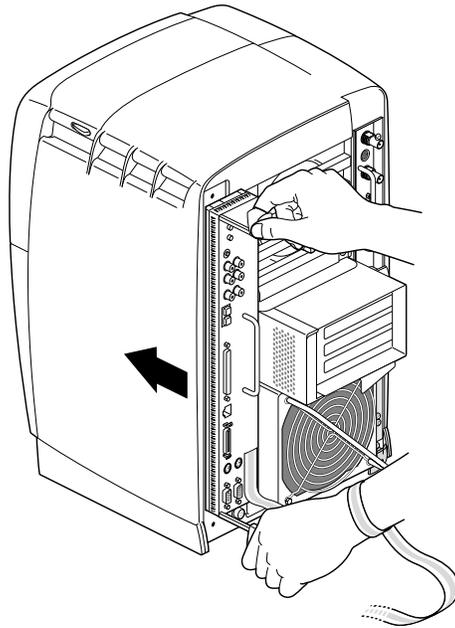


Figure 2-24 Locking the System Module to the Frontplane

4. Tighten the captive screws in the sliding handles until the system module is attached to the chassis, as shown in Figure 2-25.

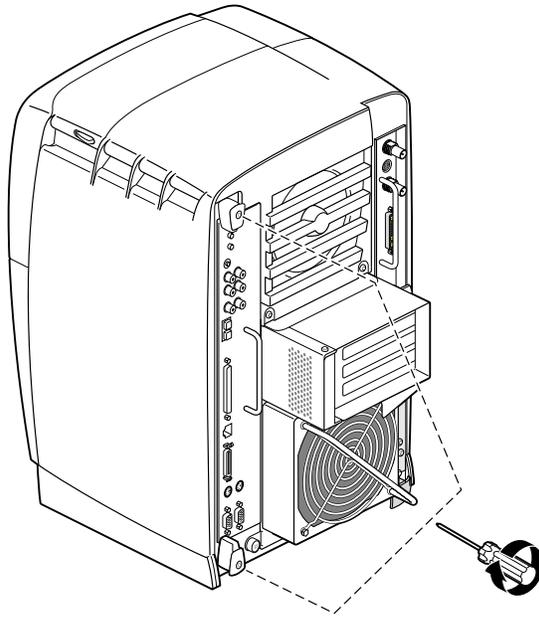


Figure 2-25 Tightening the System Module Screws

5. Remove the wrist strap.

6. Reconnect any cables you removed, as shown in the example in Figure 2-26.

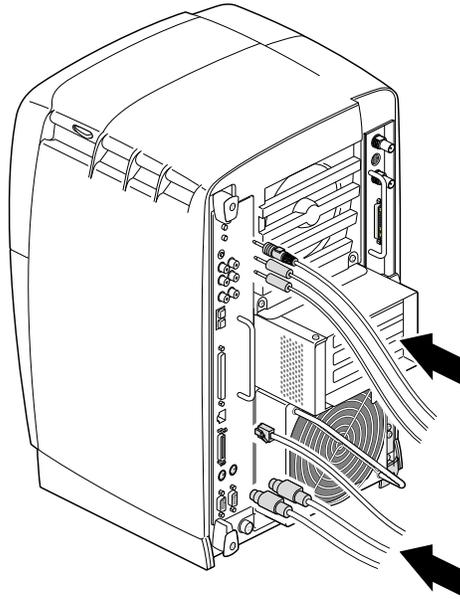


Figure 2-26 Reconnecting Cables to the System Module

Powering On the Octane2 Workstation

1. Plug in the power cable (see A in Figure 2-27).
2. Press the power button (B) on your workstation.
3. Press the monitor power button (C) to turn on your monitor.

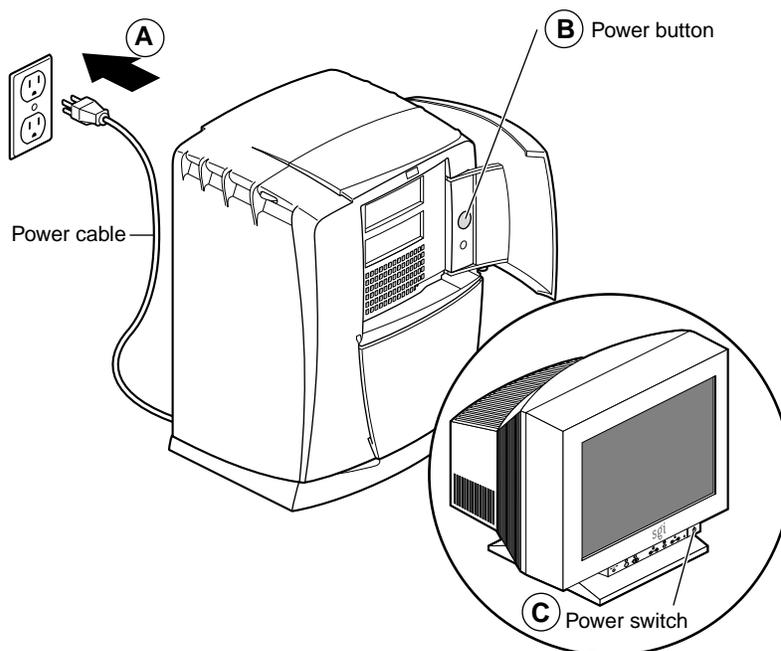


Figure 2-27 Powering On the Octane2 Workstation

4. Replace the lockbar.
 - Open the cover on the front of your workstation.
 - Slide the lockbar into the lockbar slot (see A in Figure 2-28).
 - Insert the lock (B) through the lockbar at the back of your workstation.

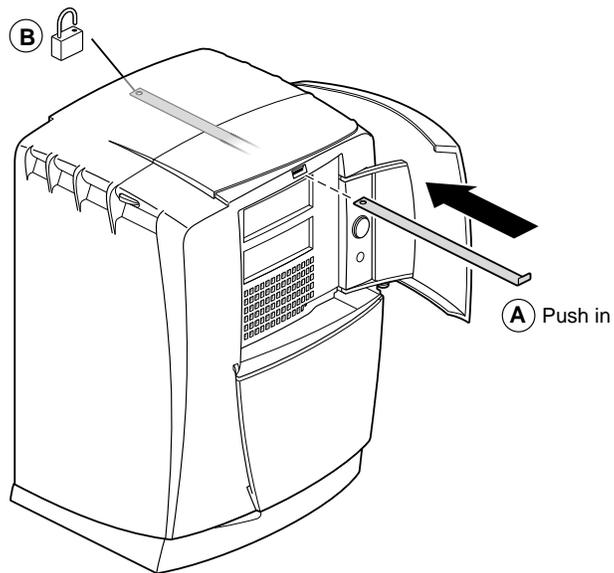


Figure 2-28 Installing the Lockbar

Verifying Memory Installation

1. After you power on your system, choose Toolchest > System Manager > Hardware and Devices > About This System and check the amount of memory displayed for Main Memory.

The displayed memory should equal the original amount of memory minus any memory you removed, plus the amount of memory you installed. For example, if you originally had 256 MB, removed two 32 MB DIMMs, and then installed two 1 GB DIMMs, the System Manager should display 2.192 GB of memory.

2. If the amount of memory is incorrect, follow the directions at the beginning of this chapter to power off your system and check the installation or removal procedure.
 - Check the angle of the DIMMs. They should be upright and completely seated.
 - Check that each bank is populated with two DIMMS, and that they are the same type. You must have an even number of DIMMS installed.
 - Recheck the installation procedure, then power on your workstation. If the amount of memory displayed in About This System is still incorrect, refer to Chapter 8, "Troubleshooting".

Installing and Removing the Power Supply

This chapter shows you how to remove and replace the Octane2 power supply, which is located at the bottom of your workstation. The following topics are covered:

- “Preparing the Workstation” on page 62
- “Removing the PCI Module” on page 64
- “Removing the Power Supply” on page 64
- “Installing the Power Supply” on page 66

Preparing the Workstation

Before removing the power supply, you must power off your workstation.

1. Open the cover and press the power button (see A in Figure 3-1) to power off your workstation.
2. Unplug the power cable (B) from the electrical socket.
3. Press the monitor power switch (C) to power off your monitor.

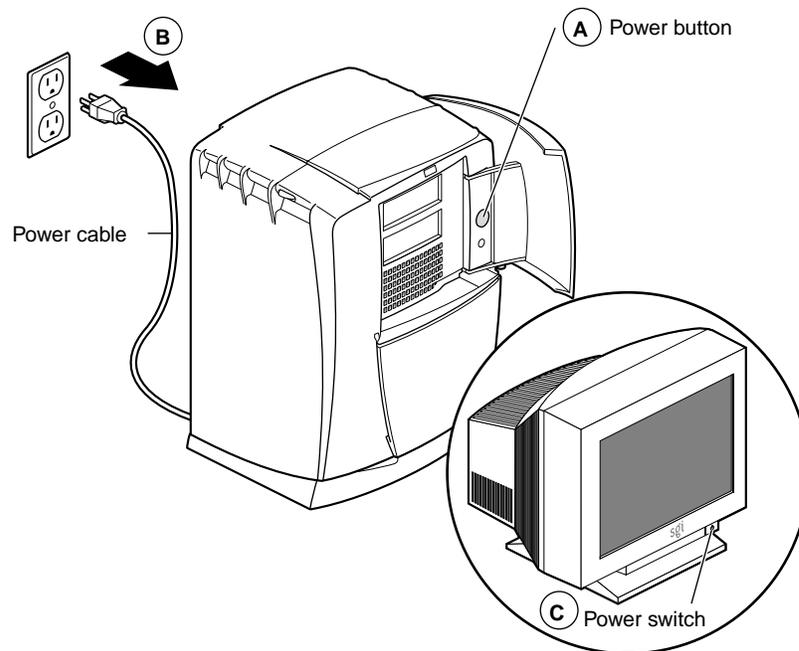


Figure 3-1 Powering Off the Octane2 Workstation

4. Face the back of your workstation.
5. Unplug the power cable from your workstation (power supply), as shown in Figure 3-2.

Before proceeding to the next section, wait until the power supply fan stops spinning and you cannot feel any air coming out of the power supply.

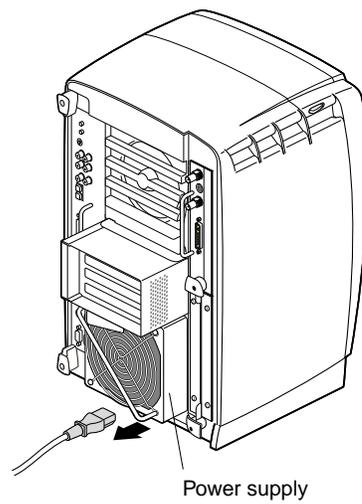


Figure 3-2 Unplugging the Power Cable

Removing the PCI Module

If a PCI module is not installed in your workstation, go to the next section. If a PCI module is installed in your workstation, you must remove it before you remove the power supply. For instructions on removing the PCI module, go to “Removing the PCI Module” on page 75, then follow the instructions below to remove the power supply.

Removing the Power Supply

If you did not power off your workstation and unplug the power cable from the electrical outlet, do it now. You do not have to wear the wrist strap to remove the power supply.



Warning: Make sure the power cable is disconnected from the electrical socket and your workstation (power supply) before you begin this procedure.

Caution: Do not remove the power cable from the power supply until the power supply is out of the chassis.

1. Locate the two captive screws near the bottom of the power supply that secure it to the chassis.
2. Using a Phillips screwdriver, loosen the captive screws, as shown in Figure 3-3, until they release from the chassis.

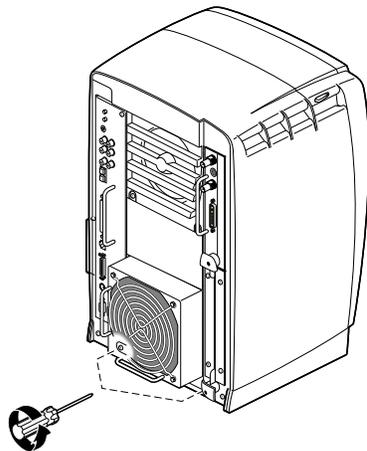


Figure 3-3 Loosening the Power Supply Screws

3. Grasp the handle and pull the power supply from the chassis, as shown in Figure 3-4.

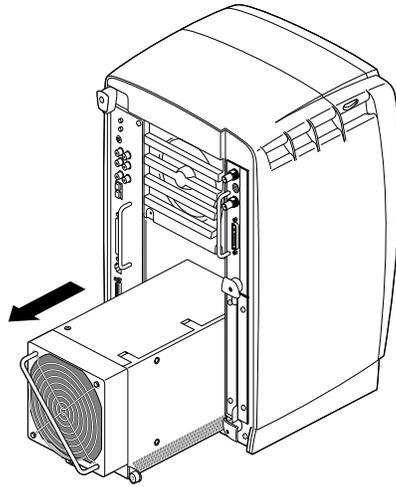


Figure 3-4 Removing the Power Supply

Installing the Power Supply

Follow these steps to install the new power supply:

1. Tilt the new power supply upward and plug the power cable into the power supply, as shown in Figure 3-5.

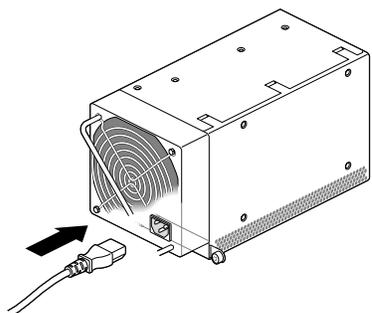


Figure 3-5 Plugging In the Power Cable

2. Slide the new power supply into your workstation, as shown in Figure 3-6.
Push on the power supply to firmly connect it to the frontplane.

Note: Be sure the tabs (holding the screws) on the power supply are flush with the chassis.

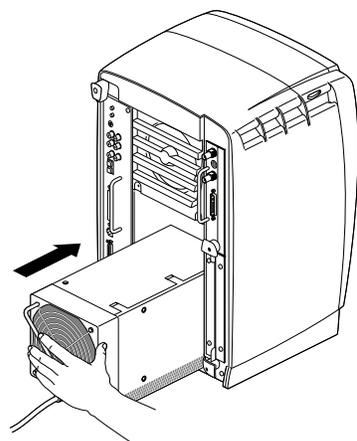


Figure 3-6 Sliding In the New Power Supply

3. Tighten the screws that attach the power supply to the workstation, as shown in Figure 3-7.

You are finished installing the new power supply.

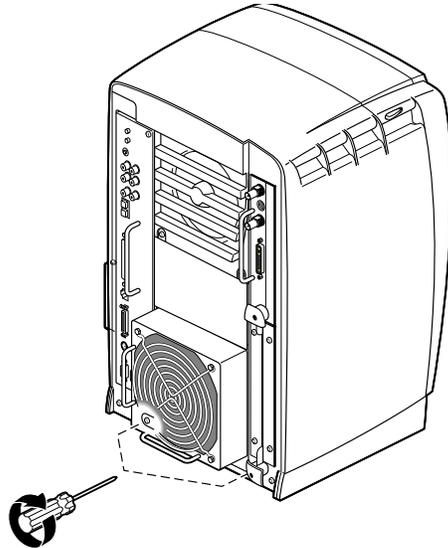


Figure 3-7 Inserting and Tightening the Screws

For instructions on reinstalling the PCI module, go to “Installing the PCI Module” on page 100, and follow the instructions through powering on the Octane2 workstation.

If you are not reinstalling a PCI module, you are ready to power on your workstation, as described in the next section.

Powering On the Octane2 Workstation

1. Plug the power cable into an electrical outlet (see A in Figure 3-8).
2. Press the power button (B) on your workstation.
3. Press the monitor power button (C) to turn on your monitor.

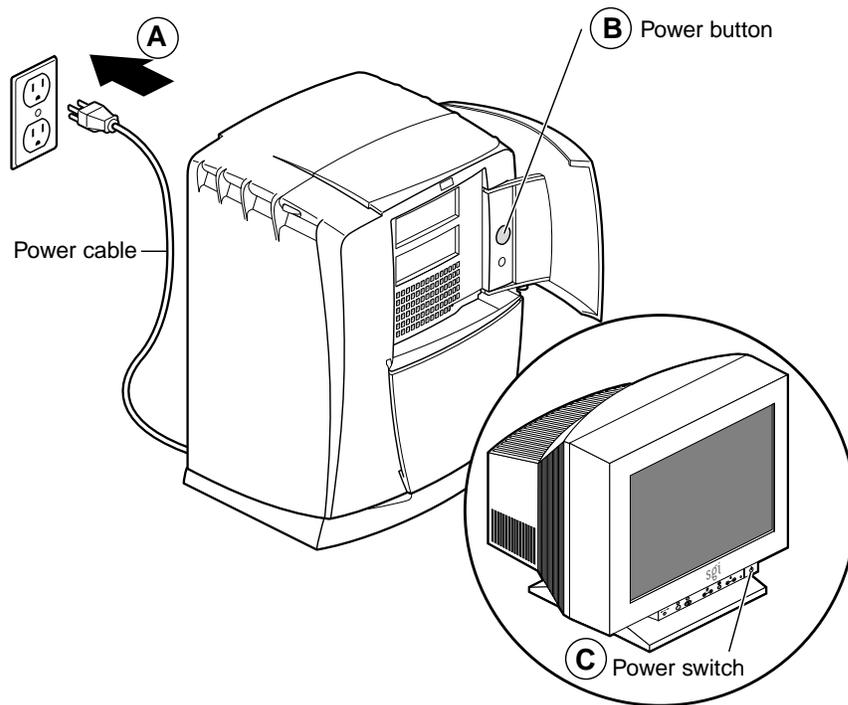


Figure 3-8 Powering On the Octane2 Workstation

Installing and Removing PCI Boards

This chapter shows you how to install and remove PCI boards. The following topics are covered:

- “About the PCI Module and Boards” on page 70
- “Preparing the Workstation” on page 72
- “Removing the PCI Module” on page 75
- “Opening the PCI Module” on page 78
- “Identifying a PCI Slot” on page 79
- “Installing a PCI Board” on page 80
- “Removing a PCI Board” on page 89
- “Installing the PCI Module” on page 100
- “Verifying the PCI Board Installation” on page 105

About the PCI Module and Boards

To install PCI boards, you must use the PCI module. The PCI module is an optional Octane2 component that allows you to install and remove PCI boards without opening your workstation. If your workstation does not have a PCI module installed, a blank panel covers the module slot, as shown in Figure 4-1.

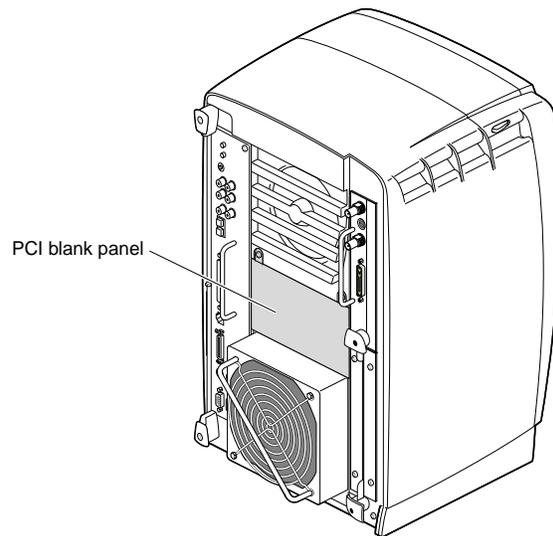


Figure 4-1 Workstation without the Optional PCI Module

If your workstation has a PCI module installed, it protrudes from the rear of the workstation, as shown in Figure 4-2.

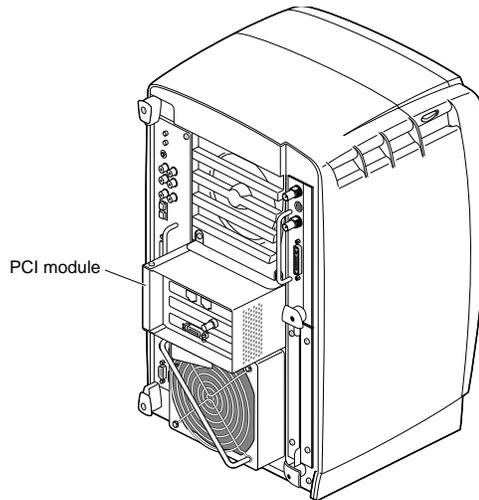


Figure 4-2 Workstation with the Optional PCI Module

The Octane2 PCI module is a 5V system environment.

Total power for the PCI module (the sum of the power for all installed PCI boards) must not exceed 45.0W (average 15.0W per board).

For complete PCI module power specifications, go to “PCI Module Power Specifications” in Appendix B, “Technical Specifications.”

The PCI module supports full-size and half-size boards, and is compatible with boards that have extra-long I/O connectors. You can install a maximum of three boards in the following combinations:

- Two full-size boards and one half-size board
- One full-size board and two half-size boards
- Three half-size boards

Preparing the Workstation

To install or remove a PCI board, power off your workstation, remove any cables attached to the PCI module, and then attach the wrist strap.

1. Open the cover and press the power button (see A in Figure 4-3).
2. Unplug the power cable from the electrical outlet (B).
3. Press the monitor power switch to turn off your monitor (C).

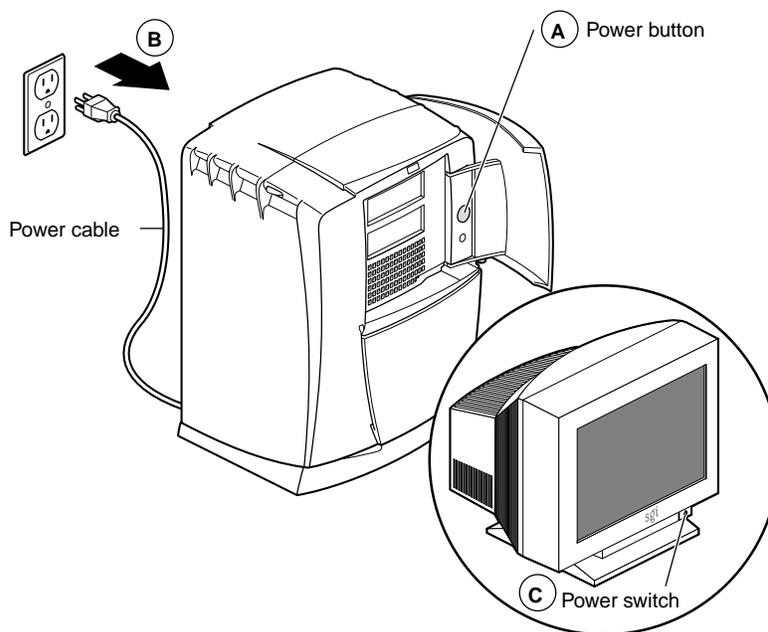


Figure 4-3 Powering Off the Octane2 Workstation

4. Face the rear of your workstation.
5. Remove any cables from the PCI module, as shown in Figure 4-4.

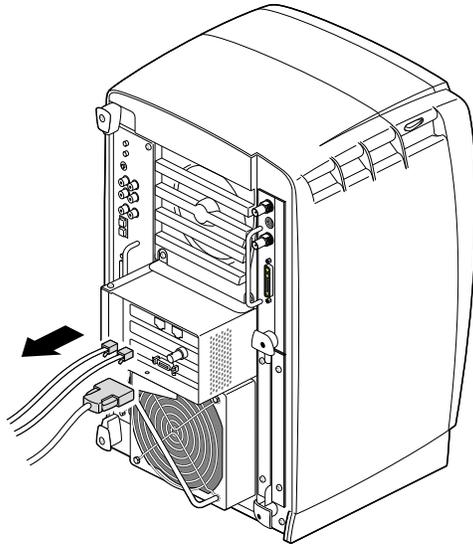


Figure 4-4 Removing the Cables from the PCI Module

Attaching the Wrist Strap

Caution: The components inside your workstation are extremely sensitive to static electricity; you must wear the wrist strap while replacing parts.

1. Unroll the first two folds of the band (see A in Figure 4-5).
2. Wrap the exposed adhesive side firmly around your wrist (B), unroll the rest of the band, then peel the liner from the copper foil at the opposite end.
3. Attach the copper foil to any exposed electrical ground, such as a metal part of the workstation (C).

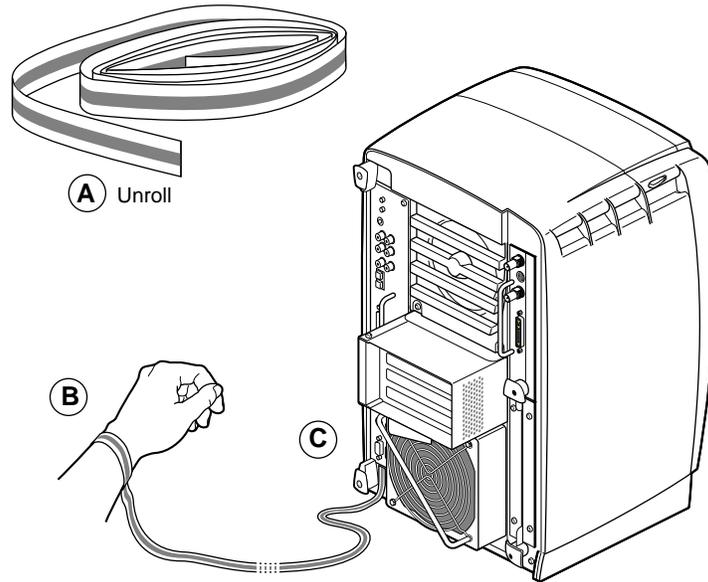


Figure 4-5 Attaching the Wrist Strap to the Chassis

Removing the PCI Module

To install or remove PCI boards, you must remove the PCI module from the workstation.

1. Loosen the two captive screws that secure the PCI module to the workstation, as shown in Figure 4-6, until they are disconnected from the chassis.

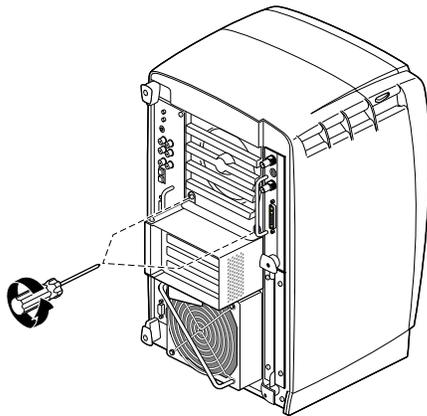


Figure 4-6 Removing the Screws From the PCI Module

2. Pull the release lever toward you and to the right, as shown in Figure 4-7.

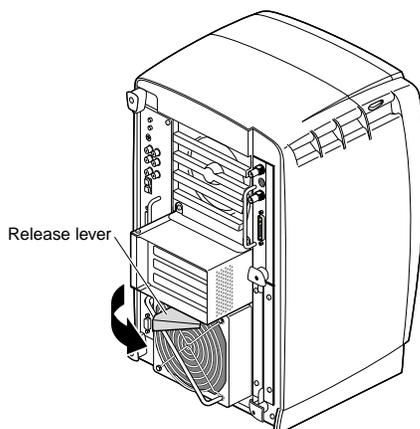


Figure 4-7 Opening the Release Lever

3. Remove the PCI module by sliding it out of the workstation, as shown in Figure 4-8, then place it on a dry, antistatic surface, such as your desk.

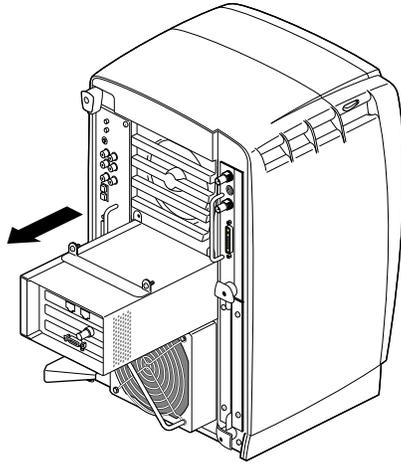


Figure 4-8 Removing the PCI Module

Caution: The compression connector on the back of the PCI module is delicate and easily damaged. Do not touch or bump the gold area of the compression connector (see Figure 4-9). For information about compression connectors, see Appendix A.

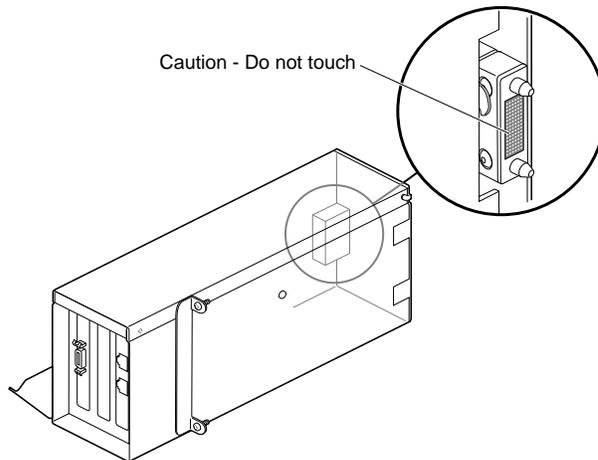


Figure 4-9 Identifying the Compression Connector on the PCI Module

4. Place a cap on the compression connector on the back of the PCI module, as shown in Figure 4-10 (compression connector caps are included with the workstation).

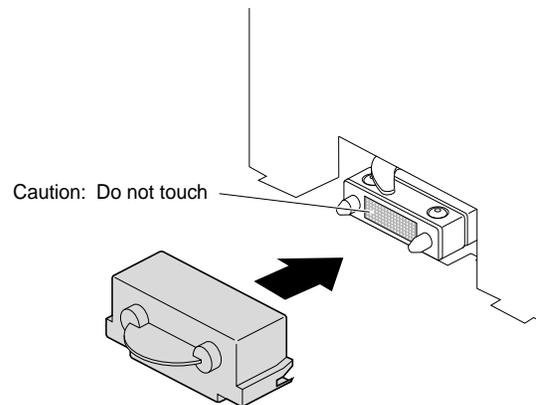


Figure 4-10 Installing a Cap on the Compression Connector

Opening the PCI Module

If you removed the PCI module from your workstation, go to step 1, below. If the PCI module is still installed in your workstation, go to “Preparing the Workstation” on page 72 and follow the instructions through removing the PCI module.

1. Turn the PCI module on its side, as shown in Figure 4-11.
2. Loosen the screws that secure the PCI module door, but do not remove them.

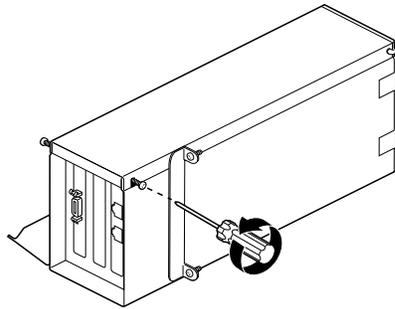


Figure 4-11 Loosening the Screws on the PCI Module

3. Pull the PCI module door up and off, as shown in Figure 4-12.
4. The release hinge allows the module door to slide up and off.

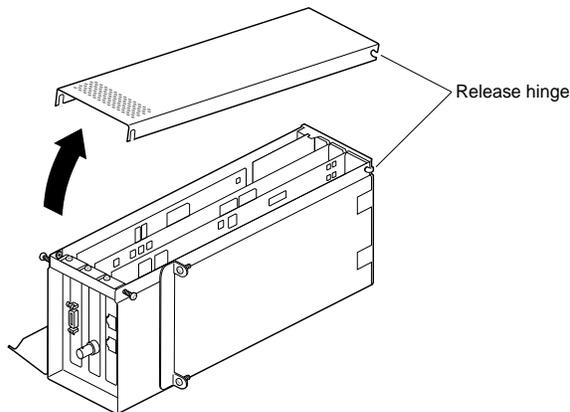


Figure 4-12 Opening and Removing the PCI Module Door

Identifying a PCI Slot

PCI physical slots and PCI slots identified by the system software have the same identification numbers (see Figure 4-13).

- The top slot is PCI ID #1.
- The middle slot is PCI ID #2.

The bottom (half-sized) slot is PCI ID #3.

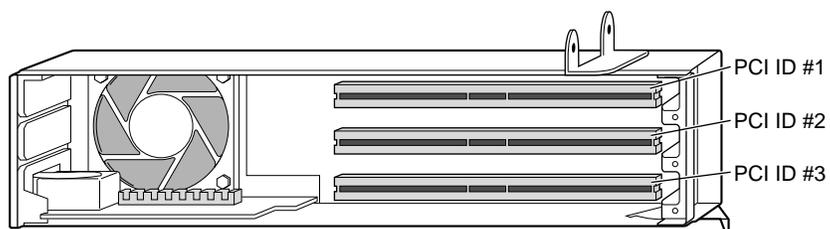


Figure 4-13 Identifying PCI Slots

Installing a PCI Board

If you did not prepare your workstation for a PCI board installation, go to “Preparing the Workstation” on page 72 and follow the instructions through removing the PCI module. Then return to this page and follow these steps:

Caution: PCI boards are extremely sensitive to static electricity: You must wear the wrist strap while removing or installing them. The wrist strap prevents the flow of static electricity, which could damage the PCI board.

1. Remove the screw from the blank I/O panel that covers the slot you want to use for the PCI board, as shown in Figure 4-14.

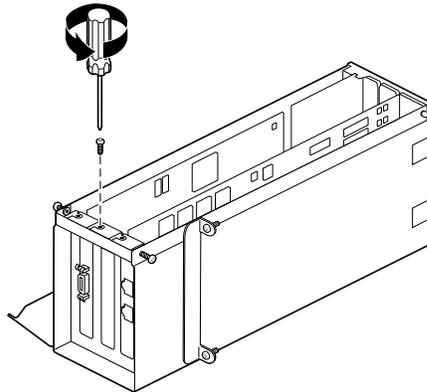


Figure 4-14 Removing the Blank I/O Panel Screw

2. Remove the blank I/O panel by pulling it up, as shown in Figure 4-15.
Use the metal knob on the side of the blank panel to help lift it out of the PCI module.

3. Store the I/O blank panel in a safe place.

Note: If you remove an installed PCI board and do not replace it with another board, reinstall the blank panel.

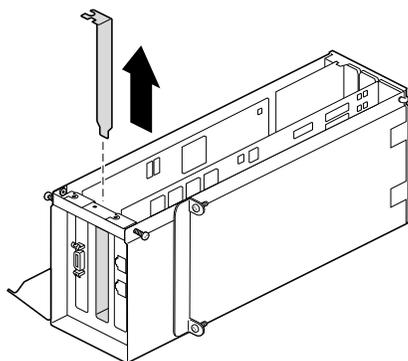


Figure 4-15 Removing the Blank I/O Panel

4. Insert the PCI board into the connector in the PCI module, as shown in Figure 4-16. Push gently but firmly until the PCI board snaps into place.

Note: If the board has an extra-long connector that makes it difficult to insert, skip to the next section, “Opening the I/O Door for Extra-Long Connectors” on page 84.”

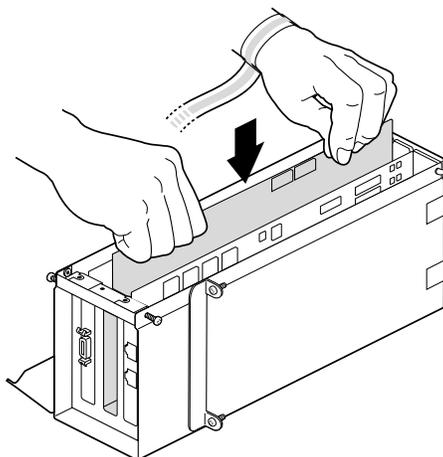


Figure 4-16 Inserting a PCI Board into the PCI Module

5. Insert and tighten the screw that secures the PCI board to the PCI module, as shown in Figure 4-17.

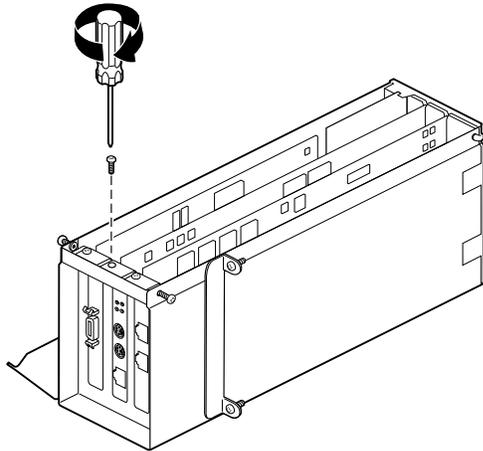


Figure 4-17 Inserting the Board Screw

6. Place the hinged door on the PCI module, as shown in Figure 4-18.

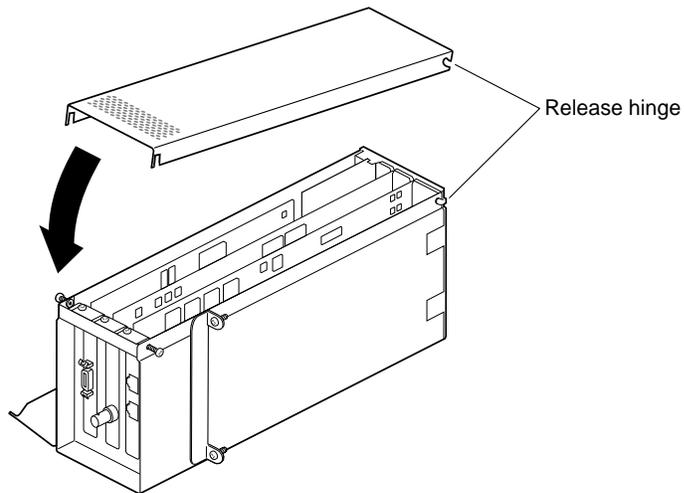


Figure 4-18 Placing the Door on the PCI Module

7. Tighten the I/O door screws, as shown in Figure 4-19.

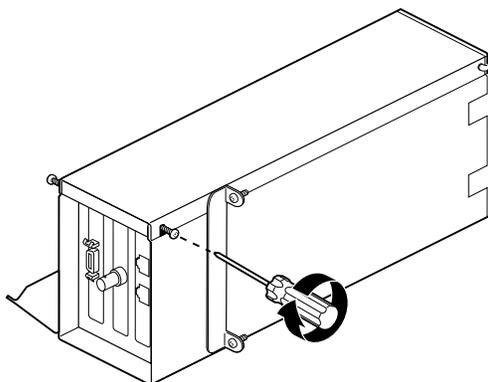


Figure 4-19 Tightening the I/O Door Screws

Go to “Installing the PCI Module” on page 100.

