

# Indigo<sup>2</sup> IMPACT™ Texture Memory Option Board Installation Guide

Document Number 007-3079-002

## CONTRIBUTORS

Written by Charmaine Moyer  
Illustrated by Dany Galgani, Dan Young, and Cheri Brown  
Production by Cindy Stief

Reviewers: Bob Abbott, Susheel Bhasin, Bob Cook, Judy Muchowski, Michael Nagy,  
Michael Wright, Richard Wright

© Copyright 1995, Silicon Graphics, Inc.— All Rights Reserved.

This document contains proprietary and confidential information of Silicon Graphics, Inc. The contents of this document may not be disclosed to third parties, copied, or duplicated in any form, in whole or in part, without the prior written permission of Silicon Graphics, Inc.

## RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure of the technical data contained in this document by the Government is subject to restrictions as set forth in subdivision (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at DFARS 52.227-7013 and/or in similar or successor clauses in the FAR, or in the DOD or NASA FAR Supplement. Unpublished rights reserved under the Copyright Laws of the United States. Contractor/manufacturer is Silicon Graphics, Inc., 2011 N. Shoreline Blvd., Mountain View, CA 94043-1389.

Silicon Graphics, and the Silicon Graphics logo are registered trademarks and Indigo<sup>2</sup>, Indigo<sup>2</sup> IMPACT, and Indigo<sup>2</sup> High IMPACT and Indigo<sup>2</sup> Maximum IMPACT are trademarks of Silicon Graphics, Inc.

---

# Contents

<b>List of Figures</b>	v
<b>List of Tables</b>	ix
<b>Introduction</b>	xi
Product Support	xi
Exterior of Your Indigo <sup>2</sup> IMPACT Workstation	xii
Interior of Your Indigo <sup>2</sup> IMPACT Workstation	xiii
<b>1. Upgrading the Texture Memory Option Board: High IMPACT to Maximum IMPACT</b>	<b>1</b>
Shutting Down and Powering Off Your Indigo <sup>2</sup> IMPACT Workstation	2
Removing the Cover	4
Attaching the Wrist Strap	6
Removing the Indigo <sup>2</sup> IMPACT Graphics Board Set	7
Identifying Option Boards and Graphic Boards	11
Identifying the Option Boards and the Graphic Board Set	11
Removing Option Boards	14
Installing Cables and Standoffs	19
Replacing the Board Set in the Workstation	26
Replacing the Cover	31
Turning On the Indigo <sup>2</sup> IMPACT Workstation	33
<b>2. Installing the Texture Memory Option Board</b>	<b>35</b>
Shutting Down and Powering Off Your Indigo <sup>2</sup> IMPACT Workstation	36
Removing the Cover	38
Attaching the Wrist Strap	40
Removing the Indigo <sup>2</sup> IMPACT Graphics Board Set	41

- Identifying Option Boards and Graphic Boards 45
  - Illustrating Option Boards and Graphics Boards 45
  - Removing Option Boards 50
  - Installing Cables, Standoffs, and Option Boards 54
- Installing the Texture Memory Option Board on the Top Board of the Board Set 57
- Installing the Texture Memory Option Board on the Middle Board of the Maximum IMPACT Board Set 63
- Replacing Option Boards and the Graphics Board Sets 72
- Replacing the Cover 80
- Turning On the Indigo<sup>2</sup> IMPACT Workstation 82
- 3. Removing the Texture Memory Option Board 85**
  - Powering Off Your Indigo<sup>2</sup> IMPACT Workstation 86
  - Attaching the Wrist Strap 86
  - Identifying and Removing Option Boards and the Graphics Board Set 86
  - Removing the Indigo<sup>2</sup> High IMPACT or Maximum IMPACT Graphics Board Set 87
  - Removing the Texture Memory Option Board from the Top Board 87
  - Removing the Texture Memory Option Board from the Middle Board 89
  - Returning Parts to Silicon Graphics 97
- 4. Regulatory Information 99**
  - Manufacturer's Regulatory Declarations for the Indigo<sup>2</sup> IMPACT Graphics Boards 99
    - Electromagnetic Emissions 99
    - Radio and Television Interference 100
    - Shielded Cables 101
    - Electrostatic Discharge 101

---

## List of Figures

<b>Figure In-1</b>	Exterior of Workstation	xii
<b>Figure In-2</b>	Interior of Workstation	xiii
<b>Figure 1-1</b>	Opening the Front Cover	2
<b>Figure 1-2</b>	Pressing and Releasing the Power Switch	3
<b>Figure 1-3</b>	System Power-Off Notifier	3
<b>Figure 1-4</b>	Releasing the Bezel	4
<b>Figure 1-5</b>	Removing the Bezel	5
<b>Figure 1-6</b>	Releasing the Top Cover	5
<b>Figure 1-7</b>	Removing the Top Cover	6
<b>Figure 1-8</b>	Lowering the Metal Panel in Front of the Expansion Slots	7
<b>Figure 1-9</b>	Removing the Screws From the Graphic Board's Metal Panel	8
<b>Figure 1-10</b>	Removing the Retention Pin	9
<b>Figure 1-11</b>	Removing the Indigo <sup>2</sup> High IMPACT Graphics Board Set	10
<b>Figure 1-12</b>	High IMPACT Graphics Board Set With Texture Memory Option Board	12
<b>Figure 1-13</b>	High IMPACT Graphics Board Set with Connected Option Boards	13
<b>Figure 1-14</b>	Standoff Wrench	14
<b>Figure 1-15</b>	Disconnecting the Ribbon Cable	14
<b>Figure 1-16</b>	Removing Standoff Screws	15
<b>Figure 1-17</b>	Disconnecting the Pull Straps	16
<b>Figure 1-18</b>	Releasing Flex Connectors	17
<b>Figure 1-19</b>	Removing Flex Cable from Connector	17
<b>Figure 1-20</b>	Removing Flex Cables that Attach to an Option Board	18

---

<b>Figure 1-21</b>	Releasing the Flex Cable Connectors	18
<b>Figure 1-22</b>	Maximum IMPACT Board Set with Connected Option Boards	19
<b>Figure 1-23</b>	Removing the Standoff Screws from the Top of the Maximum IMPACT Graphics Board Set	20
<b>Figure 1-24</b>	Installing Flex Cables to the Top of the Maximum IMPACT Graphics Board Set	21
<b>Figure 1-25</b>	Sliding the Cable Through the Levers	22
<b>Figure 1-26</b>	Attaching Flex Cables to Back of Maximum IMPACT Graphics Board Set	23
<b>Figure 1-27</b>	Seating Connectors	24
<b>Figure 1-28</b>	Reattaching the Flex Connectors	25
<b>Figure 1-29</b>	Inserting the Maximum IMPACT Graphics Board Set	26
<b>Figure 1-30</b>	Board Set, Correctly Aligned, Viewed From Above	27
<b>Figure 1-31</b>	Replacing the Screw of the Graphics Board Set	28
<b>Figure 1-32</b>	Replacing the Retention Pin	29
<b>Figure 1-33</b>	Closing the Metal Panel in Front of the Option Slots	30
<b>Figure 1-34</b>	Replacing the Cover	31
<b>Figure 1-35</b>	Replacing the Bezel	32
<b>Figure 1-36</b>	Turning On the Indigo <sup>2</sup> IMPACT Workstation	33
<b>Figure 2-1</b>	Opening the Front Cover	36
<b>Figure 2-2</b>	Pressing and Releasing the Power Switch	37
<b>Figure 2-3</b>	System Power-Off Notifier	37
<b>Figure 2-4</b>	Releasing the Bezel	38
<b>Figure 2-5</b>	Removing the Bezel	39
<b>Figure 2-6</b>	Releasing the Top Cover	39
<b>Figure 2-7</b>	Removing the Top Cover	40
<b>Figure 2-8</b>	Lowering the Metal Panel in Front of the Expansion Slots	41
<b>Figure 2-9</b>	Removing the Screws From the Graphic Board's Metal Panel	42
<b>Figure 2-10</b>	Removing the Retention Pin	43
<b>Figure 2-11</b>	Removing the Indigo <sup>2</sup> High or Maximum IMPACT Graphics Board Set	44

---

<b>Figure 2-12</b>	High IMPACT Graphics Board Set With Texture Memory Option Board 46
<b>Figure 2-13</b>	High IMPACT Graphics Board Set with Connected Option Boards 47
<b>Figure 2-14</b>	Maximum IMPACT Graphics Board Set with Texture Memory Option Boards 48
<b>Figure 2-15</b>	Maximum IMPACT Graphics Board Set with Texture Memory Option Boards and Connected Option Board 49
<b>Figure 2-16</b>	Standoff Wrench 50
<b>Figure 2-17</b>	Disconnecting the Ribbon Cable 50
<b>Figure 2-18</b>	Removing Standoff Screws 51
<b>Figure 2-19</b>	Disconnecting the Pull Straps 52
<b>Figure 2-20</b>	Releasing Flex Connectors 53
<b>Figure 2-21</b>	Removing Flex Cable from Connector 53
<b>Figure 2-22</b>	Seating Connectors 55
<b>Figure 2-23</b>	Reattaching the Flex Connectors 56
<b>Figure 2-24</b>	Placement of the Texture Memory Board 58
<b>Figure 2-25</b>	Aligning the Texture Memory Board 59
<b>Figure 2-26</b>	Seating the Texture Memory Board 60
<b>Figure 2-27</b>	Checking the Connectors 61
<b>Figure 2-28</b>	Seating the Push Pins 62
<b>Figure 2-29</b>	Removing the Screws from the Standoffs 64
<b>Figure 2-30</b>	I/O Wrench 65
<b>Figure 2-31</b>	Removing I/O Panel Screws 65
<b>Figure 2-32</b>	Rotating the Top Board Back and Down 66
<b>Figure 2-33</b>	Location of Texture Memory Board Connectors on the Middle Board 66
<b>Figure 2-34</b>	Aligning the Texture Memory Board on the Middle Board 67
<b>Figure 2-35</b>	Seating the Texture Memory Option Board 68
<b>Figure 2-36</b>	Correctly Seating the Texture Memory Option Board 68
<b>Figure 2-37</b>	Seating the Push Pins 69
<b>Figure 2-38</b>	Rotating the Top Board Into Place 70
<b>Figure 2-39</b>	Replacing the Screws in the Standoffs 71

---

<b>Figure 2-40</b>	Identifying Option Slots	72
<b>Figure 2-41</b>	Reconnecting the High IMPACT Graphics Board Set to the Midplane	74
<b>Figure 2-42</b>	Reconnecting the Maximum IMPACT Graphics Board Set to the Midplane	75
<b>Figure 2-43</b>	Board Set, Correctly Aligned, Viewed From Above	76
<b>Figure 2-44</b>	Replacing the Screws of the Graphics Board Set	77
<b>Figure 2-45</b>	Replacing the Retention Pin	78
<b>Figure 2-46</b>	Closing the Metal Panel in Front of the Option Slots	79
<b>Figure 2-47</b>	Replacing the Cover	80
<b>Figure 2-48</b>	Replacing the Bezel	81
<b>Figure 2-49</b>	Turning On the Indigo <sup>2</sup> IMPACT Workstation	82
<b>Figure 3-1</b>	Locating Texture Memory Option Board	87
<b>Figure 3-2</b>	Removing the Pins From the Texture Memory Board	88
<b>Figure 3-3</b>	Removing the Standoff Screws	90
<b>Figure 3-4</b>	I/O Wrench	91
<b>Figure 3-5</b>	Removing I/O Panel Screws	91
<b>Figure 3-6</b>	Rotating the Top Board Back and Down	92
<b>Figure 3-7</b>	Locating the Texture Memory Option Board	93
<b>Figure 3-8</b>	Removing the Texture Memory Option Board	94
<b>Figure 3-9</b>	Rotating the Top Board Into Place	95
<b>Figure 3-10</b>	Replacing the Screws in the Standoffs	96

---

## List of Tables

<b>Table 2-1</b>	Placement of Indigo <sup>2</sup> High IMPACT Board Set and Option Boards 72
<b>Table 2-2</b>	Placement of Maximum IMPACT Board Set and Option Boards 73



---

## Introduction

This guide explains how to install and remove the texture memory option board for the Indigo<sup>2</sup> High IMPACT™ and Indigo<sup>2</sup> Maximum IMPACT™ graphics boards in your Indigo<sup>2</sup> IMPACT™ workstation.

Read this guide once all the way through before you start to work. That way you'll be familiar with the Indigo<sup>2</sup> IMPACT system and the parts you'll be working with.

In this section are exterior and interior drawings of your Indigo<sup>2</sup> IMPACT workstation to help you familiarize yourself with your workstation, and illustrations of the graphics board sets and options boards.

If you find a term you haven't seen before, refer to your workstation owner's guide. The glossary there contains definitions of many of the terms used in this pamphlet.

## Product Support

Silicon Graphics<sup>®</sup>, Inc., provides a comprehensive product support and maintenance program for its products. If you are in the United States or Canada and would like support for your Silicon Graphics supported products, contact the Technical Assistance Center at 1-800-800-4SGI or your authorized service provider. If you are outside North America, contact the Silicon Graphics subsidiary or the authorized distributor in your country.