Opening the I/O Door for Extra-Long Connectors

1. If boards are installed in the PCI module, remove the I/O panel screws that secure the boards, as shown in Figure 4-20.

Note: Do not remove any blank I/O panels. They are attached to the door and move with it.

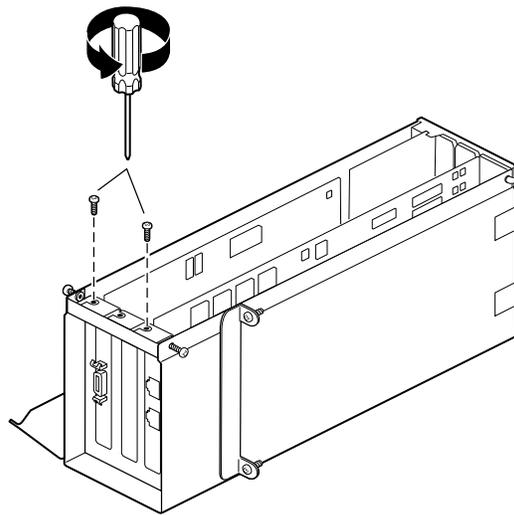


Figure 4-20 Removing the I/O Panel Screws

2. Completely remove the screws that secure the I/O door to the PCI module, as shown in Figure 4-21.

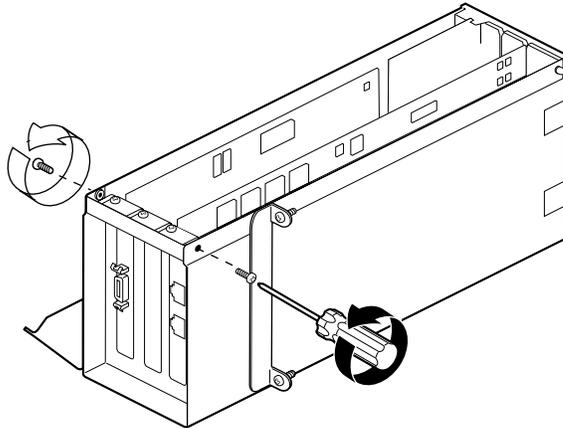


Figure 4-21 Removing the I/O Door Screws

3. Slide open the I/O door to expand the PCI module, as shown in Figure 4-22.

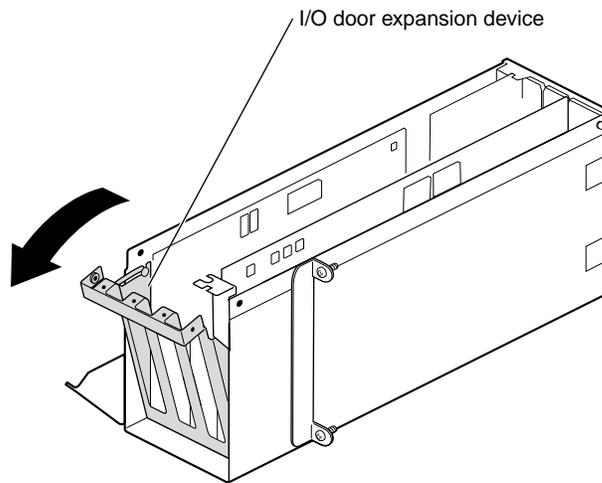


Figure 4-22 Opening the I/O Door

4. Insert the PCI board into the connector in the PCI module, as shown in Figure 4-23. Press gently but firmly until the board snaps into place.

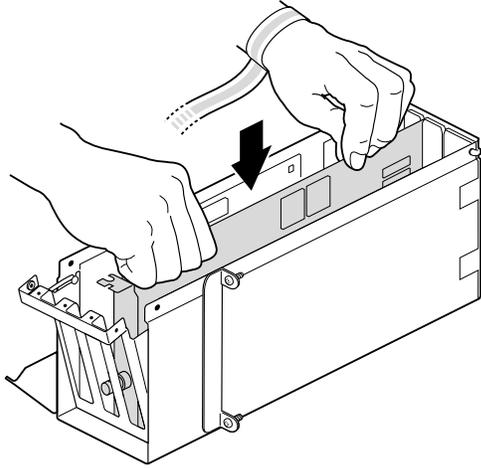


Figure 4-23 Inserting a PCI Board with an Extra-long Connector

5. Close the I/O door, as shown in Figure 4-24.

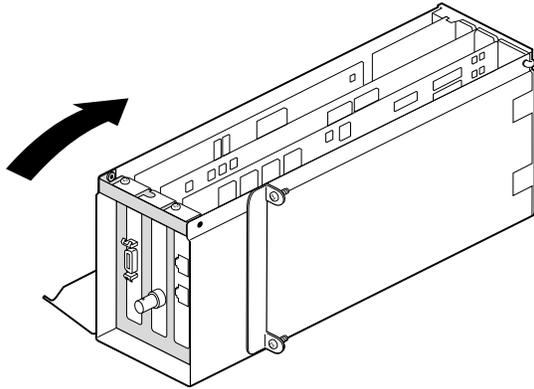


Figure 4-24 Closing the I/O Door

6. Insert and tighten the screws that secure the I/O door, as shown in Figure 4-25.

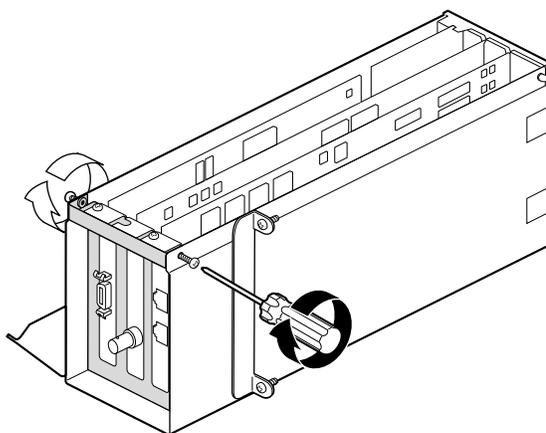


Figure 4-25 Reinstalling the I/O Door Screws

7. Insert and tighten the screws that secure all PCI boards to the I/O panel, as shown in Figure 4-26.

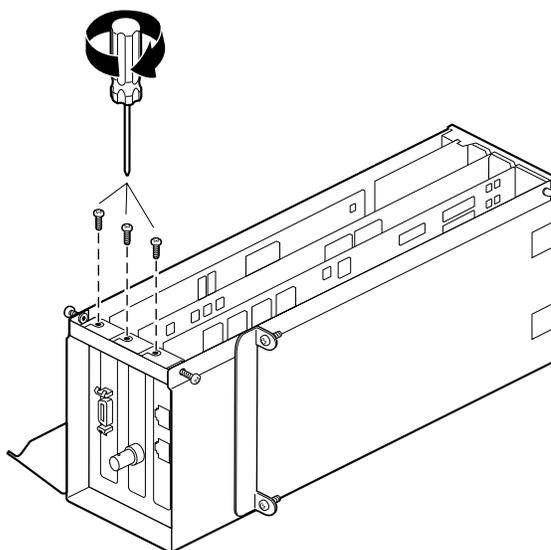


Figure 4-26 Reinstalling the I/O Panel Screws

8. Reinstall the PCI module door, as shown in Figure 4-27.

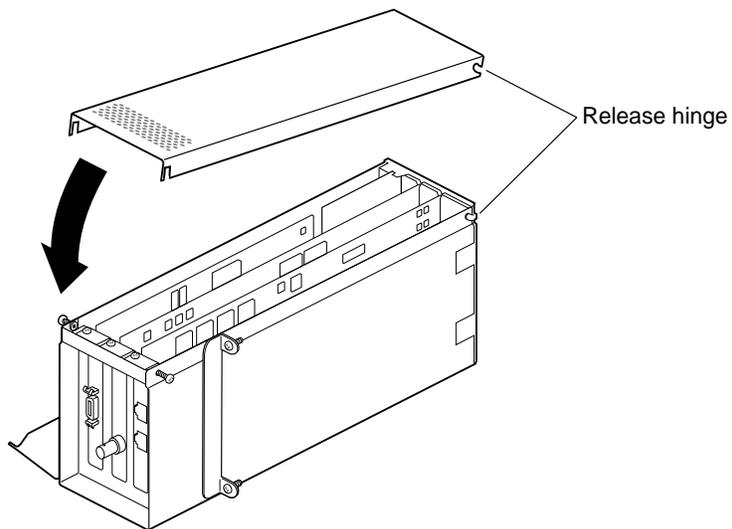


Figure 4-27 Reinstalling the PCI Module Door, as shown in Figure 4-28.

9. Tighten the PCI module door screws.

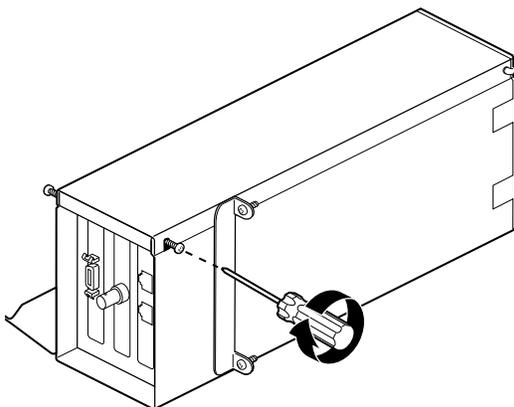


Figure 4-28 Tightening the PCI Module Door Screws

Go to “Installing the PCI Module” on page 100.

Removing a PCI Board

If you did not prepare your workstation for removal of a PCI board, go to “Preparing the Workstation” on page 72, and follow the instructions through removing the PCI module. Then return to this page and follow these steps:

1. Remove the screw that secures the PCI board to the module, as shown in Figure 4-29.

If you have a board with an extra-long connector, go to “Opening the I/O Door for Extra-Long Connectors” on page 94. Otherwise, go to step 2.

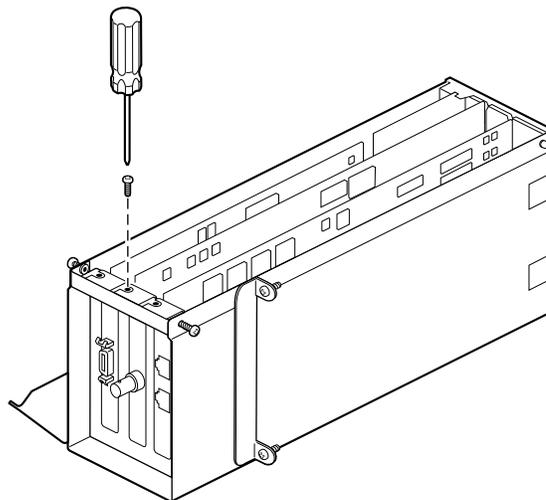


Figure 4-29 Removing the PCI Board Screw

2. Grasp the PCI board on the top edge to extract it, as shown in Figure 4-30.
3. Pull up until the board releases.

If the board is firmly installed, it may be hard to remove. If it is very hard to remove, go to “Opening the I/O Door for Extra-Long Connectors” on page 94.

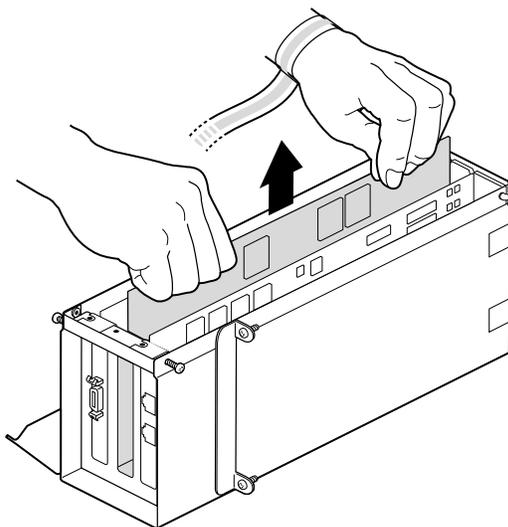


Figure 4-30 Extracting the PCI Board

If you want to install another PCI board, go to “Installing a PCI Board” on page 80.

If you are not installing another PCI board in the same slot, you must insert an I/O blank panel as described in steps 4 and 5.

4. Insert, but do not tighten, the screws securing the I/O door to the PCI module, as shown in Figure 4-31.

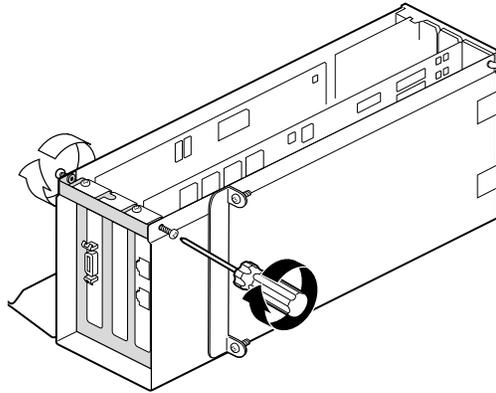


Figure 4-31 Inserting the I/O Door Screws

5. Install an I/O blank panel in the I/O door in place of the PCI board, as shown in Figure 4-32.

Use the knobs on the back of the blank panel to position it. Make sure you place the tip of the I/O blank panel inside the groove at the bottom of the PCI module. Do not position the tip outside the groove.

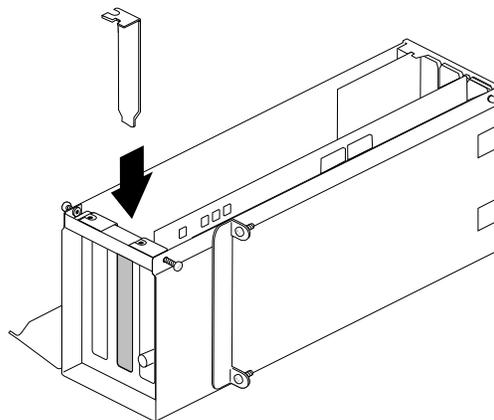


Figure 4-32 Inserting the I/O Blank Panel

6. Attach the blank panel to the I/O door with the screw you removed in step 1, as shown in Figure 4-33.

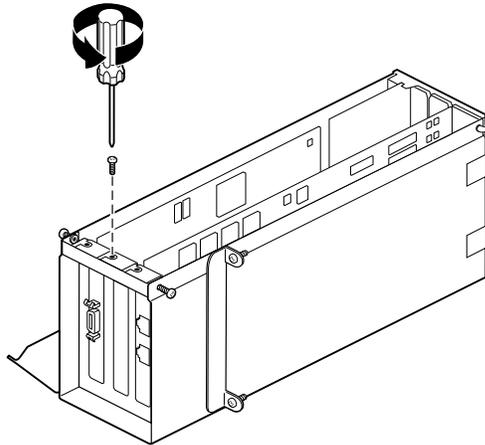


Figure 4-33 Attaching the Blank Panel to the I/O Door

7. Reinstall the PCI module door, as shown in Figure 4-34.

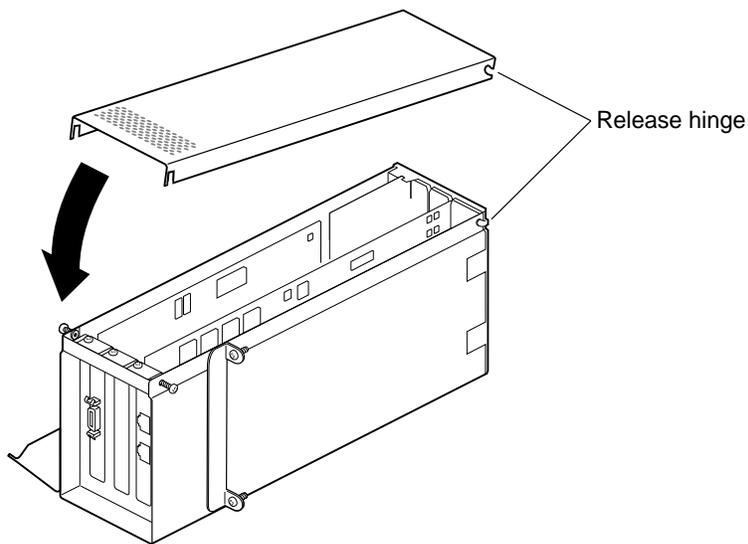


Figure 4-34 Reinstalling the PCI Module Door

8. Tighten the door screws, as shown in Figure 4-35.

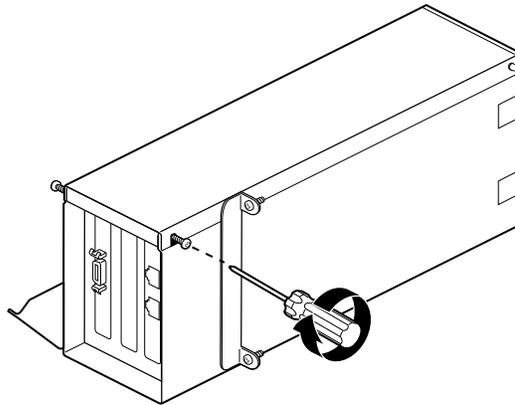


Figure 4-35 Replacing the Screws of the PCI Module Door

Go to “Installing the PCI Module” on page 100.

Opening the I/O Door for Extra-Long Connectors

1. Remove the screws that secure any other PCI boards to the module, as shown in Figure 4-36.

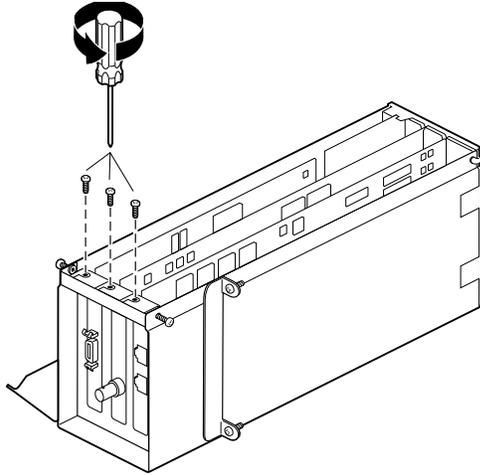


Figure 4-36 Removing the I/O Panel Screws

2. Remove the screws that secure the I/O panel door to the PCI module, as shown in Figure 4-37.

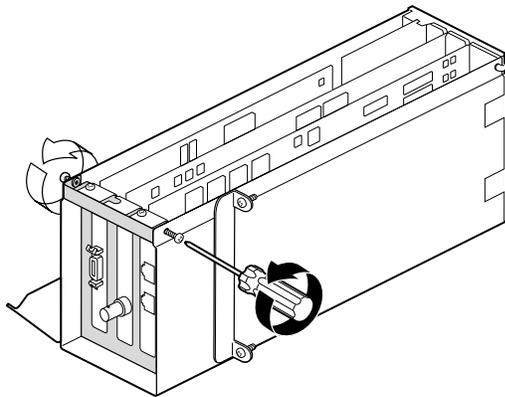


Figure 4-37 Removing the I/O Door Screws

3. Slide open the I/O door, as shown in Figure 4-38.

This provides clearance for the I/O connector at the end of the PCI board.

Now you can easily remove the board. If two other boards are installed at the sides of the PCI module, you can now grasp their edges.

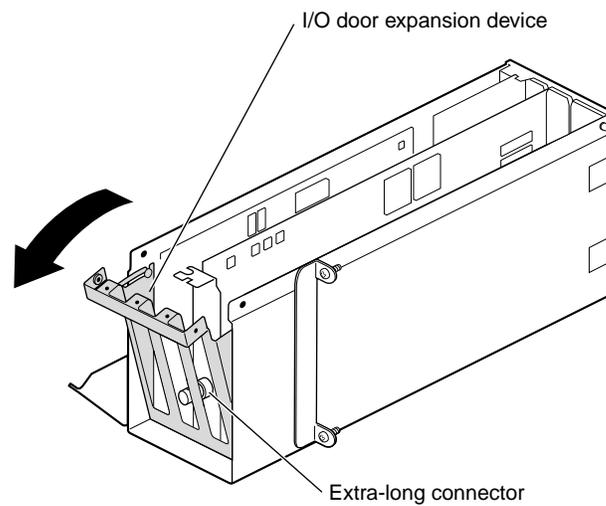


Figure 4-38 Opening the I/O Door

4. Grasp the PCI board on the top edge to extract it.
5. Pull up until the board releases, Figure 4-39.

If the board is firmly installed, it may be difficult to remove.

If you want to install another PCI board, go to “Installing a PCI Board” on page 80.

If you are not installing another PCI board in the same slot, insert an I/O blank panel, then go to the next step.

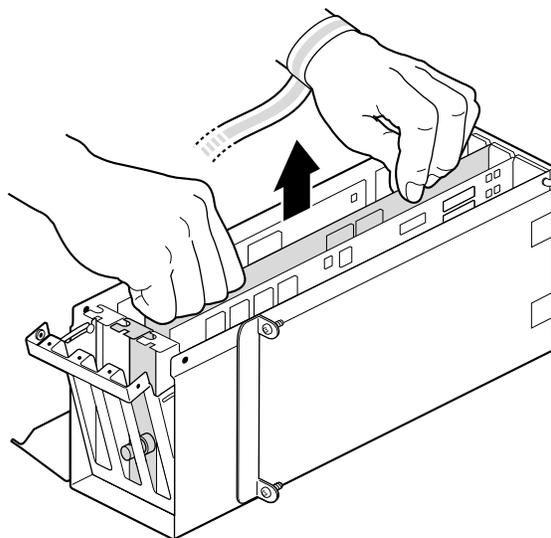


Figure 4-39 Removing a PCI Board

6. Close the I/O door, as shown in Figure 4-40.

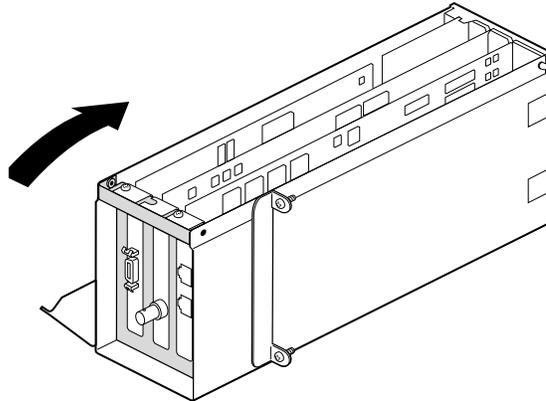


Figure 4-40 Closing the I/O Door

7. Insert, but do not tighten, the screws holding the I/O door to the PCI module, as shown in Figure 4-41.

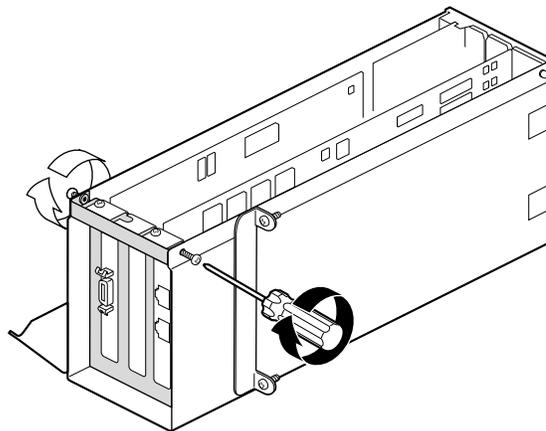


Figure 4-41 Inserting the I/O Door Screws

8. Install an I/O blank panel in the I/O door in place of the PCI board, as shown in Figure 4-42.

Use the knobs on the back of the blank panel to position it. Make sure you place the tip of the I/O blank panel inside the groove at the bottom of the PCI module. Do not position the tip outside the groove.

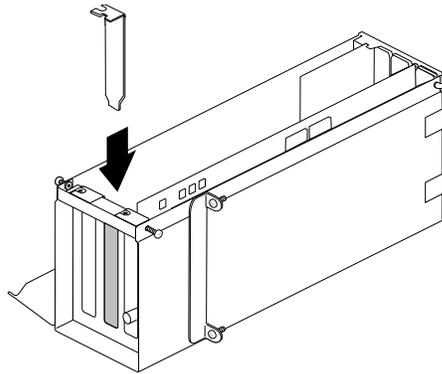


Figure 4-42 Inserting the I/O Blank Panel

9. Attach the blank panel to the I/O door with the screw you removed earlier in this section, as shown in Figure 4-43.

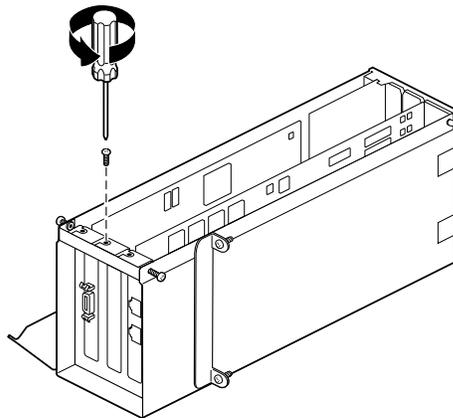


Figure 4-43 Attaching the Blank Panel to the I/O Door

10. Reinstall the PCI module door, as shown in Figure 4-44.

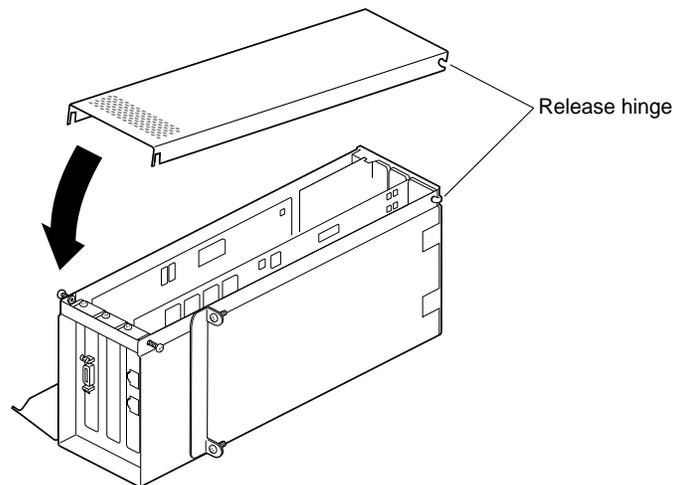


Figure 4-44 Reinstalling the PCI Module Door

11. Tighten the PCI module door screws, as shown in Figure 4-45.

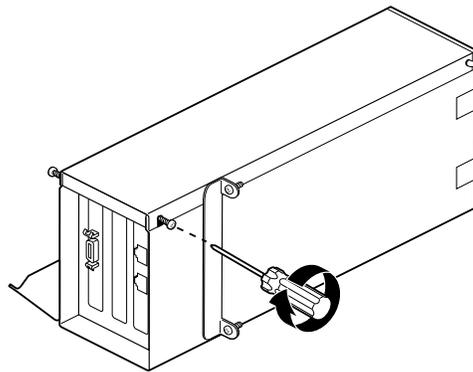


Figure 4-45 Tightening the PCI Module Door Screws

Go to “Installing the PCI Module” on page 100.

Installing the PCI Module

If you are installing a PCI module for the first time, you have to remove the blank panel.

1. Using a Phillips screwdriver, remove the screws from the blank panel, as shown in Figure 4-46.

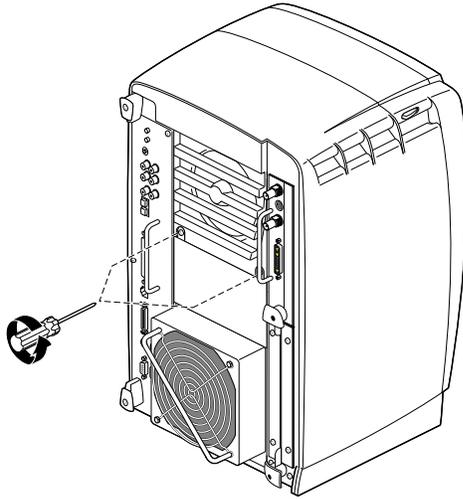


Figure 4-46 Removing the Screws from the Blank Panel

2. Using a flathead screwdriver, place the tip of the screwdriver in the slot at the top and middle of the blank panel.
3. Pull the panel outward and lift it up and out, as shown in Figure 4-47.

Note: Save the blank panel in case you want to remove the PCI module at a later time. Either the PCI module or the blank panel must be installed at all times.

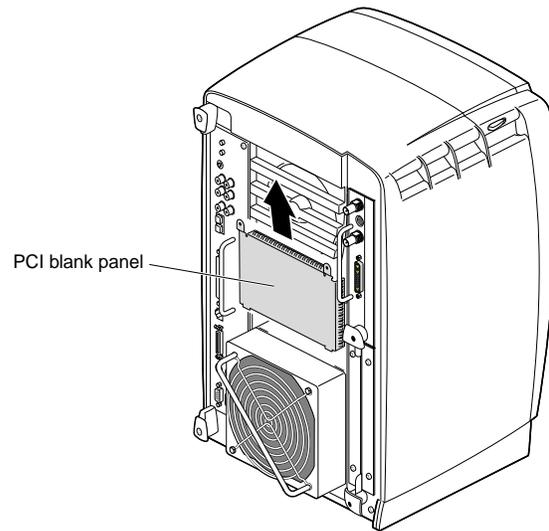


Figure 4-47 Removing the Blank Panel

4. Remove the cap from the compression connector on the back of the PCI module, and save it for future use, as shown in Figure 4-48.

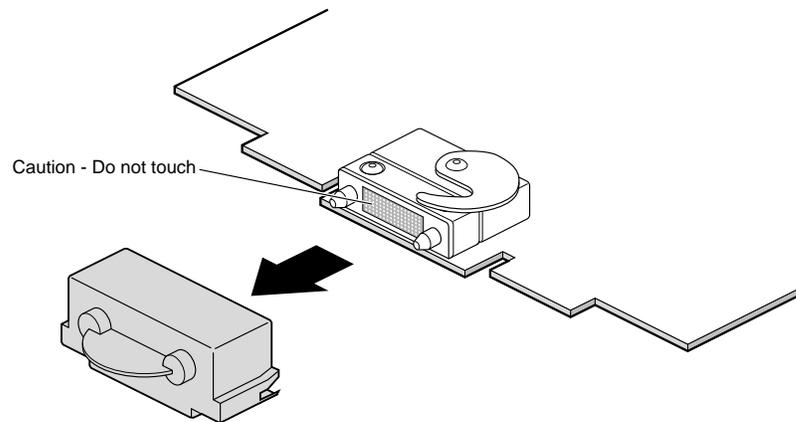


Figure 4-48 Removing the Cap from the Compression Connector

5. Insert the PCI module in your workstation, as shown in Figure 4-49, then push it until the tabs are flush with the chassis.

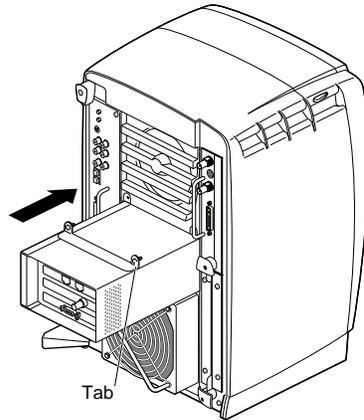


Figure 4-49 Installing the PCI Module

6. Close the release lever by pushing it to the left until it is parallel with the PCI module, as shown in Figure 4-50.

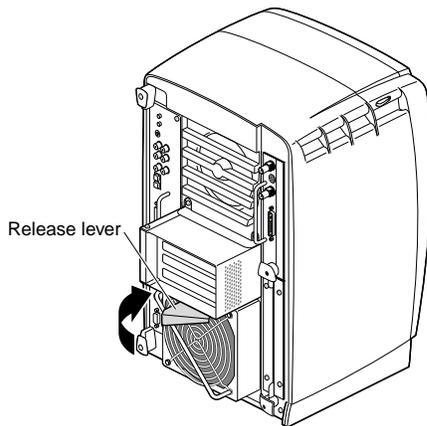


Figure 4-50 Closing the Release Lever

7. Tighten the captive screws that secure the PCI module to the workstation, as shown in Figure 4-51.

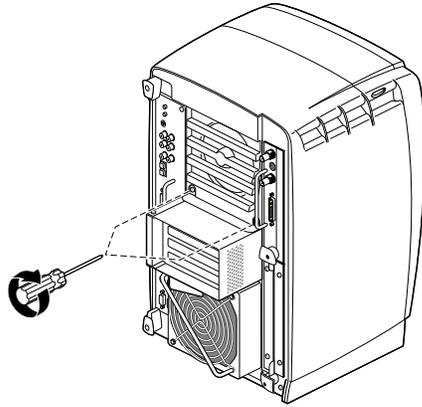


Figure 4-51 Tightening the PCI Screws

8. Connect any PCI cables to the PCI connectors, as shown in Figure 4-52.

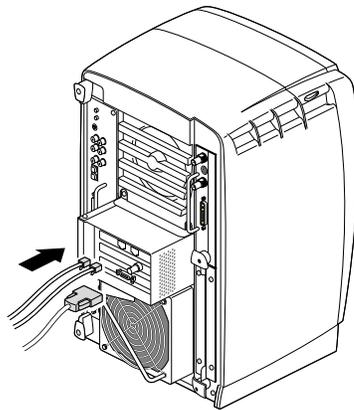


Figure 4-52 Installing the PCI Cables

9. Remove the wrist strap.

You are finished installing the PCI module.

Go to “Powering On the Octane2 Workstation” on page 104.

Powering On the Octane2 Workstation

1. Face the front of your workstation.
2. Connect the workstation's power cable to an electrical outlet (see A in Figure 4-53).
3. Press the power button (B) to power on your workstation.
4. Press the monitor power switch (C) to power on your monitor.

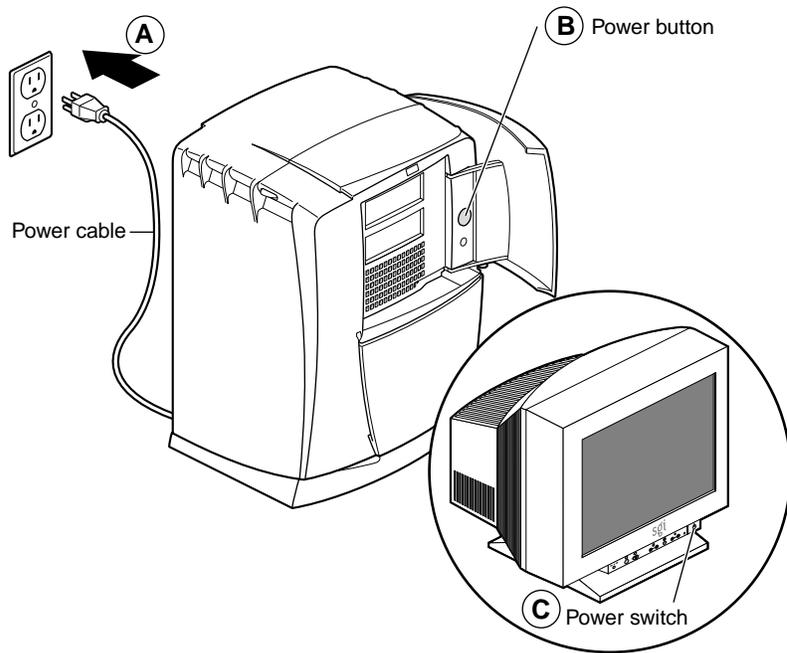


Figure 4-53 Replacing the Power Cord and Turning On the Workstation

Verifying the PCI Board Installation

For instructions on checking the PCI board installation, see the *Octane2 PCI Module Installation Guide*.

1. If your PCI board does not function properly, repeat the installation procedure.
2. If you repeat the installation procedure and your PCI board still does not function properly, call your authorized SGI service representative.

Installing and Removing XIO Boards

This chapter describes the Octane2 XIO Tri-Module and shows you how to install and remove XIO option boards. In addition to the onboard VPro graphics, you can connect one or two XIO option boards to the Tri-Module, such as the Octane2 video option board or the Ultra SCSI option board.

The following topics are covered in this chapter:

- “About the XIO Tri-Module and XIO Boards” on page 108
- “Preparing the Workstation” on page 110
- “Removing the XIO Tri-Module” on page 114
- “Removing an Option Board or Blank Panel” on page 118
- “Installing an Option Board or Blank Panel” on page 121
- “Reinstalling the XIO Tri-Module” on page 124
- “Verifying the Option Board Installation” on page 128

About the XIO Tri-Module and XIO Boards

The XIO Tri-Module is located on the right-rear side of your workstation, as shown in Figure 5-1. It is a tray-like holding mechanism for the Octane2 VPro graphics board and XIO option boards. You can connect up to three option boards to the XIO Tri-Module using slots A/B, C, and D.

- The VPro graphics board must be in slot A/B (slot B is a daughterboard slot).
- You can install option boards in slots B, C, and D.
- Protective blank panels must be installed in unused slots.
- If you lose a screw that holds a single-layer option board or blank panel to the XIO Tri-Module, use M3 x 8 mm size screws. To hold option boards with attached daughterboards to the XIO Tri-Module, use the screw size listed in your option board manual.

Note: The VPro graphics board I/O panel must be at the top when reinstalling the XIO Tri-Module, as shown in Figure 5-1 (or damage can occur due to overheating).