## Exterior of Your Indigo<sup>2</sup> IMPACT Workstation

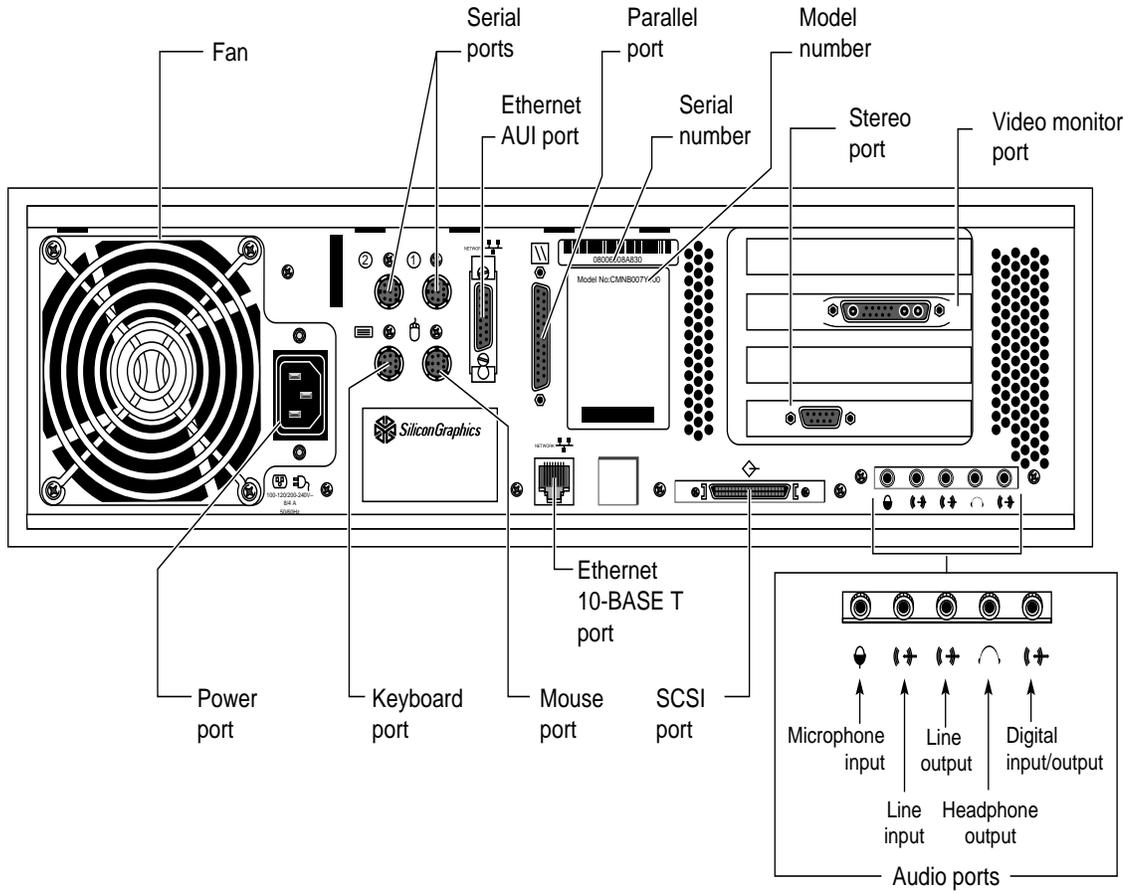


Figure In-1 Exterior of Workstation

# Interior of Your Indigo2 IMPACT Workstation

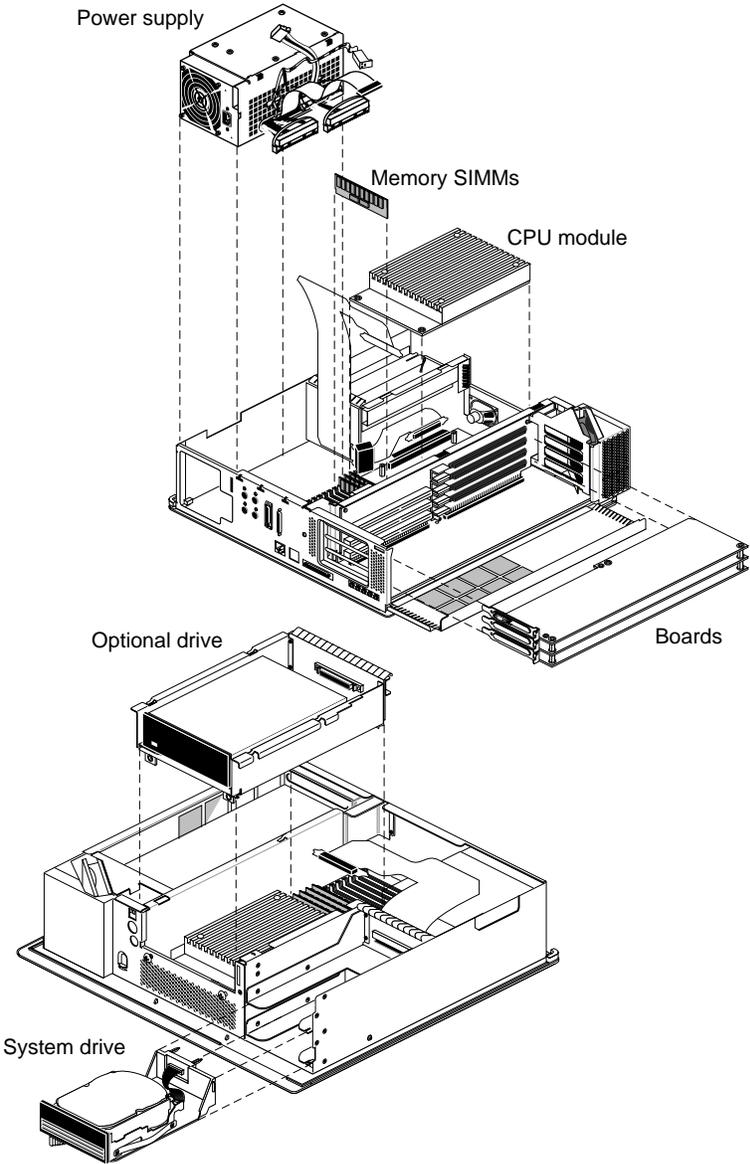


Figure In-2 Interior of Workstation



## Upgrading the Texture Memory Option Board: High IMPACT to Maximum IMPACT

This chapter explains how to upgrade from a High IMPACT graphics board set with a texture memory option board installed to a Maximum IMPACT graphics board set with two texture memory option boards installed.

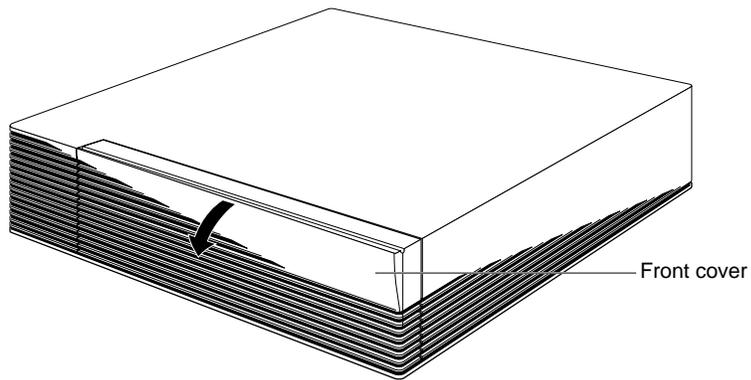
To perform this upgrade, complete the following steps:

1. Shut down the system.
2. Remove the cover.
3. Identify and remove any option boards and the graphics board set.
4. Replace any option boards and the graphics board set.
5. Replace the cover.

## Shutting Down and Powering Off Your Indigo<sup>2</sup> IMPACT Workstation

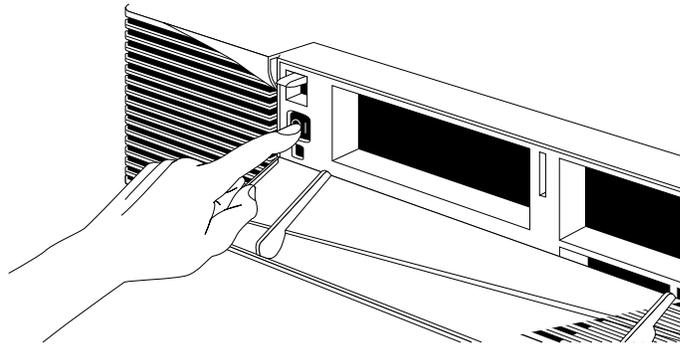
To use the power switch to shut down the software and power off the system, follow these steps:

1. Open the front cover of the chassis, as shown in Figure 1-1.
  - Face the front of the Indigo<sup>2</sup> workstation.
  - Snap the cover away from the top edge of the workstation and tip it down, as shown in Figure 1-1.



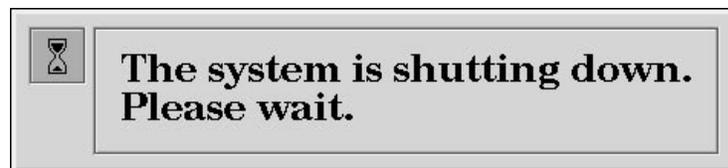
**Figure 1-1** Opening the Front Cover

2. Press and release the power switch, as shown in Figure 1-2.



**Figure 1-2** Pressing and Releasing the Power Switch

3. The notifier shown in Figure 1-3 appears on your screen within a few seconds. Then the system powers off automatically within the next minute.



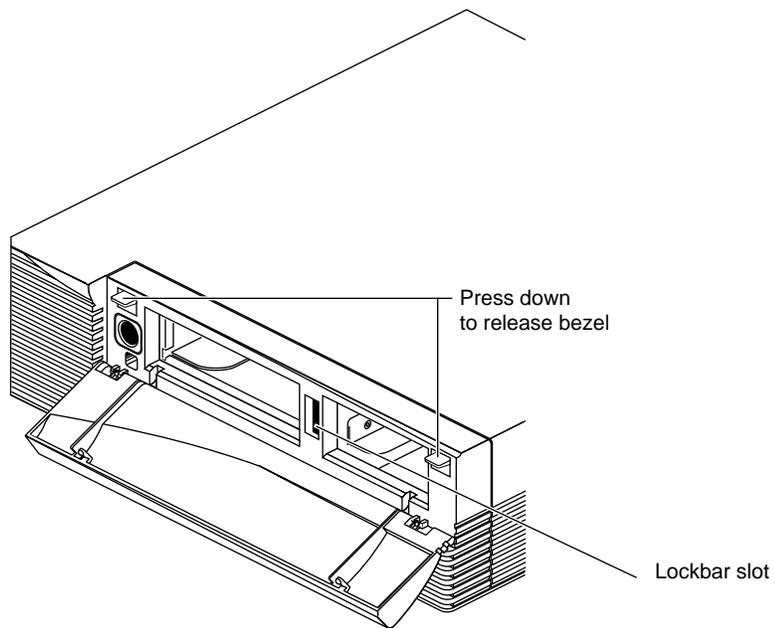
**Figure 1-3** System Power-Off Notifier

4. Turn off the monitor by pressing the monitor power switch.
5. Disconnect the cables from the back of the Indigo<sup>2</sup> workstation.

## Removing the Cover

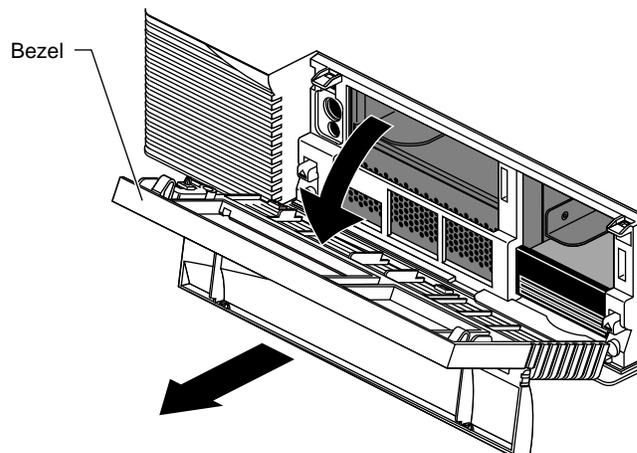
Once the system is shut down and the cables are disconnected, follow these steps:

1. Open the bezel.
2. Remove the lockbar, if one is installed.
  - Remove the lock from the lockbar at the exterior rear of the workstation.
  - Slide the lockbar out through the bezel.
3. Remove the bezel.
  - Press down on the tabs on each side of the bezel, as shown in Figure 1-4.



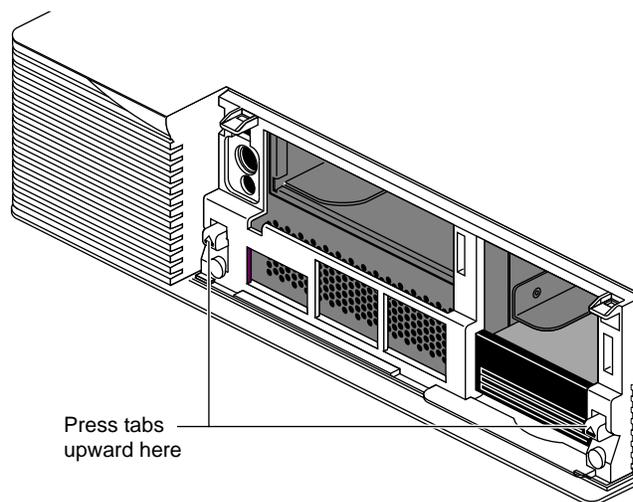
**Figure 1-4** Releasing the Bezel

- Pull the bezel away from the chassis.



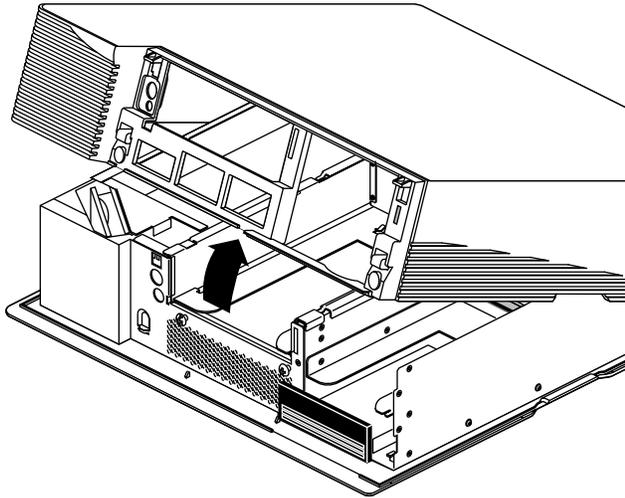
**Figure 1-5** Removing the Bezel

4. Remove the top cover.
  - Press up on the tabs on each side of the drive openings, as shown in Figure 1-6.



**Figure 1-6** Releasing the Top Cover

- Pull up on the cover and rotate it back and away from the chassis.



**Figure 1-7** Removing the Top Cover

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

## Attaching the Wrist Strap

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

**Caution:** The components inside the Indigo<sup>2</sup> IMPACT are extremely sensitive to static electricity. Handle all boards carefully, and wear the wrist strap shipped with the option board while replacing parts inside the system.

To attach the wrist strap, follow these steps:

1. Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.
2. Unroll the rest of the band and peel the liner from the copper foil at the opposite end.

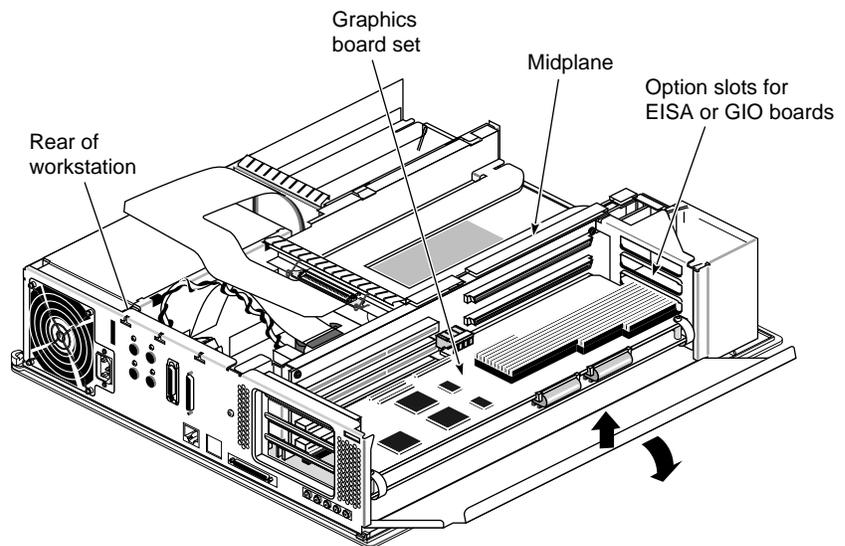
3. Attach the copper foil to a convenient and exposed electrical ground, such as a metal part of the Indigo<sup>2</sup> IMPACT workstation.

## Removing the Indigo<sup>2</sup> IMPACT Graphics Board Set

**Caution:** The heat sinks in your Indigo<sup>2</sup> IMPACT workstation become hot when the workstation is running. Take a coffee break for a few minutes while the graphics boards cool, before you begin working with them.

To remove the Indigo<sup>2</sup> High IMPACT graphics board set and any attached option boards, follow these steps:

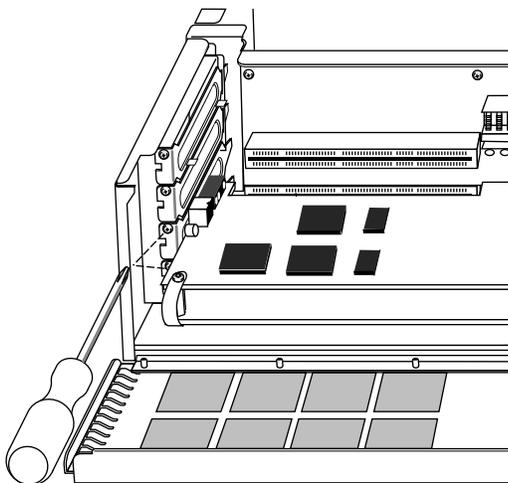
1. Make sure the wrist strap is attached to a metal part of the chassis.
2. Move the workstation or position yourself so that you are facing the expansion slots, as shown in Figure 1-8.
3. Open the metal panel in front of the expansion slots by pulling up on the panel and lowering it.



**Figure 1-8** Lowering the Metal Panel in Front of the Expansion Slots

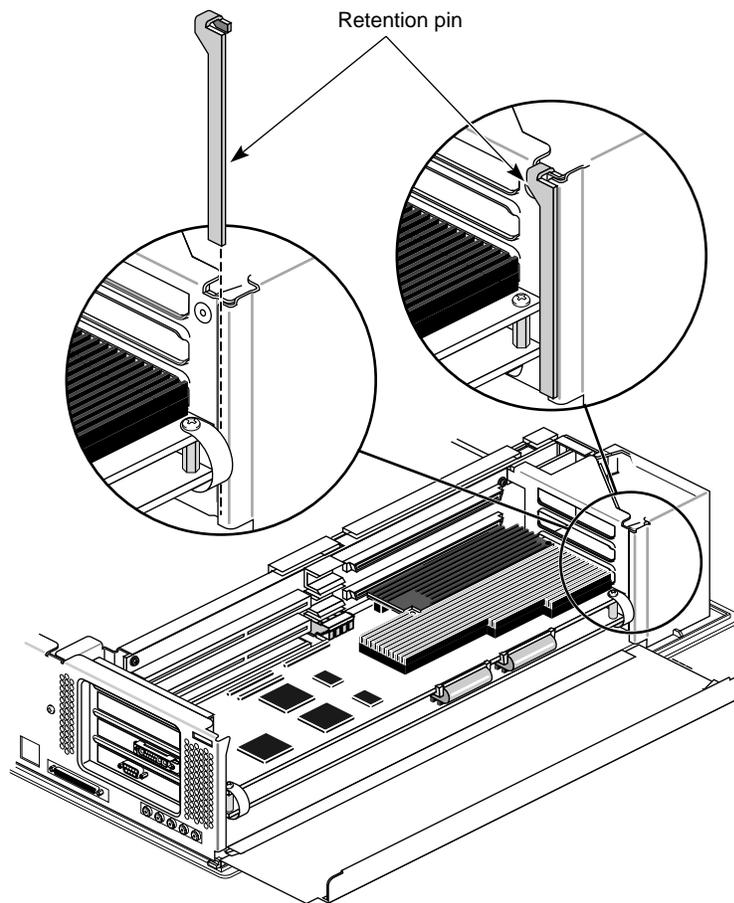
4. Remove the screws attaching the board set to the workstation. See Figure 1-9. The screws are located on the metal panel on the left side of the board.
  - Loosen the screws first with the Phillips screwdriver.
  - Then unscrew them all the way with your hand, and remove them.

**Tip:** The screws are very small. If you drop a screw into the chassis, remove it to prevent shorting the system.



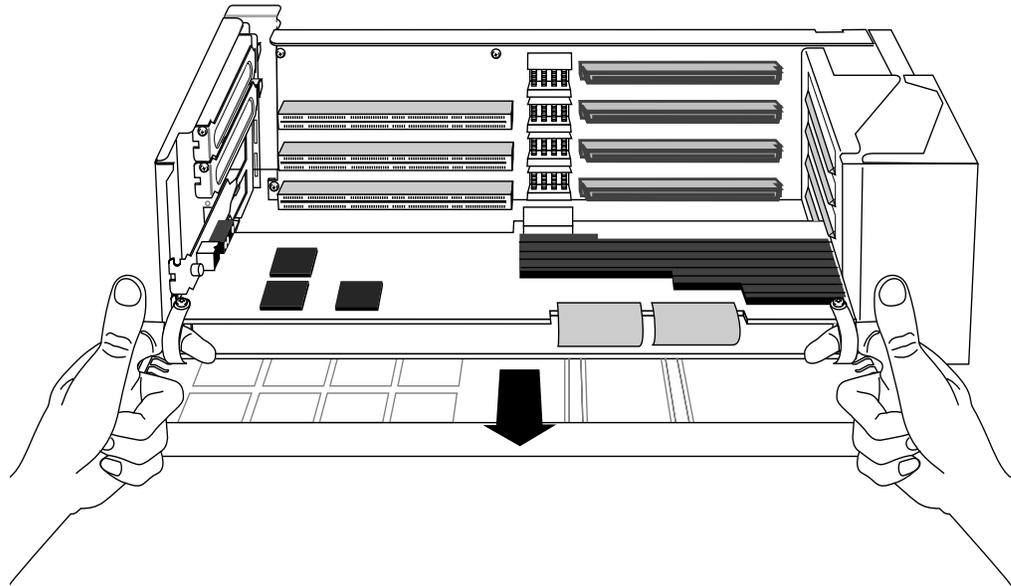
**Figure 1-9** Removing the Screws From the Graphic Board's Metal Panel

5. Remove the retention pin.
  - Note the location of the retention pin. It hangs in front of the graphics boards.
  - Grasp the top of the retention pin and pull it up and off. See Figure 1-10.



**Figure 1-10** Removing the Retention Pin

6. Remove the board set and any attached option boards from the workstation.
7. Place your index fingers behind the plastic loops on each side of the board set, as shown in Figure 1-11.
  - Brace your knuckles and thumbs on the chassis frame and pull the board set out of its slots. You may need to use some force.
  - Place the board set on a flat, antistatic surface so the side with the chips faces up. An empty antistatic bag or a clean, dry desktop works well.



**Figure 1-11** Removing the Indigo<sup>2</sup> High IMPACT Graphics Board Set

If you have only a High IMPACT graphics board set with no option boards, go to “Replacing the Board Set in the Workstation” on page 26.

## Identifying Option Boards and Graphic Boards

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

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

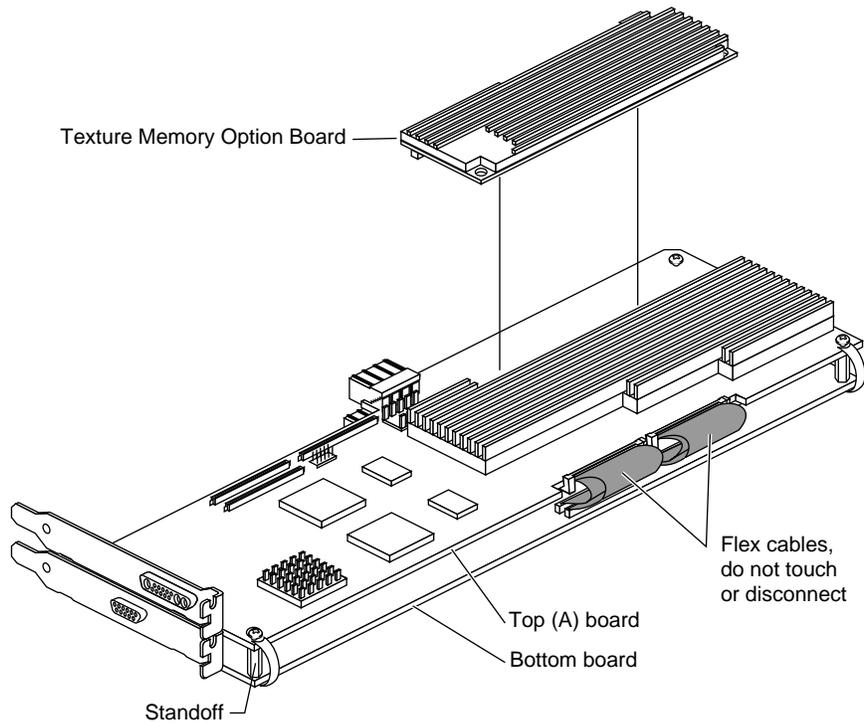
This section will tell you how to:

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

## Identifying the Option Boards and the Graphic Board Set

The following four pages provide annotated illustrations to help you identify option boards and graphics board sets in your workstation.

1. Use the illustrations to identify the boards in your workstation.
2. Use the directions at the bottom of these pages to move to the appropriate part of this manual to complete your task.