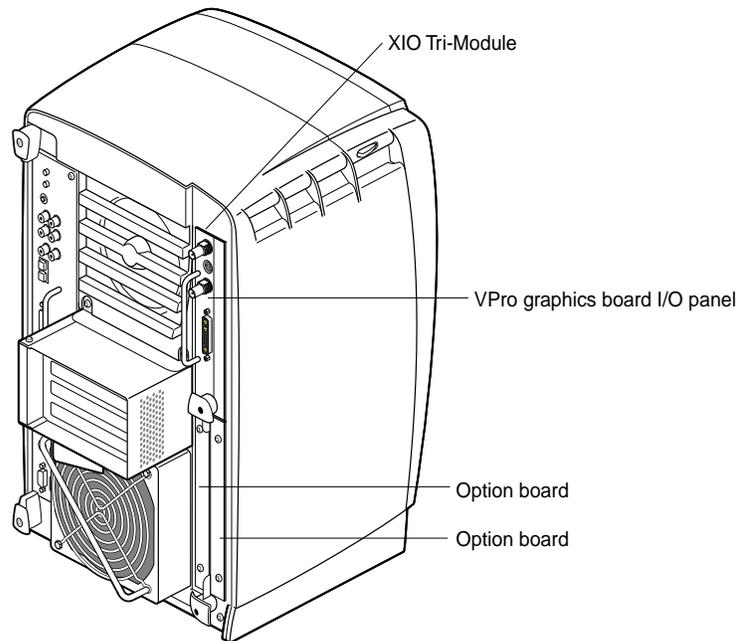


Figure 5-1 Locating the XIO Tri-Module

Figure 5-2 shows the XIO Tri-Module and each of the VPro graphics board I/O ports.

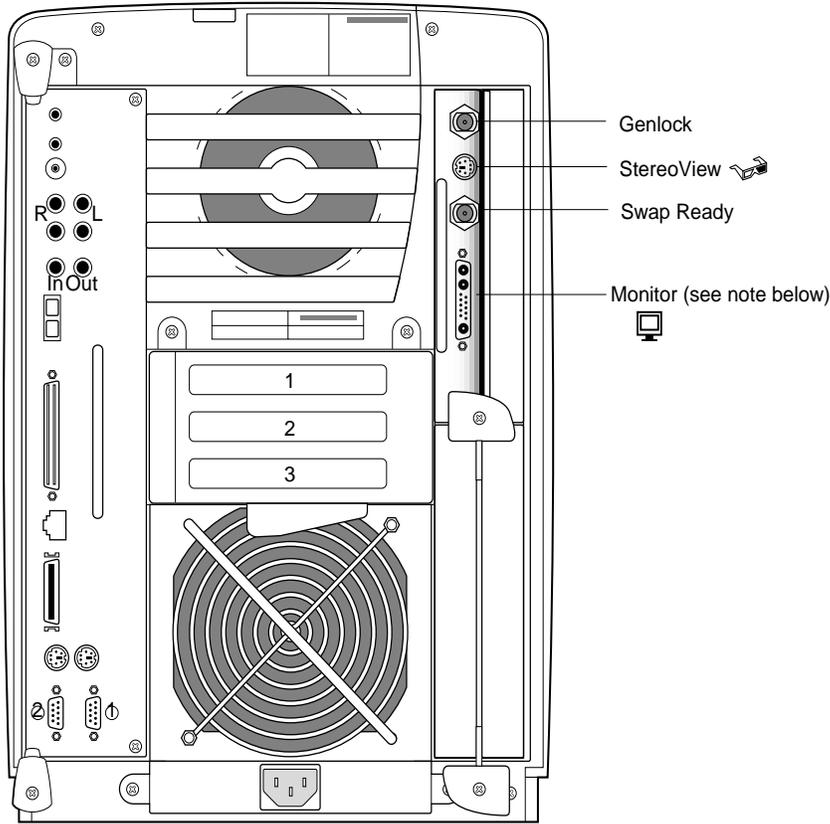


Figure 5-2 XIO Tri-Module with VPro Graphics Board I/O Ports

Note: For VPro graphics, a 1280 x 1024 display resolution is only possible using the Sony G1 21" or 24" monitors at a vertical refresh rate of 96Hz. If you have another monitor, you cannot run 1280 x 1024 resolution at any vertical refresh rate. For a matrix of supported scan rates, see page 239.

Preparing the Workstation

1. Open the cover and press the power button (see A in Figure 5-3) to power off your workstation.
2. Unplug the power cable (B).
3. Power off the monitor by pressing the monitor power switch (C).
4. Wait 5 minutes before removing the XIO Tri-Module.

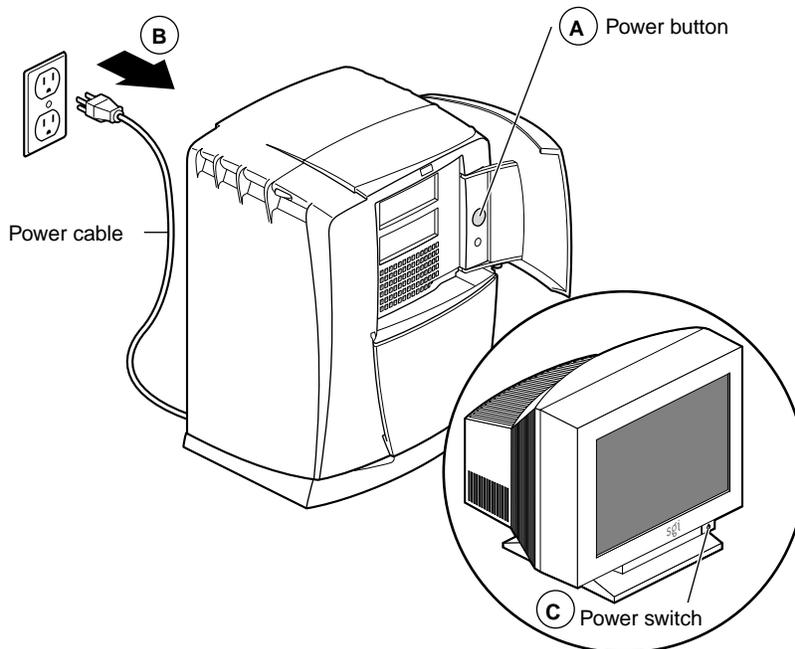


Figure 5-3 Powering Off the Octane2 Workstation



Warning: The heat sinks on the XIO boards get very hot. Wait 5 minutes after powering off your workstation before you remove the XIO Tri-Module. Test before touching any of the XIO boards.

5. Remove all the cables from the XIO Tri-Module (only one is shown in Figure Figure 5-4).

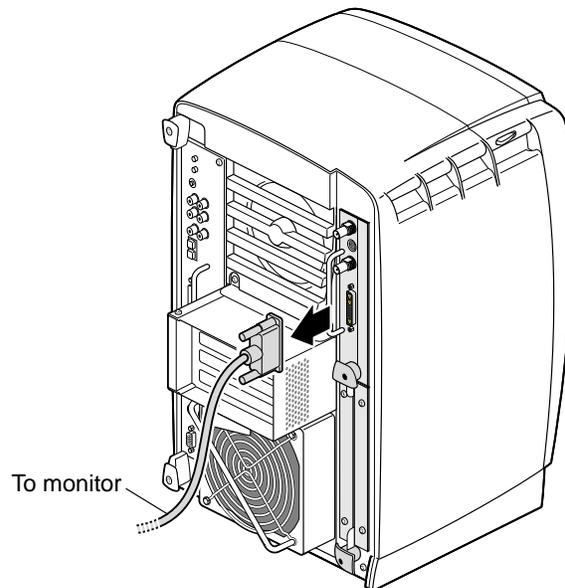


Figure 5-4 Removing the Monitor Cable

Attaching the Wrist Strap

Caution: The internal components are extremely sensitive to static electricity; always wear the wrist strap when you handle parts inside your workstation.

To attach the wrist strap, follow these steps:

1. Unroll the first two folds of the band (see A in Figure 5-5).
2. Wrap the exposed adhesive side firmly around your wrist (B), unroll the rest of the band, then peel the liner from the copper foil at the opposite end.
3. Attach the copper foil to any exposed electrical ground, such as a metal part of the workstation (C).

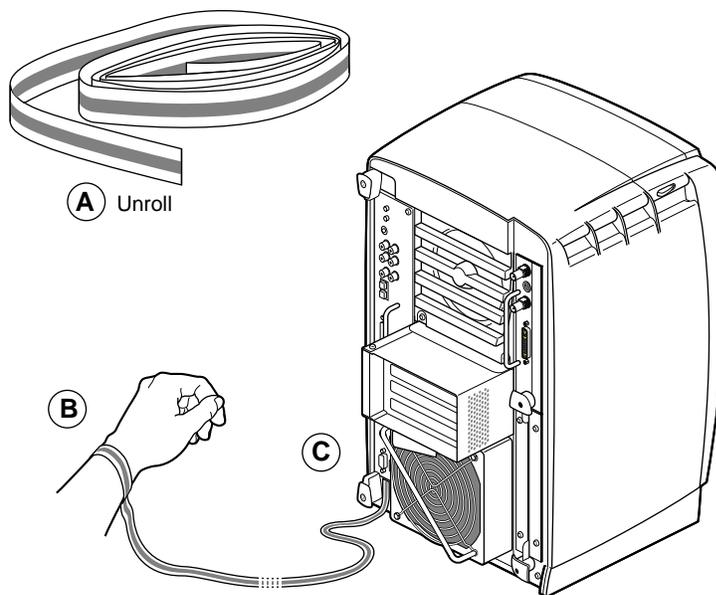


Figure 5-5 Attaching the Wrist Strap

Compression Connector Caution

Caution: The compression connectors on all VPro graphics boards and most option boards are very delicate and easily damaged. Do not touch or bump the gold bristled pad shown in Figure 5-6. The connectors are on the side opposite the handles. Do not grab the back of the XIO Tri-Module when you remove it, or the compression connectors may be damaged.

Before you remove the XIO Tri-Module, read Appendix A, "Care and Cleaning of Compression Connectors."

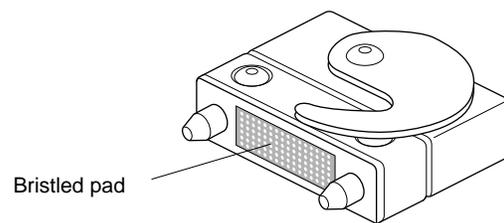


Figure 5-6 Identifying the Compression Connector

Removing the XIO Tri-Module

Before removing the XIO Tri-Module, you must power off your workstation, wait 5 minutes to allow the heat sinks to cool, and attach the wrist strap. If you did not already do this, go to “Preparing the Workstation” on page 110 and follow the instructions through attaching the wrist strap. Then return to this page and follow these steps:

1. Loosen the two captive screws in the XIO Tri-Module sliding handles with the supplied Phillips screwdriver, as shown in Figure 5-7, until the screws are disconnected from the chassis.

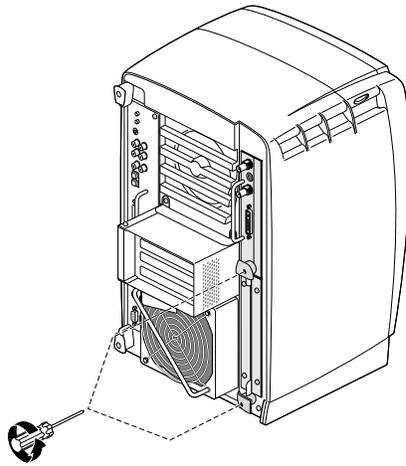


Figure 5-7 Removing the XIO Tri-Module Screws



Warning: The heat sinks on the XIO boards get very hot. Wait 5 minutes after powering off your workstation before you remove the XIO Tri-Module. Test before touching any of the XIO boards.

2. Grasp the sliding handles and pull them until the sliding portion of the XIO Tri-Module protrudes about an inch from the chassis, as shown in Figure 5-8.
The sliding handles and XIO Tri-Module move out about one inch before the I/O panels move.

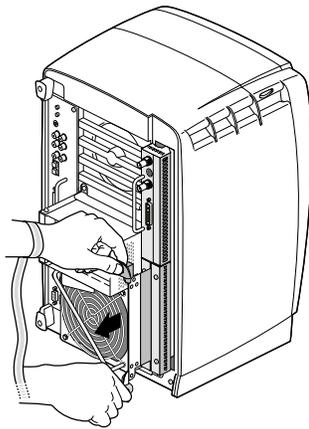


Figure 5-8 Releasing the XIO Tri-Module

3. Grasp the XIO Tri-Module by the immovable handle, and support the base of the module as you remove it from the chassis, as shown in Figure 5-9.

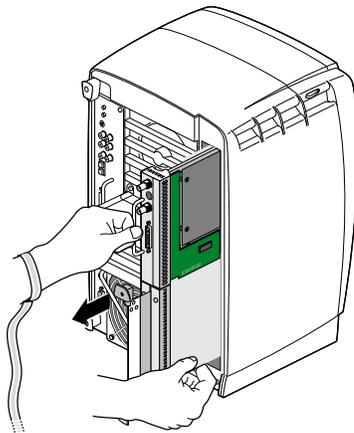


Figure 5-9 Removing the XIO Tri-Module

4. Place the XIO Tri-Module on a flat, antistatic surface, such as an empty antistatic bag on your desk.

When the XIO Tri-Module is out of the chassis, the sliding handles must protrude, as shown in Figure 5-10. A label identifies each XIO slot, (D and A on one side, C and B on the other). Slot B is a daughterboard slot that is located on the other side of the VPro graphics board.

Do not push on the sliding handles after you remove the XIO Tri-Module. Later when you reinsert the Tri-Module, the sliding handles must protrude.

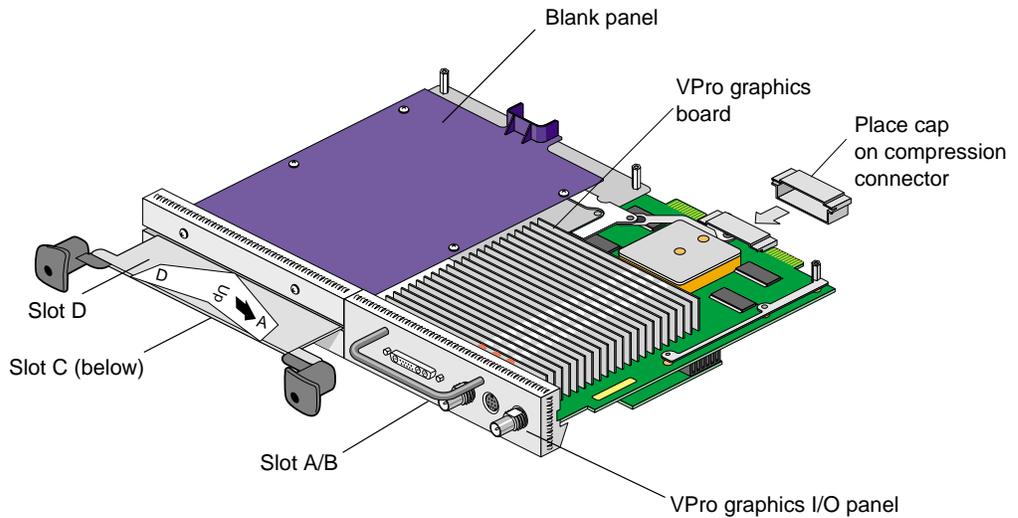


Figure 5-10 Placing the XIO Tri-Module on Its Side

5. Place a cap on the VPro graphics board compression connector, as shown in Figure 5-10 and Figure 5-11.

Spare caps are included with your workstation.

Caution: To prevent damage to the connector, *do not* touch or bump the gold (front) surface. For compression connector care and cleaning instructions, see Appendix A, "Care and Cleaning of Compression Connectors."

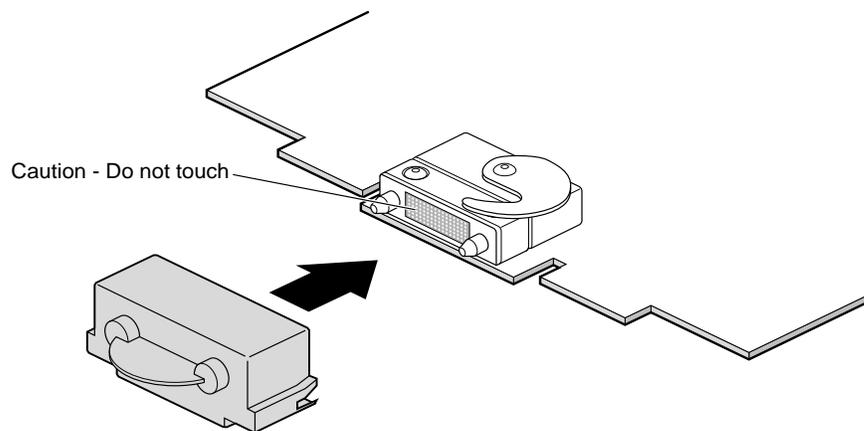


Figure 5-11 Placing a Cap on the XIO Compression Connector

Removing an Option Board or Blank Panel

Before removing an option board, or blank panel from slot C or D, you must power off your workstation, wait 5 minutes, attach the wrist strap, and remove the XIO Tri-Module (See “Preparing the Workstation” on page 110 and follow the instructions through removing the XIO Tri-Module). Also read “About the XIO Tri-Module and XIO Boards” on page 108. The VPro graphics board is always installed in slot A/B, as shown in Figure 5-12. Slot B is a daughterboard slot that is located on the other side of the VPro graphics board.

Before you install an option board in slot C or D, you *must* remove the protective blank panel or the option board currently installed in that slot. Follow the same procedure to remove an option board or a blank panel.

Note: For instructions on removing a blank panel or daughterboard from slot B, see your daughterboard installation guide.

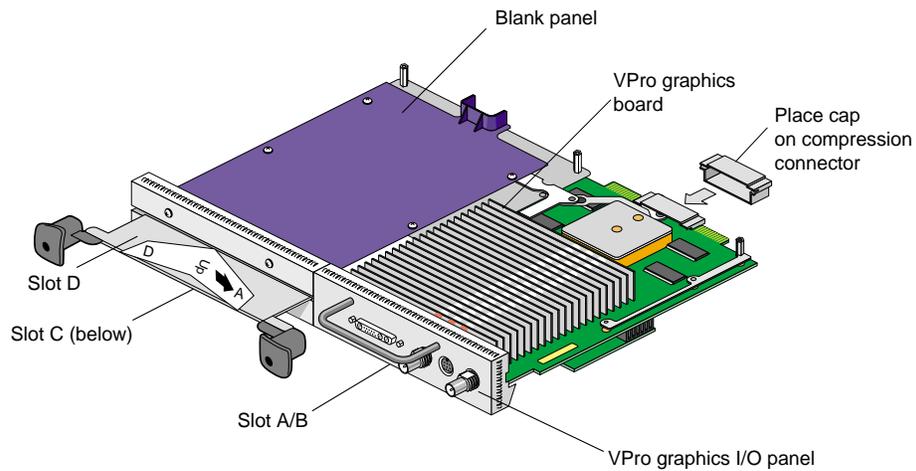


Figure 5-12 Identifying the Slots Used by an XIO Option Board



Warning: The heat sinks on the XIO boards get very hot. Wait 5 minutes after powering off your workstation before removing the XIO Tri-Module. Test before touching any of the XIO boards.

Caution: Do not touch the gold XIO compression connector.

Before you remove an option board place a cap on the XIO compression connector, as shown in Figure 5-13, to prevent accidental damage when removing the board.

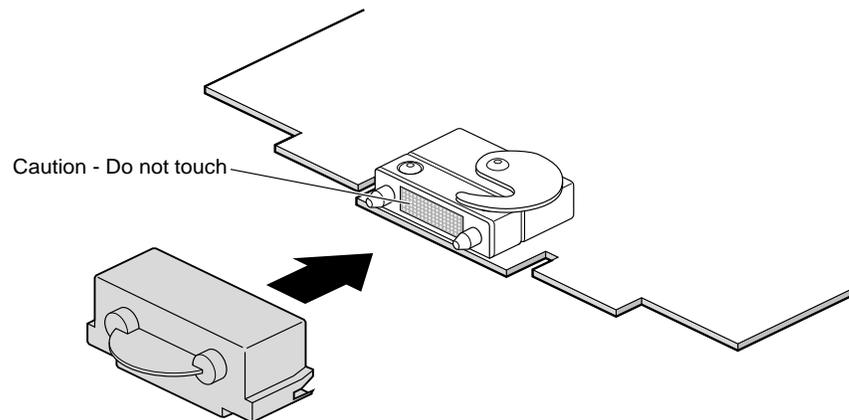


Figure 5-13 Placing the Cap on the XIO Compression Connector

Note: The following illustrations show you how to remove a blank panel.

- Using the supplied Phillips screwdriver, remove the screws from the option board or blank panel, as shown in Figure 5-14.

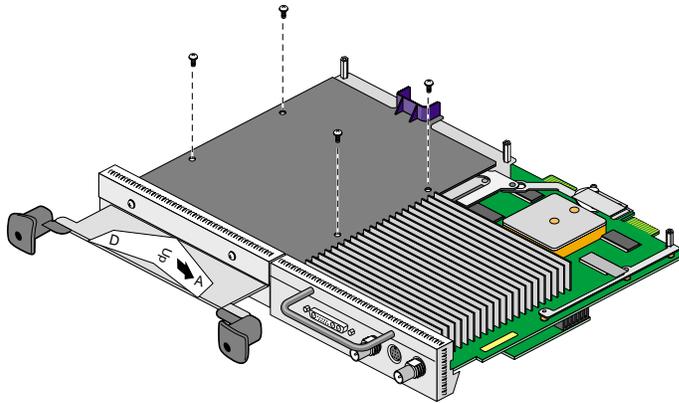


Figure 5-14 Removing the Screws from the Blank Panel

- Grasp the blank panel or option board on the front and on the side of the board with no connectors and lift, as shown in Figure 5-15.

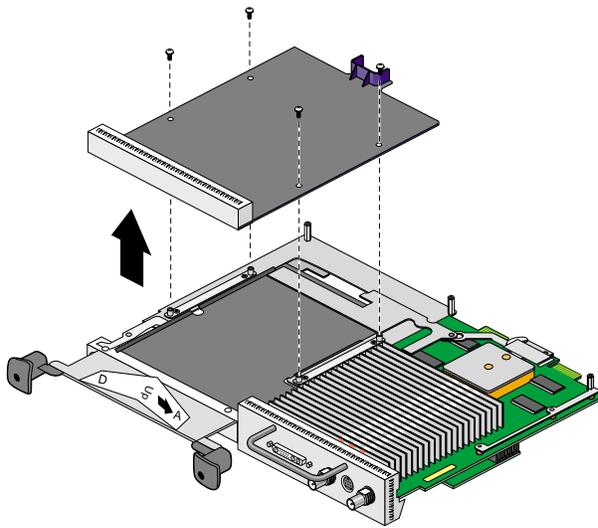


Figure 5-15 Removing the Blank Panel

8. With the same side facing up, place the board on a clean, antistatic surface.

Store the blank panel in a safe place. You may need to reinstall it if you remove an option board.

Installing an Option Board or Blank Panel

Note: For complete instructions on installing your option board, refer to your option board installation manual.

Before installing an option board, or blank panel, you must power off your workstation, wait 5 minutes for the heat sinks to cool, attach a wrist strap, and remove the XIO Tri-Module (See “Preparing the Workstation” on page 110 and follow the instructions through removing the XIO Tri-Module). Also read “About the XIO Tri-Module and XIO Boards” on page 108.

Caution: Do not remove the cap on the XIO compression connector until completing the installation process.

1. Place the XIO Tri-Module on its side with the handles facing you, and then identify the slot where you want to install the option board, or blank panel.

The VPro graphics board always uses slot A/B. Option boards always go in slot B, C, or D. Slot B is a daughterboard slot on the other side of the VPro graphics board. For instructions on installing a daughterboard in slot B, see your daughterboard installation guide.

Tip: Orient the board so the thick side is facing up. The thick side contains components, heat sinks, or daughterboards.

2. Using the supplied Phillips screwdriver, remove the screws from the option board or blank panel currently occupying the desired slot, then remove the board or panel (see Figure 5-15).

The following illustrations show you how to install an option board.

3. Place the option board or blank panel on the standoffs.

Some option boards must be placed in designated slots. Always check your option board installation manual for information about board placement or other pertinent information.

4. Install the screws, tightening the board or panel to the standoffs, as shown in Figure 5-16.

Note: Make sure all the slots are filled, with the VPro graphics board, and either an option board, or blank panel. The system does not cool properly if any of the slots are empty.

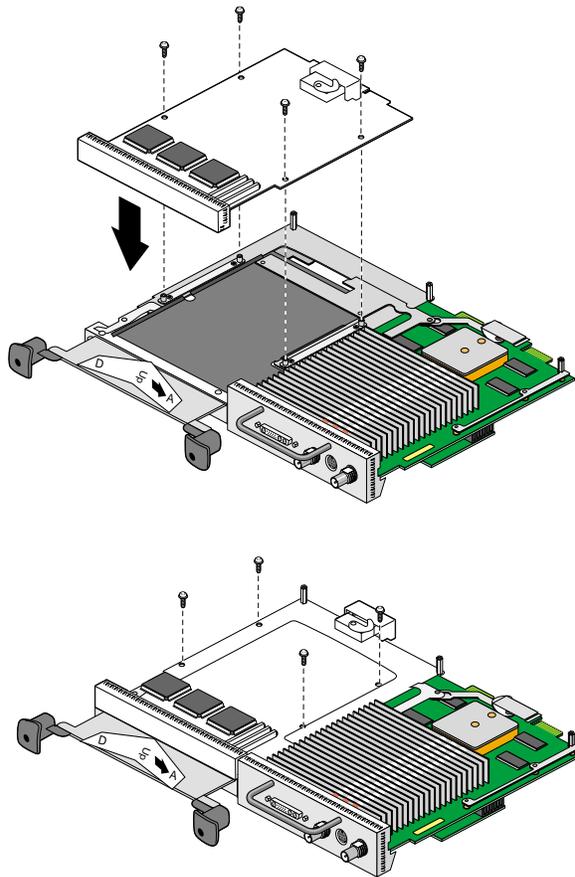


Figure 5-16 Installing the Screws

5. Remove the cap from the XIO compression connectors, as shown in Figure 5-17.
Keep the caps to protect the compression connector if you remove any XIO board.

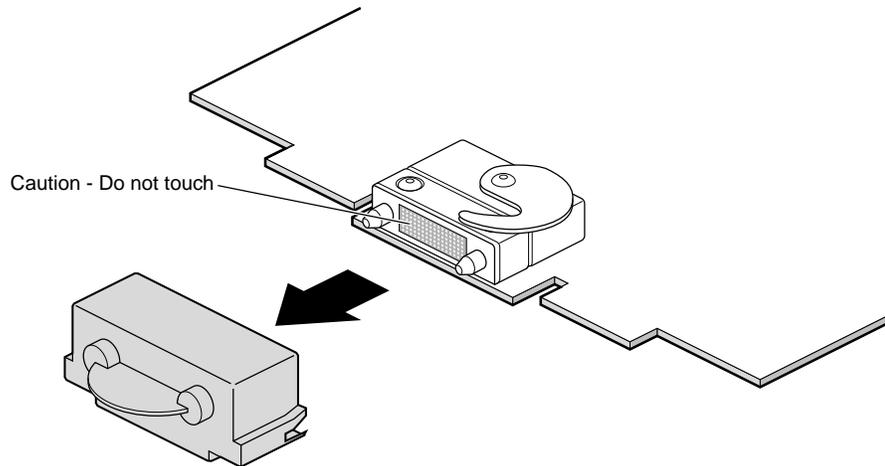


Figure 5-17 Removing the Cap from the XIO Board Compression Connector

Reinstalling the XIO Tri-Module

Caution: To prevent damage to your workstation, reinstall the XIO Tri-Module with the VPro graphics I/O panel aligned with the top of the workstation, as shown in Figure 5-18.

Follow these instructions to reinstall the XIO Tri-Module:

1. Remove the cap from the XIO Tri-Module compression connector.
2. Slide the XIO Tri-Module into the guides on the top and bottom of the workstation.
3. Before you insert the XIO Tri-Module, make sure the sliding handles protrude in a locked position from the I/O panels, as shown in Figure 5-18.

If the sliding handles are flush with the I/O panels, the XIO Tri-Module will stop during insertion. Pull out the sliding handles until the sliding portion of the XIO Tri-Module looks like Figure 5-18.

4. Grasp the immovable handle area with one hand while supporting the XIO Tri-Module with the other, and slide the module into the chassis.

Use the immovable handle to push the XIO Tri-Module into a locked position (the I/O panels are nearly flush with the workstation when properly inserted, but there is a slight variation in the depth of the boards.)

5. Push the sliding handles until the sliding portion of the module is flush with the workstation.

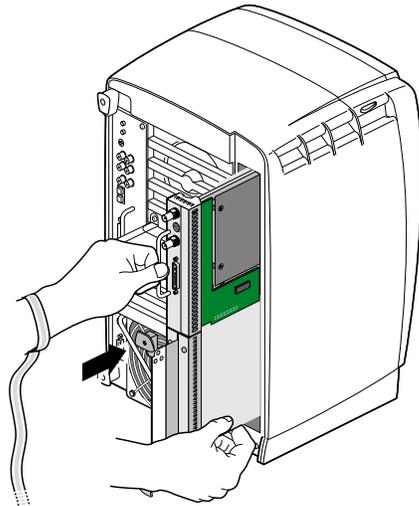


Figure 5-18 Inserting the XIO Tri-Module

6. Tighten the captive screws in the sliding handles, as shown in Figure 5-19.

Tip: Start by tightening a few threads on each captive screw before fully tightening.

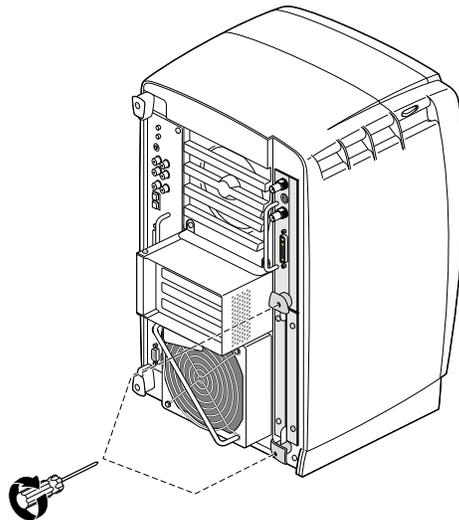


Figure 5-19 Tightening the XIO Tri-Module Screws

7. Remove the wrist strap.
8. Reconnect all cables to the XIO Tri-Module.
9. Connect any new cables to the XIO Tri-Module.

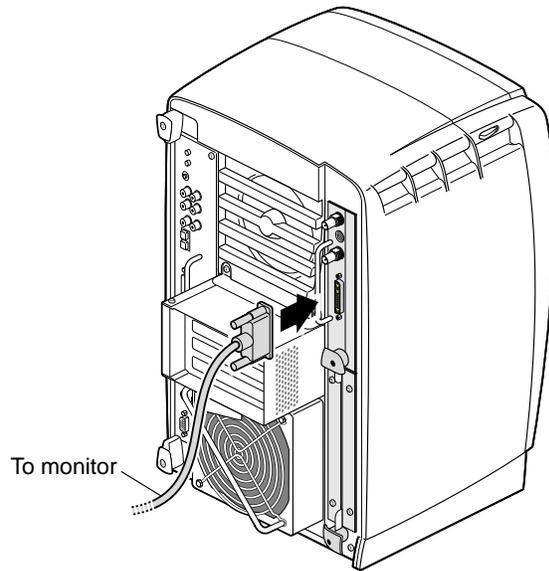


Figure 5-20 Reconnecting the Monitor Cable

You are finished installing your XIO option board.

Go to “Powering On the Octane2 Workstation” on page 127.

Powering On the Octane2 Workstation

1. Plug the power cable into an electrical outlet (see A in Figure 5-21).
2. Press the power button (B) on the front of your workstation.
3. Press the monitor power switch (C) to turn on your monitor.

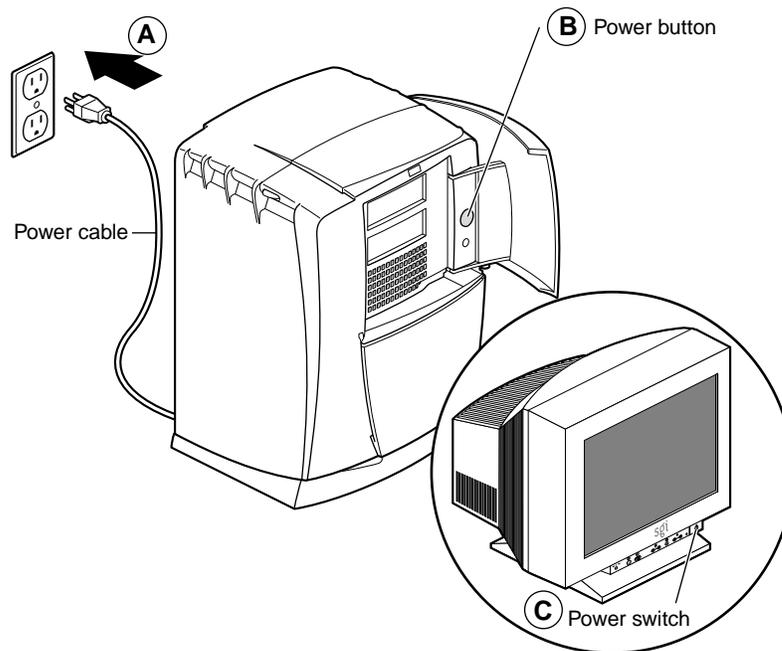


Figure 5-21 Powering On the Octane2 Workstation

Verifying the Option Board Installation

To verify that your graphics or option boards are recognized, follow these instructions:

1. From Toolchest > Desktop, open a UNIX shell.
2. At the prompt, type: **hinv**.
3. Look for a line similar to this:
name of option board, module x slot x: revision x
If your option board is not recognized, repeat the installation procedure.
4. If the graphics or option board is still not recognized, see Chapter 8, "Troubleshooting," or your option board manual.
5. If your option board is still not recognized, contact your authorized SGI service representative.

Installing and Removing External Devices

This chapter provides information about SCSI bus bandwidths and rates, SCSI and serial device cabling, rules for daisy-chaining peripherals, pointers to configuration documentation, and instructions for installing and removing external devices. For information on internal SCSI devices, see Chapter 7, “Installing and Removing Internal Drives and Front Module Parts.”

To install an external device, power down your workstation, connect the device to your workstation, power on the device, then power on your workstation. Following this sequence allows the system software to recognize the external device.

The following topics are covered in this chapter:

- “About SCSI Buses and Devices” on page 130
- “Installing External SCSI Devices” on page 131
- “Installing Serial Devices” on page 147
- “Installing Audio Devices” on page 150
- “Replacing the Keyboard or Mouse” on page 156

About SCSI Buses and Devices

SCSI devices continue to evolve with higher bus bandwidths, faster data transfer rates, and channels with longer cables and more devices. The Octane2 workstation has two wide SCSI buses, one for internal devices and one for external devices.

Table 6-1 compares Ultra and Fast, wide and narrow SCSI rates.

Table 6-1 Comparison of Ultra and Fast, Wide and Narrow SCSI Rates

	Wide (16-bit) Bus	Narrow (8-bit) Bus
Ultra SCSI (Fast-20)	40 MB/s (theoretical peak rate)	40 MB/s (theoretical peak rate)
Fast SCSI	20 MB/s (theoretical peak rate)	10 MB/s (theoretical peak rate)

Note: Ultra SCSI is also referred to as Fast-20.

The data transfer rate is also affected by the media speed of the SCSI device. Fast-20 SCSI is not merely “fast SCSI.” The “-20” in this term signifies the maximum number of megatransfers (millions of 8-bit or 16-bit data transfers per second) that can occur during an I/O operation.

Data transfer rates are either slow or fast, and are measured in megabytes per second. An operation is either 8-bit or 16-bit in size; thus, data transfer rates depend on bus width.

By default, the Ultra SCSI controller tries to negotiate for wide (16-bit) and for Ultra speed. Table 6-2 provides data burst rate information.

Table 6-2 Bus Rate + Operating Mode = Data Burst Rates

Existing Bus	Operating Mode	Data Burst Rate
8-bit	Fast	10 MB/second
8-bit	Ultra	20 MB/second
16-bit	Fast	20 MB/second
16-bit	Ultra	40 MB/second

Following are some tips for connecting SCSI devices to your workstation.

- You can mix Ultra and Fast devices on the same bus. You can also mix 16-bit and 8-bit devices on the same bus. The overall performance of a mixed bus can vary widely.
- To daisy-chain a mix of wide and narrow devices, place the wide devices (as a group) closest to the Octane2 workstation where the bus is wide, and place the narrow devices (as a group) at the end of the daisy chain.

Note: Be sure to use an adapter or other special cable that terminates the upper half of the SCSI bus when converting from the final wide device to the first narrow device. SGI integrates termination into all SGI-supplied cables, but not all third-party cables have integrated termination.

- Unsupported devices may not work with the Octane2 workstation, and may be incompatible with supported devices.
- The combined length of all the SCSI cables on a daisy-chain determines how many devices can be daisy-chained.
- Set addresses manually only on external SCSI devices. See the device manual for setting the address on the device. Each device must have a unique address.
- Drives are easily damaged. Handle your drive carefully; do not drop it or handle it roughly.

Installing External SCSI Devices

This section shows you how to connect external SCSI devices to your workstation. External devices include:

- DAT or DLT tape drives
- CD-ROM drives
- Floppy drives
- Other external SCSI devices

For information about SCSI bus and device speeds, see “About SCSI Buses and Devices” on page 130.

Assigning a SCSI Address on an External Device

You must assign a SCSI address to each external SCSI device before you connect the device to your workstation. Bus 1 (the external bus) has addresses such as 1-1, 1-2, 1-3. The second number indicates the unique SCSI address you must set for each external device.

Caution: *Do not* use address 0, which is reserved for the system SCSI ID.

- If you do not have any external SCSI devices connected to your system, you can assign any number between 1 and 15 (for wide SCSI devices) or 1 and 7 (for narrow devices) to your new SCSI device. Skip to the next section “Setting the SCSI Address on an External Device” on page 133.
- If you have one or more external SCSI devices connected to your system, assign a number between 1 and 15 (for wide SCSI devices) or between 1 and 7 (for narrow SCSI devices) that is not assigned to any of the other external SCSI devices. Check available addresses for external SCSI devices as follows:

1. If your workstation is powered off, turn on the power.
2. Log in to your account.

For more information on logging in, go to “Logging In to the Octane2 Workstation” on page 21.

3. When the system comes up, choose Toolchest > System > System Manager > Hardware and Devices > Removable Media Manager.

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

4. Choose a number between 1 and 15 (for a wide SCSI device) or between 1 and 7 (for a narrow SCSI device) that is not assigned to any of your connected SCSI devices.
5. Go to the next section, “Setting the SCSI Address on an External Device.”

Setting the SCSI Address on an External Device

To set the SCSI address, locate a switch, button, dial, or jumpers on the external device, then manually set the address to the number you chose in step 4 of the previous section.

Note: Although you can connect up to 15 wide SCSI devices to the Octane2 workstation, some devices may have SCSI address dials that provide only 9 possible addresses.

If the SCSI device has a button, switch, or dial on the back, follow these steps (if there is no switch or dial on the device, see the instructions included with the device).

1. Remove the SCSI device from its packaging, then locate the button, switch, or dial. It may be on the rear or bottom of the device. An example is shown in Figure 6-1.
2. Use a small screwdriver or pencil tip to move the dial or button to the number you chose in step 4 of the previous section.

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

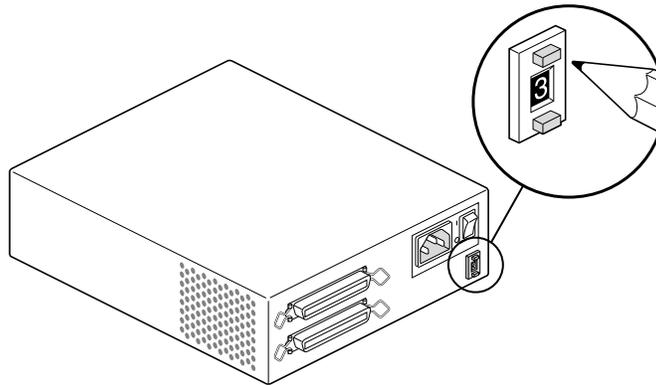


Figure 6-1 Manually Setting the SCSI Address

About Cables

You can connect one or more external SCSI devices to the SCSI port on the back of your workstation. Connecting more than one device is called daisy-chaining. You connect external SCSI devices in a chain, with the first device attached to the SCSI port on your workstation.

The combined length of SCSI cables determines the number of external SCSI devices you can daisy-chain. Table 6-3 shows the maximum cable lengths for the various types of SCSI devices.

Table 6-3 Maximum Combined Cable Length

SCSI type	Maximum cable length
Ultra SCSI	1.5 meters
Fast SCSI 2	3 meters
Ultra SCSI and Fast SCSI 2	1.5 meters

Caution: Using a cable without controlled impedance can cause your device to function improperly. For any external device, it is extremely important to use a cable with controlled impedance and impedance-matched connectors. Some cables that have the correct connectors do not function properly. This is particularly important if you connect more than one external device.

Use the cables and active terminator that came with the wide device, or purchase an active terminator, if necessary. Use only an active terminator.

Caution: Using other types of cables or terminators can cause your system to malfunction.

If you want to connect a device to your system, but do not have the required cables, you can order them by contacting your authorized SGI service representative.

To connect an external device, power off your workstation, then prepare the device for installation. Instructions begin in the next section.

Shutting Down and Powering Off the System

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

1. Open the cover and press the power button (see A in Figure 6-2) to power off your workstation.
2. Unplug the power cable from the electrical outlet (B) and from your workstation.
3. Press the monitor power switch (C) to power off your monitor.

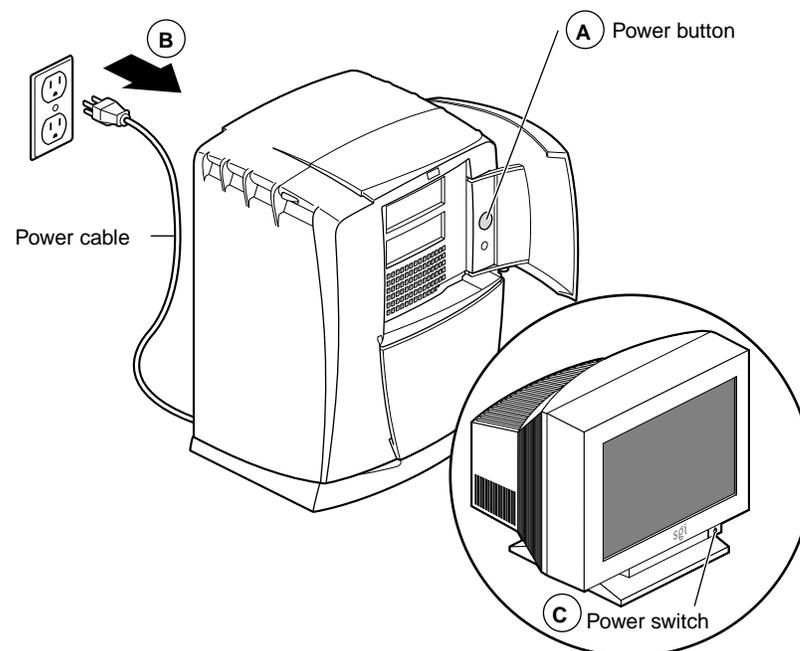


Figure 6-2 Powering Off the Octane2 Workstation

Preparing a SCSI Device for Cabling

1. If you are daisy-chaining a new SCSI device to a connected SCSI device, remove the terminator from the connector on the last device in the current chain by squeezing the clips on both sides of the terminator and pulling it off. See Figure 6-3.
2. If the new SCSI device is the only SCSI device, *do not* remove its terminator.

Note: If no SCSI devices are connected to your workstation, termination is not required on the workstation's SCSI port.

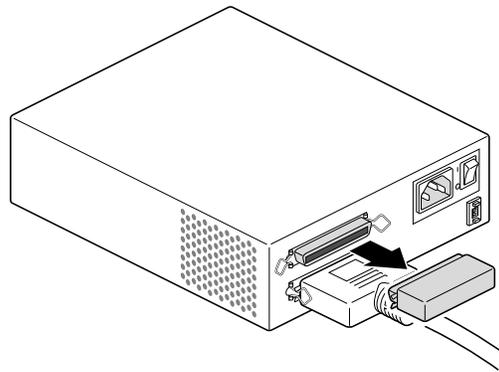


Figure 6-3 Removing the Terminator from the Last Device on the Daisy Chain

Cabling the Devices

Caution: Ultra and Fast SCSI devices require higher quality cables than earlier SCSI devices. Use the cable and active terminator included with the device. Using other types of cables or terminators can cause your system to malfunction.

- 1. Choose the required SCSI cable to connect your external SCSI device.

Caution: Exceeding the maximum 1.5 or 3 meters combined cable length recommended for your SCSI type can cause your external SCSI devices to operate unreliably (see Table 6-3 for maximum cable length for each type of device or combination of devices).

- 2. Connect the fastest SCSI device or devices to your workstation and to each other, then connect slower devices at the end of the chain. See Figure 6-4.

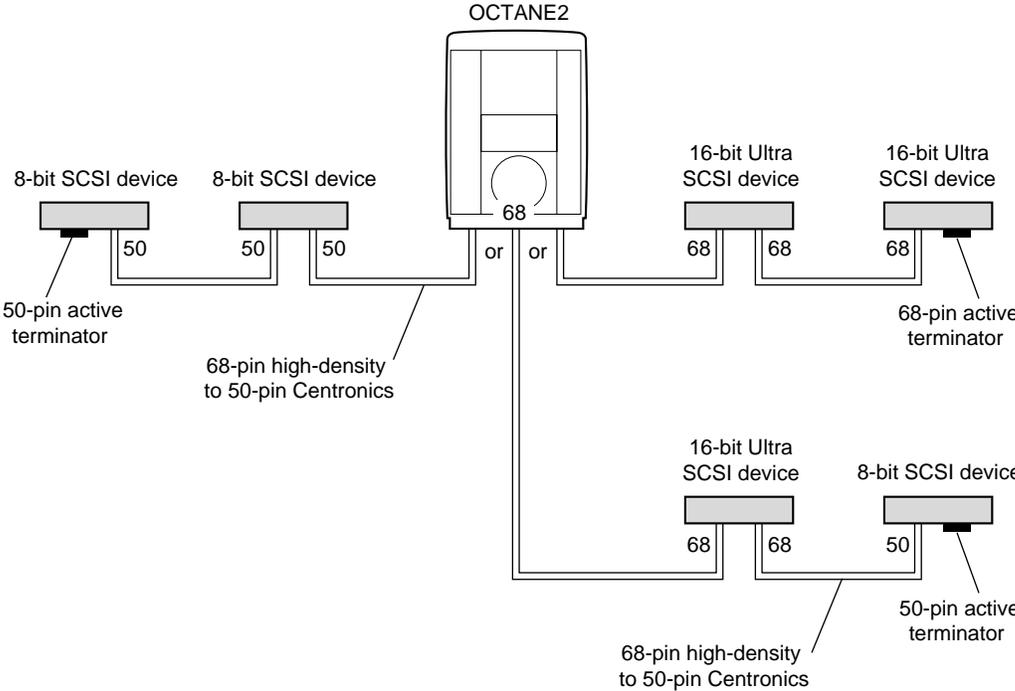


Figure 6-4 Using the Correct Cables between Devices and/or the Octane2 Workstation

3. Use the following cables between your workstation and the SCSI device, or between devices:
 - To connect the device directly to your workstation's SCSI port, use the high-density 68-pin to Centronics® 50-pin Fast SCSI cable. See Figure 6-5.
 - To daisy-chain an Ultra SCSI device to another Ultra SCSI device, use a 68-pin to 68-pin cable.
 - To daisy-chain an Ultra SCSI device to a Fast SCSI device, use a 68-pin to 50-pin Centronics Fast SCSI cable.

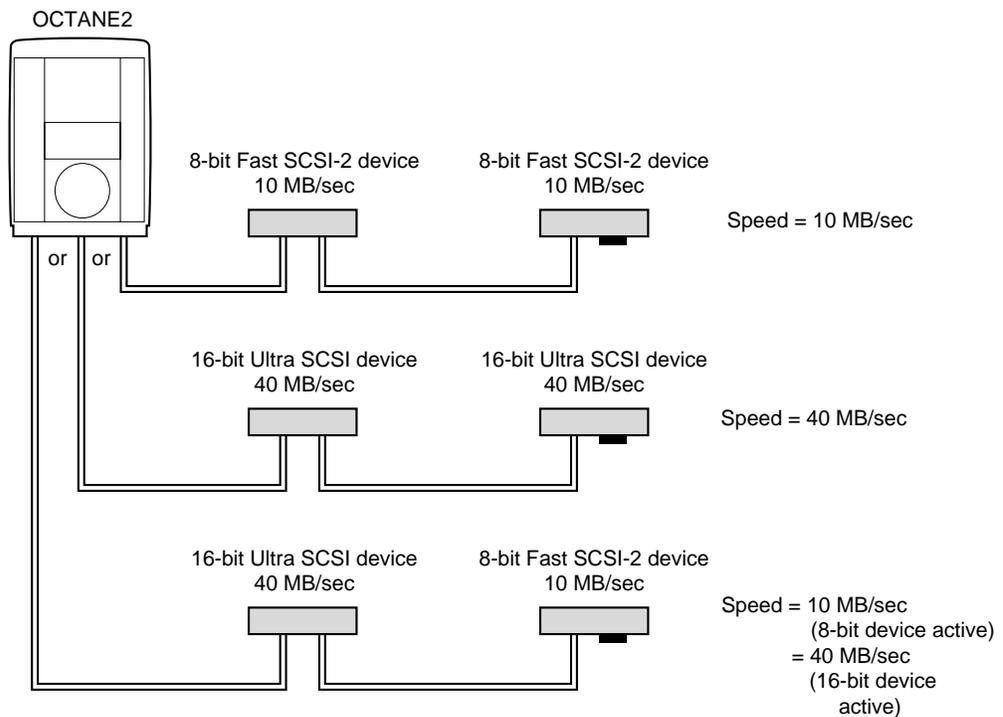


Figure 6-5 Comparing Speed of Daisy-Chained Devices

The speed of the active SCSI device determines the speed of any other devices in a daisy chain. If a slow device is active, the SCSI bus runs at a slow speed; if a high-speed device is active, the SCSI bus runs at a high speed.

Connecting SCSI Devices

1. Connect a single device, or the first of several devices, as shown in Figure 6-6.
 - Connect one end of the SCSI cable to your workstation's SCSI port or to the back of another SCSI device.
 - Connect the other end of the SCSI cable to one of the SCSI connectors on the back of the device and secure the clips on each side of the connector.

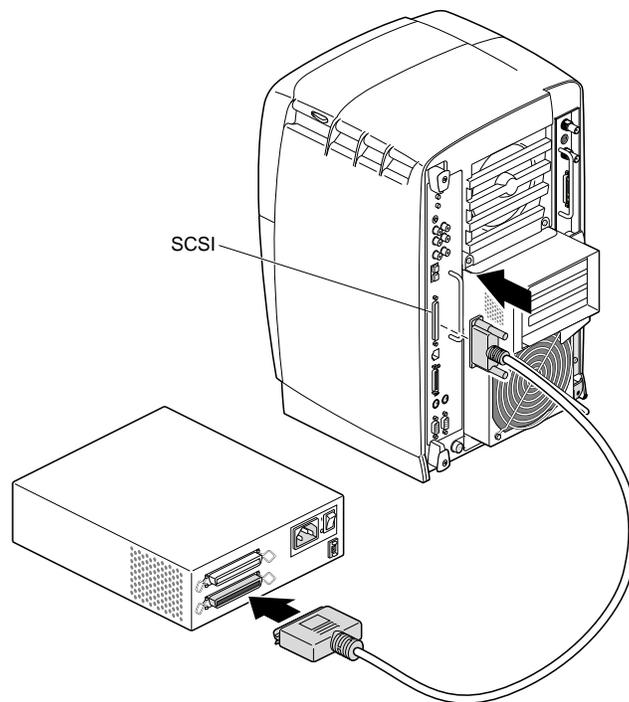


Figure 6-6 Connecting an External SCSI Device to the Octane2 Workstation

- Connect one end of the SCSI cable to the open connector on the first SCSI device, as shown in Figure 6-7.
- Attach the other end of the SCSI cable to one of the connectors on the SCSI device you are adding.

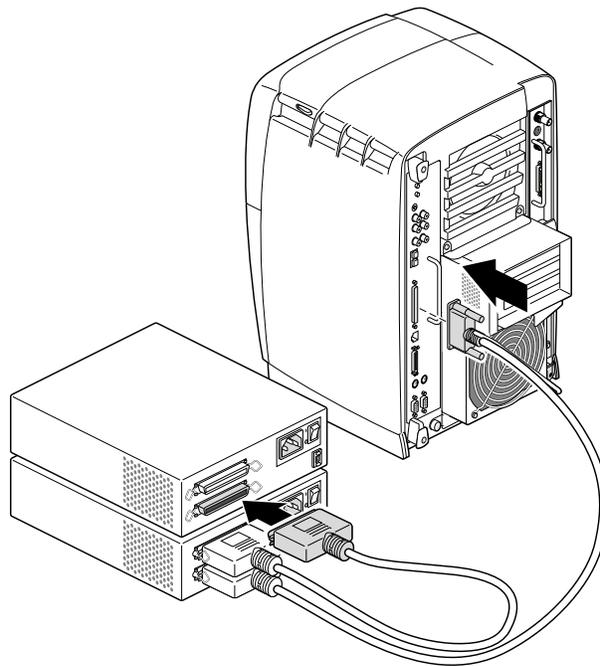


Figure 6-7 Daisy-Chaining an External SCSI Device to Another External SCSI Device

2. Connect the terminator to the last device in the daisy chain (see A in Figure 6-8).
Make sure you secure the clips on each side of the terminator. The terminator is designed to fit in only one direction.

3. Connect power cables (B) to each device and to an electrical outlet.

Note: Remember to turn on the external SCSI devices first, then turn on your workstation, to make sure your system recognizes the devices.

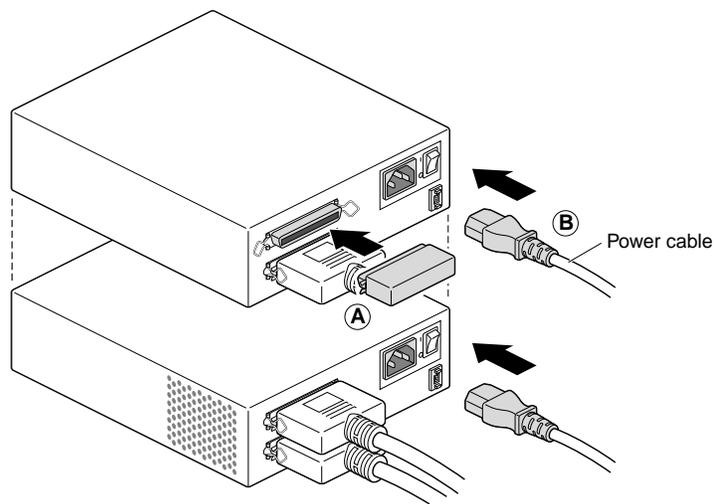


Figure 6-8 Connecting the Terminator and Power Cable to an External Device

You are now ready to power on your workstation and verify that your system recognizes the external SCSI devices.

Powering On the Octane2 Workstation

1. Plug in the power cable (see A in Figure 6-9).
2. Replace the lockbar (if one was removed).
 - Open the cover on the front of your workstation.
 - Slide the lockbar into the lockbar slot.
 - Insert the lock through the lockbar at the back of the workstation.
3. Press the power button (B) on your workstation.
4. Press the monitor power switch (C) to power on your monitor.

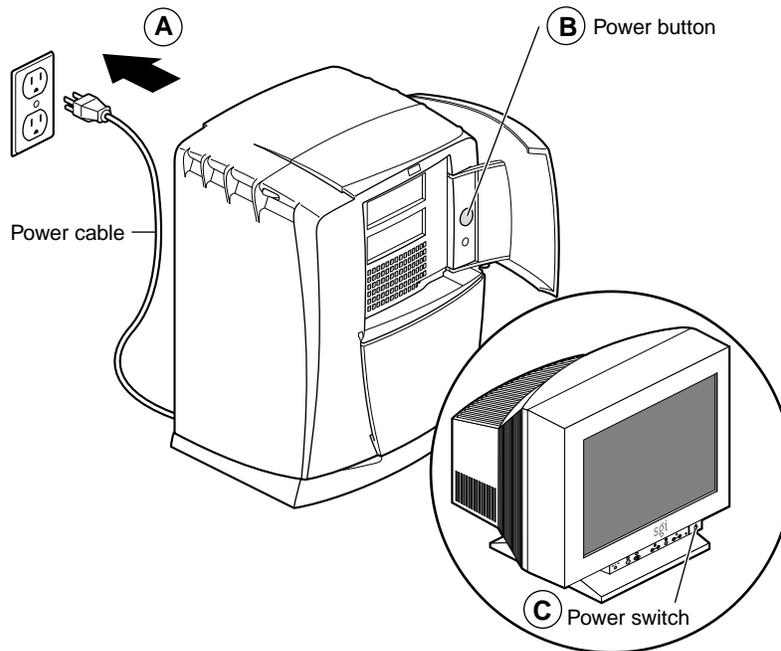


Figure 6-9 Powering On the Octane2 Workstation

Testing an External Device

After you connect the external SCSI device to your workstation, verify that your system recognizes the device.

The system software automatically recognizes most external SCSI devices and displays an icon representing that device on the desktop.

1. Turn on all external SCSI devices first.

You can turn on external devices (see A in Figure 6-10) in any order.

Tip: Always turn on the external SCSI device(s) *before turning on your workstation*; otherwise, the system does not recognize the device.

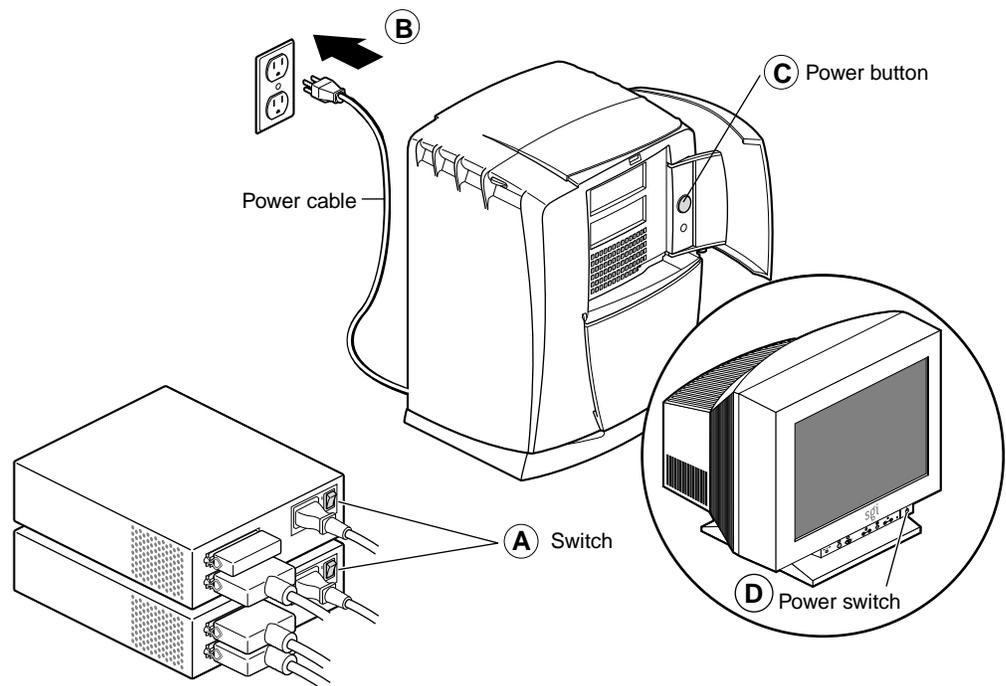


Figure 6-10 Turning On External Devices and the Octane2 Workstation

To check the system configuration, follow these steps:

2. If your workstation is unplugged, plug in the power cable (B), then open the cover on the front of your workstation.
3. Press the power button (C) to turn on your system.
4. Press the monitor power switch (D) to power on your monitor.

After a few moments, the system starts.

5. When you see the login screen, log in to your account. For more information on logging in, go to “Logging In to the Octane2 Workstation” on page 21.

If the SCSI device is installed correctly, an icon representing the device appears on the desktop. Figure 6-11 shows the icon for a CD-ROM drive.



Figure 6-11 Identifying the CD-ROM Icon

You can also use the System Manager to verify that the external device is installed correctly.

1. Choose Toolchest > System > System Manager > Hardware and Devices > Removable Media Manager.

A list of installed external devices appears.

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

You can also display this information by opening an IRIX shell and typing `hinv`.

If the device you installed does not appear, follow these steps:

1. Power off your system.
2. Make sure you connected the correct SCSI cable to the device or between devices.
3. If you daisy-chained a mix of wide and narrow SCSI devices, make sure you connected the wide devices (as a group) closest to your workstation (where the bus is wide), and the narrow devices (as a group) at the end of the daisy chain.

4. If the device is the last SCSI device on the chain, make sure a terminator is plugged into one of its SCSI connectors.
5. Restart your system and recheck the System Manager listing or *hinv* listing (see step 1).

The system automatically recognizes most installed SCSI devices. Table 6-4 provides additional references for the various external SCSI devices.

Table 6-4 Additional References on External SCSI Devices

Installed device:	For Information on:	Go to:
Floppy drive	Formatting and ejecting a disk	"Formatting a Floppy Disk from an External Drive" on page 146
CD-ROM drive	Setting up a CD-ROM other users can access	Toolchest > Help > Online Books > End User Bookshelf > Personal System Administration Guide > Setting Up SCSI Peripherals
	Additional information	Toolchest > Help > Online Books > End User Bookshelf > Personal System Administration Guide > Hardware and Devices
Tape drive	Backing up data onto a tape	Toolchest > Help > Online Books > End User Bookshelf > Personal System Administration Guide > Backing Up and Restoring Files
Printer	Setting up a printer	Toolchest > System > Printer Manager
	Additional information	Toolchest > Help > Online Books > End User Bookshelf > Personal System Administration Guide > Hardware and Devices

Cleaning DAT or DLT Drives

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

If the green LED on the front of the DAT drive flashes at about 5-second intervals, clean the DAT drive heads. Clean DAT drives after approximately 30 hours of use. Clean DLT drives more frequently.

Follow these steps to clean your DAT or DLT drive:

1. Insert a DAT or DLT cleaning cassette tape.

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

The drive loads the tape and cleans the heads automatically.

The DAT or DLT drive ejects the cleaning tape when the cleaning is complete.

2. If the green LED on the front of the DAT drive continues to flash at about 5-second intervals after cleaning the drive, there may be a problem with your cleaning-tape, or your drive may require cleaning by an authorized service provider.
 - First, try cleaning your drive again with a new DAT or DLT cleaning cassette tape.
 - If the LED continues to flash, take your drive to an authorized service provider for professional cleaning.

Formatting a Floppy Disk from an External Drive

If you are using the external floppy drive as an IRIX device, you can format a floppy disk as follows:

1. Choose Toolchest > System > System Manager > Hardware and Devices > Removable Media Manager.

A window appears with icons of the recognized devices.

2. Click the device you want to format.
3. Click the *Format* button.

Note: Floppy disks take about 2 minutes to format. You can eject a floppy disk by pressing the eject button on the external floppy drive.

For more information on formatting disks, choose Toolchest > Help > Online Books > *IRIX Admin: Peripheral Devices* and search for “Formatting Floppy Disks.”

Installing Serial Devices

This section shows you how to install serial devices. Serial devices include:

- Dials and button boxes
- Digitizer tablets
- Console terminals
- Modems

About Serial Ports

The Octane2 workstation has two PC-compatible serial ports. You can also configure these ports to operate in other modes. Adapter cables are available that simplify interconnection for each of these modes. For more information, see “Serial Port Adapter Cables” on page 235 or *Octane2 Hardware Central*.

Installing the Serial Device

To install a serial device, follow these steps:

1. Locate the serial ports on the back of your workstation, as shown in Figure 6-12. Serial ports are labeled **1** and **2** and are DB9 connectors.
2. Unpack the serial device and cables.

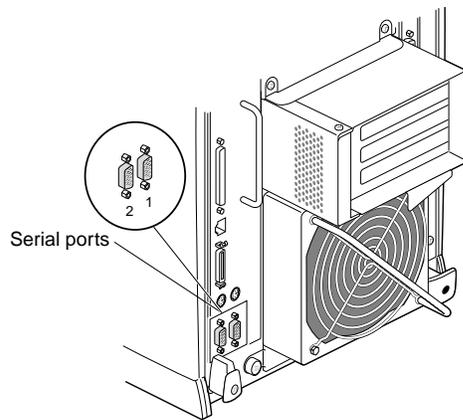


Figure 6-12 Locating the Serial Ports on the System Module

Table 6-5 Serial Port Assignment

If you are installing:	Use:
A console terminal	Serial port 1
Any other serial device	Either serial port

3. Attach the serial device cable.
 - See the instructions included with the serial device for detailed instructions on connecting the cable to the device.
 - Plug the other end of the cable to the serial connector on the back of your workstation, as shown in Figure 6-13.
4. Plug in the serial device's power cable (if any).
 - Plug the socket end of the power cable into the power connector on the back of the serial device.

Plug the other end into a grounded three-pronged wall outlet or power strip.

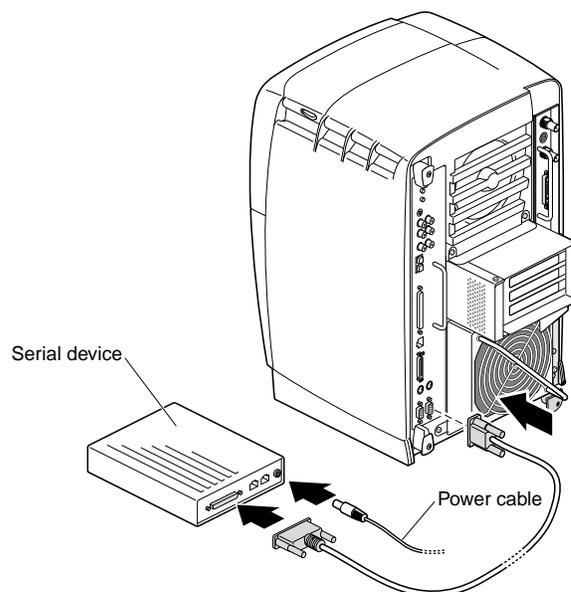


Figure 6-13 Plugging In the Serial Cable

Configuring the Device

After you connect the serial device to your workstation, configure it for your system. Choose Toolchest > Help > Online Books > Personal System Administration Guide, and search for “Setting Up Serial Peripherals.”

Installing Audio Devices

All Octane2 audio ports are located on the upper left side of the system module, as shown in Figure 6-14.

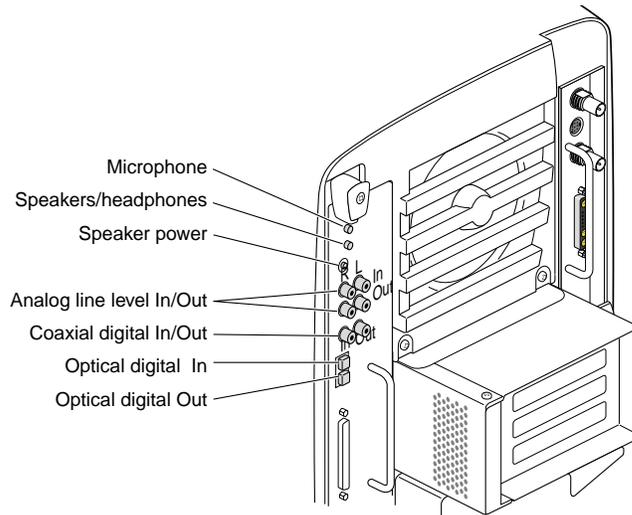


Figure 6-14 Audio Ports on the System Module

To connect an audio device, plug the device cable into the appropriate port.

Use the Audio Panel in Toolchest > Desktop > Control Audio to adjust the audio.

For additional audio information, choose Toolchest > Help, then choose one of the following sources:

- Online Books > End User > Media Tools User’s Guide
- How Do I (if you have a specific audio task you want to perform).

Installing the Microphone

Attach the microphone to your workstation as follows:

1. Place the microphone cord through the slot in the microphone base.
2. Slide the microphone into the base, as shown in Figure 6-15.
3. Place the microphone on top of the monitor (in the center, near the front).
4. Drape the cord over the back of the monitor.

Draping the cord over the side of the monitor causes the microphone to point away from the user, reducing the quality of the sound.

5. Connect the microphone cable to the microphone port on your workstation.

For pinout and technical specifications, see Appendix B.

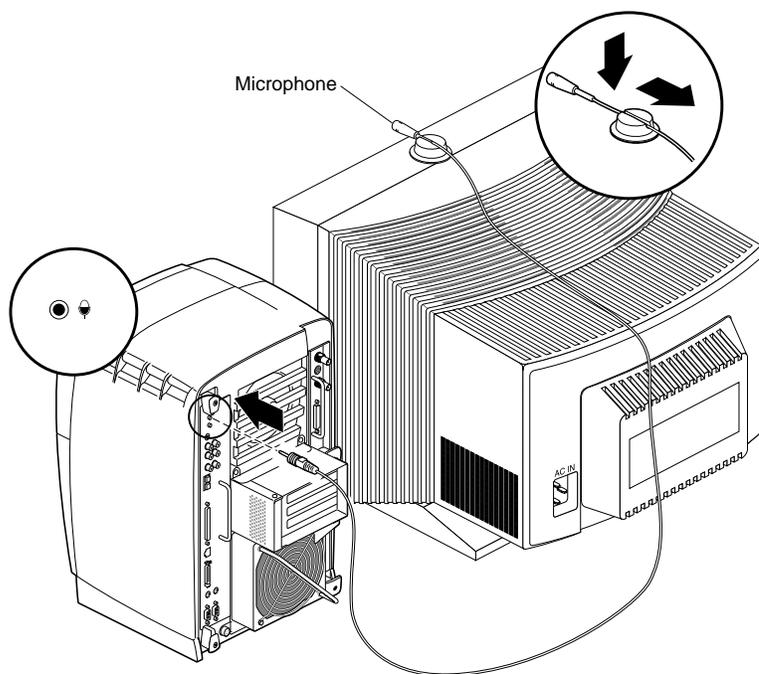


Figure 6-15 Installing the Microphone

Installing the Speakers and Headphones

You connect the speakers to the speaker ports on the system module. If you want to use headphones without speakers, plug the headphones directly into the speaker port. Otherwise, insert the headphones into the jack on the front of the right (active) speaker.

Before connecting the speakers, power off your workstation. For instructions on shutting down and powering off the Octane2 workstation, see “Shutting Down and Powering Off the System” on page 135. Then return to this page for instructions on connecting the speakers.

1. Place the left (passive) speaker on the left side of the monitor and the right (active) speaker on the right side of the monitor (the left [passive] speaker has a cord permanently attached to it).
2. Run the cord from the left (passive) speaker behind the monitor.
3. Attach the left (passive) speaker cord to the right (active) speaker. Use the port marked L, as shown in Figure 6-16.

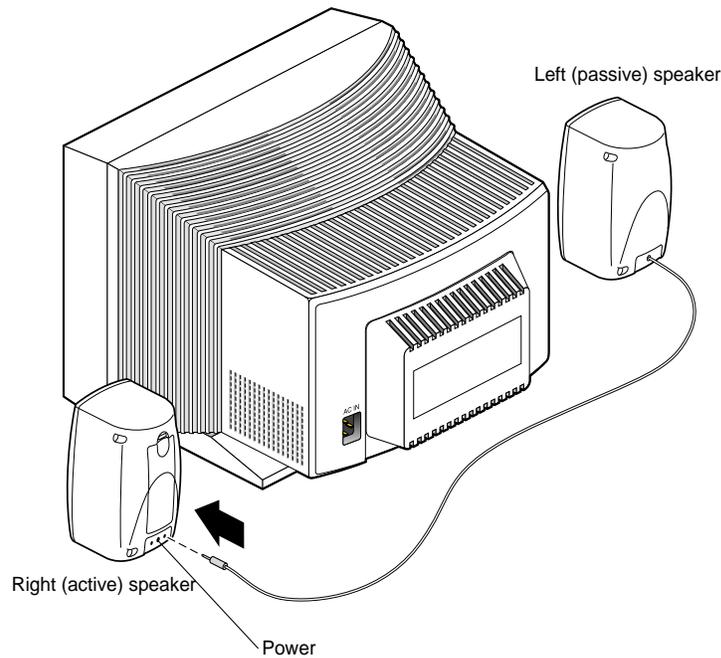


Figure 6-16 Setting Up the Speakers

4. On the cable with double connectors on each end, locate the end with one female connector and one male connector.
5. Attach the female power connector to the middle port on the right (active) speaker, as shown in Figure 6-17.
6. Attach the male connector to the port labeled R on the right (active) speaker.

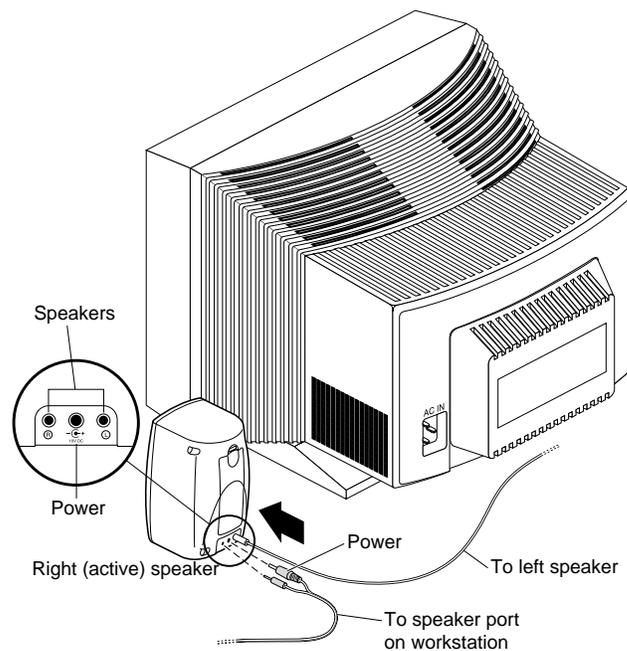


Figure 6-17 Attaching the Speaker Cables to the Active Speaker

7. Attach the other end of the speaker power and audio cable to your workstation as follows:
 - Attach the smaller tipped power connector to the speaker power port.
 - Attach the larger tipped connector to the speaker port, as shown in Figure 6-18.
8. Press the power button on the front of the active speaker.