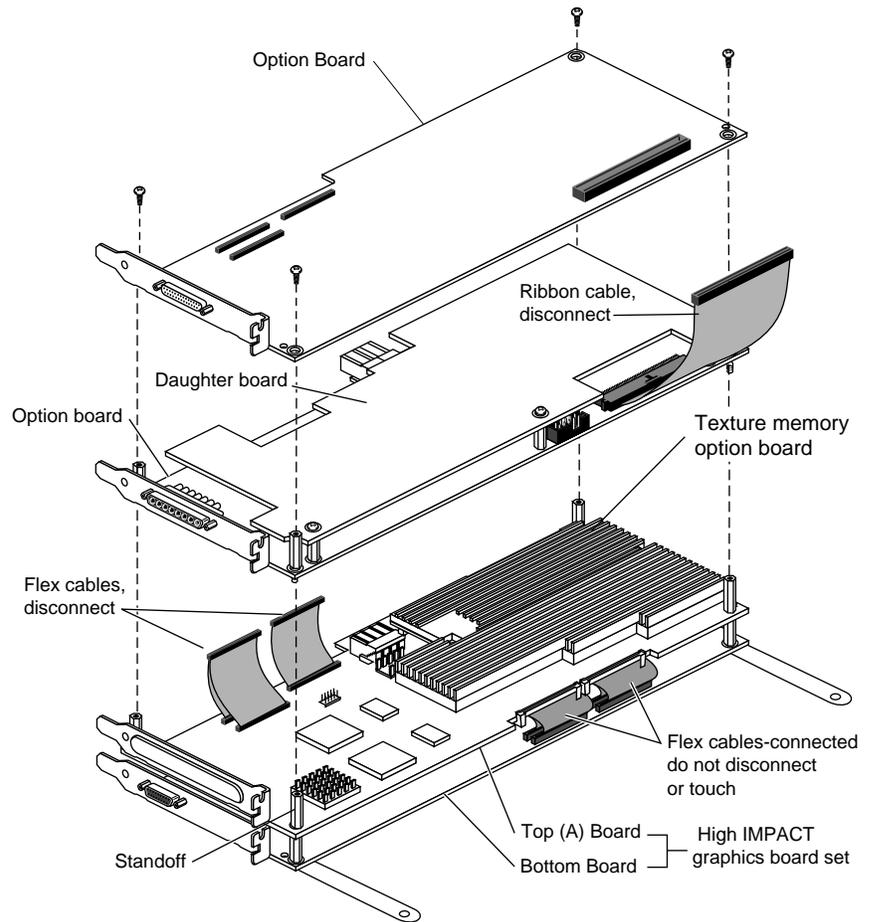
**Figure 1-12** High IMPACT Graphics Board Set With Texture Memory Option Board

Your graphics board set is always the bottom two board (High IMPACT graphics board set) or three board (Maximum IMPACT graphics board set) connected by corner standoffs and cables.

**Tip:** Your pull straps will be labeled 2 board pull straps for the High IMPACT graphics board set, and 3 board pull strap for the Maximum IMPACT graphics board set.

**Note:** The daughter board in Figure 1-13 is not attached by *corner* standoffs. You do not need to remove the daughter board from an option board when removing the option board to reach the graphics board set.

If you have only a High IMPACT graphics board set with no option boards, go to “Replacing the Board Set in the Workstation” on page 26.

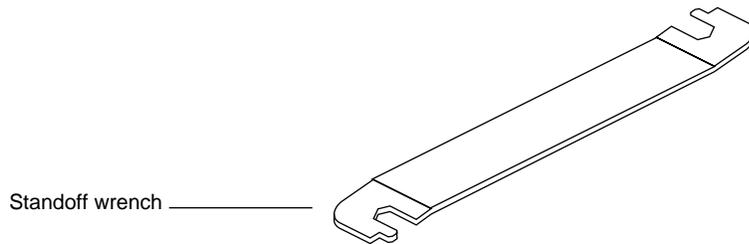


**Figure 1-13** High IMPACT Graphics Board Set with Connected Option Boards

Figure 1-13 shows the maximum number of option boards that can be attached to the High IMPACT graphics board set by standoffs and cables. You may see one option, an option with a daughter board, or two option boards as other possible connected combinations.

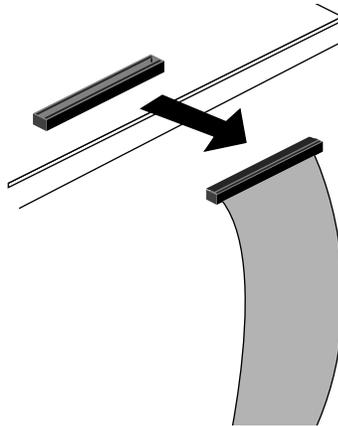
### Removing Option Boards

This section tells you how to remove standoffs and cables connecting the option boards and graphics board sets. You will need a Phillips screwdriver to complete the task. You may find a standoff wrench, shown in Figure 1-14 useful.



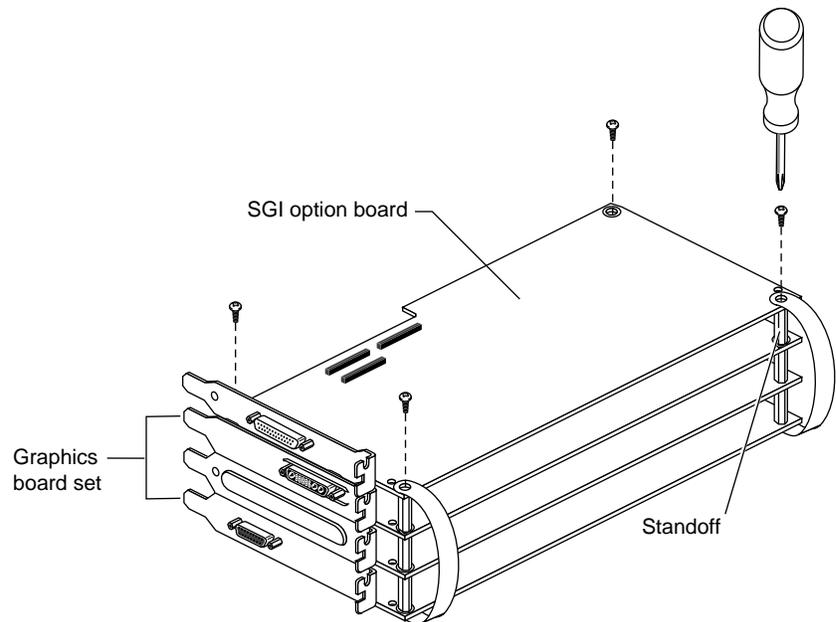
**Figure 1-14** Standoff Wrench

1. Decide on a pattern for laying the boards you remove on an antistatic surface so that you can replace them in the proper order.
2. Disconnect any ribbon cable from the top board. See Figure 1-15. If you have no ribbon cable, go to step 3. Ribbon cable connectors push together and pull apart.
  - Pinch the connector on the sides and pull away. See Figure 1-15.



**Figure 1-15** Disconnecting the Ribbon Cable

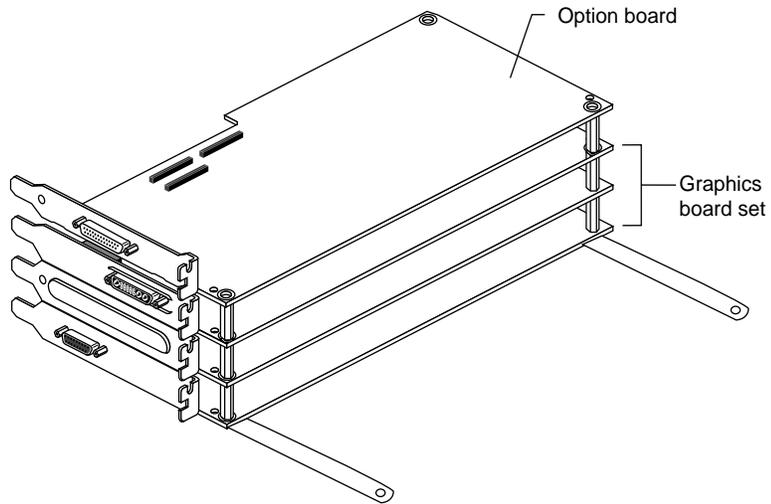
3. Unscrew the corner standoff screws from the top four corners. See Figure 1-16. If the standoff beneath the screw spins, hold it steady with the standoff wrench.



**Figure 1-16** Removing Standoff Screws

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

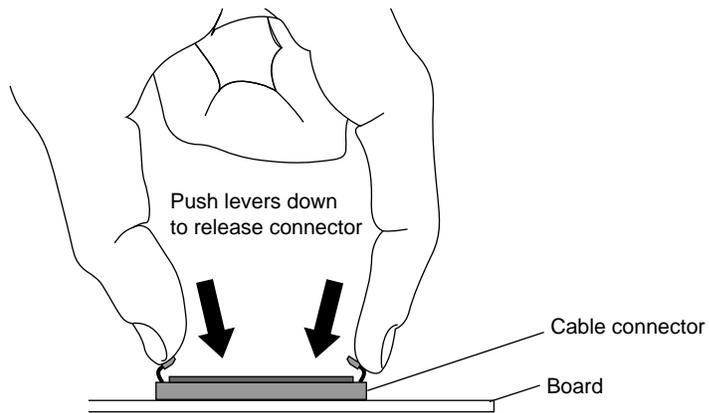
- Disconnect the pull straps from the top of the board by peeling the adhesive-backed strap from the board. See Figure 1-17.



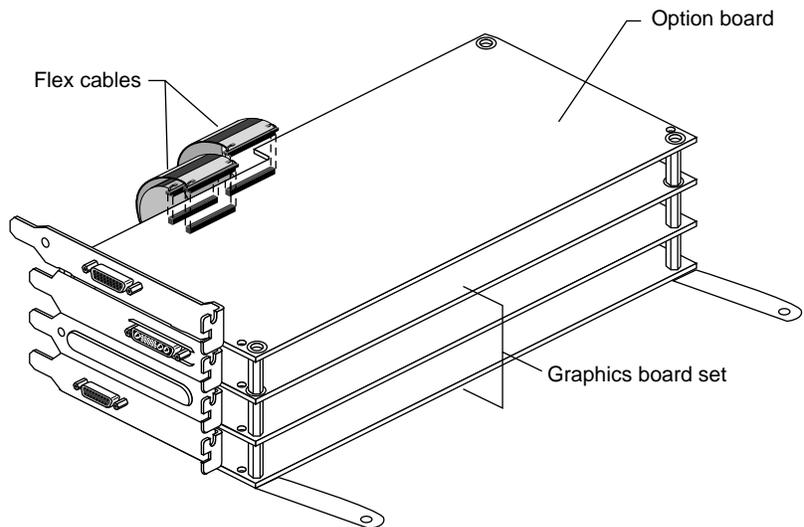
**Figure 1-17** Disconnecting the Pull Straps

4. If you have flex cables connecting to an option board, go to step 7.
5. Remove the board and put it on an antistatic surface.
6. If you have no flex connectors on the next board, go to step 11.

7. Disconnect any flex cables from the top of the board
  - Flex cables push together and pull apart, but have levers to press for removal. See Figure 1-18. Press down on the levers to release the connector. Then grasp the sides of the connector and pull up. See Figure 1-19.

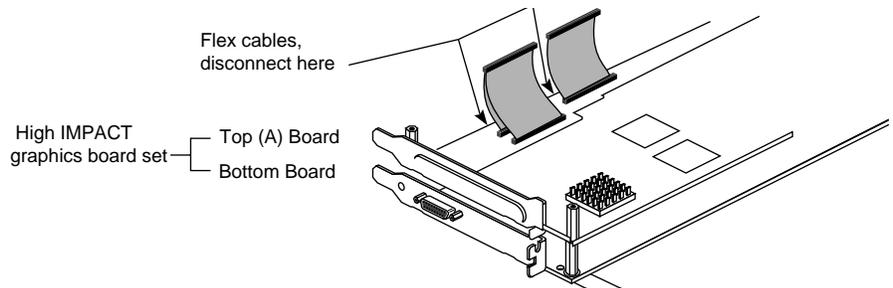


**Figure 1-18** Releasing Flex Connectors



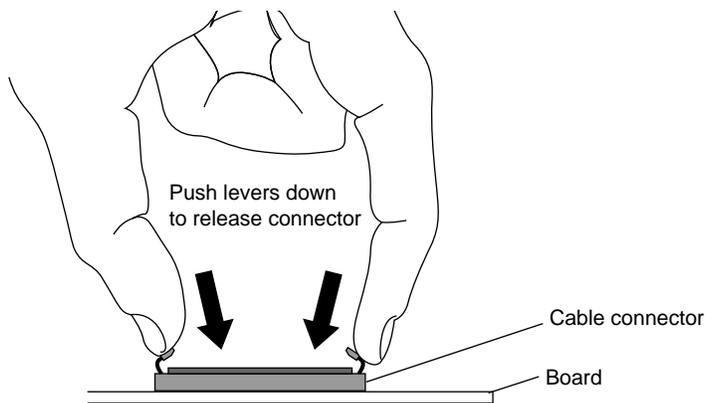
**Figure 1-19** Removing Flex Cable from Connector

8. If you have no standoffs to remove, go to step 10.
9. Remove the corner standoffs. Use the wrench if necessary.
10. Remove the board and place it on an antistatic surface.
11. After you have removed the High IMPACT graphics board set from the workstation and removed any option boards, remove the flex cables that connected your High IMPACT graphics board set to an option board above. See Figure 1-20.



**Figure 1-20** Removing Flex Cables that Attach to an Option Board

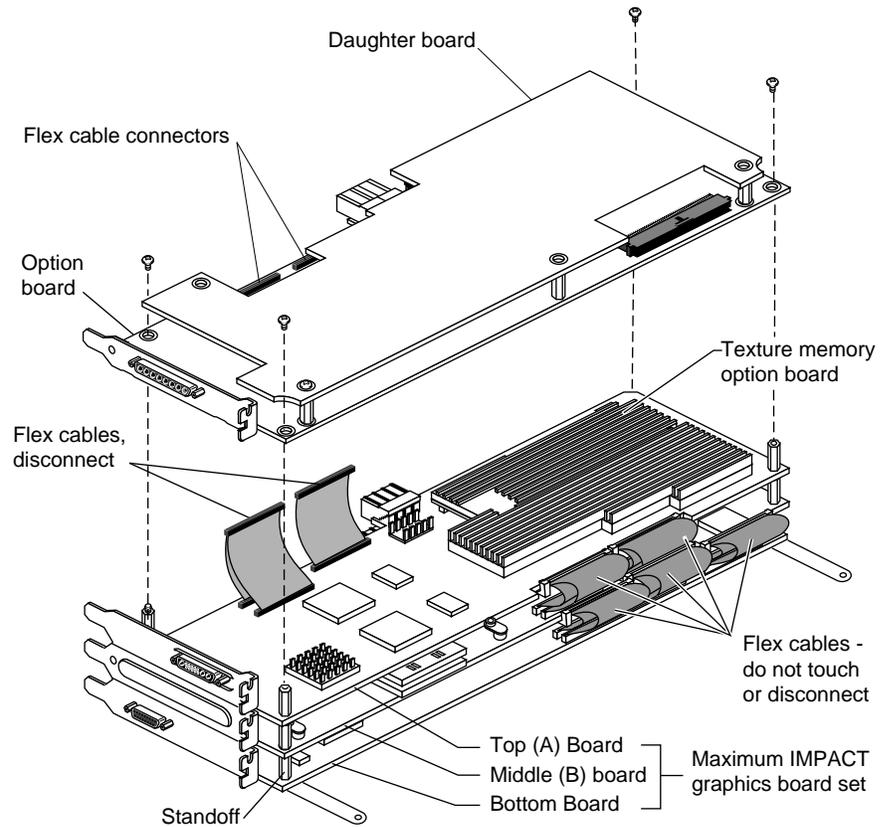
12. Disconnect the flex cables that attach to an option board, from the top of the High IMPACT (A) board.
  - Press down on the levers to release the connector. Then grasp the sides of the connector and pull up. See Figure 1-21.



**Figure 1-21** Releasing the Flex Cable Connectors

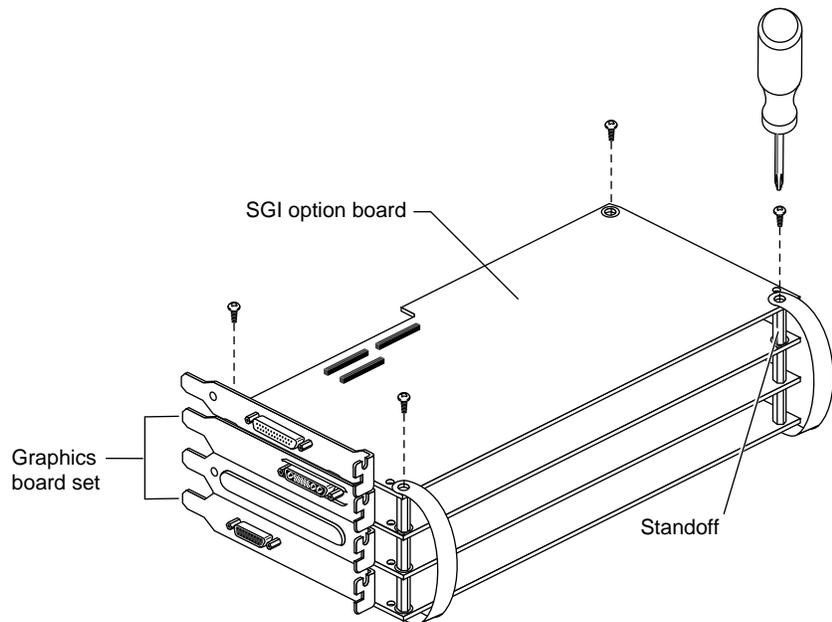
## Installing Cables and Standoffs

The Maximum IMPACT Graphics Board Set can be attached by standoffs to one option board, or one option board and daughter board. See Figure 1-22.



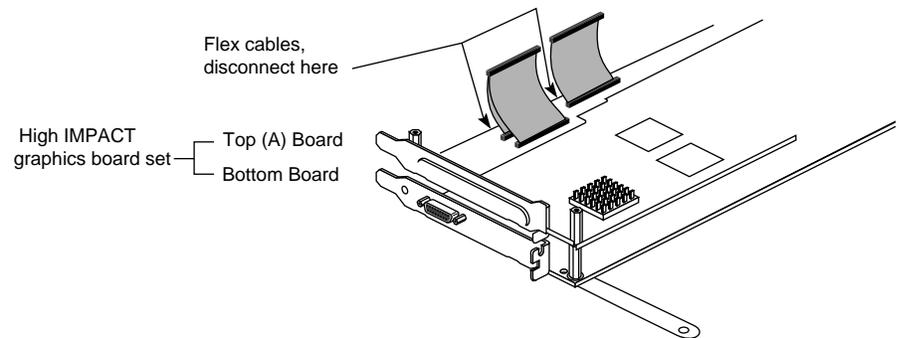
**Figure 1-22** Maximum IMPACT Board Set with Connected Option Boards

1. To reconnect cables and standoffs to option boards, follow these instructions:
2. Unscrew the corner standoff screws from the top four corners of your Maximum IMPACT graphics board set. See Figure 1-16. If the standoff beneath the screw spins, hold it steady with the standoff wrench.



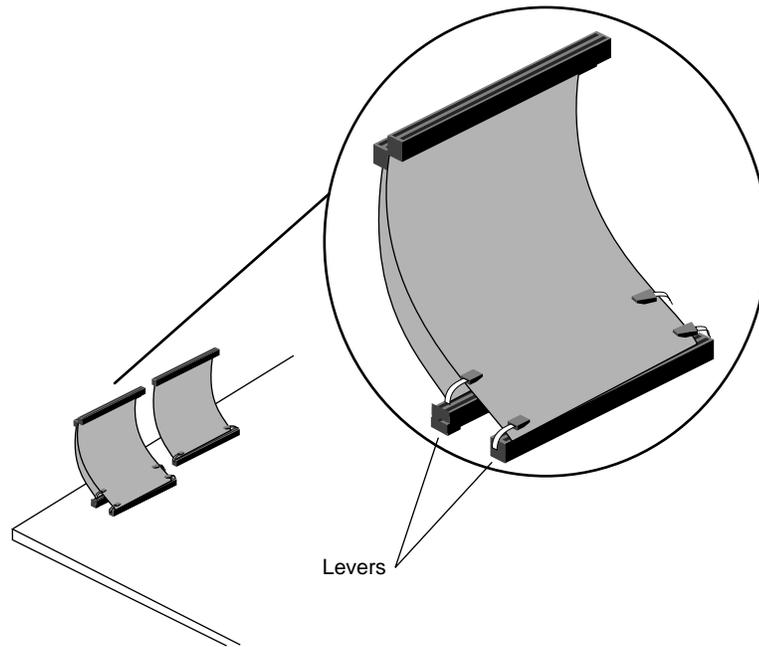
**Figure 1-23** Removing the Standoff Screws from the Top of the Maximum IMPACT Graphics Board Set

3. Place the standoffs you removed from the High IMPACT graphics board set on the top board of the Maximum IMPACT graphics top board. See Figure 1-24.
  - Insert the standoffs through the holes in the corner of the board to the standoffs below. Tighten the standoff to the one below.

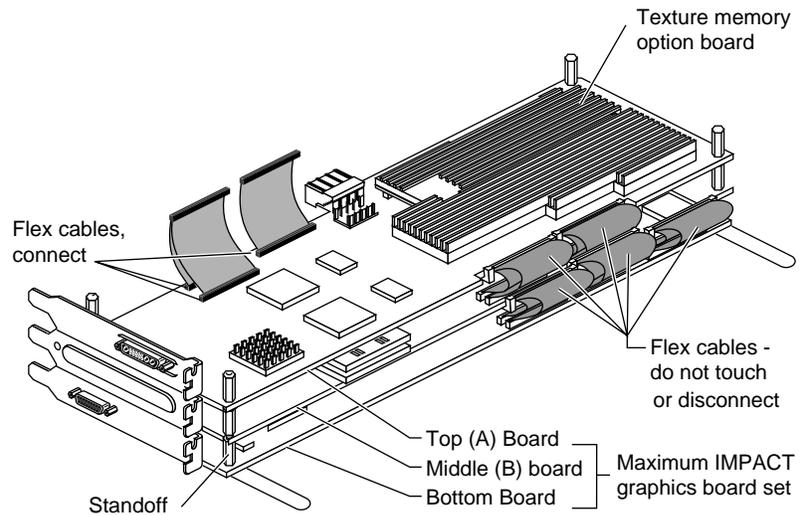


**Figure 1-24** Installing Flex Cables to the Top of the Maximum IMPACT Graphics Board Set

4. Install the flex cables into the same connectors on the top of the Maximum IMPACT board set.
5. Slip the innermost cable through the levers of the outermost connector. See Figure 1-25.



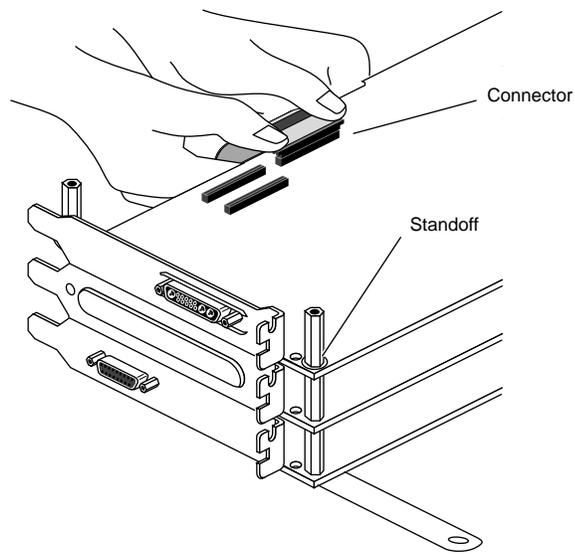
**Figure 1-25** Sliding the Cable Through the Levers



**Figure 1-26** Attaching Flex Cables to Back of Maximum IMPACT Graphics Board Set

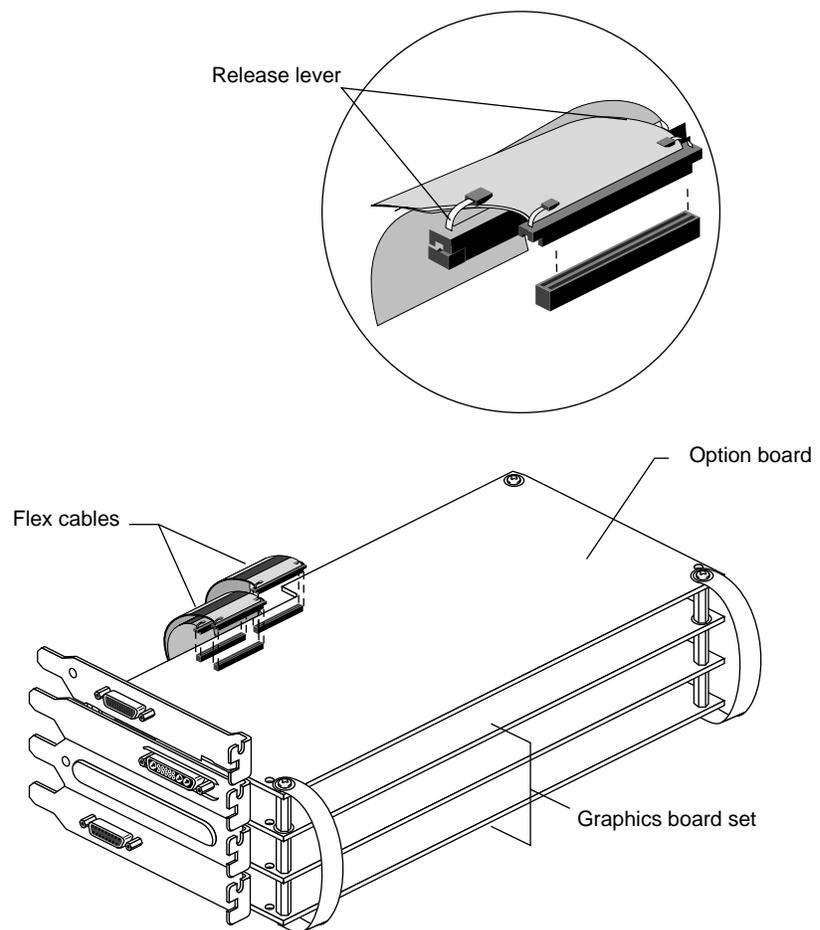
6. Put the option board on the standoffs.
7. At the top board level, attach the new pull straps to the top board.
  - Align the holes in the pull straps with the holes in the board.
  - Press down on the top of the pull strap to reattach the adhesive on the back of the strap to the board.
8. Insert the screws through the pull strap and corner holes of the board and into the standoffs. Tighten using a Phillips screwdriver.