9. Power on your workstation. For instructions, see “Powering On the Octane2 Workstation” on page 157.

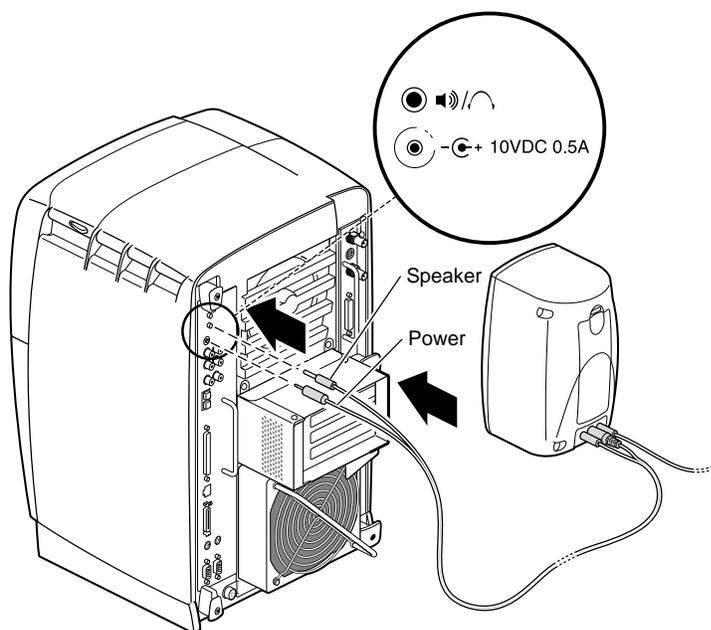


Figure 6-18 Attaching the Speaker Cables to the Octane2 Workstation

For pinout and technical information, see Appendix B, “Technical Specifications,” or *Octane2 Hardware Central*.

About Analog Line Level Audio

You can identify the analog line level audio ports as follows:

- Red is right
- White is left
- Input is upper
- Output is lower

These ports are compatible with consumer devices such as stereo receivers, VCRs, and professional audio equipment.

For pinout and technical information, see Appendix B, “Technical Specifications.”

About Coaxial Digital Audio

The coaxial digital audio ports are color-coded. Output is white. Input is red. These ports are compatible with consumer devices with coaxial digital interfaces, CD players, and professional audio equipment.

This port is in accordance with AES-3id recommendations for 75 ohm 1 V peak-to-peak coaxial connection of AES3-1992 interfaces.

For pinout and technical information, see Appendix B, “Technical Specifications.”

About the Optical Digital Port and Cable

A red LED is visible in the optical digital Out port or cable tip when audio is activated. Optical digital In is the upper port. Optical digital Out is the lower port.

These ports are compatible with other equipment displaying the ADAT® optical logo, as well as consumer devices such as CD players with digital optical interfaces.

When not in use, cover the optical digital port with a cap to keep out dust and debris.

Note: Do not touch the tip of the fiber optic cable, or performance may be reduced.

Optical digital cable should be three meters or less. Using a longer cable may cause performance to be reduced.

For pinout and technical information, see Appendix B, “Technical Specifications” or *Octane2 Hardware Central*.

Replacing the Keyboard or Mouse

1. Follow the instructions for “Shutting Down and Powering Off the System” on page 135.

SGI recommends that you connect the keyboard to the keyboard port, and the mouse to the mouse port. However, both work in either port. Before switching the ports, you *must* power off your workstation.

Note: Although you can disconnect and reconnect the mouse/keyboard while the system is on, you cannot switch ports unless you turn off your workstation.

For pinout and technical information, see Appendix B.

2. With your workstation shut down, disconnect the mouse or keyboard from its port on the back of the workstation.
3. Connect the new mouse or keyboard cable to your workstation, as shown in Figure 6-19.
4. Power on your workstation.

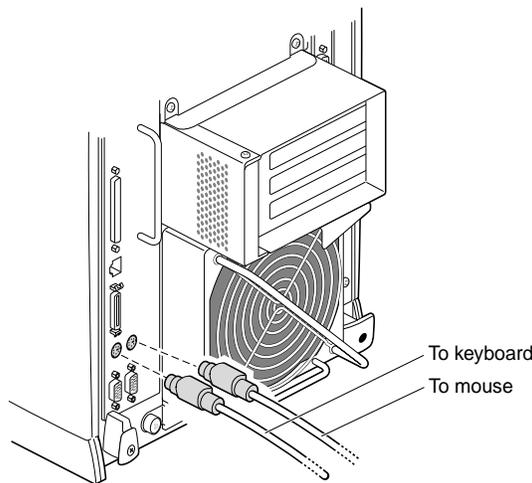


Figure 6-19 Disconnecting the Mouse and Keyboard

Powering On the Octane2 Workstation

1. Plug in the power cable to an electrical outlet (see A in Figure 6-20).
2. Press the power button (B) on your workstation.
3. Press the monitor power switch (C) to power on your monitor.

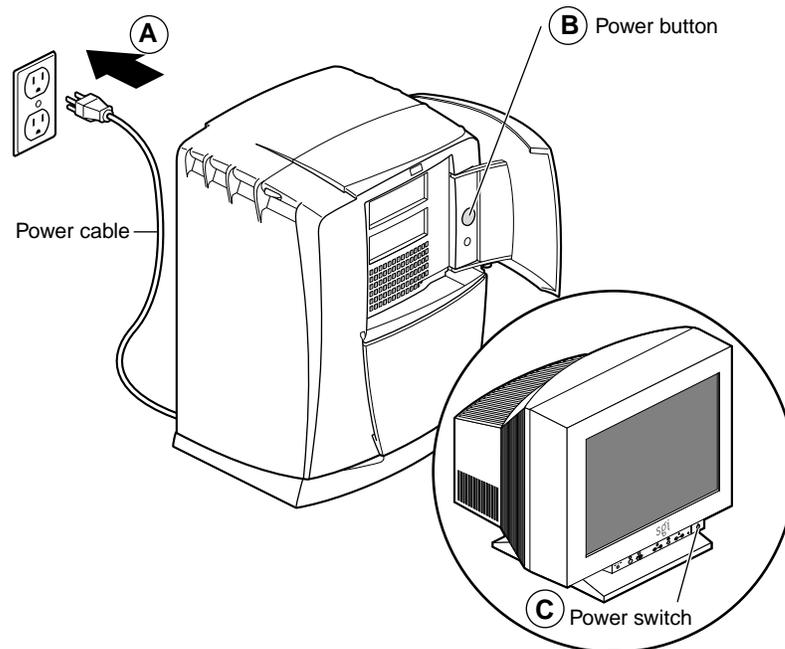


Figure 6-20 Powering On the Octane2 Workstation

Installing and Removing Internal Drives and Front Module Parts

This chapter shows you how to remove and install an internal drive, light module, frontplane module, system fan, and the external plastics located behind the bezel on the front of your workstation. Installing an internal drive is an easy task that requires no tools or screws. It is unlikely that you will need to replace the light module, frontplane module, system fan, or external plastics. Replacing any of these components is a complicated and lengthy task; it is best performed by an experienced user.

The following topics are covered in this chapter:

- “Installing and Removing Internal Drives” on page 160
- “Removing and Replacing the Light Module” on page 177
- “Removing and Replacing the Frontplane Module” on page 180
- “Removing and Replacing the System Fan” on page 187
- “Removing and Replacing the Plastics: Top and Base” on page 190

Installing and Removing Internal Drives

This section shows you how to install and remove internal drives. Internal drives include the system disk drive, secondary (option) disk drives, and DAT and DLT drives.

Caution: Drives can be easily damaged. Handle your drive carefully and do not drop it or handle it roughly.

About Internal Drives

- Unsupported devices may be incompatible with the Octane2 workstation and may cause problems with supported products.
- All internal devices have a 3.5-inch form factor.
- Set addresses manually only on external SCSI devices; internal SCSI devices (drives) are installed on a separate bus and are automatically assigned an address. Each bus has a unique address.
- Bus 0 (internal devices) has addresses such as 0-1, 0-2, 0-3.
- The system drive is SCSI ID 0-1.
- The option drive above it is SCSI ID 0-2.
- The option drive at the top of the Octane2 workstation is SCSI ID 0-3.
- Bus 1 (external devices) has addresses such as 1-1, 1-2, 1-3.

Tip: To determine the total capacity and megabytes available on your disks, choose the Toolchest > System > File System Manager and click the *Get Info* button.

Shutting Down and Powering Off the System

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

1. Open the cover and press the power button (see A in Figure 7-1) to power off your workstation.
2. Unplug the power cable from the electrical outlet and from your workstation (B).
3. Press the monitor power switch (C) to power off your monitor.

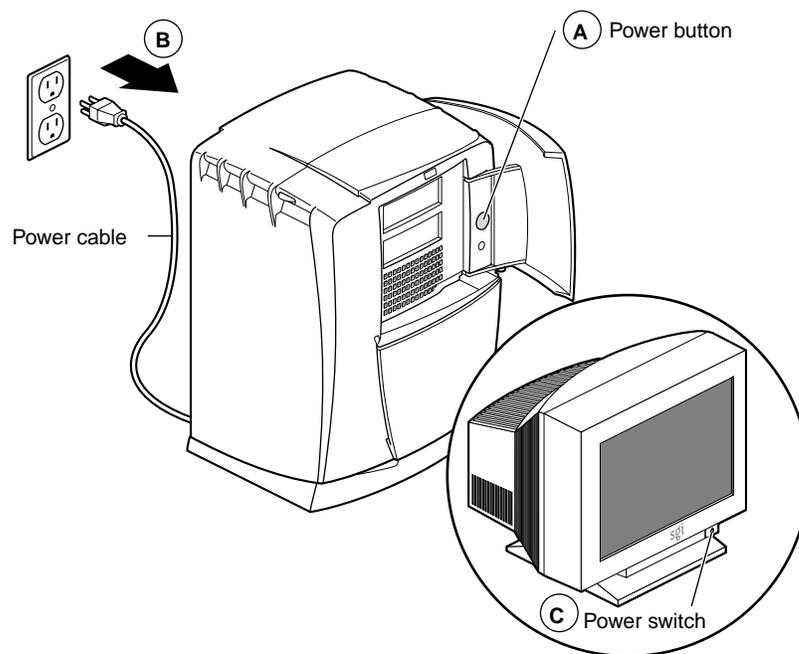


Figure 7-1 Powering Off the Octane2 Workstation and Monitor

Removing the Bezel

Before you remove the bezel, shut down and power off your system, as described in “Shutting Down and Powering Off the System” on page 161.

To remove the bezel, follow these steps:

1. Locate the lockbar, as shown in Figure 7-2.

If a lockbar is not installed, skip to step 4.

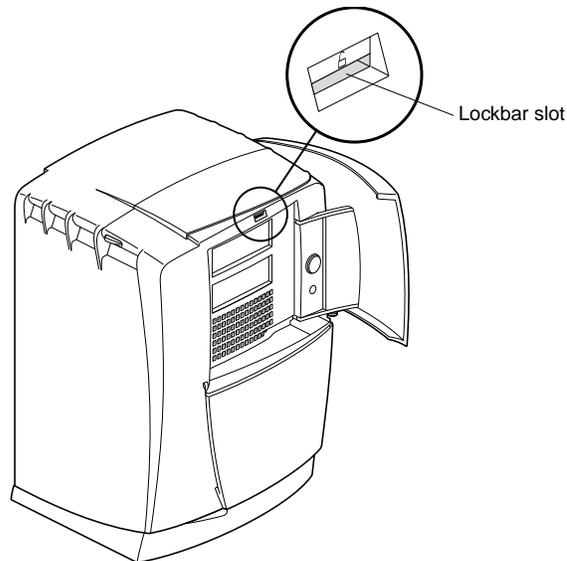


Figure 7-2 Locating the Lockbar on the Front of the Octane2 Workstation

2. Unlock and remove the lockbar (see A in Figure 7-3).
3. Close the door (B) on the front of your workstation.

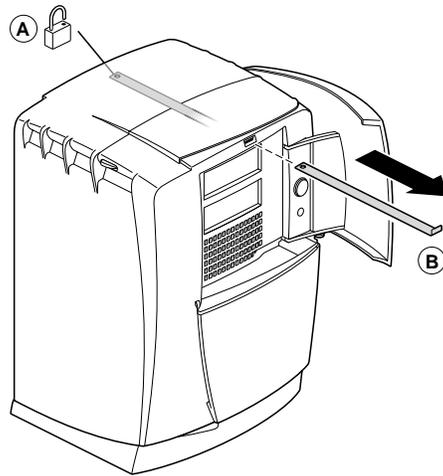


Figure 7-3 Unlocking and Removing the Lockbar

4. Press both bezel release buttons, as shown in Figure 7-4.

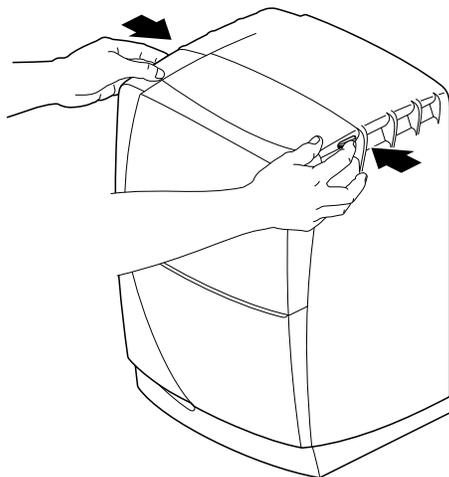


Figure 7-4 Pressing the Bezel Release Buttons

5. Remove the bezel by tilting it forward, then lifting it from its release hooks at the bottom, as shown in Figure 7-5.

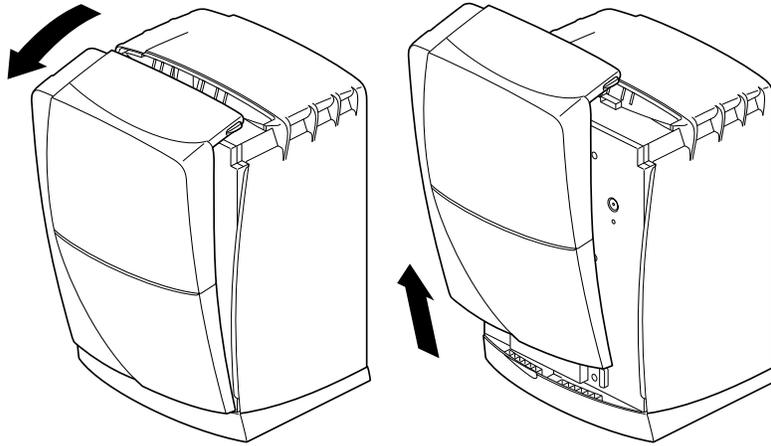


Figure 7-5 Removing the Bezel

Installing Secondary (Option) Internal Drives

To prepare your workstation for installation of a secondary internal drive, see “Shutting Down and Powering Off the System” on page 161, then follow the instructions for “Removing the Bezel” on page 162.

The secondary drive bays are the two top drive bays, as shown in Figure 7-6. You can install an internal drive in either bay.

The system automatically assigns an address to an internal drive as follows:

- The system drive is SCSI ID 0-1
- The drive directly above it is SCSI ID 0-2
- The upper option drive is SCSI ID 0-3

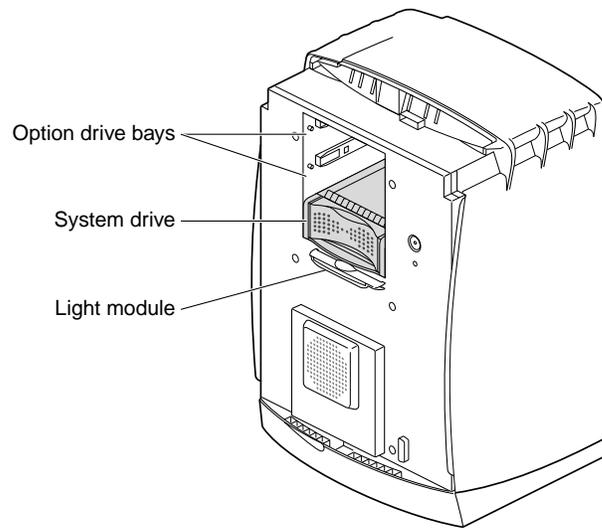


Figure 7-6 Identifying the Secondary (Option) Drive Bays

1. Lift the handle on the drive to a horizontal position, then slide the drive into the drive bay.

The drive handle is the same color as the drive. See Figure 7-7.

2. Slide the drive in gently until you feel solid resistance.

The drive is connected to the frontplane when the front of the drive is flush with the chassis.

Caution: Pushing the drive into the frontplane with force can damage the drive.

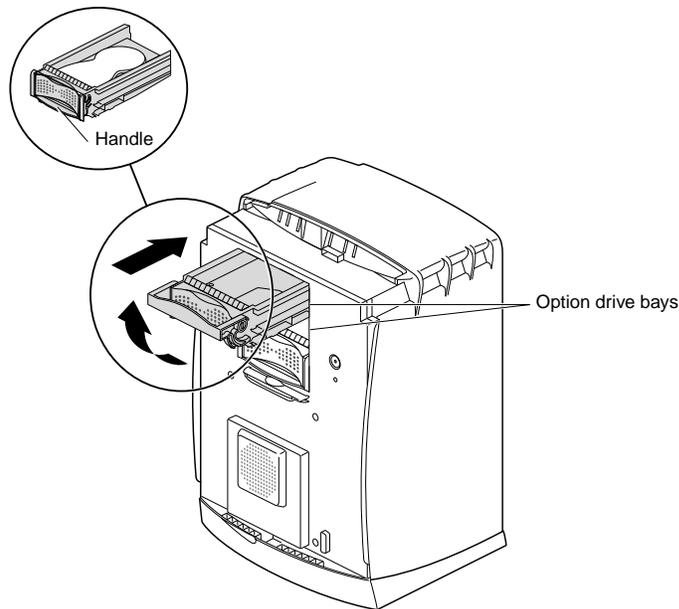


Figure 7-7 Inserting a Secondary (Option) Internal Drive

3. With the drive completely inserted, rotate the handle downward to lock the drive in the workstation, as shown in Figure 7-8.

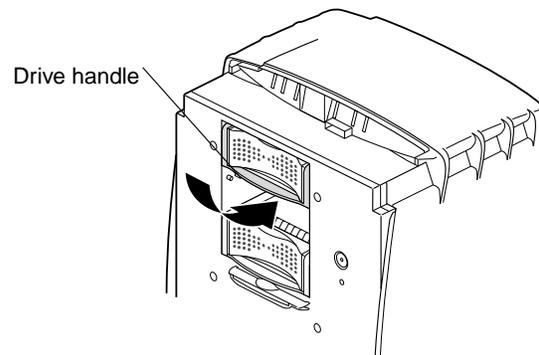


Figure 7-8 Locking the Secondary (Option) Drive

You are finished installing a secondary internal drive and are ready to remove the blank panel on the bezel.

Removing the Blank Panel

After installing a new option drive, remove a blank panel from the bezel.

1. Place the bezel on a flat surface with the door facing up.
2. Open the door, as shown in Figure 7-9.
3. Locate the blank panel covering the drive bay where you installed the option drive.

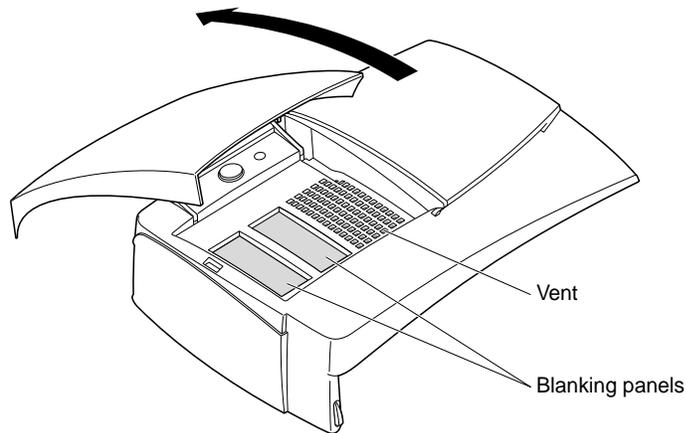


Figure 7-9 Opening the Bezel Door

4. Press down on the blank panel covering the desired drive bay, as shown in Figure 7-10.

The blank panel pops out the back of the bezel.

Store the blank panel in a safe place. You must replace it if you remove the drive.

Caution: To prevent damage to your workstation, you must place a blank panel in the bezel if you remove a drive. The blank panel ensures proper airflow through the workstation.

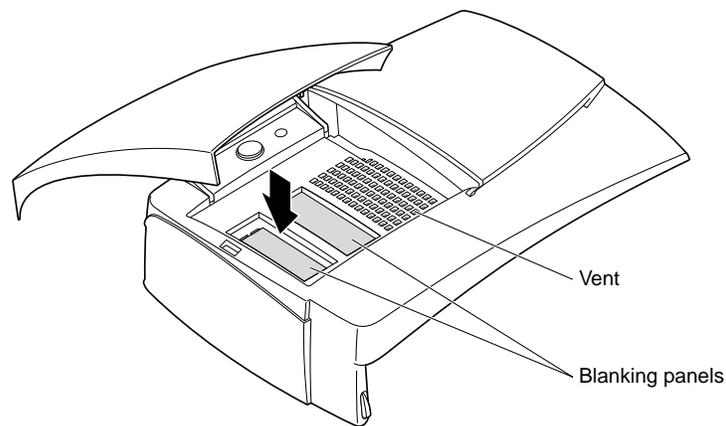


Figure 7-10 Releasing the Blank Panel

Go to “Reinstalling the Bezel” on page 195.

Removing Internal Secondary (Option) Drives

To remove an internal secondary (option) drive, see “Shutting Down and Powering Off the System” on page 161 and follow the instructions through “Removing the Bezel.” Then return to this page and follow these steps:

1. Lift the drive handle to unlock the drive.

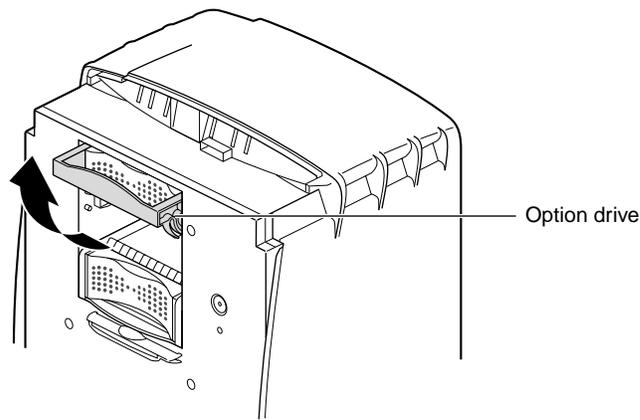


Figure 7-11 Lifting the Drive Handle to Unlock the Drive

2. Pull the drive directly toward you to remove it from the drive bay, as shown in Figure 7-12.

For instructions on installing a drive in a secondary (option) drive bay, go to “Installing and Removing Internal Drives” on page 160.

To leave the drive bay empty, replace the blank panel before replacing the bezel, as described in the next section.

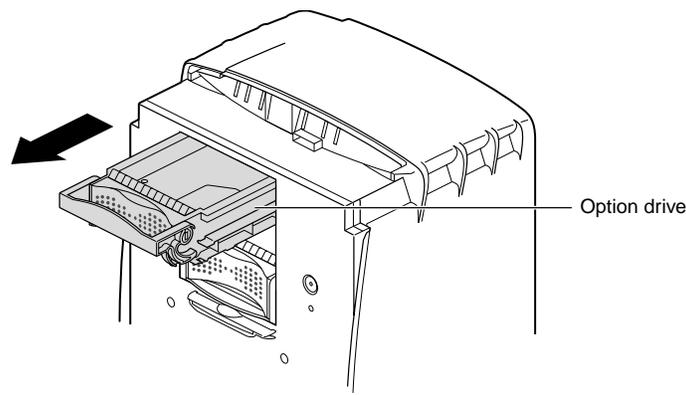


Figure 7-12 Sliding Out the Secondary (Option) Drive

Replacing a Blank Panel

When you remove a secondary drive and do not replace it, you must replace the appropriate blank panel. You must also reconfigure the system for the removal of a drive.

Note: For information on reconfiguring the system for removal of a drive, choose Toolchest > Help > Online Books > End User bookshelf > Personal System Administration Guide, then search for “Removing a Disk.”

To replace the blank panel, follow these steps:

1. Remove the bezel, as described in “Removing the Bezel” on page 162.
2. Place the bezel face down on the flat surface with the door closed (make sure you place the bezel on a surface that does not scratch or mar the bezel).
3. Locate the appropriate opening for the blank panel (opposite the empty drive bay), then place the blank panel in it, as shown in Figure 7-13.

4. Press the blank panel until both sides snap firmly into place.

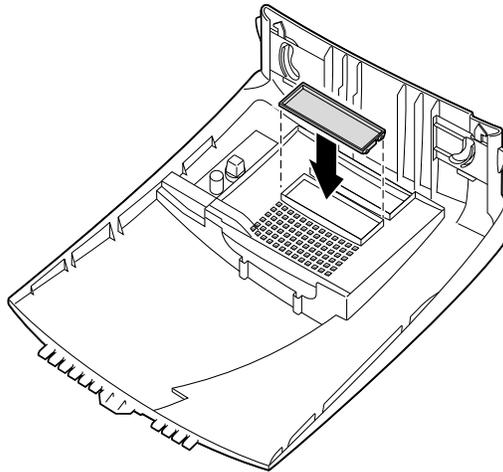


Figure 7-13 Replacing the Blank Panel

Replacing the System Drive

To replace the system drive, you must shut down your workstation and remove the bezel. For more information, see “Shutting Down and Powering Off the System” on page 161, then follow the instructions for “Removing the Bezel” on page 162.

Caution: Do not remove the system drive unless you have a new system drive to replace it. A system drive must remain in place to prevent damage to the Octane2 workstation.

The SCSI ID of the system drive is 0-1.

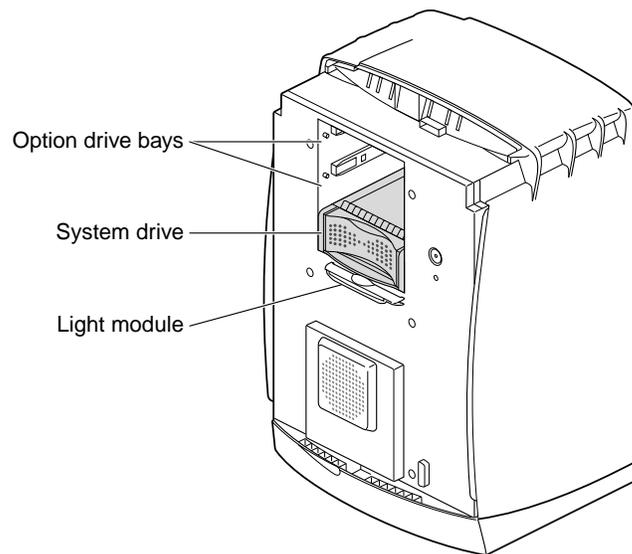


Figure 7-14 Locating the System Drive

To replace the system drive, follow these steps:

1. Locate the system drive.
2. Raise the handle to a horizontal position, as shown in Figure 7-15.

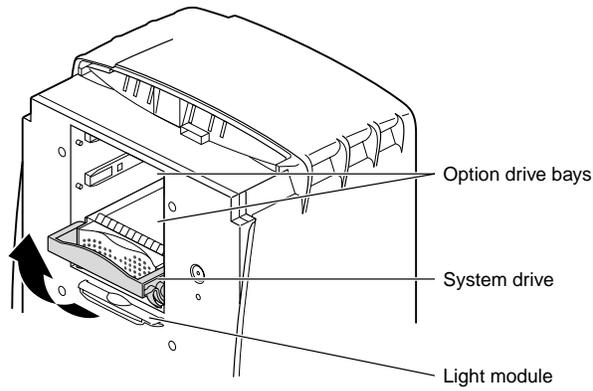


Figure 7-15 Unlocking the System Drive

3. Pull the system drive out of your workstation, as shown in Figure 7-16.

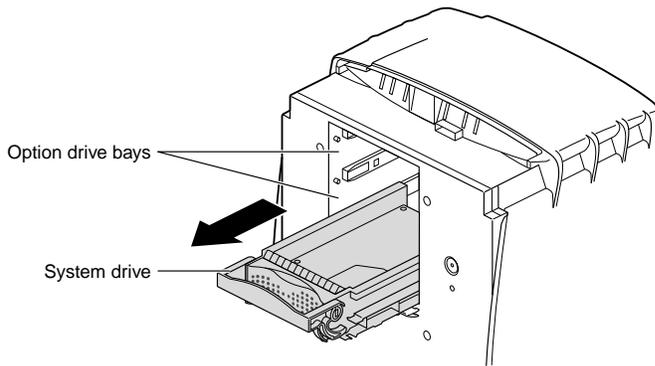


Figure 7-16 Removing the System Drive

4. Replace the system drive, as follows:
 - Lift the handle.
 - With the handle fully extended, gently slide the drive into the drive bay, as shown in Figure 7-17. The drive is connected to the frontplane when the front edge of the drive is flush with the chassis.

Caution: Pushing in the system drive with force can damage the drive.

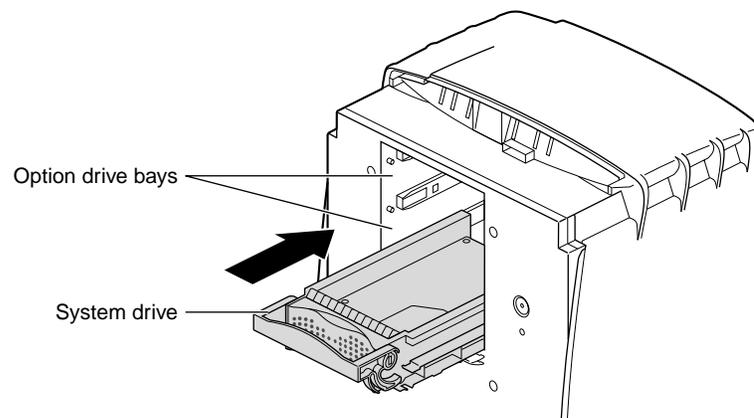


Figure 7-17 Inserting the New Drive

5. Rotate the handle down to lock the system drive to the workstation, as shown in Figure 7-18.

Go to “Reinstalling the Bezel” on page 195 and follow the instructions through powering on the Octane2 workstation. When you see the login screen, you are ready to log in. Return to this section to test the internal drive.

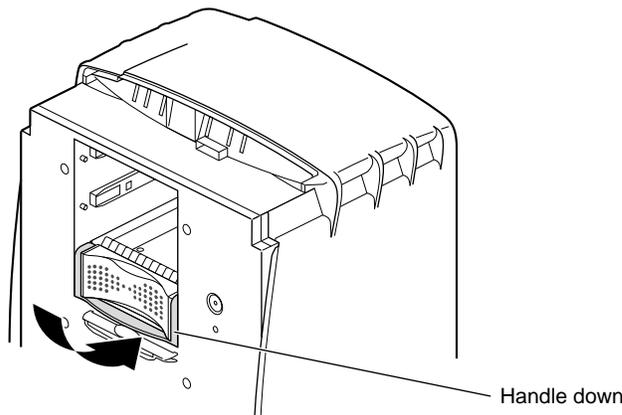


Figure 7-18 Locking the System Drive

Testing an Internal Drive

The system automatically recognizes most internal devices and displays an icon on the desktop that represents the device.

After you install an internal drive, follow these steps to verify that the system recognizes the new drive.

1. Log in to your account.

For more information, see “Logging In to the Octane2 Workstation” on page 21.

If the internal drive is installed correctly, an icon representing the drive appears on the desktop.

2. Double-click the drive icon to set up the internal drive.

3. You can also use the System Manager to verify installation of the drive.
 - Choose Toolchest > System > System Manager > Hardware and Devices > Disk Manager to display a list of installed drives.
 - Choose the new internal drive, then click the *Get Info* button.

If the new internal drive does not appear in the list, power off your system, and make sure the drive is completely seated in its slot. Then restart your system and check the System Manager list again.

Removing and Replacing the Light Module

The light module provides the light for the light bar on the front of the Octane2 workstation. The light module is located on the sheet-metal face, behind the bezel, as shown in Figure 7-19.

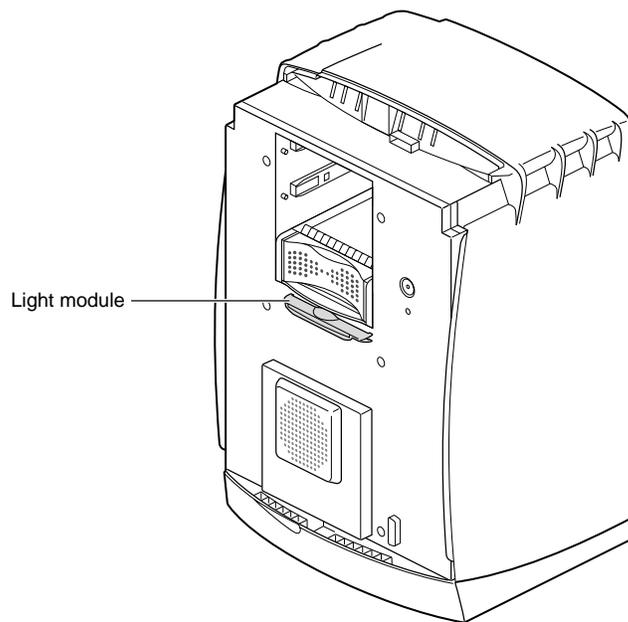


Figure 7-19 Locating the Light Module

The light module is located directly below the system drive. To replace the light module, go to “Shutting Down and Powering Off the System” on page 161 and follow the instructions through “Removing the Bezel.” Then return to this section and follow the instructions below.

1. Squeeze both top and bottom wings together at both ends of the light module and gently pull straight back, as shown in Figure 7-20.

If the light module does not release, squeeze more firmly until it releases from the workstation.

2. Discard the module.

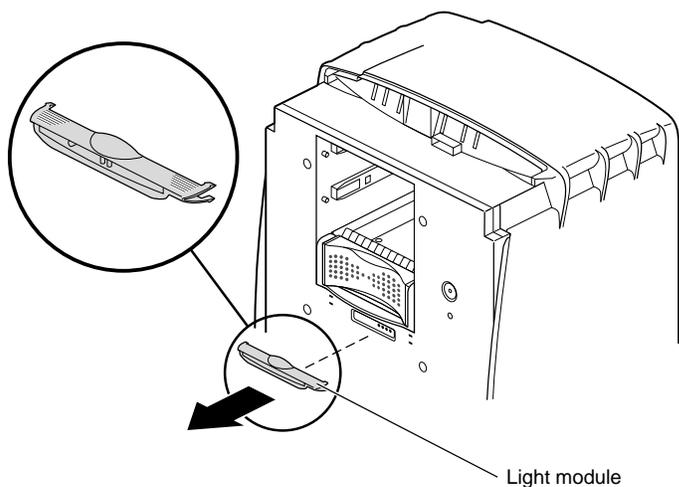


Figure 7-20 Removing the Light Module

3. Insert the new light module, as shown in Figure 7-21.
 - Align the two hollow plastic pins on the module with the two solid metal pins on the sheet metal cap.
 - Slide the module onto the sheet metal face until the module snaps into place. Make sure both sides snap firmly into place.

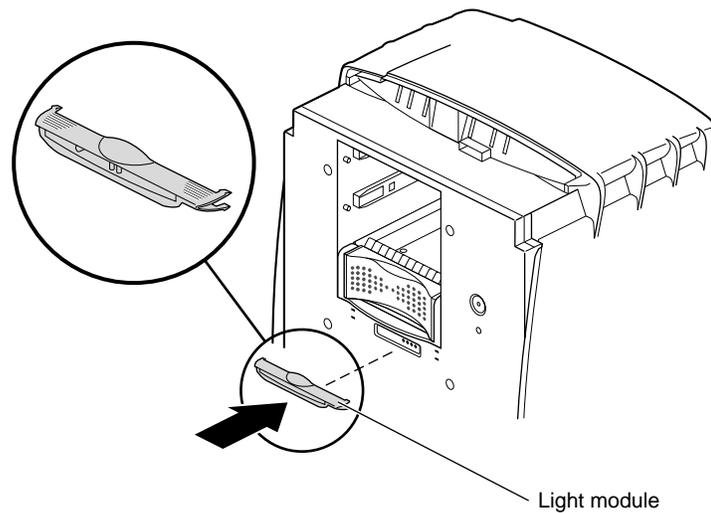


Figure 7-21 Inserting the Light Module

You are finished installing the light module and are ready to replace the bezel. Go to “Reinstalling the Bezel” on page 195 and follow the instructions through “Powering On the Octane2 Workstation.”

Removing and Replacing the Frontplane Module

You must remove the frontplane module if you want to install a new system fan or a new frontplane module. If you are installing a new frontplane module, you must also remove the system identification module, as described later in this section.

Caution: The components on the frontplane module are extremely sensitive to static electricity; you must wear the wrist strap while working with the frontplane module.

Attaching the Wrist Strap

1. Unroll the first two folds of the band (see A in Figure 7-22).
2. Wrap the exposed adhesive side firmly around your wrist (B), unroll the rest of the band, then peel the liner from the copper foil at the opposite end.
3. Attach the copper foil to any exposed electrical ground, such as a metal part of the workstation (C).