9. Attach the flex cables to the option board.
  - Press the connectors together with your fingers. Try to support the board from beneath with your fingers, so the connectors seat tightly. If possible check visually to be sure the connectors are properly seated.



**Figure 1-27** Seating Connectors

10. The cable of the second pair of a flex cables must be reinserted beneath the release levers of the first flex cable connector before it is reconnected. See Figure 1-28.



**Figure 1-28** Reattaching the Flex Connectors

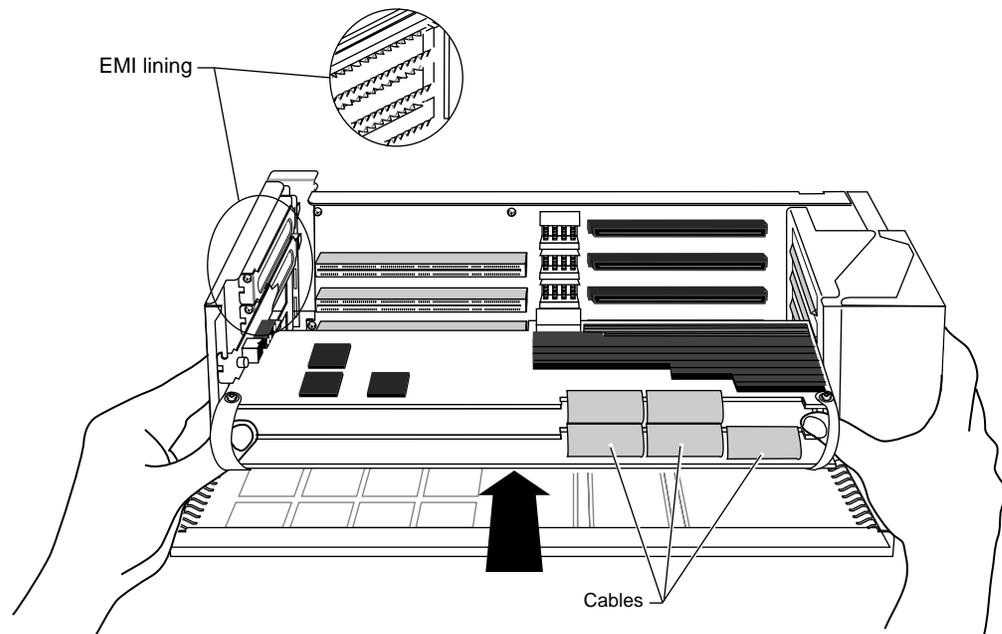
Congratulations! You have finished connecting the option board to the Maximum IMPACT board set and are ready to install the graphics board set with option board into the workstation.

## Replacing the Board Set in the Workstation

1. Insert the board carefully so that the board edge does not catch on the EMI lining along the inner left cutout area. Make sure the EMI lining is not damaged and remains between the chassis and the graphics board's metal extension.
2. Grasp the chassis with your fingers. See Figure 1-29.
3. Position your right thumb so that it is behind the pull strap, pushing on the standoff between the top and middle boards. See Figure 1-29. Position your left thumb so that it is behind the pull strap and is pushing on the middle board.

**Note:** Always apply pressure to a standoff or board edge near the top of the board set to get the best connection to the connectors on the midplane.

**Caution:** Do not press on the flex cables that connect your Indigo<sup>2</sup> Maximum IMPACT boards. See "cables" in Figure 1-29.

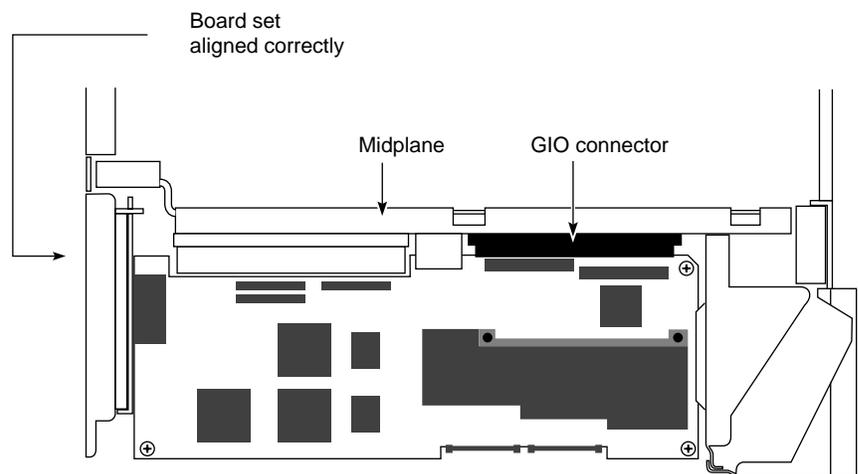


**Figure 1-29** Inserting the Maximum IMPACT Graphics Board Set

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

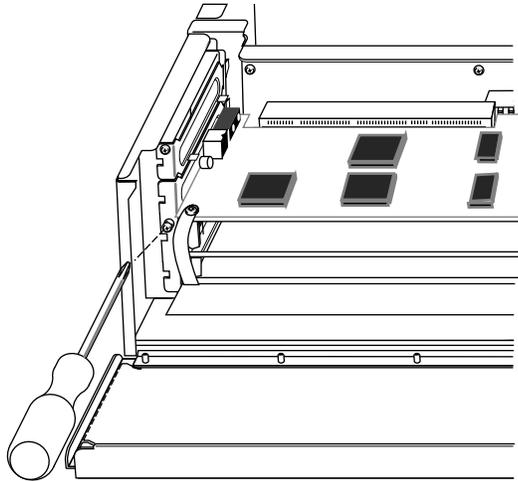
**Note:** You will need to use some force.

4. Visually check to be sure the boards are completely seated in their connectors. The board set should not look tilted when viewed from above. See Figure 1-30.



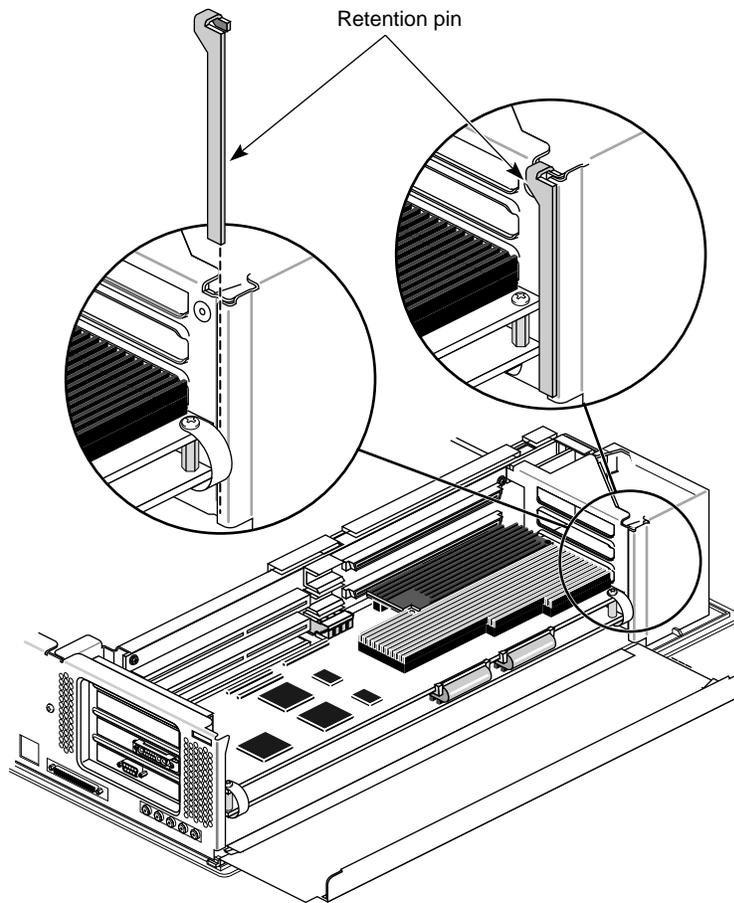
**Figure 1-30** Board Set, Correctly Aligned, Viewed From Above

5. Insert and tighten the screw that holds the board set to the chassis. The screw opening is located on the metal extension on the left side of each board. See Figure 1-31.



**Figure 1-31** Replacing the Screw of the Graphics Board Set

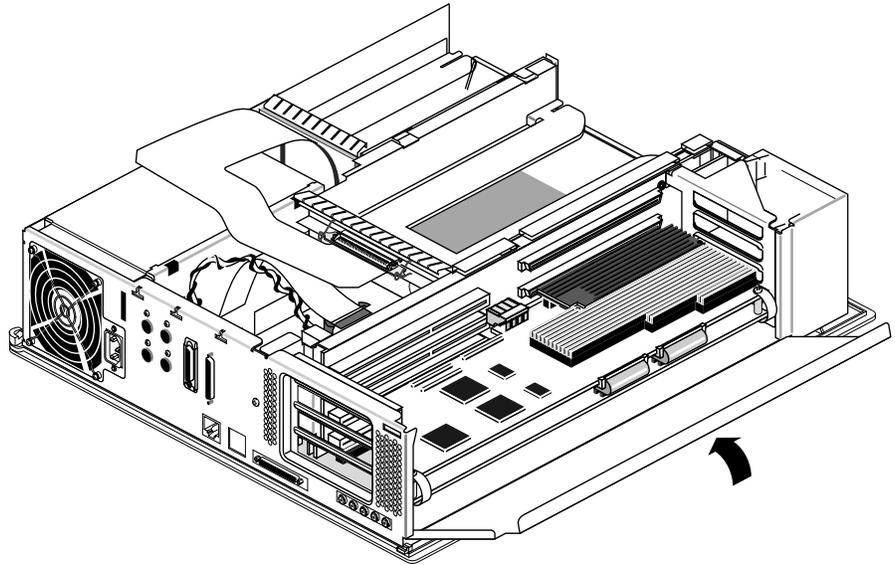
6. Replace the retention pin along the right end of the board set. The retention pin sits in front of the board. See Figure 1-32.



**Figure 1-32** Replacing the Retention Pin

**Tip:** Use the retention pin as a plumb line to determine if the board set is properly seated. If the retention pin hangs at a 90° angle to the top of the workstation, the board set is properly installed. If the pin is tilted, push on the board set until it is properly connected.

7. Tip up the metal panel until it snaps into place. See Figure 1-33.



**Figure 1-33** Closing the Metal Panel in Front of the Option Slots

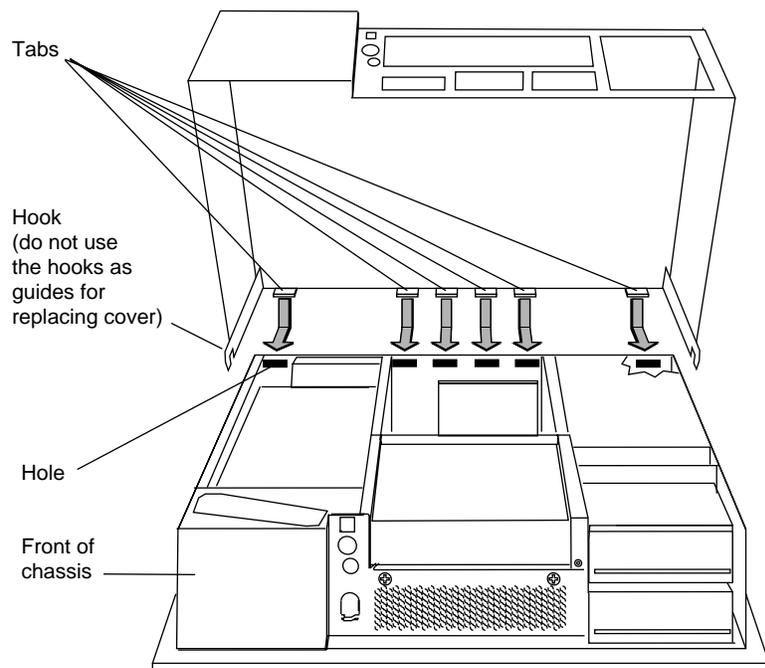
8. Remove the antistatic wrist strap.

You have finished installing the Maximum IMPACT graphics board set.

## Replacing the Cover

To replace the top cover, follow these steps:

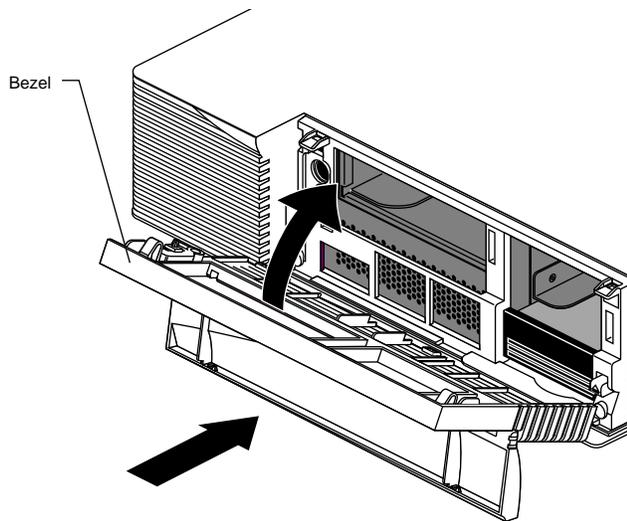
1. Locate the tabs on the inside and back of the top cover and the holes on the back of the workstation. See Figure 1-34.
2. Face the front of the workstation.
  - Look through the holes as you lower the cover to move the tabs into place.



**Figure 1-34** Replacing the Cover

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

3. Replace the bezel.
  - Place the tabs on the bottom of the bezel in the grooves in the front of the chassis, as shown in Figure 1-35.
  - Tilt the bezel up until it snaps into place.
4. If you removed a lockbar, replace it.
5. Close the front cover of the bezel.



**Figure 1-35** Replacing the Bezel

6. Reconnect the cables to the connectors on the back of the Indigo<sup>2</sup> IMPACT workstation.

You are now ready to turn on your Indigo<sup>2</sup> IMPACT workstation.

7. Pack and ship your High IMPACT graphics board set with the installed Texture Memory Option Board to your service provider. See Chapter 9, in the *Indigo<sup>2</sup> IMPACT Workstation Owner's Guide*, for instructions on returning your board set.

## Turning On the Indigo<sup>2</sup> IMPACT Workstation

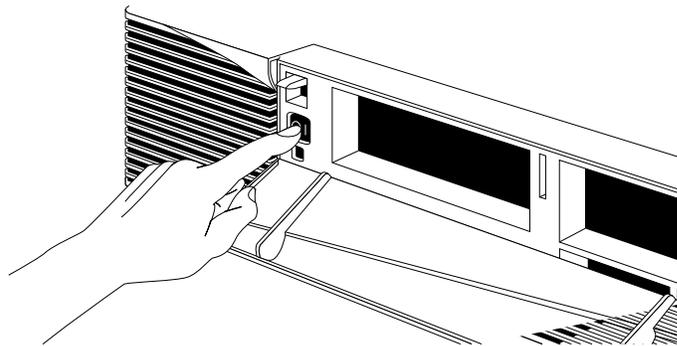
Once you've connected the cables to the rear of the system, power on and log in to your workstation by following these steps:

1. Turn on the monitor.

The monitor's power switch is on the front of the monitor in the lower right corner. The LED next to the switch lights up when you turn on the monitor.

2. Turn on the system power.

- Open the front cover by snapping it away from the top edge of the chassis and tipping it down.
- Press the power switch to turn on the system, as shown in Figure 1-36.



**Figure 1-36** Turning On the Indigo<sup>2</sup> IMPACT Workstation

When you power on your system, you hear the boot “tune” and see the LED on the front of the machine turn on. While the system is running power-on diagnostics, you see an orange light. You should see the orange light for a few seconds. If the system passes all of the diagnostics tests, the light will turn green, and the system will continue booting. If you do not hear the boot tune or the LED does not turn green, there may be a problem.

If there seems to be a problem, turn off the system power, remove the cover, and make sure the boards are seated correctly. Read the installation instructions again to check that you have completed all the steps.

For additional troubleshooting, see Chapter 7, “Troubleshooting,” in the *Indigo<sup>2</sup> IMPACT Workstation Owner’s Guide*.

## Installing the Texture Memory Option Board

This chapter explains how to install the Indigo<sup>2</sup> IMPACT Texture Memory Option Board on the High IMPACT and Maximum IMPACT graphics boards in an Indigo<sup>2</sup> IMPACT workstation.

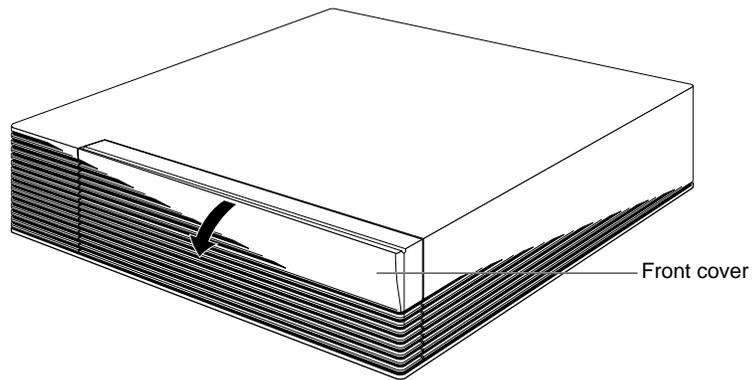
To install the texture memory option board, complete the following steps:

1. Shut down the system.
2. Remove the cover.
3. Remove any option boards.
4. Remove the existing graphics board set.
5. Install the texture memory option board or boards.
6. Replace the existing graphics board set.
7. Replace any option boards.
8. Replace the cover.

## Shutting Down and Powering Off Your Indigo<sup>2</sup> IMPACT Workstation

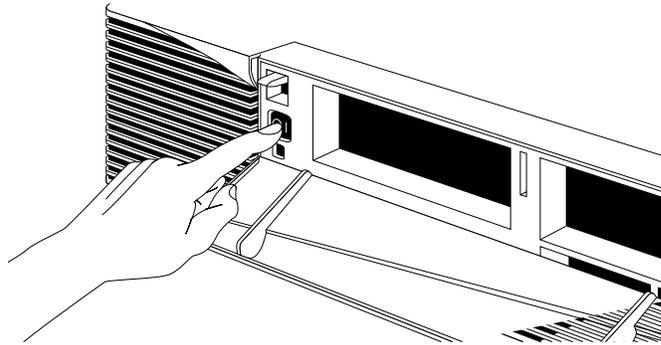
To use the power switch to shut down the software and power off the system, follow these steps:

1. Open the front cover of the chassis, as shown in Figure 2-1.
  - Face the front of the Indigo<sup>2</sup> workstation.
  - Snap the cover away from the top edge of the workstation and tip it down, as shown in Figure 2-1.



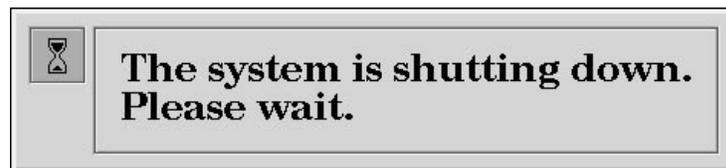
**Figure 2-1** Opening the Front Cover

2. Press and release the power switch, as shown in Figure 2-2.



**Figure 2-2** Pressing and Releasing the Power Switch

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



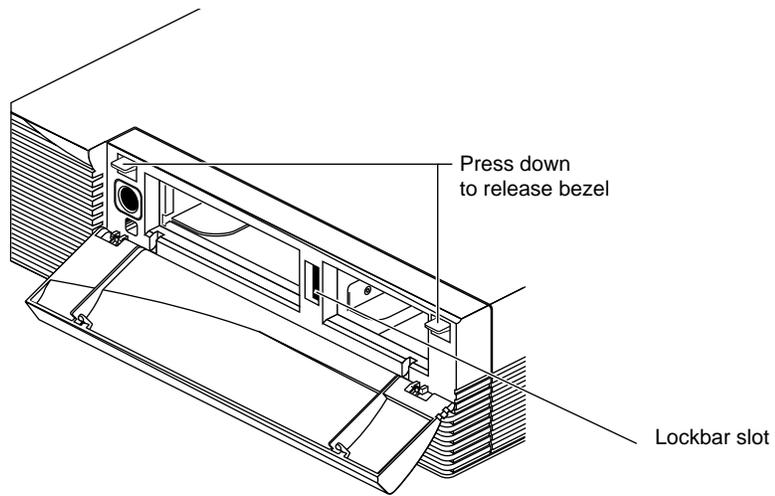
**Figure 2-3** System Power-Off Notifier

4. Turn off the monitor by pressing the monitor power switch.
5. Disconnect the cables from the back of the Indigo<sup>2</sup> workstation.

## Removing the Cover

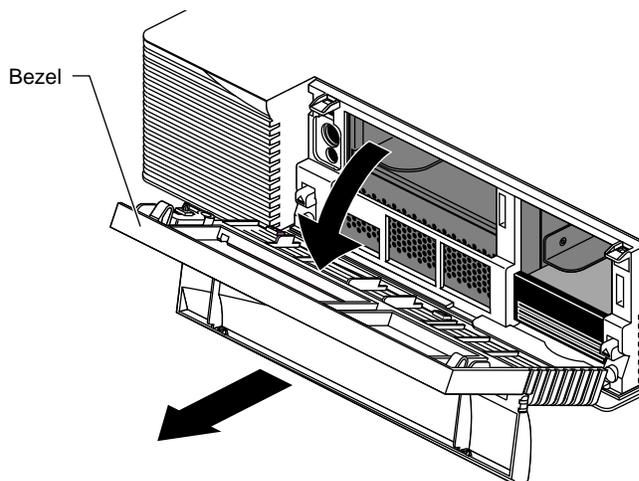
Once the system is shut down and the cables are disconnected, follow these steps:

1. Open the bezel.
2. Remove the lockbar, if one is installed.
  - Remove the lock from the lockbar at the exterior rear of the workstation.
  - Slide the lockbar out through the bezel.
3. Remove the bezel.
  - Press down on the tabs on each side of the bezel, as shown in Figure 2-4.



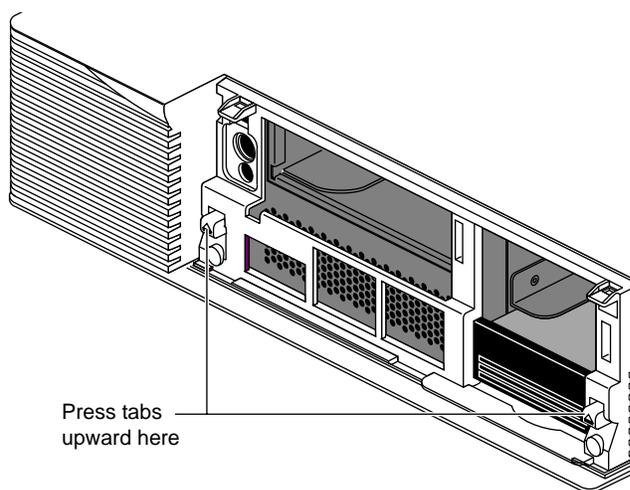
**Figure 2-4** Releasing the Bezel

- Pull the bezel away from the chassis.



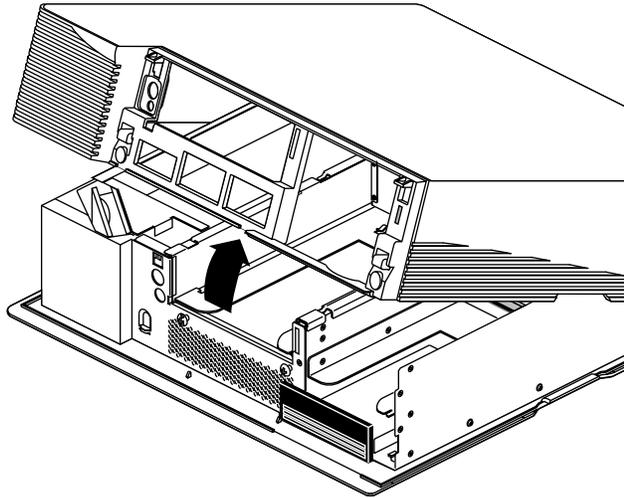
**Figure 2-5** Removing the Bezel

4. Remove the top cover.
  - Press up on the tabs on each side of the drive openings, as shown in Figure 2-6.



**Figure 2-6** Releasing the Top Cover

- Pull up on the cover and rotate it back and away from the chassis.



**Figure 2-7** Removing the Top Cover

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

## Attaching the Wrist Strap

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

**Caution:** The components inside the Indigo<sup>2</sup> IMPACT are extremely sensitive to static electricity. Handle all boards carefully, and wear the wrist strap shipped with the option board while replacing parts inside the system.

To attach the wrist strap, follow these steps:

1. Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.
2. Unroll the rest of the band and peel the liner from the copper foil at the opposite end.

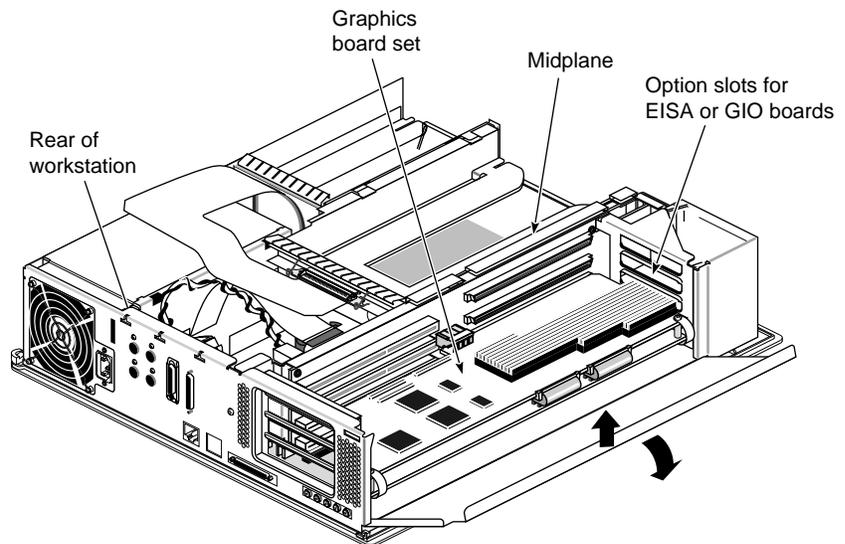
3. Attach the copper foil to a convenient and exposed electrical ground, such as a metal part of the Indigo<sup>2</sup> IMPACT workstation.