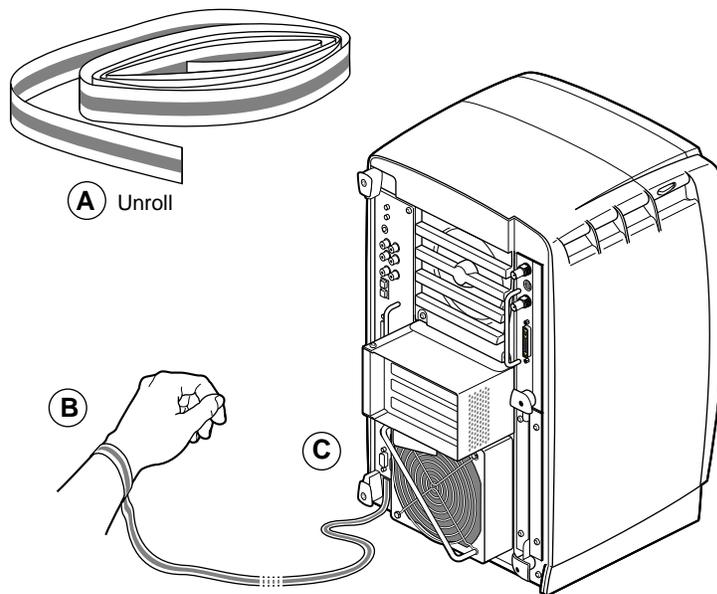


Figure 7-22 Attaching the Wrist Strap

Preparing the Workstation to Remove the Frontplane Module

The procedure for replacing the frontplane module includes a number of steps from earlier sections of this guide (as described below). Bookmarking these sections can help you organize this task. For help identifying Octane2 components, refer to the illustrations in Chapter 1. Make sure you have the new part nearby before beginning the replacement procedure.

1. Go to “Shutting Down and Powering Off the System” on page 161, then follow the instructions for “Removing the Bezel” on page 162.
2. Face the back of your workstation, then follow these steps:
 - Disconnect the system module from the chassis by unscrewing the captive screws and pulling the module an inch or two from the chassis, or remove it (for more information, see “Removing the System Module” on page 36).
 - Disconnect the PCI module (if installed) from the chassis by unscrewing the captive screws and pulling the module an inch or two from the chassis, or remove it (for more information, see “Removing the PCI Module” on page 75).
 - Disconnect the power supply from the chassis by unscrewing the captive screws and pulling the power supply an inch or two from the chassis, or remove it (for more information, see “Removing the Power Supply” on page 64).
 - Disconnect the XIO Tri-Module from the chassis by unscrewing the captive screws and pulling the module an inch or two from the chassis, or remove it (for more information, see “Removing the XIO Tri-Module” on page 114).

3. Face the front of your workstation and follow these steps:
 - Remove the system drive and any option drives (for more information, go to “Replacing the System Drive” on page 173 and “Removing Internal Secondary (Option) Drives” on page 170).
 - Remove the light module (for more information, go to “Removing and Replacing the Light Module” on page 177).

You are ready to remove the frontplane module, as described in the next section.

Removing the Frontplane Module

If you did not attach the wrist strap and prepare your workstation, go to “Removing and Replacing the Frontplane Module” on page 180 and follow the instructions before you begin this procedure.

1. Place an antistatic bag on a clean, antistatic surface, such as your desktop.
2. Loosen the six captive screws holding the frontplane module to the chassis, as shown in Figure 7-23, until the screws are loose in their sockets.
3. Place your hand inside the drive bay, and lift the frontplane module out of the chassis.

Caution: The frontplane module is large and unwieldy. Steady it by placing your free hand on the edge of the frame as you remove it from the chassis.

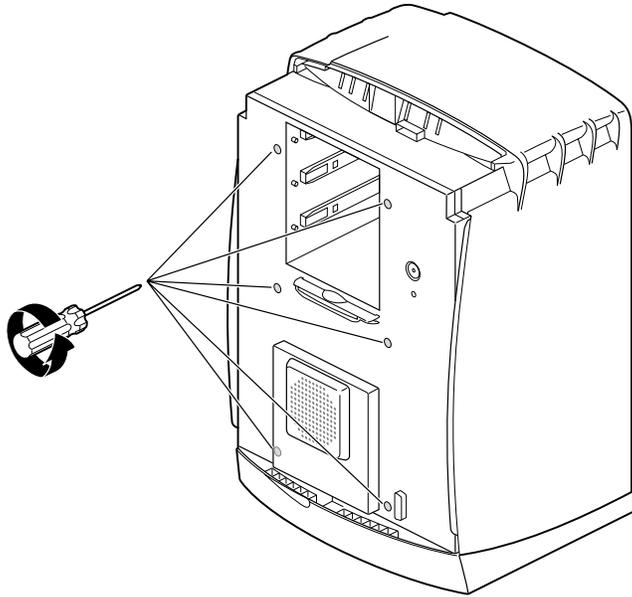


Figure 7-23 Loosening the Captive Screws on the Frontplane Module

4. Gently place the frontplane module face down on the antistatic bag, as shown in Figure 7-24

To adjust the position of the frontplane module, handle it by the metal frame to avoid damaging components.

If you are replacing the frontplane module with a new frontplane module, go to the next section and remove the system identification module. You must remove the system identification module from the old frontplane module and reinstall it on the new frontplane module.

If you removed the frontplane module because you are replacing the system fan, skip to “Removing the System Fan” on page 188.

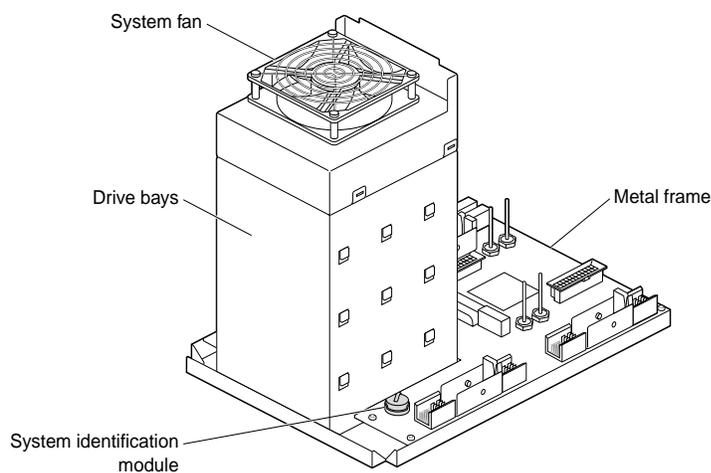


Figure 7-24 Placing the Frontplane Module Face Down on a Clean Surface

If you did not attach the wrist strap, prepare your workstation, and remove the frontplane module, go to “Removing and Replacing the Frontplane Module” on page 180 and follow the instructions before you begin this procedure.

Removing and Reinstalling the System Identification Module

Note: Remove the system identification module only if you are installing a *new* frontplane module. If you are replacing only the system fan, skip this section and go to “Removing the System Fan” on page 188.

1. Lift the metal retaining clip, as shown in Figure 7-25.
2. Slide the system identification module to the side and out.
3. Place the system identification module on the new frontplane module:
 - Lift the retaining clip.
 - Slide the system identification module under the clip.

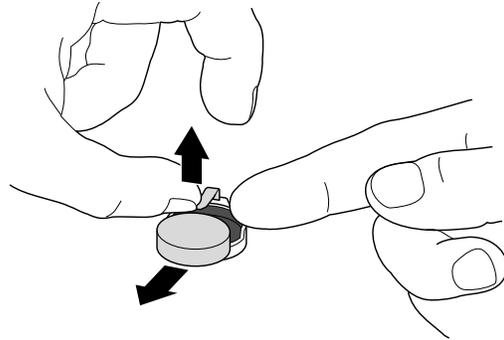


Figure 7-25 Sliding Out the System Identification Module

Installing the Frontplane Module

Follow these steps to replace or reinstall the frontplane module:

1. Grasp the frontplane module by the metal frame on the edge of the front plane.
2. Lift the frontplane module into place and gently insert it into your workstation.
3. Tighten the six captive screws, as shown in Figure 7-26.

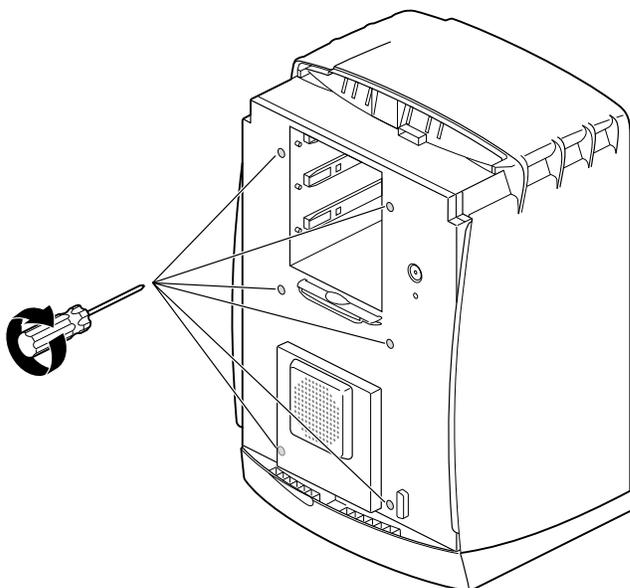


Figure 7-26 Tightening the Captive Screws on the Frontplane Module

4. Reinstall the system drive, as described in “Replacing the System Drive” on page 173.
5. Reinstall any internal secondary drives, as described in “Installing Secondary (Option) Internal Drives” on page 165.
6. Reinstall the light module, as described in “Removing and Replacing the Light Module” on page 177.

7. Face the back of your workstation and reinstall the following components:
 - XIO Tri-Module (for more information, see “Reinstalling the XIO Tri-Module” on page 124).
 - Power supply (for more information, see “Installing the Power Supply” on page 66).
 - System module (for more information, see “Reinstalling the System Module” on page 53).
 - PCI module (for more information, see “Installing the PCI Module” on page 100).

You are finished installing the frontplane module and are ready to reinstall the bezel.

Go to “Reinstalling the Bezel” on page 195 and follow the instructions through “Powering On the Octane2 Workstation” on page 197

Removing and Replacing the System Fan

The procedure for replacing the system fan includes a number of steps from earlier sections of this guide (as described below). Bookmarking these sections can help you organize this task. For help identifying Octane2 components, see the illustrations in Chapter 1. Make sure you have the new fan nearby before beginning the replacement procedure.

To replace the system fan, follow these steps:

1. Go to “Shutting Down and Powering Off the System” on page 161 and follow the instructions through “Removing the Bezel” on page 162. Then return to this section.
2. Go to “Replacing the System Drive” on page 173 and “Removing Internal Secondary (Option) Drives” on page 170 and follow the instructions for removing the system drive and any secondary drives. Then return to this section.
3. Go to “Removing and Replacing the Light Module” on page 177 and follow the instructions for removing the light module. Then return to this section.
4. Go to “Removing and Replacing the Frontplane Module” on page 180 and follow the instructions through removing the module (*Do not* remove the system identification module). Then return to this section.

5. Follow the instructions in the next two sections for removing and replacing the system fan, then reinstall the system drive, any internal secondary drives, the light module, frontplane module, and bezel.

Removing the System Fan

1. Locate the system fan.
The system fan is attached to the back of the drive bay.
2. Using a flatsided screwdriver, slide the tip of the screwdriver between the tab and fan, as shown in Figure 7-27.
3. Tilt the screwdriver to release the fan from the pressure of the tab.

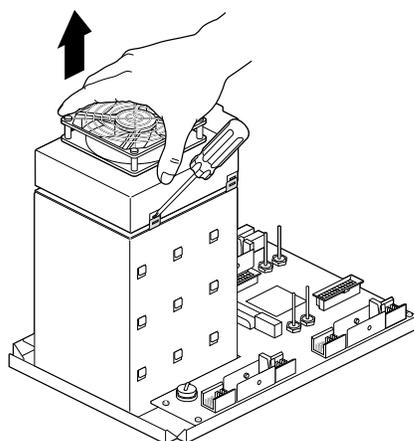


Figure 7-27 Releasing the System Fan from the Back of the Drive Bay

4. Partially lift the fan from the back of the drive bays.
5. Gently pull up on the cable connector, as shown in Figure 7-28.
6. Discard the old fan.

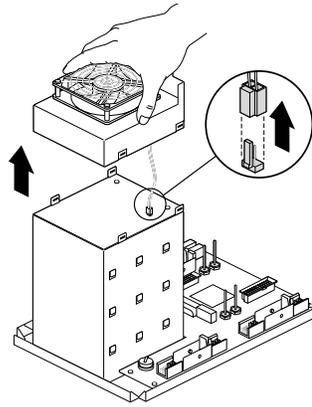


Figure 7-28 Removing the Fan From the Back of the Drive Bay

Replacing the System Fan

1. Gently slide the new cable connector onto the connector on the back of the drive bay.
2. Place the new fan on the back of the drive bay, as shown in Figure 7-29.
The fan snaps into place when properly aligned.
3. Reinstall the frontplane module, as described in “Installing the Frontplane Module” on page 186.

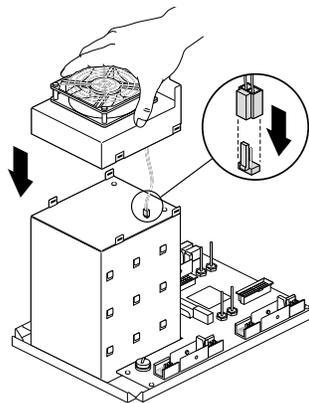


Figure 7-29 Placing the Fan on the Back of the Drive Bay

Removing and Replacing the Plastics: Top and Base

To remove the plastics, top or base, you must shut down your system and remove the bezel. Go to “Shutting Down and Powering Off the System” on page 161 and follow the instructions through “Removing the Bezel” on page 162. Then return to this page.

Removing and Replacing the Top Cover

1. Locate the two top cover release areas, as shown in Figure 7-30.
2. Press on the two top cover release areas and hold.
3. While pressing inward on both areas, pull the top cover toward the front.

The top cover should slide forward.

If the top cover does not slide forward, press harder to release the catches, then slide the cover forward.

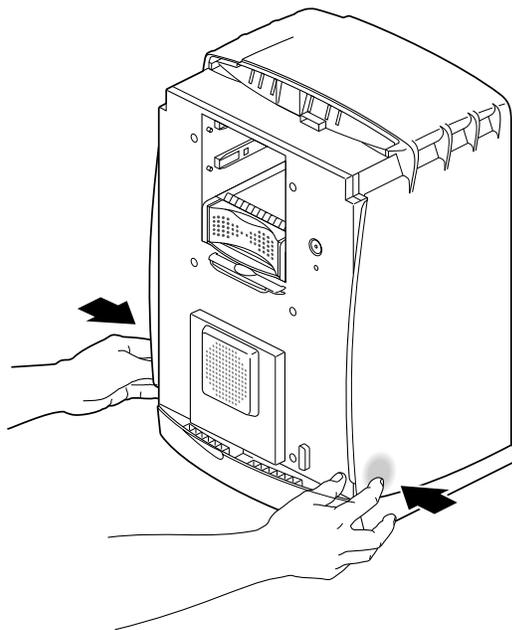


Figure 7-30 Releasing the Plastic Top Cover

4. After the cover slides forward, lift it straight up and off the chassis, as shown in Figure 7-31.
5. Install the new top cover.
 - Slide the new top cover straight down over the chassis.
 - Slide the new top cover back until it snaps into place.The new top cover snaps into place when it is correctly aligned.

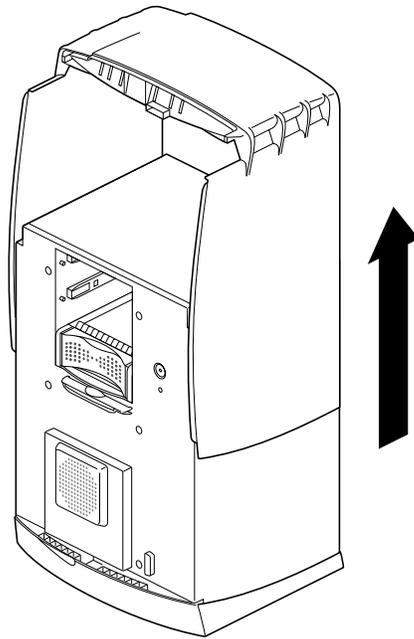


Figure 7-31 Sliding the Front Cover Forward

Removing and Installing the Base

To remove the base, you need to shut down the system, remove the bezel, and remove the top cover.

To shut down the system, go to “Shutting Down and Powering Off the System” on page 161 and follow the steps through “Removing the Bezel” on page 162. Then go to “Removing and Replacing the Plastics: Top and Base” on page 190, remove the top cover, and return to this section.

1. On the base of the workstation, find the plastic release tab that is located in front of the metal tab, as shown in Figure 7-32.

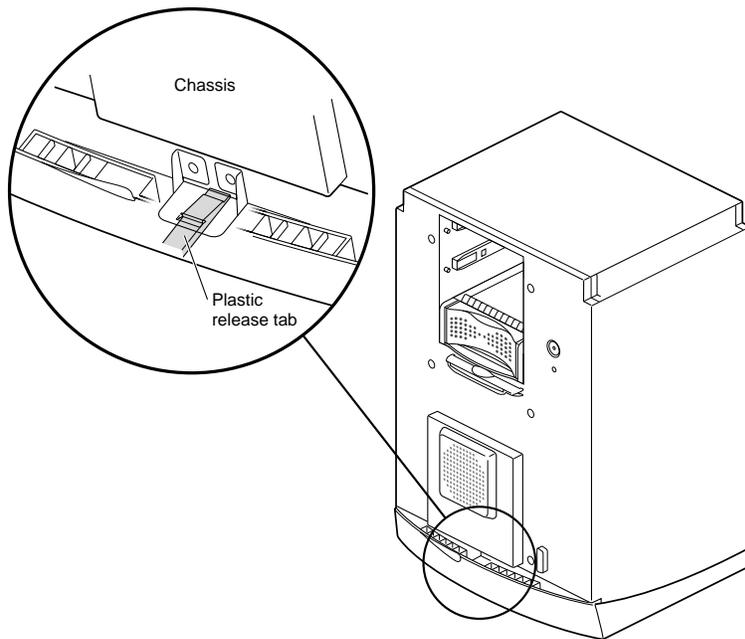


Figure 7-32 Locating the Release Slots

2. Use a flat-sided screwdriver to press down on the plastic release tab, as shown in Figure 7-33.

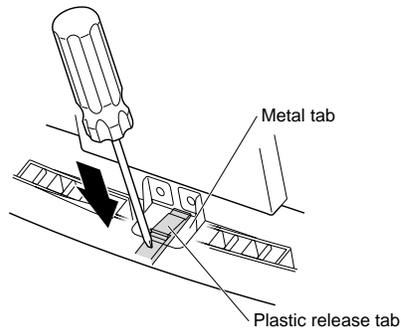


Figure 7-33 Releasing the Plastic Base

3. While pressing down on the tab, slide the chassis back about 1-1/2 inches, until it stops, as shown in Figure 7-34.

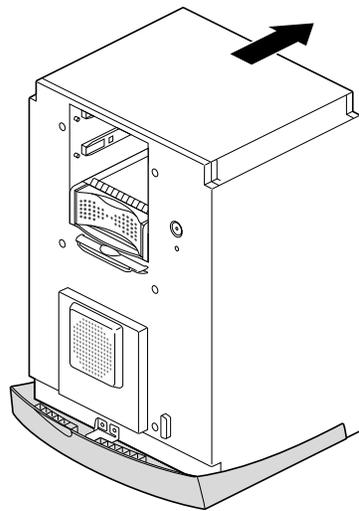


Figure 7-34 Sliding the Chassis Backward

4. Lift the chassis straight up and off the base, as shown in Figure 7-35.



Warning: Do not attempt to lift the Octane2 workstation by yourself. It is heavy and requires two people to safely lift.

5. Place the new base on a clean surface.
6. Align the first four tabs on each side of the chassis with the slots in the base, then lower the chassis onto the base.
7. Slide the chassis forward about 1-1/2 inches until it locks to the base.
8. Place the plastic cover over the chassis and snap it into place.

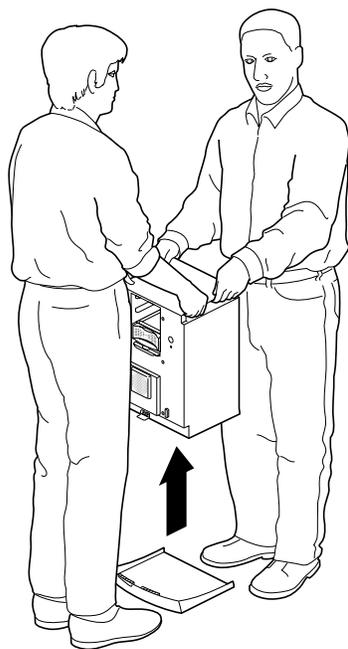


Figure 7-35 Lifting the Octane2 Workstation off the Plastic Base

You are finished replacing the plastic base and are ready to reinstall the bezel.

Reinstalling the Bezel

1. Replace the bezel, as shown in Figure 7-36.
 - Lower the bezel into the lower edge of the chassis.
 - Hook the bezel in place.
 - Rotate the bezel back and into the closed position.

When the bezel is properly installed, you can hear the latches snap into place.

To reinstall the lockbar, go to the next section, "Reinstalling the Lockbar" on page 196. Otherwise, skip to "Powering On the Octane2 Workstation" on page 197.

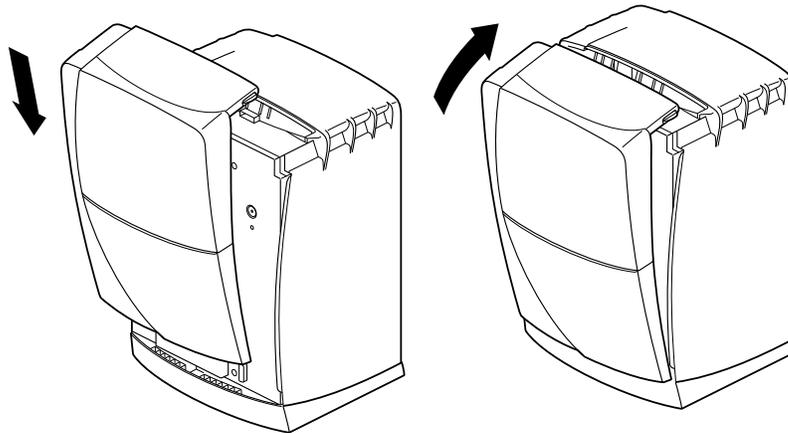


Figure 7-36 Reinstalling the Bezel

Reinstalling the Lockbar

1. Open the door on the front of your workstation.
2. Insert the lockbar into the front of your workstation, with the angled end up (see A in Figure 7-37).
3. Insert and close the lock (B) at the back of the your workstation.

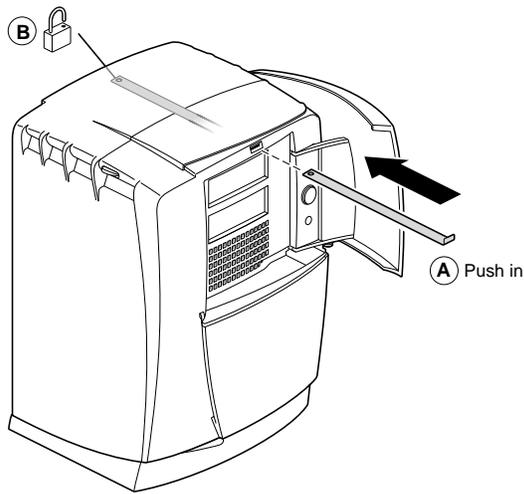


Figure 7-37 Replacing the Lockbar

You are now ready to power on your workstation.

Powering On the Octane2 Workstation

1. Plug the power cable into a wall outlet (see A in Figure 7-38).
2. Power on the Octane2 workstation.
 - Press the power button (B).
 - Close the door.
3. Press the monitor power switch (C) to turn on your monitor.

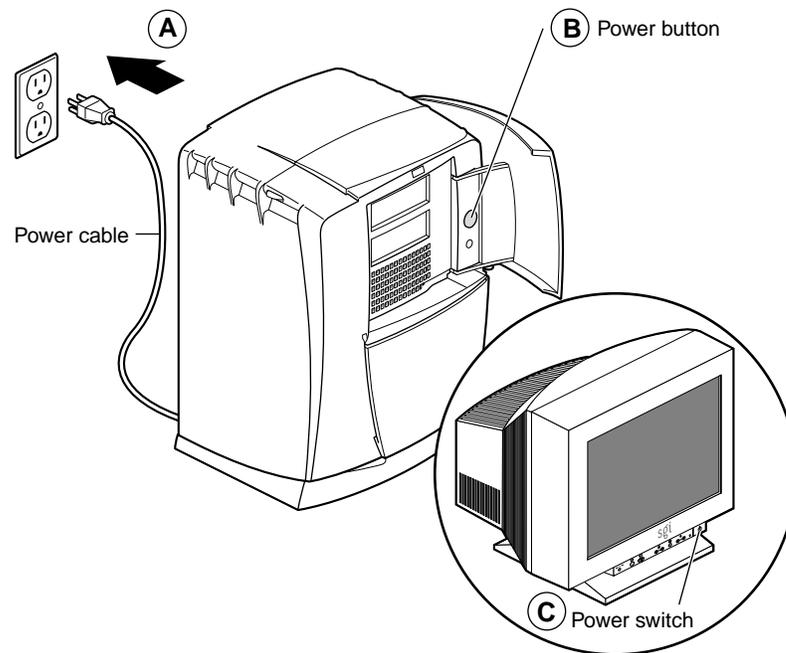


Figure 7-38 Powering on the Octane2 Workstation

Troubleshooting

This chapter helps you isolate and solve possible problems with your workstation. The following topics are covered:

- “Using the LEDs on the Lightbar” on page 200
- “Using the NMI Button” on page 203
- “Accessing the System Maintenance Menu” on page 204
- “Running Diagnostic Tests” on page 205
- “Recovering From a System Crash” on page 207
- “Disabling the System Maintenance Password” on page 211
- “Enabling the System Maintenance Password” on page 213
- “System Does Not Power Off” on page 215
- “Returning Parts” on page 216

Using the LEDs on the Lightbar

Refer to Figure 8-1, Figure 8-2, and Figure 8-3 on the following pages to isolate and solve possible hardware problems.

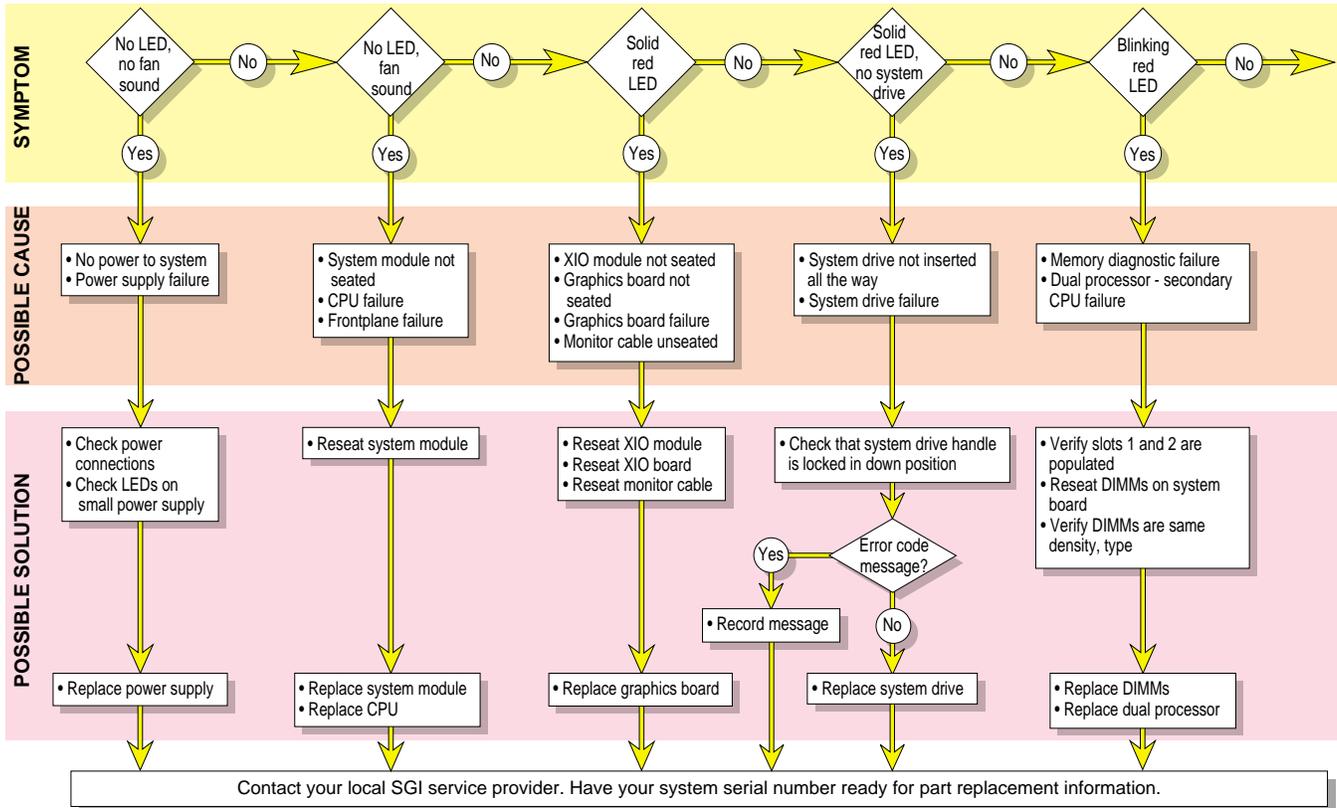


Figure 8-1 Lightbar LEDs - Front of Octane2, Diagnostic Chart #1

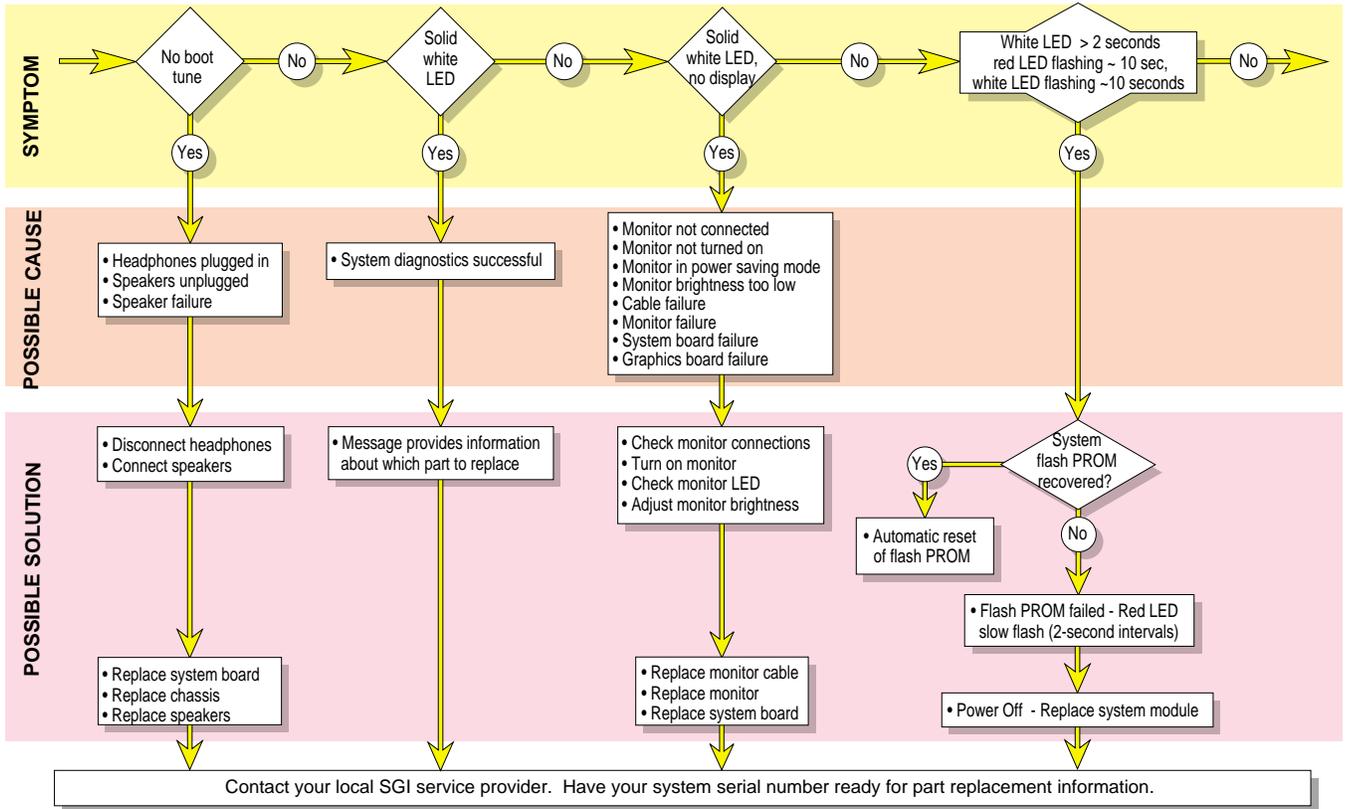


Figure 8-2 Lightbar LEDs - Front of Octane2, Diagnostic Chart #2

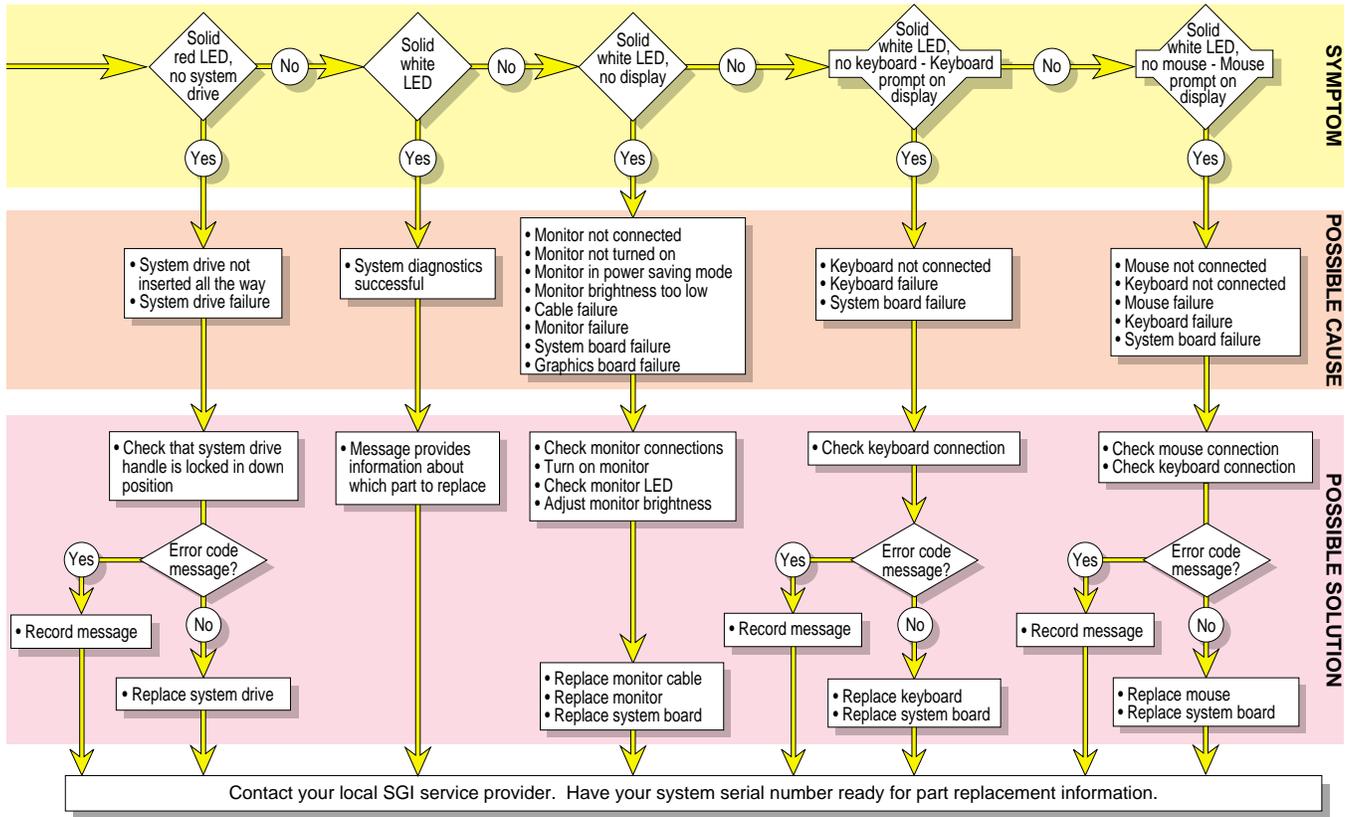


Figure 8-3 Lightbar LEDs - Front of Octane2, Diagnostic Chart #3

Using the NMI Button

If your system is experiencing problems and no error information is provided, you can force a non-maskable interrupt (NMI). When you press the *NMI* button, the system saves a record of its activity to a file and then powers down.

Caution: When you push the *NMI* button, you lose any work in progress at the moment.

The *NMI* button is located behind the bezel, beneath the *Power* and *Reset* buttons, as shown in Figure 8-4. To press the *NMI* button, you must remove the bezel, as described in “Removing the Bezel” on page 162. Use a straightened paper clip to press the *NMI* button.

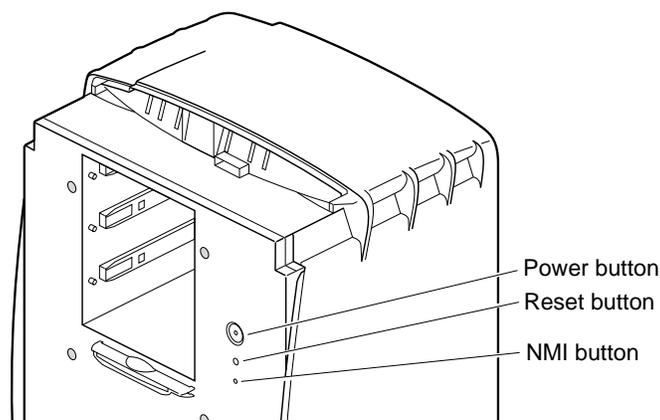


Figure 8-4 Locating the NMI Button

Customer Support uses the file generated by the *NMI* button to help diagnose the specific problem that caused the system to malfunction. These files are saved in the `var/adm/crash` directory. Make sure these files are accessible when you contact Customer Support.

Accessing the System Maintenance Menu

You can use the System Maintenance menu for some specialized tasks, such as installing system software, running diagnostics, recovering the system, entering the command monitor, or selecting your keyboard layout.

1. Press the power button on the front of your workstation to shut down and power off, as described in “Shutting Down and Powering Off the Octane2 Workstation” on page 25.

Note: You can also shut down and power off using the System menu in the Toolchest, as described in Chapter 1.

2. After a few seconds, press the power button to power on.

The Start notifier appears, as shown in Figure 8-5

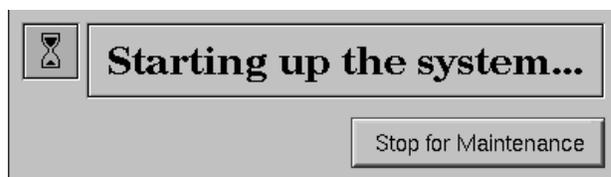


Figure 8-5 Start Notifier

3. Click the *Stop for Maintenance* button in the Start notifier.
The System Maintenance menu appears.
4. Choose the desired option in the System Maintenance menu.

Running Diagnostic Tests

You can run the following software diagnostic tests on the Octane2 workstation:

- Power-On Tests
- Confidence Tests
- IDE Tests

Power-On Tests

These tests run automatically for the major hardware components each time you turn on your workstation. If the power-on tests find a faulty component, the lightbar LED on the front of your workstation turns red and an error message usually appears. For more information, go to the beginning of this section and see "Using the LEDs on the Lightbar."

Confidence Tests

There are confidence tests for the mouse, keyboard, monitor, audio subsystem, external SCSI devices (excluding hard disks), Presenter, and ISDN connection.

To run the confidence tests, choose Toolchest > System > Confidence Tests. Double-click the icon for the part you want to test, and follow the online instructions.

IDE Tests

The Interactive Diagnostic Environment (IDE) tests are more comprehensive than the confidence tests, and run longer (up to 30-45 minutes). To perform these tests, follow these steps:

1. Turn off your workstation, wait a few seconds, then turn it on again.

After a while, the Start notifier appears, as shown in Figure 8-6.

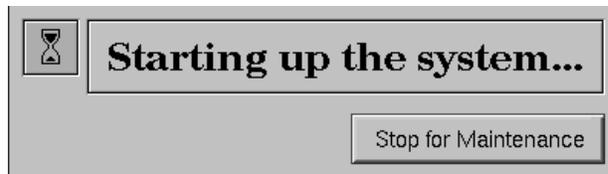


Figure 8-6 Start Notifier

2. Click *Stop for Maintenance* in the System Startup notifier, or press **Esc**.
The System Maintenance menu appears.
3. Choose `Run Diagnostics` in the System Maintenance menu or type **3**.

Tip: You can stop the tests at any time by pressing **Esc**.

Note: If you cannot access the System Maintenance menu, your system is faulty. If you cannot run the diagnostics, you may have a faulty disk drive or other problem. Contact your local authorized SGI service provider.

At the end of the tests a message appears that displays the test results.

4. Press **Enter** and then **Esc** to return to the System Maintenance menu, then restart your system.

Recovering From a System Crash

In most cases, your system recovers from a system crash automatically when you reboot. If, however, you lose data on your system disk, and you cannot communicate with your workstation using the mouse or keyboard, or over the network, follow the steps in this section. These instructions assume you have a backup tape of your system that was made using the System Manager backup tool, or with the `/usr/sbin/Backup` script. You also need a CD with the current IRIX operating system level. If you are recovering data from a tape on a remote tape device, you must know the hostname, tape device name, and IP address of the remote system.

Note: For instructions on creating a system disk from the PROM monitor, refer to your *Personal System Administration Guide*. For information on installing the operating system or other software, see the *Installation Instructions* included with your CDs.

To recover from a system crash, follow these steps:

1. Use a pen tip or an unwound paper clip to press the *Reset* button located on the front panel, as shown in Figure 8-7.

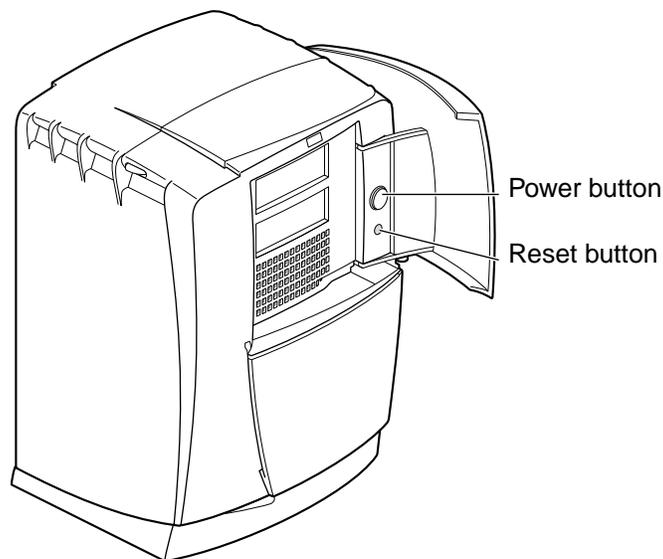


Figure 8-7 Pressing the Reset Button

After a while, the Start Notifier appears, as shown in Figure 8-8.

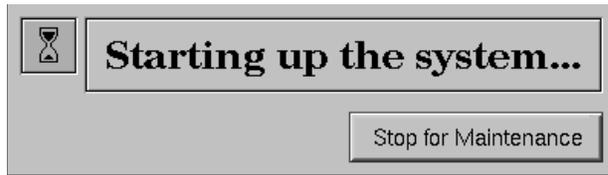


Figure 8-8 Start Notifier

2. Click *Stop for Maintenance* in the Start notifier, or press **Esc**.
The System Maintenance menu appears.
3. Choose *Recover System* in the *System Maintenance menu*, or type **4**.
The System Recovery menu appears, as shown in Figure 8-9.



Figure 8-9 System Recovery Menu

4. If you have the IRIX CD, and a CD-ROM drive is connected to your system, click *Local CD-ROM*, and then click *Accept* in the System Recovery menu.
You are prompted to insert the IRIX CD.
5. Insert the IRIX CD.
The system copies the required files, which takes about 5 minutes.

Note: If you do not have a CD-ROM drive, use a drive that is connected to another system on the network and click *Remote Directory* in the System Recovery Menu. You are prompted to enter the remote hostname. Type the system's name, a colon (:), and the full pathname of the remote CD-ROM drive, followed by `/dist`. For example, to access a CD-ROM drive on the system "mars," type the following:

```
mars:/CDROM/dist
```

After the system copies the required files from the local or remote CD, you can restore your data from a recent full backup tape that was created using the System Manager backup tool, or with the `/usr/sbin/Backup` script.

Tip: If you need to check something on your system during the restore process, you can display a shell prompt by typing `sh` at most question prompts.

If a local tape device is connected to your system, the following message appears:

```
Restore will be from <tapename> OK? ([Y]es, [N]o): [Y]
```

`tapename` is the name of the local tape device.

If you are using a remote (network) tape device and the system does not find a tape device, or you answer `No` to the above message, the following message appears:

```
Remote or local restore ([r]emote, [l]ocal):
```

- If you select `remote`, this initiates a network restore, and you must know the hostname, tape device name, and IP address of the remote system. You also must know the IP address of your system. The IP address, such as 192.0.2.1, always has four components separated by periods.
- If you select `local`, this means a tape device is connected to your system, and you are prompted to enter the name of the tape device.

Then the following message appears:

```
Insert the first backup tape in the drive, then press <Enter>,
[q]uit (from recovery), [r]estart:
```

6. Remove the CD, insert your most recent full backup tape, and then press **Enter**.

The system pauses while the backup program retrieves several files from the backup tape, and then the following message appears for each filesystem that was installed at the time of the backup.

```
Erase /x filesystem and make new one (y,n)? [n]
```

- If you answer **n** for no, the system tries to save as many files as possible. Then it uses your backup tape to replace the files it could not save. In most cases, you should answer no, especially if do not have a recent backup tape. If the file systems are badly damaged, or the backup was from a different level operating system, you may have to answer yes.
- If you answer **y** for yes, the system erases the filesystem and copies everything from your backup tape to the disk. This operation results in a loss of all the data on the filesystem since your last backup.

Then the following message appears:

```
Starting recovery from tape.
```

After 2 or 3 minutes, the system displays the names of the files it is copying to your disk.

After the first tape is complete (if it is the first in a set), you are prompted for the second tape, and so on.

After the first tape set (full backup) is completed, you are prompted for any incremental or additional tapes to be restored.

When all the tapes are restored, you are prompted to restart the system.

When the recovery is complete, the following message appears:

```
Recovery complete, restarting system.
```

Note: After the system recovery is complete, if your backup tapes are old, or you are changing your operating system level, reinstall the operating system from the IRIX CD that came with your system. When you see the Start notifier, press **Esc** or click *Stop for Maintenance*, and then click *Install System Software*. For more information on installing the operating system, see “Installing Software” in the *Personal System Administration Guide* or the *Installation Instructions* included with your CDs.

Disabling the System Maintenance Password

In the System Maintenance menu, if you choose *Install System Software*, *Run Diagnostics*, *Recover System*, or *Enter Command Monitor*, a password prompt may appear. If you do not know the password, you can disable it by installing a jumper (a small cap that connects two pins) on the system board inside the workstation. The system board is located in the system module. To install the jumper, you must first remove the system module.

Note: The jumper is a small plastic cap that resides near the CPU, as shown in Figure 8-10. The jumper sits on the right two of three pins.

To disable the system maintenance password, follow these steps:

1. Go to "Preparing the Workstation" on page 32 and follow the instructions through "Removing the System Module."
2. Locate the white rectangle printed on the system board at the base of the jumper.
The rectangle has "Disable passwd" beside it. The white rectangle surrounds the jumper and one pin to the left of the jumper. The jumper is on the middle and right pins.
3. Pull up on the jumper and remove it.
4. Place the jumper on the left and middle pins within the rectangle.
The password is now disabled.
5. Go to "Reinstalling the System Module" on page 53 and follow the instructions through "Powering On the Octane2 Workstation" on page 58.

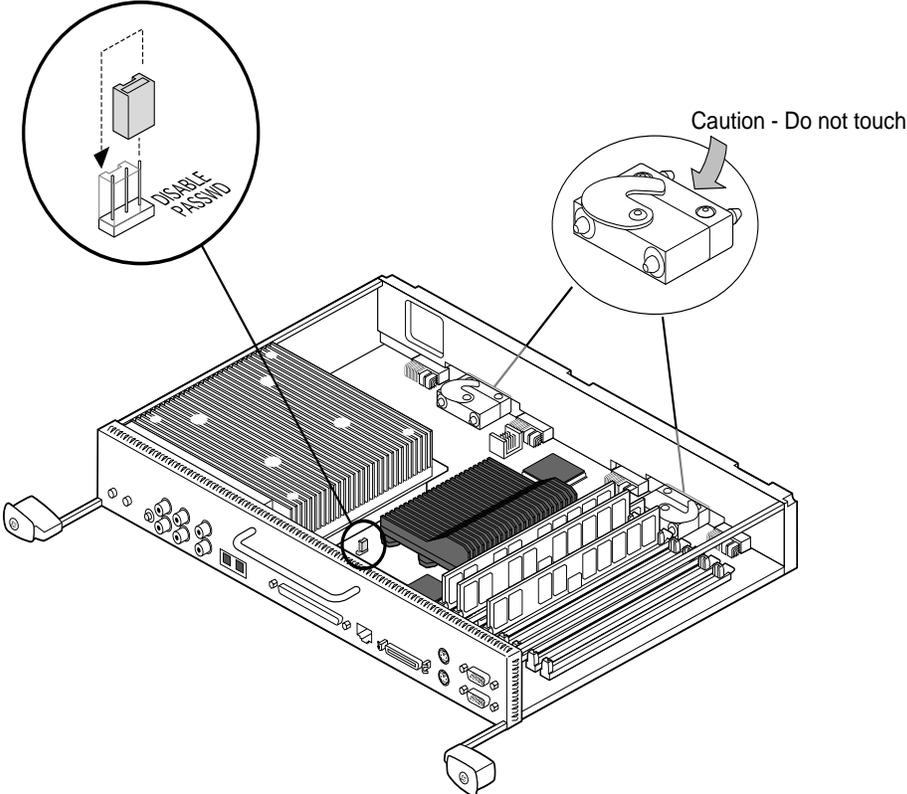


Figure 8-10 Removing the Jumper for Disabling the Password

Enabling the System Maintenance Password

After you power on your workstation, you can choose another system maintenance password.

1. Power on your workstation, if it is turned off.
2. Choose Toolchest > Help > InfoSearch > Online Books > SGI End User > Personal System Administration Guide and select “Creating, Changing and Deleting Passwords” in Chapter 5.
3. Follow the instructions for creating or changing a password, then return to this page for instructions on moving the jumper.
4. Go to “Preparing the Workstation” on page 32 and follow the instructions through “Removing the System Module.”

After you remove the system module, return to this page for instructions on enabling the password.

Note: The jumper is a small plastic cap that resides near the CPU. The jumper is on the left side of the 3-pin configuration because the password was disabled by moving the jumper to the left. To enable the password, you must move the jumper to the right. Go to the next step for instructions on moving the jumper to the right.

5. Locate the white rectangle printed on the system board at the base of the jumper, as shown in Figure 8-11.

The rectangle has “Disable passwd” beside it.

The white rectangle surrounds the jumper and one pin to the left of the jumper. The jumper is now disabled, and sits on the left and middle pins.

6. Pull up on the jumper and remove it.
7. Place the jumper on the middle and right pins (within the rectangle).

The password is now enabled.

You are ready to replace the system module.

Go to “Reinstalling the System Module” on page 53 and follow the instructions through “Powering On the Octane2 Workstation” on page 58.

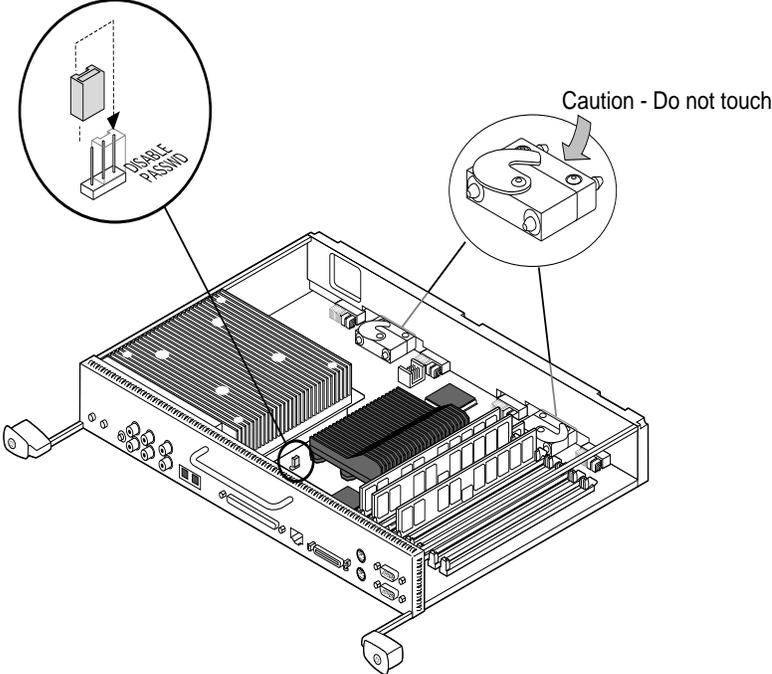


Figure 8-11 Removing the Jumper to Enable the Password

System Does Not Power Off

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

1. Press the power button again (see Figure 8-12).

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

If pressing the power button a second time does not work, use a pencil or pen to press the reset button.

2. If the system still fails to power off, unplug the power cord from the back of the workstation, and contact your authorized SGI service provider.

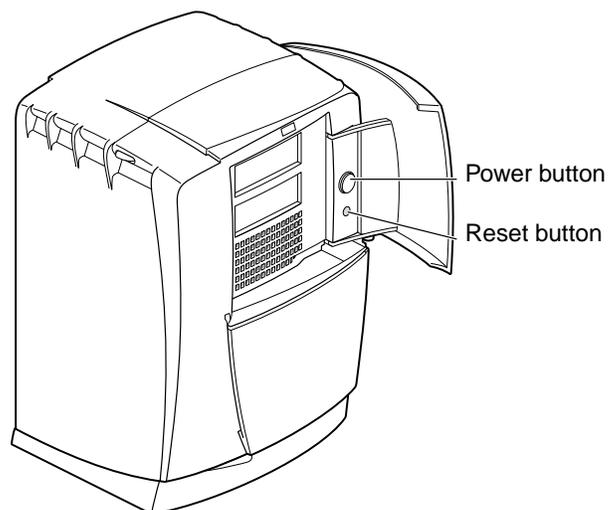


Figure 8-12 Power Button and Reset Button

Returning Parts

To return any part, use the packaging materials and box that came with your replacement part.

For product support information, see page xxiv.

Care and Cleaning of Compression Connectors

The Octane2 workstation uses compression connectors to connect several modules and boards to the frontplane.

A single compression connector is used on the following components:

- Back of the PCI module
- Each XIO option board
- XIO Tri-Module

Two compression connectors are used on the system module.

The compression connector has 96 pads that enable signals to pass between the system (via the frontplane) and the system module, PCI module, or XIO option board.

The compression connector has two halves: one half is located on the frontplane of the chassis; the other half is on the system module, PCI module, or XIO board. Each pad on a frontplane connector is a flat gold-plated surface. Each pad on the system module, PCI module, or XIO board is composed of hundreds of tiny bristles (dendrites). When a bristled pad (see Figure A-1) is pressed into a gold-plated pad, a connection is created for one signal.

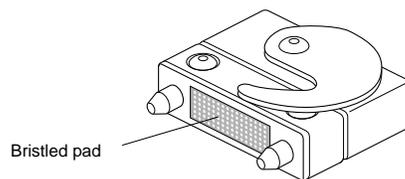


Figure A-1 Identifying the Bristled Pad on a Compression Connector

The bristled pad can attract and hold dust, lint, grease, powder, and dirt. The presence of these substances clogs or damages the bristles and prevents them from making proper contact with the gold-plated pads on the system's frontplane. It is important to prevent this.

Storing and Handling the Compression Connector

To avoid damaging a compression connector and to keep it in optimal working condition, follow these guidelines when a board or module is not installed.

Caution: Failure to follow these instructions can result in irreparable damage to the surface of the connector's pads, which may result in intermittent or complete failure of the product.

- Do not wipe or touch the pads of the compression connector with anything (no fingers, brushes, cloths, or probes), except as specified in the cleaning instructions, below. The bristles might be damaged.
- When the board or module is not in the chassis, place the protective cap over the compression connector and place the board or module in an antistatic bag. Make sure you close (fold over) the open end of the bag to minimize exposure to dust and atmospheric gases.
- Do not put anything (not even water) on the pads, except as specified in the cleaning instructions, below.
- Before laying the board on a surface, make sure the surface is free of dust, lint, powder, metal filings, oil, water, and so on.
- Do not blow dust, dirt, or powder anywhere near the board when it is not inside its protective bag.

Cleaning a Compression Connector

A compression connector should never require cleaning if you keep its protective cover on when the module or board is not in the chassis. However, if the connector gets dirty, follow these steps for removing pollutants.

Note: Some pollutants can irreversibly damage (corrode or chemically alter) the pad surfaces. Although cleaning may remove the pollutant, it does not repair damage incurred by this contact.

To remove pollutants, follow these steps:

1. Obtain a can of dry compressed air or inert gas. The Envi-ro-tech Duster 1671 product manufactured by TECHSPRAY, (USA telephone 806-372-8523) works extremely well for this application.

Caution: Do not use a cleaning product that contains any of the following ingredients: halogenated hydrocarbons, aromatic hydrocarbons, ethers, sulfur, ketones, or solvents of any kind. These substances cause irreparable damage to the connector's surface.

2. Follow the instructions on the can, for example, if a tube is provided, attach it to the can's dispensing mechanism.
3. Hold the can in a vertical position.
4. Place or hold the board or module with the rounded edge of the compression connector facing up.

Note: The rounded edge is completely closed, so that air cannot flow into the connector, while the squared edge has an opening.

Caution: Spraying into the squared (open) edge of the connector can destroy it.

5. Position the board or module at an angle to the can, so that the tip of the can's applicator is 1 to 2 inches away from the first (top) row of pads, as shown in Figure A-2. Do not allow the applicator to touch the pads. When you spray, the air hits each pad and flows downward.

6. Start spraying.
As you spray, move the spray along the length of the compression connector until the entire length is sprayed. Move down a few rows and spray again along the entire length.

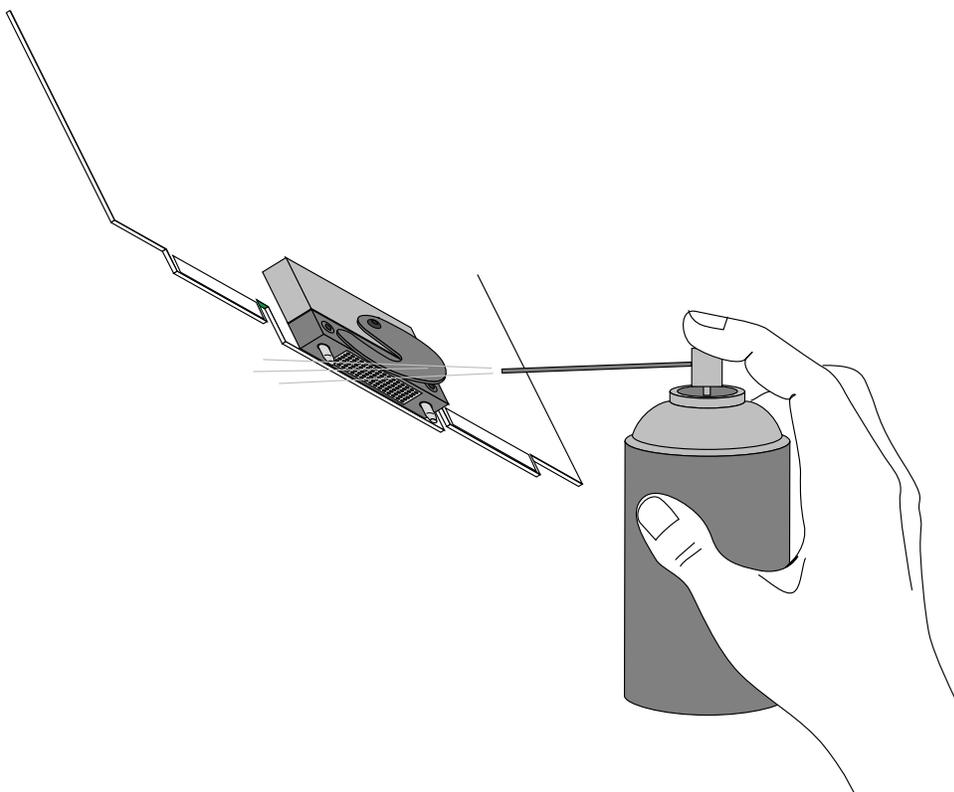


Figure A-2 Spraying the Compression Connector

- Note:** Do not shake the can. Stop spraying if any visible material (for example, foam) appears. The foam blows away when you resume spraying air.
7. Repeat the above procedure until all the pads are sprayed.
 8. When you finish, cover the compression connector with its cap or immediately install the board or module.

Technical Specifications

To see the information in this appendix in a Web browser, enter the following URL:

```
file:/usr/share/Insight/library/SGI_bookshelves/SGI_EndUser/books/Octane2_HWCnt1/index.html
```

Or, choose Toolchest > Help > InfoSearch, and type **Octane2 Hardware Central** (You cannot access *Octane2 Hardware Central* from the Online Books path).

Port Pinout Assignments

This section contains port pinout information for the following Octane2 ports:

- “Audio Ports”
 - Microphone
 - Speaker
 - Analog line level audio
 - Coaxial digital audio
 - Optical digital audio
- “SCSI Port”
- “Ethernet 10-Base-T/100-Base-T Port”
- “Parallel Port”
- “Keyboard and Mouse Ports”
- “Serial Ports”
- “Serial Cables and Adapters”
- “Monitor Port”
- “StereoView Port”

Audio Ports

Microphone Port

The following diagram shows the microphone port pinout.

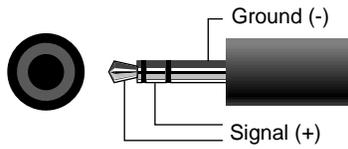


Table B-1 shows the microphone port pinout information.

Table B-1 Microphone Port Pinout

Microphone	Tip	Ring	Sleeve
Silicon Graphics-supplied electret mono microphone	Signal(+)	Signal(+) NC (no connection)	Ground(-)
Line level mono microphone	Ground (-)	Signal (+)	Ground (-)

Speaker Port Pinout

The following diagram shows the port and plug pinout for the speaker/headphone port.

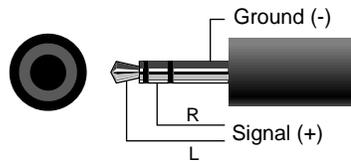


Table B-2 shows the port pinout assignments for the speaker/headphone port.

Table B-2 Speaker/Headphone Port Pinout

Speaker/Headphone Signal	Tip	Ring	Sleeve
	Left	Right	Ground

The following diagram shows the speaker power port and plug pinout.

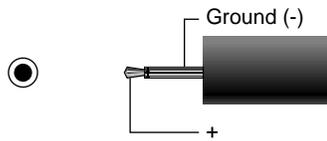


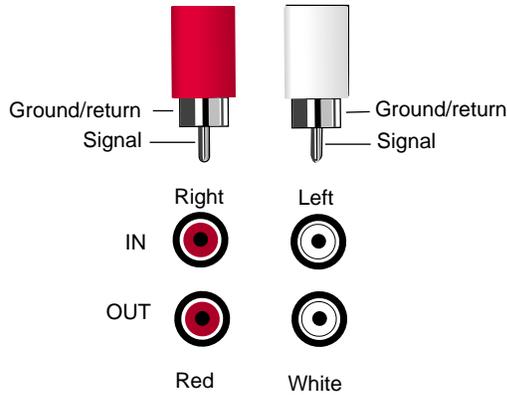
Table B-3 shows the port pinout assignments for the speaker power port.

Table B-3 Speaker Power Port Pinout

Speaker	Tip	Sleeve
10 Volt DC 500 mA	Power (+)	Ground

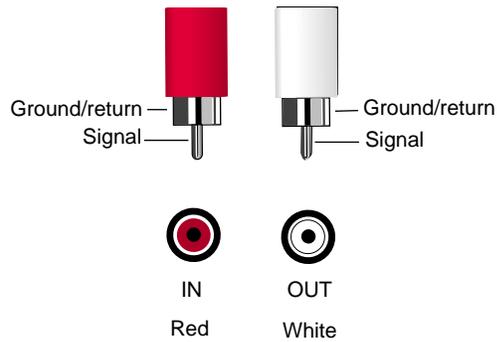
Analog Line Level Port Pinout

The following diagram shows the pinouts for the analog audio ports and plugs.



The following diagram shows the port (jack) pinout for the coaxial digital ports and plugs.

Coaxial Digital Port Pinout



Coaxial digital has these features:

- Supports the AES3id professional format.
- Compatible with consumer formats including CP340, IEC958, and S/PDIF.

Optical Digital Port Pinout

The following diagram shows the optical digital port, which has these features:

- Supports ADAT 8-channel, 24-bit connections.
- Compatible with consumer formats including CP340, IEC958, and S/PDIF.



SCSI Port

The following diagram shows the SCSI port.

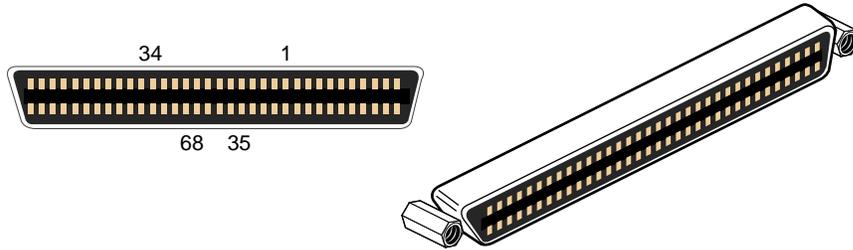


Table B-4 shows the cable and pinout assignments for the SCSI port.

Table B-4 SCSI Port Pinout

Pin	Assignment	Pin	Assignment
1	Ground	35	DB(12)
2	Ground	36	DB(13)
3	Ground	37	DB(14)
4	Ground	38	DB(15)
5	Ground	39	DB(P1)
6	Ground	40	DB(0)
7	Ground	41	DB(1)
8	Ground	42	DB(2)
9	Ground	43	DB(3)
10	Ground	44	DB(4)
11	Ground	45	DB(5)
12	Ground	46	DB(6)
13	Ground	47	DB(7)
14	Ground	48	DB(P)

Table B-4 (continued) SCSI Port Pinout

Pin	Assignment	Pin	Assignment
15	Ground	49	Ground
16	Ground	50	Ground
17	Tempwpr	51	Tempwpr
18	Tempwpr	52	Tempwpr
19	Open	53	Open
20	Ground	54	Ground
21	Ground	55	ATN
22	Ground	56	Ground
23	Ground	57	BSY
24	Ground	58	ACK
25	Ground	59	RST
26	Ground	60	MSG
27	Ground	61	SEL
28	Ground	62	C/D
29	Ground	63	REQ
30	Ground	64	I/O
31	Ground	65	DB(8)
32	Ground	66	DB(9)
33	Ground	67	DB(10)
34	Ground	68	DB(11)

Ethernet 10-Base-T/100-Base-T Port

The Octane2 workstation autoselects the speed and type (duplex vs. half duplex) at bootup, based on what it is connected to.

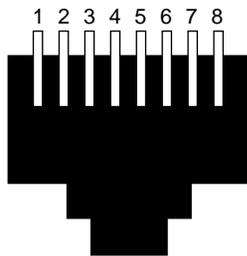


Table B-5 shows the cable pinout assignments for the Ethernet 10-Base-T/100-Base-T port.

Table B-5 Ethernet 10-BASE-T/100-BASE-T Port Pinout

Pin	Assignment
1	Transmit+
2	Transmit-
3	Receive+
4	(Reserved)
5	(Reserved)
6	Receive-
7	(Reserved)
8	(Reserved)

Parallel Port

The following diagram shows the IEEE 1284-C parallel port.

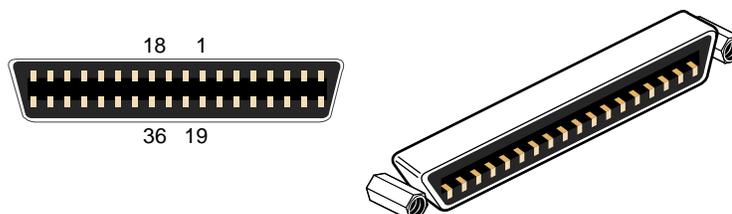


Table B-6 shows the cable pinout assignments for the IEEE 1284-C parallel port.

Table B-6 Parallel Port Pinout

Pin	Assignment	Pin	Assignment
1	BUSY	19	Signal ground (BUSY)
2	SELECT	20	Signal ground (SELECT)
3	nACK	21	Signal ground (nACK)
4	nFAULT	22	Signal ground (nFAULT)
5	pERROR	23	Signal ground (pERROR)
6	DATA 1	24	Signal ground (DATA 1)
7	DATA 2	25	Signal ground (DATA 2)
8	DATA 3	26	Signal ground (DATA 3)
9	DATA 4	27	Signal ground (DATA 4)
10	DATA 5	28	Signal ground (DATA 5)
11	DATA 6	29	Signal ground (DATA 6)
12	DATA 7	30	Signal ground (DATA 7)
13	DATA 8	31	Signal ground (DATA 8)
14	nINIT	32	Signal ground (nINIT)
15	nSTROBE	33	Signal Ground (nSTROBE)

Table B-6 (continued) Parallel Port Pinout

Pin	Assignment	Pin	Assignment
16	nSELECTIN	34	Signal Ground (nSELECTIN)
17	nAUTOFD	35	Signal Ground (nAUTOFD)
18	HOST LOGIC HIGH	36 view	PERIPHERAL LOGIC HIGH

Keyboard and Mouse Ports

The following diagram shows the standard pinout for PC PS/2 keyboards and mice. The mouse and keyboard are electrically PS/2-compatible. They also use the same protocol as the PC PS/2 keyboards and mice.

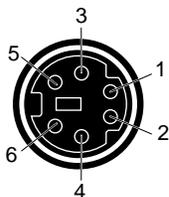


Table B-7 shows the cable pinout assignments for the keyboard and mouse ports.

Table B-7 Keyboard and Mouse Port Pinout

Pin	Assignment
1	Keyboard/mouse Data
2	(Reserved)
3	Ground
4	Keyboard/mouse power (+5V)
5	Keyboard/mouse clock
6	(Reserved)

Serial Ports

The Octane2 workstation serial ports can operate in one of several modes:

- RS-232 electrical levels with a standard PC pinout.
- Macintosh-style electrical levels and a Macintosh-compatible pinout (This mode requires an additional adapter cable. See “Serial Port Adapter Cables” on page 235).
- ANSI/SMPTE 207M electrical levels and pinout (This mode requires an additional adapter cable. See “Serial Port Adapter Cables” on page 235).

The following diagram shows the PC-compatible pinout. The range of supported baud rates is 300 baud to 460K baud.

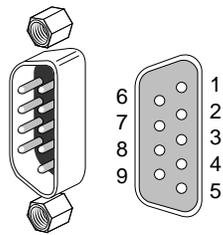


Table B-8 shows cable pinout assignments for the PC-compatible serial ports.

Table B-8 Serial Port Pinout - PC-Compatible

Pin	Assignment	Description
1	DCD	Data carrier detect
2	RD	Receive data
3	TD	Transmit data
4	DTR	Data terminal ready
5	SG	Signal ground
6	DSR	Data set ready
7	RTS	Request to send

Table B-8 (continued) Serial Port Pinout - PC-Compatible

Pin	Assignment	Description
8	CTS	Clear to send
9	RI	Ring indicator

Table B-9 shows cable pinout assignments for the Macintosh-compatible serial ports (This mode requires an additional adapter cable. See “Serial Port Adapter Cables” on page 235).

Table B-9 Serial Port Pinout - Macintosh-Compatible

Pin	Assignment	Description
1	GPI	General purpose input
2	RxD-	Receive data-
3	TxD-	Transmit data -
4	TxD+	Transmit data +
5	SG	Signal ground
6	RxD+	Receive data +
7	HSKo	Handshake out
8	HSKi	Handshake in
9	Unused	

Serial Cables and Adapters

This section contains cable pinout information for serial cables that you can connect to your Octane2 workstation. It also describes SGI serial port converters. The following topics are covered:

- “Printer/Dumb Terminal Serial Cable”
- “PC Modem Serial Cable”
- “Serial Port Adapter Cables”

Printer/Dumb Terminal Serial Cable

For serial printers and dumb terminals, use a 3-wire standard PC cable. Table B-10 shows the cable connector pinout assignments for this cable.

Note: For a 3-wire cable and no hardware flow control modem, you must use the `/dev/ttyd*` command devices in the configuration files. For more detailed information, see the *serial* man page. To access the man page, choose Toolchest >Help > InfoSearch > Man pages. Or place the cursor in the console window and type:

```
man serial
```

Table B-10 Printer/Dumb Terminal Cable Pinout

Signal Description	Pin Number DB9 Connector (Female)	Pin Number DB-25 Connector (Male)
	1	NOT CONNECTED
RXD	2	2
TXD	3	3
	4	NOT CONNECTED
GND	5	7
	6	NOT CONNECTED
	7	NOT CONNECTED
	8	NOT CONNECTED
	9	NOT CONNECTED

PC Modem Serial Cable

Use a full-handshake (includes RTS and CTS) PC modem serial cable for a modem with RTS/CTS flow control. Table B-11 shows the cable connector pin assignments for this cable.

You can use this cable for all serial devices except those that do not need RTS flow control. If you add a null modem adapter to one end of the cable, you can still use it with devices like serial printers and dumb terminals that do not need RTS flow control. You can purchase the full-handshake PC modem serial cable from SGI or your local service provider.

Note: If you are attaching a modem with modem signals and RTS/CTS flow control, you must use the `/dev/ttyf*` command devices in the configuration files. For more detailed information, see the *serial* man page. To access this man page, choose Toolchest > Help > InfoSearch > Man pages. Or place the cursor in the console window and type:

```
man serial
```

Table B-11 PC Modem Cable Pinout

Signal Description	Pin Number DB9 Connector (Female)	Pin Number DB-25 Connector (Male)
DCD	1	8
RXD	2	3
TXD	3	2
DTR	4	20
GND	5	7
DSR	6	6
RTS	7	4
CTS	8	5
RI	9	22

Serial Port Adapter Cables

The Octane2 workstation's serial ports conform to the PC standard pinout for EIA standard RS-232 signals.

The purpose of the adapter cable is to allow the Octane2 workstation to use standard PC or Macintosh serial devices.

Table B-12 shows the adapter cable pinout for a standard PC or Macintosh serial port.

Table B-12 Female DB9 to Female MiniDIN8 Adapter Cable Pinout

From: Female DB	To: MiniDIN8	PC Signal	Macintosh Signal
1	7	DCD	GPi
2	5	RD	RxD-
3	3	TD	TxD-
4	1	DTR	TxD+
5	4	SG	SG
6	8	DSR	RxD+
7	6	RTS	HSKo
8	2	CTS	HSKi
9	unused	RI	unused

The purpose of the following adapter cable is to support ANSI/SMPTE Standard 107M-1992.

Table B-13 shows the pinout for a female DB9 to female DB9 adapter cable.

Table B-13 Female DB9 to Female DB9 Adapter Cable Pinout

Female DB9 Connected to Octane2	Female DB9 Connected to Peripheral
1	Unused
2	To DB9 -2 (RxD-)
3	To DB9-8 (TxD-)
4	Unused
5	To DB9-6and DB9-4 (GND)
6	To DB9-7 (RxD+)
7	To DB9-3 (TxD+)
8	Unused
9	Unused

Note: For more detailed information, see the serial man page. To access it, place the cursor in an IRIX shell and enter:

```
man serial
```

Or, access Man Pages by choosing Toolchest > Help > InfoSearch > and enter:

```
man serial
```

VPro Graphics Board I/O Ports

Monitor Port

The following diagram shows the monitor port.

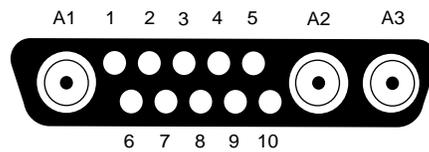


Table B-14 shows the port pinout assignments for the 20-inch monitor.

Table B-14 20-Inch Monitor Pinout

Pin	Assignment
A1	Red signal, analog
A2	Green signal, analog
A3	Blue signal, analog
1	Monitor ID bit 3, TTL
2	Monitor ID bit 0, TTL
3	Composite sync (active low), TTL
4	Horizontal sync (active high), TTL
5	Vertical sync (active high), TTL
6	Monitor ID bit 1, TTL
7	Monitor ID bit 2, TTL
8	Ground
9	Ground
10	Ground

Table B-15 shows the port pinout assignments for an Octane2 DDC-enabled monitor.

Table B-15 DDC-Enabled Monitor Pinout

Pin	Assignment
A1	Red
A2	Green
A3	Blue
1	Data clock (SCL)
2	Bi-directional data (SDA)
3	Composite sync
4	Horizontal sync
5	Vertical sync
6	DDC (+5VInput)
7	DDC ground
8	Chassis ground
9	Chassis ground
10	Chassis ground

Table B-16 lists the VPro graphics board supported scan rates.

Table B-16 VPro Graphics Board Scan Rates

Format Name	Vertical Refresh Rate (Hz)
640 x 480_60	59.940
800 x 600_60	60.317
1024 x 768_60	60.004
1024 x 768_75	60.317
1280 x 720_60	60.000
1280 x 720_72	72.002
1280 x 1024_60_safe	60.020
1280 x 1024_96	96.037
1600 x 1024_83	82.982
1600 x 1200_72	72.013
1600 x 1200_75	75.000
1920 x 1080_72	72.005
1920 x 1200_60	60.017
1280 x 1024_100s	50.000 per eye

Note: For VPro graphics, a 1280 x 1024 display resolution is only possible using the Sony G1 21" or 24" monitors at a vertical refresh rate of 96Hz. If you have another monitor, you cannot run 1280 x 1024 resolution at any vertical refresh rate.

StereoView Port

The following diagram shows the StereoView Port.

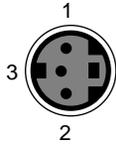


Table B-17 shows the cable pinout assignments for the StereoView port on the VPro graphics board.

Table B-17 StereoView Pinout Assignments

Pin	Assignment
1	+12V DC output to StereoView device
2	Ground
3	Stereo left/ right Eye signal (1=left, 0=right) (STEREO_LEFT)

Genlock Port

The following diagram shows the Genlock port.

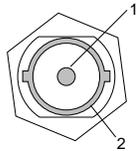


Table B-18 shows the cable pinout assignments for the Genlock port on the VPro graphics board.

Table B-18 Genlock Pinout Assignments

Pin	Assignment
1	Genlock Input/output video or 3.3V TTL signal levels
2	Sigma - return ground

Swap Ready Port

The following diagram shows the Swap Ready port.

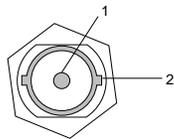


Table B-19 shows the cable pinout assignments for the Swap Ready port on the VPro graphics board.

Table B-19 Swap Ready Pinout Assignments

Pin	Assignment
1	Swapbuffer gang sync open Collector I/O
2	Signal return ground

Physical Environment Specifications

Table B-20 shows the physical environment specifications for the Octane2 workstation.

Table B-20 Physical Environment Specifications

Workstation dimensions	16.25" (41.3 cm) H x 11.0" (28 cm) W x 13.25" (33.7 cm) D 14.75" D (37.5 cm) (depth in localized area of power supply) 16.25" D (41.3 cm) (depth in localized area of optional PCI module)
Power requirements	Voltage and frequency: 100-240 VAC, 50-60 Hz, 10-4.2A, 850W
Ambient temperature	+13° C (23.4° F) to +35° C (95° F) (operating) -10° C (14° F) to +65° C (149° F) (non-operating)
Relative humidity	10% to 80% operating (no condensation) 10% to 95% non-operating (no condensation)
Heat dissipation	700 watts, 2400 Btu/hr
Altitude	10,000 ft. (3,049 m) operating; 40,000 ft. (12,195 m) non-operating
Vibration	0.02', 5-19Hz; 0.35 G, 19-500 Hz
Voltage and frequency	100-120/200-240 VAC

Microphone Specifications

Table B-21 shows the microphone specifications.

Table B-21 Microphone Specifications

Microphone Jack	
Connector	3.5 mm stereo mini
Power	+5 V phantom power on tip
Type	Unidirectional electret condenser

Speaker Specifications

Table B-22 shows the speaker specifications.

Table B-22 Speaker Specifications

Speakers	
Rated power	3 W(average) per channel
Frequency range	180 Hz - 15K Hz
Magnetic flux leakage	<50 mGauss @2 cm
Input impedance	150 ohms
Signal connector	3.5 mm stereo mini
Power connector	2.5 mm mono micro

Headphone Specifications

Table B-23 shows the headphone specifications.

Table B-23 Headphone Specifications

Headphones	
Recommended impedance	35 ohms
Connectors	3.5 mm stereo mini

Analog Line Level Audio Specifications

Table B-24 shows the analog audio line level specifications.

Table B-24 Analog Line Level Specifications

Specifications	Line In	Line Out
Line level	-10dBV	-10dBV
0dBFS maximum	+10dBV to -22dBV	6.5dBV ± 0.5dBV

PCI Module Power Specifications

Total power for the PCI module (the sum of power for all boards from all power supply rails) must not exceed 45.0W (average 15.0W per board).

The Octane2 PCI module is a 5V system environment.

Table B-25 PCI Module Power Specifications

Power Supply Rail	Maximum Current	Maximum Power
3.3V	10.0A	33.0W
5.0V	9.0A	45.0W
12.0V	1.5A	12.0W
-12.0V	0.3A	3.6W

Note: For additional information see Section 4.3.4.1, in the chapter called “Power Requirements,” in the *PCI Local Bus Specification*, Rev. 2.1, June 1995 (PCI Special Interest Group, Portland, OR).

Regulatory Information

Manufacturer's Regulatory Declarations

The Octane2 workstation conforms to several national and international specifications and European Directives listed on the Manufacturer's Declaration of Conformity. The CE insignia displayed on each device is an indication of conformity to the European requirements.

Caution: Your workstation has several governmental and third-party approvals, licenses, and permits. Do not modify this product in any way that is not expressly approved by SGI. If you do, you may lose these approvals and your governmental agency authority to operate this device.

CMN Number

The Octane2 model number, or CMN number, is on the system label on the back of your workstation, as shown in "Back View" on page 4.

You must provide the CMN number to SGI to obtain the Manufacturer's Declaration of Conformity. You also use the CMN number to determine the class of your Octane2 workstation. Match the CMN number on the back of your workstation with the CMN number on the Class A FCC Declaration of Conformance or Class B FCC Declaration of Conformance on the following pages. The model number for Class A begins with "CMNB015A" and the model number for Class B begins with "CMNB015B."

Manufacturer's Declaration of Conformity

To obtain a Manufacturer's Declaration of Conformity, contact your local SGI sales representative and provide your system's CMN (model) number, which is on the system label on the back of your workstation (see "Back View" on page 4).

Upgrade Regulatory Labels

To place upgrade regulatory labels, follow these steps:

1. If you received a system upgrade label, place it on the system label.
 - Face the back of the Octane2 workstation. The system label is located at the top center of the back of the workstation. See "Back View" on page 4.
 - Place the system upgrade label over the lower right portion of the system label, over the VCCI and SISPR 22 information.
2. If you received a regulatory label with a processor upgrade, place it on the label between the fan and PCI module, in the middle of the back of the workstation. See "Back View" on page 4.
 - Place the CPU upgrade label over "CPU Upgrade 1," if it is the first CPU upgrade to the base system.
 - If the CPU upgrade is a second or third upgrade, place the label in the appropriate location: over "CPU Upgrade 2" or "CPU Upgrade 3."

Class A**Table C-1** FCC Declaration of Conformance

Trade Name	SGL, Inc.
Product	Computer Graphics Workstation
Model Number	CMNB015A
Date of Conformance	1/97
Responsible Party	SGL, Inc.
Address	2011 North Shoreline Boulevard Mountain View, California 94043-1389
Telephone	(650) 933-3405

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 workstation base configuration. See the Manufacturer's Declaration of Conformity for your workstation's specific classification, which may be different from the base configuration. For details, see "Manufacturer's Declaration of Conformity" on page 248 of this appendix.

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 n'émet pas de perturbations radioélectriques dépassant les normes applicables aux appareils numériques de Classe A prescrites dans le Règlement sur les interférences radioélectriques établi par le Ministère des Communications 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; and Japan's VCCI Class A limits.

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

従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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 the following URL:
<http://www.fcc.gov/Bureaus/Compliance/WWW/tribook.html>

Shielded Cables

The Octane2 workstation is FCC-compliant under test conditions that include the use of shielded cables between Octane2 and its peripherals. Your Octane2 workstation and any peripherals you purchase from SGI 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 SGI, make sure they are shielded. Telephone cables do not need to be shielded.

The monitor cable supplied with your system uses additional filtering molded into the cable jacket to reduce radio frequency interference. Always use the cable supplied with your system. If your monitor cable becomes damaged, a replacement cable should be obtained from SGI.

Electrostatic Discharge

SGI 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.

Caution: While operating your Octane2, keep all the covers and doors, including the plastics, in place. The shielded cables included 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.

Class B

Table C-2 FCC Declaration of Conformance

Trade Name	SGI, Inc.
Product	Computer Graphics Workstation
Model Number	CMNB015B
Date of Conformance	1/97
Responsible Party	SGI, Inc.
Address	2011 North Shoreline Boulevard Mountain View, California 94043-1389
Telephone	(650) 933-3405

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.

Note: This equipment has been tested and found to comply with the limits for a Class B 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 workstation base configuration. See the Manufacturer's Declaration of Conformity for your workstation's specific classification, which may be different from the base configuration. For details, refer to "Manufacturer's Declaration of Conformity" on page 248 of this appendix.

This device complies with the Class B limits of Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique n'émet pas de perturbations radioélectriques dépassant les normes applicables aux appareils numériques de Classe B prescrites dans le Règlement sur les interférences radioélectriques établi par le Ministère des Communications du Canada.

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

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Shielded Cables

The Octane2 workstation is FCC-compliant under test conditions that include the use of shielded cables between Octane2 and its peripherals. Your Octane2 workstation and any peripherals you purchase from SGI 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 SGI, make sure they are shielded. Telephone cables do not need to be shielded.

The monitor cable supplied with your system uses additional filtering molded into the cable jacket to reduce radio frequency interference. Always use the cable supplied with your system. If your monitor cable becomes damaged, a replacement cable should be obtained from SGI.

Electrostatic Discharge

SGI 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.

Caution: While you are operating your Octane2 you keep all the covers and doors, including the plastics, in place. The shielded cables included 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.

Glossary

account

See login account.

active window

The only window that recognizes input (activity) from the keyboard and mouse; only one window is active at a time.

ADAT optical interface

The ADAT optical interface provides a unidirectional point-to-point connection of 8 tracks of 24-bit digital audio, with subcodes, at professional sampling rates, on a single consumer-grade optical fiber. A typical use is for a data connection between multiple ADAT tape decks, for bouncing tracks between decks.

address dial

See SCSI address dial.

administrator

See system administrator *and* network administrator.

AES3

The AES3-1992 specification of transmission format for digital audio data. This specification is also commonly referred to as AES/EBU. See also ANSI S4.4-1992 and IEC958, Audio Engineering Society, Inc., Vol. 40, No. 3, 1992, New York, NY 10165. For more information on this specification, see <http://www.aes.org/publications/>.

AES3id

An information document describing implementation of AES3-1992 (see above attribution) using 75-ohm coaxial cable with 1 V peak-to-peak signal levels. See <http://www.aes.org/publications/>.

back up

To copy files and directories from your hard disk to a tape.

backup tape

A tape that contains a copy of the files and directories on your hard disk. A full backup tape contains a copy of all files and directories, including IRIX, on your hard disk.

baud rate

The speed (calculated as bits per second) at which the computer sends information to a serial device, such as a modem or terminal.

bezel

The frame that holds the front cover. It attaches to the front of the chassis.

blank panel

A piece of plastic or metal that covers openings in the chassis. A blank panel may be in front of an empty drive bay, an empty graphics board slot, an empty PCI module opening, or an empty PCI slot.

boot

To start the system by turning on the workstation and monitor; the system is fully booted when you see the `console login:` prompt or the login screen.

button

On a mouse, a button is a switch that you press with your finger. In a window on your screen, a button is a labeled rectangle that you click using the cursor and mouse.

CD-ROM (CD)

A flat metallic disk that contains information that you can view and copy onto your own hard disk; you cannot change or add to its information. CD-ROM is short for *compact disc read-only memory*.

chassis

The exterior metal framework of the workstation that contains its working parts.

choose

To press the left mouse button to display a popup menu, move the cursor to highlight a command, and then release the button.

click

To press and immediately release a mouse button.

compression connector

A specialized connector with two halves. One-half of each connector resides on the frontplane. The other half resides on the module or XIO board to which it is attached: the system module, the PCI module, or the XIO graphics or option boards. The connector on the frontplane has pads; the connector on the module or board side has bristles. The compression connector must always be covered when a board or module is out of the Octane2 workstation. It is easily damaged. See Appendix A, "Care and Cleaning of Compression Connectors".

compression connector cap

A cap that fits over a compression connector and protects it from being damaged by dust, finger oil, scratches, dents, and so on. The cap must be on a compression connector attached to a module or XIO board whenever the board or module is out of the Octane2 workstation.

configuration file

A system file that you change to customize the way your system behaves. Such files are sometimes referred to as *customization files*.

confidence test

A test that you run to make sure a particular device (such as the keyboard, mouse, or drive) is set up and working properly.

connector

Hardware at the end of a cable that lets you fasten the cable to an outlet, port, or other connector. A connector can also be on a PCI or graphics board and attaches to a connector on the end of a cable.

console window

The window that appears as a stowed icon each time you log in; IRIX reports all status and error messages to this window.

CPU board

The printed circuit board within your workstation chassis that contains the central processing unit (CPU) and its associated cache memory. The processor board plugs into the system module in the Octane2 workstation.

current working directory

The directory within the filesystem in which you are located when you are working in a shell window.

cursor

The small arrow or other shape on the screen that follows the movements of the mouse. It may change shape depending on its location on the screen.

DAT

Digital Audio Tape. A magnetic tape from which you can read and to which you can copy audio and digital media.

dBV

Decibels relative to $1V_{\text{rms}}$. To calculate the dBV value for " x " V_{rms} , use $20\log_{10}(x/1V_{\text{rms}})$.

default printer

The printer to which the system directs a print request if you do not specify a printer when you make the request. You set the default printer using the Print Manager.

defaults

A set of behaviors that Silicon Graphics specifies on every system. You can later change these specifications, which range from how your screen looks to what type of drive you want to use to install new software.

diagnostics

A series of tests that check the hardware components of your system.

DIMM

Dual inline memory module. A small printed circuit board with DRAM (dynamic random access memory) chips. DIMMs are made in various types and densities. Only one type and one density can be used in a DIMM bank.

DIMM socket

A long thin female connector located on the system board into which you insert a DIMM.

directory

A special file in the filesystem in which you store other directories and files.

disk resource

Any disk (hard, tape, CD-ROM, or floppy) that you can access either because it is physically attached to your workstation with a cable or because it is available over the network using NFS.

disk use

The percentage of space on your disk that contains information.

double-click

To press and release a button twice, very rapidly. When you double-click an icon, it opens into a window; when you double-click the window Menu button, the window closes.

drag

To press and hold down a mouse button, and then move the mouse. This action drags the cursor to move icons or to highlight menu items.

drive

A hardware device that lets you access information on various forms of media, such as hard and floppy disks, CD-ROM disks, and magnetic tapes.

drive address

See SCSI address.

export

To use NFS software to make all or part of your filesystem available to other users and systems on the network.

external device

Any piece of hardware that is attached to the workstation with a cable.

female connector

A connector that has indentations or holes into which you plug a male connector. An example of a female connector is an electrical wall outlet that accepts an electrical plug.

field

An area in a window in which you can enter text.

file

A set of disk blocks in which you store information such as text, programs, or images that you created using an application.

filesystem

A hierarchy of directories and files. Directories contain other directories and files; files cannot contain directories. The root (/) directory is at the top of the hierarchy.

form

A window containing buttons that you must click and/or fields in which you must enter text.

frontplane

The circuit board that connects PCI and XIO boards to the system board.

GB (gigabyte)

The abbreviation for a standard unit for measuring the information storage capacity of disks and memory; 1,024 megabytes equal one gigabyte, in most cases.

genlock

A port on the graphics board to which you attach a cable that attaches to an external video source. This allows you to synchronize local video to video from various external sources.

graphics board

The printed circuit board within your workstation that contains the graphics processors. Graphics boards reside on the XIO module.

grounded electrical outlet

An electrical wall outlet that accepts a plug with a grounding prong. In the U.S.A., all three-prong outlets are grounded.

handshake

The protocol that controls the flow of information between a workstation and a printer.

highlight

To change the color of an item on the screen by positioning the cursor over it, or by positioning the cursor over it and pressing a mouse button.

home directory

The active directory each time you log in. It is specified in your login account; you own this directory and, typically, all its contents.

host

Any system connected to the network.

hostname

The name that uniquely identifies each host (system) on the network.

human factors guidelines

A set of standards and suggestions for making your physical working environment more comfortable and healthy.

icon

A small picture that represents a stored or closed file, directory, application, or IRIX process.

InfoSearch

The Silicon Graphics online search tool that finds information by keyword, topic, or task. InfoSearch seeks information in all information sources: man (reference) pages, online books, application help, release notes, and task cards. InfoSearch is located in the Toolchest.

internal drive

A drive that fits inside the workstation and connects to an internal port; it is never connected with a cable to a visible external port. An internal drive is occasionally referred to as a front-loading drive.

I/O

Input/Output signals to and from graphics/XIO boards and PCI boards.

IP address

A number that uniquely identifies each host (system) on a TCP/IP network.

IRIX

The Silicon Graphics version of the UNIX operating system. *See also* system software.

jot

A mouse-and window-based text editor included with the IRIX operating system.

KB (kilobyte)

The abbreviation for a standard unit for measuring the information storage capacity of disks and memory (RAM and ROM); 1024 bytes equal one kilobyte, in most cases.

launch

To start an application, often by double-clicking an icon.

LED

Light-Emitting Diode. A light on a piece of hardware that indicates status or error conditions.

local workstation

The physical workstation whose keyboard and mouse you are using, all hardware that is connected to that workstation, and all software that resides on that hardware or its removable media.

lockbar

A long piece of metal with a hole on the end that you slide through the chassis. It allows you to secure the workstation with a lock and locking cable. The drives, frontplane, system module (containing the CPU and DIMMs) are inaccessible when the lockbar is locked in the system.

log in

To give the system your login name so you can start a session on the workstation.

log out

To end a session on the workstation.

login account

A database of information about each user that consists of, at the minimum, the login name, user ID, and home directory.

login name

A name that uniquely identifies a user to the system.

login screen

The window that you see after powering on the system, before you can access files and directories. The window contains one icon for each login account on the system.

male connector

A connector that has raised edges, pins, or other protruding parts that you plug into a female connector. An example of a male connector is an electrical plug that you plug into a wall outlet.

man (manual) page

An online document that describes how to use a particular IRIX command. Also called reference page.

MB (megabyte)

The abbreviation for a standard unit for measuring the information storage capacity of disks and memory (RAM and ROM); 1024 kilobytes equal one megabyte, in most cases.

menu

A list of operations or commands that the workstation can perform on various objects on the screen.

monitor

A hardware device that displays the images, windows, and text with which you interact to use the system. It is also called a video display terminal (VDT).

monitor cable

The cable that connects the monitor to the workstation to transmit video signals.

monitor power cable

The cable that connects the monitor to the workstation to provide power to the monitor. It is thick, with a male connector on one end and a female connector on the other.

mount

To make a filesystem that is stored on a local or remote disk resource accessible from a specific directory on your workstation.

mount point

The directory on your workstation from which you access information that is stored on a local or remote disk resource.

mouse

A hardware device that you use to communicate with windows and icons. You move the mouse to move the cursor on the screen, and you press its buttons to initiate operations.

mouse pad

For an optical mouse, this is the rectangular, metallic surface that reads the movements of the mouse. For a mechanical mouse, this is a clean, smooth, rectangular surface that allows the mouse's track ball to roll efficiently.

NEdit

NEdit is a graphical user interface (GUI) text editor. NEdit provides all the standard menu, dialog, editing, and mouse support found in modern GUI-based environments.

network

A group of computers and other devices (such as printers) that communicate with each other electronically to transfer and share information.

network administrator

The individual(s) responsible for setting up, maintaining, and troubleshooting the network, and for supplying setup information to system administrators of each system.

notifier

A form that appears on the monitor when the system requires that you confirm an operation that you just requested, or when an error occurs.

open

To double-click or select an icon, and then choose Open from a menu to display information that the icon represents.

option drive

Any drive other than the system disk. Option drives include floppy disk drives, secondary hard disk drives, or DAT drives.

outlets

Openings in the hardware to which you attach connectors to make electrical connections.

parallel port

An outlet on the workstation to which you connect external printers and similar devices.

password

A combination of letters and/or numbers that only you know; it is analogous to a key and prevents unauthorized access to your system. It is an optional element of your login account. If you specify a password for your account, you must type it after you type your login name before the system lets you access files and directories.

pathname

The list of directories that leads you from the root (/) directory to a specific file or directory in the filesystem.

PCI

Peripheral Component Interconnect (a bus specification). The PCI bus is a high-performance local bus used to connect peripherals to memory and a microprocessor. A wide range of vendors make devices that plug into the PCI bus.

PCI I/O blank panel

A metal panel that fits on a slot in the I/O door. It must be in place if a PCI board is not installed in the corresponding slot in the PCI module.

peripheral

A hardware device that adds more functionality to the basic workstation, such as a tape drive. *See also* external device and internal drive.

port

An outlet to which you attach cable connectors.

power cable

The cable that connects the workstation to a grounded electrical outlet.

power off

To turn off the power switches on the workstation chassis and the monitor.

power-on diagnostics

A series of tests that automatically checks the hardware components of your system each time you turn it on.

power supply

The piece of hardware in the Octane2 chassis that directs power from an electrical outlet to the chassis, monitor, and internal SCSI devices.

Printer Manager

A tool that you access through either the System toolchest or the System Manager. Use it to set up printer software and monitor jobs that you send to the printer.

PROM monitor

The interface that you use to communicate with the system after it is powered on, but before it is booted and running IRIX.

prompt

A character or word that the system displays in an IRIX shell; it indicates that the system is ready to accept commands. The default prompt for regular user accounts is %; the default prompt for the root account is #.

quit

To stop running an application.

reference page

See man (manual) page.

remote workstation, drive, disk, filesystem, or printer

A hardware device, or the information or media it contains, that you can access across the network; it is not physically connected to your workstation.

reset button

A button on the workstation that you can press, to power off and then immediately restart. Never press this button while IRIX is running unless all attempts to shut down the system using software fail. *See also* shut down.

restore (files)

To copy files from a disk or a tape back to the hard disk on which the files originally resided.

root account

The standard IRIX login account reserved for use by the system administrator. This account's home directory is the root (/) directory of the filesystem; the user of the root account has full access to the entire filesystem (that is, that user can change and delete any file or directory). The user of this account is sometimes referred to as the *superuser*.

root (/) directory

The directory at the top of the filesystem hierarchy.

screen

The portion of the monitor that displays information.

SCSI

Small Computer System Interface (pronounced "scuzzy"). SCSI is a high-speed input/output specification for small computers. The Octane2 workstation is SCSI-3 compliant and supports two Ultra fast/wide/single-ended SCSI buses, each capable of transferring data at 40 MB per second.

SCSI address

A number from one to seven that uniquely identifies a SCSI device to a system. No two SCSI devices that are physically connected to the same SCSI bus can have the same SCSI address.

SCSI address dial

A small plastic dial connected to some SGI external SCSI devices. Click its small buttons to select a SCSI address for a new SCSI device.

SCSI bus length

The combined length of all internal and external SCSI cables in a system for each SCSI bus.

SCSI cable

A cable that connects a SCSI device to a SCSI port on a workstation.

SCSI device

A hardware device that uses the SCSI protocol to communicate with the system. Hard disks and floppy disks, CD-ROM drives, and tape drives are all SCSI devices. *See also* SCSI.

SCSI terminator

An electronics device, often an external plug, that is required at the end of each SCSI bus. The Octane2 workstation uses active terminators only on an external SCSI or Ultra-SCSI device, not on the workstation itself.

select

To position the cursor over an icon, and then click the left mouse button. Once an icon is highlighted, it is the object of whatever operation you select from a menu.

serial device

Any hardware device that requires a serial cable connection to communicate with the workstation.

serial port

An outlet on the workstation to which you connect external serial devices.

server

A system that other systems on the network access to use its disk space, software, or services.

shell

A window into which you type IRIX commands.

shielded cable

A cable with a protective covering that reduces the possibility of interference with radio, television, and other devices.

shut down

To safely close all files, log out, and bring the workstation to a state in which you can safely power it off. From Toolchest > System, choose System Shutdown.

software option

Any software product that you buy from SGI, other than the standard operating system software included on your system disk.

standalone workstation

A workstation that is not connected to a network.

static electricity

Whenever your body comes in physical contact with metal parts (including printed circuit boards) of computer equipment, there is the potential for you to feel an electrical shock (electrostatic discharge, or ESD), which could damage the equipment. To prevent this, you must always wear a wrist strap when working with the internal parts of a workstation.

StereoView

A port on the graphics board to which you attach a cable that attaches to StereoView (3D) glasses or a StereoView (3D) headset.

Swap Ready

A port on the graphics board to which you attach a cable that attaches to another computer. This allows you to synchronize buffer swap events across the two computers using a double buffer application.

superuser

A user with root privileges. You become a superuser by logging in as root, by typing `su` at the shell prompt, or by running programs set up to run as root. *See also* system administrator.

system

All the workstation hardware and software.

system administration

The tasks associated with setting up, maintaining, and troubleshooting a networked or standalone system.

system administrator

The individual responsible for setting up, maintaining, and troubleshooting a system. The system administrator uses the root login account to perform most administrative tasks.

system crash

This occurs when the IRIX operating system fails and the system does not accept any keyboard or mouse input.

system disk

The physical disk that contains the standard IRIX operating system software.

System Manager

A set of tools that the administrator uses to set up and manage the Silicon Graphics workstation. You access the System Manager through the System toolchest.

system software

The standard IRIX operating system software and Silicon Graphics tools. These are included on the system disk and on the CD that you use in the event of a system crash.

System toolchest

The toolchest in the upper left-hand corner of the screen labeled "System." You start system tools, such as System Manager, using this menu.

TCP/IP

A standard networking protocol that is included in the system software.

thumbscrew

The ridged knob attached to a screw in a cable connector. You turn it to secure the connector to an outlet.

unmount

To make a filesystem that is accessible from a specific directory on your workstation temporarily inaccessible.

upgrade

Hardware or software that you add to the basic workstation to increase performance, such as additional memory (DIMMs), a higher capacity CPU, more powerful graphics boards, and so on.

user ID (UID)

A number that uniquely identifies a user to the system.

Watt (average)

Average power in watts $1W_{ave} = 1V_{rms} \times 1A_{rms}$. (Watt [average] refers to audio power, often quoted as Watts rms).

window

A portion of the screen that you can manipulate that contains text or graphics.

workstation

An assembly of hardware that includes a system board, graphics board, CPU, memory, system disk, and power supply. A workstation can include more than one of each component as well as optional boards that add functionality. The hardware is enclosed in a chassis with a cover. The addition of a monitor, keyboard, mouse, and software makes it a working system.

wrist strap

A flat cable that you wrap around your wrist and attach to a metal part of the workstation whenever you work with internal components of the workstation. This prevents electrical shocks to yourself and the components. *See also* static electricity.

XIO boards

High-speed boards produced by Silicon Graphics such as graphics, networking, disk interface, or video boards.

Index

A

- active speaker, 10, 11
- address, SCSI, 133
- analog line level audio, 154
- audio devices
 - installing, 150-154

B

- back view, workstation, 4
- banks, DIMM, 47
- base, replacing, 192
- bezel
 - locking, 18
 - reinstalling, 195
 - removing, 162-164
- blank panel
 - installing, 121-123
 - removing, 118, 120
 - removing from bezel, 168
 - replacing, 171
- booting up, 21
- bristled pad, 39
- button boxes
 - installing, 147

C

- cable
 - controlled impedance, 134
 - ethernet, 9
 - keyboard, 8
 - monitor, 14
 - mouse, 8
 - power, 11, 14
 - requirements, 137
 - SCSI, 134
 - serial, 149
 - speaker, 10
 - system module, 34
- cabling
 - SCSI devices, 137
- CD-ROM drive
 - connecting, 131
 - setting up, 145
- coaxial digital audio, 155
- commands, IRIX, 24
- components
 - displayed, 5
 - optional
 - installing, 7
 - static electricity, 35
- compression connector
 - capping, 40, 119
 - installing cap, 77
 - PCI module, 76
 - removing cap, 101, 123
 - system module, 39, 40

- VPro graphics board, 113, 117
- XIO board, 119, 121
- confidence tests, 205
- connectors
 - CPU, 44
- controlled impedance, 134
- CPU
 - connectors, 44
 - heat sinks, 32
 - installing, 32
 - removing, 32, 41-43
 - replacing, 44-46
- crash, system, 207-210

D

- daisy-chaining
 - cable requirements, 138
 - described, 131, 134
- data burst rates, 130
- data transfer rate, 130
- DAT drive
 - cleaning, 146
 - connecting, 131
 - described, 160
- device, external
 - installing, 129
- diagnostic tests
 - running, 205
- dials
 - installing, 147
- digitizer tablets, installing, 147
- DIMM
 - capacity, 47
 - density, 47
 - installing, 52
 - locating, 49
 - removing, 51

- static electricity, 47
- verifying installation, 60
- DIMM banks, 47, 48
- DIMM bracket
 - removing, 50
- DIMM sockets, 47, 48, 51
- DLT drive
 - cleaning, 146
 - connecting, 131
 - described, 160
- documentation, online, 23
- drives
 - CD-ROM, 131, 145
 - DAT, 131, 146, 160
 - DLT, 131, 146, 160
 - floppy, 131, 145, 146
 - information on, 145
 - internal
 - testing, 176
- Dual inline memory module. *See* DIMM
- dual processor
 - installing, 46
 - removing, 43
- dumpster icon, 22

E

- Ethernet cable
 - attaching, 9
- external device
 - installing, 129

F

- Fast-20, 130
- Fast SCSI
 - cable length, 134, 137

rates, 130
fiber optic cable, 155
floppy drive
 connecting, 131
 formatting, 145, 146
folder icon, 22
frontplane module
 removing, 180, 181, 183-184
 replacing, 186
front view, workstation, 3

G

graphics board. *See* VPro graphics board

H

headphones
 installing, 152
heat sinks, 32, 52
Help, 23
Human factors guidelines, 8

I

icons, 22
IDE tests, 206
InfoSearch, 23
installing
 audio devices, 150-154
 headphones, 152
 microphones, 151
 optional components, 7
 serial devices, 147-149
 speakers, 152-153
Interactive Diagnostic Environment tests, 206

internal drive
 testing, 176
I/O connector
 monitor cable, 14
 PCI module, 71
I/O door
 closing, 86-87
 opening, 84-85
 for extra-long connectors, 94-95
I/O panel, blank
 installing, 91
 removing, 80
IRIX commands, 24
IRIX Interactive desktop, ??-24

K

keyboard
 replacing, 156
keyboard cables
 attaching, 8

L

lifting, workstation, 6
Lightbar LEDs, 200-202
light module
 installing, 179
 removing, 177-178
lockbar
 installing, 16, 59
 locating, 18-19
login, 21

M

- memory
 - installing, 32, 47, 52
 - removing, 32, 47, 51
- microphone
 - installing, 151
 - setting up, 13
- modems
 - installing, 147
- monitor
 - cable, 14
 - powering on, 16
- mouse
 - replacing, 156
- mouse cables
 - attaching, 8

N

- Narrow SCSI
 - rates, 130
- NMI button
 - using, 203

O

- Octane2 Hardware Central, 2, 8, 23
- Octane2 Workstation
 - back view, 4
 - components, 5
 - front view, 3
 - lifting, 6
 - locking, 18-19
 - login, 21
 - powering off, 25-28
 - powering on, 17
 - setting up, 7, 8-17

- shutting down, 25-28
- online documentation, 23
- optical digital cable, 155
- optical digital port, 155
- optional components, installing, 7
- option board. *See* XIO option board
- option drive
 - installing, 165-167
 - removing, 170

P

- panel, blank, 70
- passive speaker, 10
- password
 - disabling, 211
 - enabling, 213
- PCI board
 - inserting into PCI module, 81
 - with extra-long connector, 86
 - installing, 70, 72, 80-88
 - power limits, 71
 - removing, 89-90, 96
 - static electricity, 80
 - verifying installation, 105
- PCI cables
 - installing, 103
- PCI module
 - described, 70
 - installing, 100-103
 - opening, 78
 - placing door on, 82
 - reconnecting door, 92, 99
 - removing, 64, 75-76
 - removing blank panel from, 101
 - removing cables from, 73
- PCI slots
 - identifying, 79

peripheral icon, 22

port

- analog line level audio, 154
- coaxial digital audio, 155
- ethernet, 9
- keyboard, 156
- L, 10
- microphone, 13
- mouse, 156
- optical digital, 155
- power, 11
- R, 10, 11
- speaker, 12

power button, 25-26

power cable

- monitor, 14
- PCI module, 64
- speaker, 11

powering off

- CPU installation, 32, 135, 161
- failure, 215
- power supply installation, 62
- procedure, 25-28

powering on

- monitor, 16
- speakers, 16
- workstation, 17, 58

power-on tests, 205

power port, 11

power supply

- installing, 66-67
- removing, 62, 64-65

processor

- removing, 41-43
- replacing, 44-46

R

release slots

- locating, 192

restart, 29-30

R port, 11

S

SCSI

- cable requirements, 138
- media speed, 130
- rates, 130

SCSI buses

- described, 130

SCSI device

- attaching to workstation, 131
- cabling, 136
- removing terminator, 136
- speed, 138
- turning on, 143

SCSI device, external, 131

- cable length, 134
- connecting, 139-141
- connecting terminator to, 141
- daisy-chaining, 136, 140
- setting addresses, 131, 133
- testing, 143
- verifying installation, 144

SCSI device, internal

- addresses, 160

SCSI ID, 132

secondary drive

- described, 160
- installing, 165-167
- removing, 170

serial cable

- plugging in, 149

- serial device
 - configuring, 150
 - installing, 147-149
- serial ports
 - assignments, 148
 - described, 147
- setup, 7
- shut down, 25-28
 - failure, 215
- single processor
 - installing, 45
 - removing, 41-42
- speaker port, 12
- speakers
 - connecting, 10-12
 - installing, 152-153
 - powering on, 16
- static electricity, 35, 47, 51, 74
- system configuration, checking, 144
- system crash
 - recovering from, 207-210
- system drive
 - described, 160
 - locating, 173
 - removing, 174
 - replacing, 173-175
- system fan
 - replacing, 187-189
- system maintenance menu
 - accessing, 204
- system maintenance password
 - disabling, 211
 - enabling, 213
- System Manager, 23
 - verifying device installation, 144
- system module
 - locating DIMM on, 49
 - locking, 18

- reinstalling, 46
- removing, 36-40
- removing cables from, 34
- replacing, 53-57

System SCSI controller, 133

system shut down, 25-28

T

- tape drive
 - setting up, 145
- terminator
 - and daisy chaining, 136
- Toolchest
 - installed devices, 144
 - memory installation, 60
 - restart, 29-30
 - SCSI addresses, 132
 - shut down, 27-28
 - system functions, 23
- top cover
 - replacing, 190

U

- Ultra SCSI
 - cable length, 134, 137
 - Fast-20, 130
 - rates, 130
- Ultra SCSI controller, 130

V

- VPro graphics board
 - compression connectors, 113, 117
 - I/O ports, 109
 - position of, 108, 118

W

- Wide SCSI
 - rates, 130
- workstation. *See* Octane2 Workstation
- wrist strap
 - attaching, 35
 - frontplane module, 180
 - PCI board, 80
 - PCI module, 72, 74
 - removing memory, 51
 - XIO option board, 112

X

- XIO blank panel
 - removing, 118, 120
- XIO option board
 - described, 108
 - identifying slots, 118
 - installing, 121-123
 - removing, 118-121
- XIO Tri-Module
 - displayed, 109
 - locating, 108
 - reinstalling, 124-126
 - releasing, 115
 - removing, 115
 - removing cables, 111
 - removing screws, 114
 - side display, 116