## Removing the Indigo<sup>2</sup> IMPACT Graphics Board Set

**Caution:** The heat sinks in your Indigo<sup>2</sup> IMPACT workstation become hot when the workstation is running. Take a coffee break for a few minutes while the graphics boards cool, before you begin working with them.

To remove the Indigo<sup>2</sup> High IMPACT or Maximum IMPACT graphics board set, follow these steps:

1. Make sure the wrist strap is attached to a metal part of the chassis.
2. Move the workstation or position yourself so that you are facing the expansion slots, as shown in Figure 2-8.
3. Open the metal panel in front of the expansion slots by pulling up on the panel and lowering it.

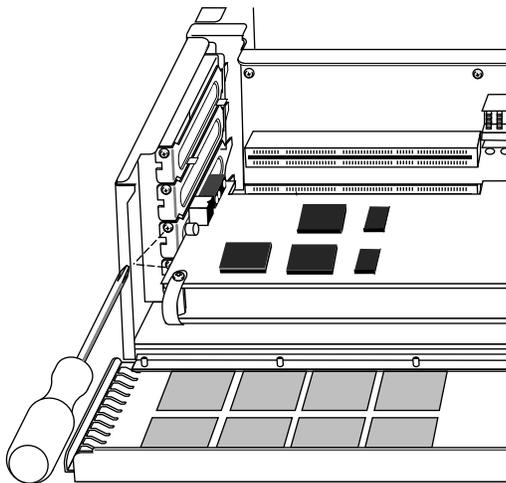


**Figure 2-8** Lowering the Metal Panel in Front of the Expansion Slots

Option boards and your Indigo<sup>2</sup> High IMPACT or Maximum IMPACT board set must be replaced in the same slots.

4. Remove the screws attaching the board set to the workstation. See Figure 2-9. The screws are located on the metal panel on the left side of the board.
  - Loosen the screws first with the Phillips screwdriver.
  - Then unscrew them all the way with your hand, and remove them.

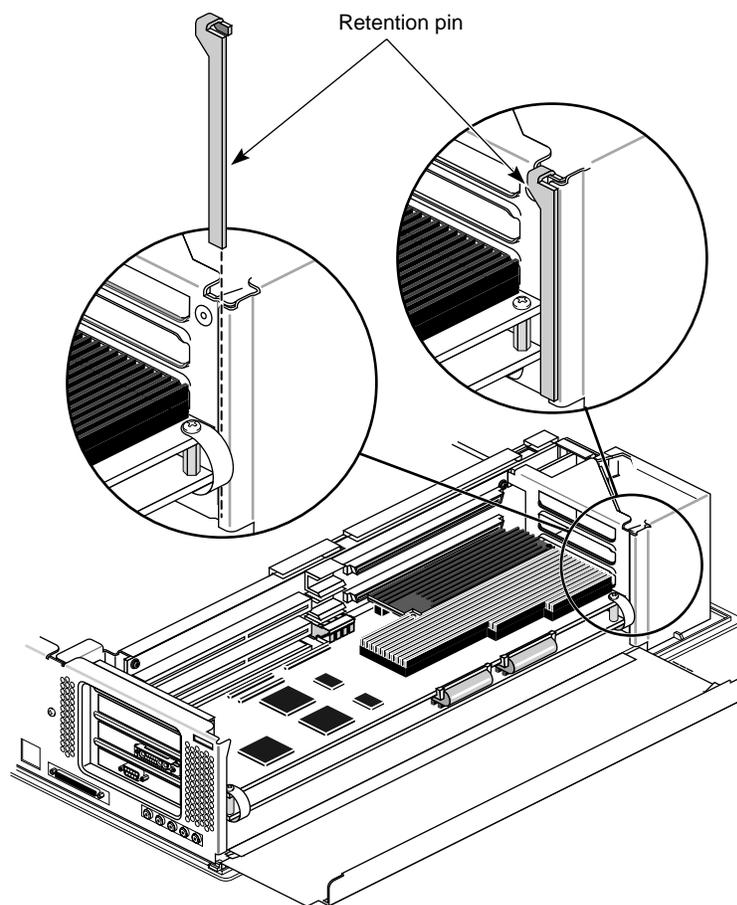
**Tip:** The screws are very small. If you drop a screw into the chassis, remove it to prevent shorting the system.



**Figure 2-9** Removing the Screws From the Graphic Board's Metal Panel

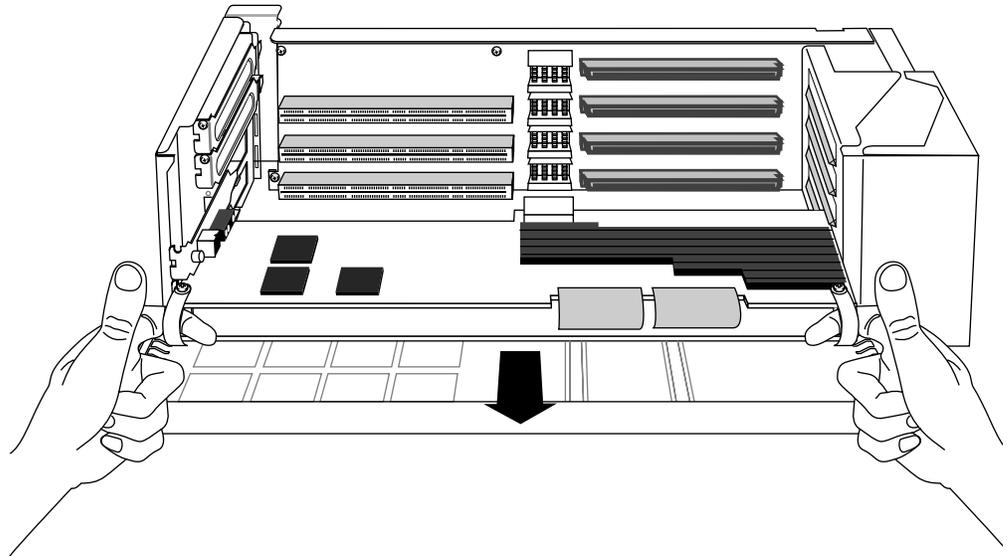
**Note:** If you have a Maximum IMPACT board set, you need to remove three screws.

5. Remove the retention pin.
  - Grasp the top of the retention pin and pull it up and off. See Figure 2-10.



**Figure 2-10** Removing the Retention Pin

6. Remove the board set from the workstation. The instructions are the same for removing the High and Maximum IMPACT graphics board sets.
  - Place your index fingers behind the plastic loops on each side of the board set, as shown in Figure 2-11.
  - Brace your knuckles and thumbs on the chassis frame and pull the board set out of its slots. You may need to use some force.
  - Place the board set on a flat, antistatic surface so the side with the chips faces up. An empty antistatic bag or a clean, dry desktop works well.



**Figure 2-11** Removing the Indigo<sup>2</sup> High or Maximum IMPACT Graphics Board Set

## Identifying Option Boards and Graphic Boards

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

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

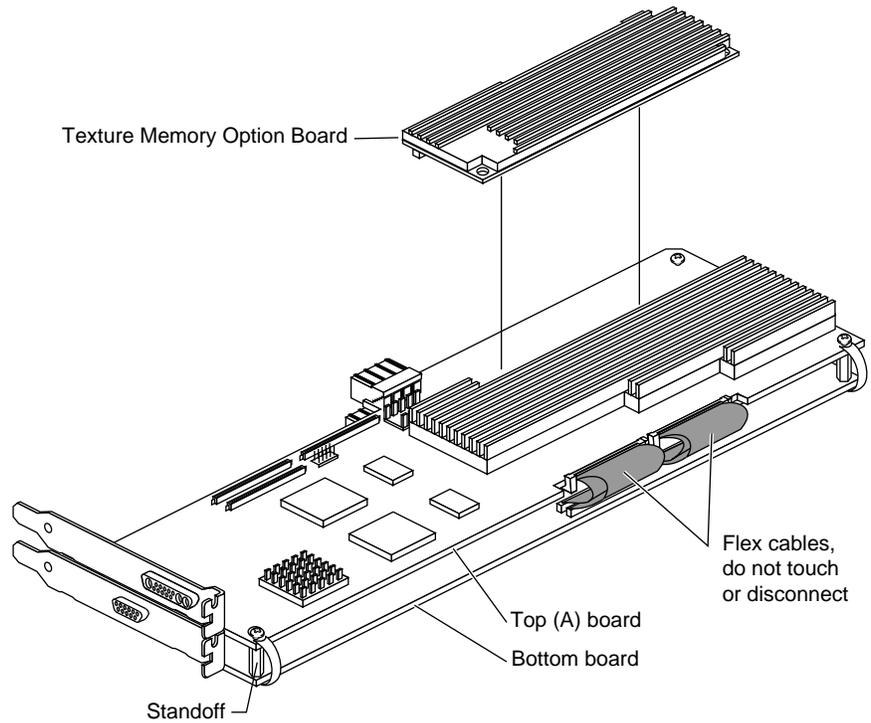
This section will tell you how to:

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

## Illustrating Option Boards and Graphics Boards

The following four pages provide annotated illustrations to help you identify option boards and graphics board sets in your workstation.

1. Use the illustrations to identify the boards in your workstation.
2. Use the directions at the bottom of these pages to move to the appropriate part of this manual to complete your task.



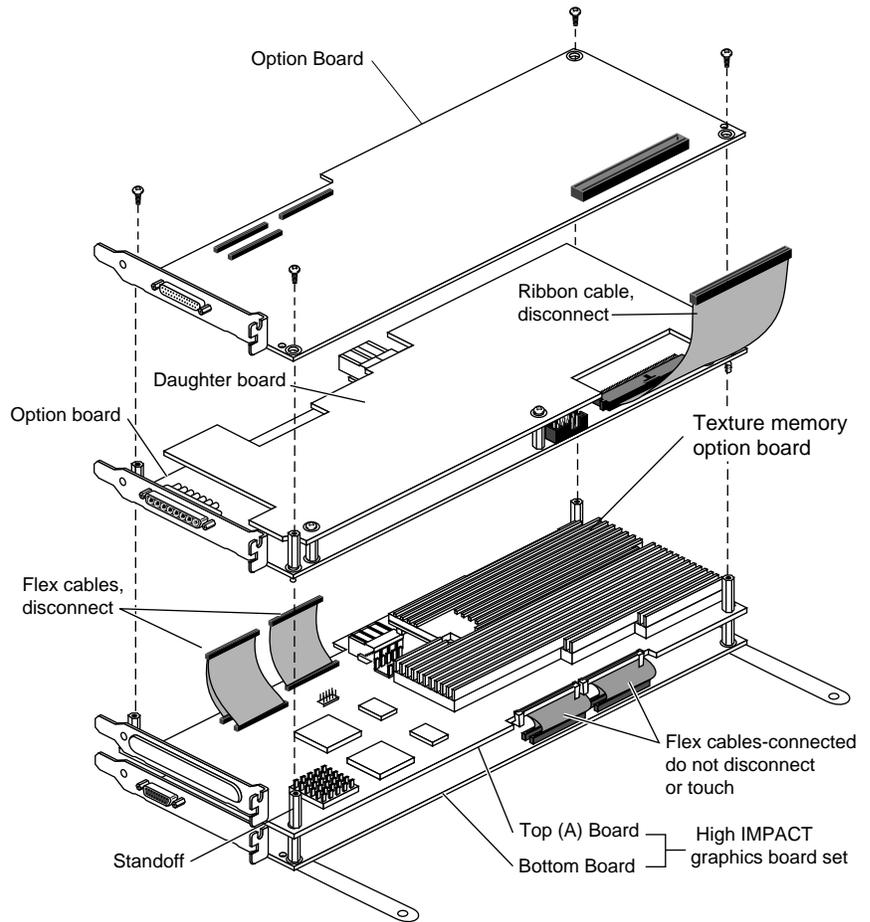
**Figure 2-12** High IMPACT Graphics Board Set With Texture Memory Option Board

Your graphics board set is always the bottom two board (High IMPACT graphics board set) or three board (Maximum IMPACT graphics board set) connected by corner standoffs and cables.

**Tip:** Your pull straps will be labeled 2 board pull straps for the High IMPACT graphics board set, and 3 board pull strap for the Maximum IMPACT graphics board set.

**Note:** The daughter board in Figure 2-13 is not attached by *corner* standoffs. You do not need to remove the daughter board from an option board when removing option board to reach the graphics board set.

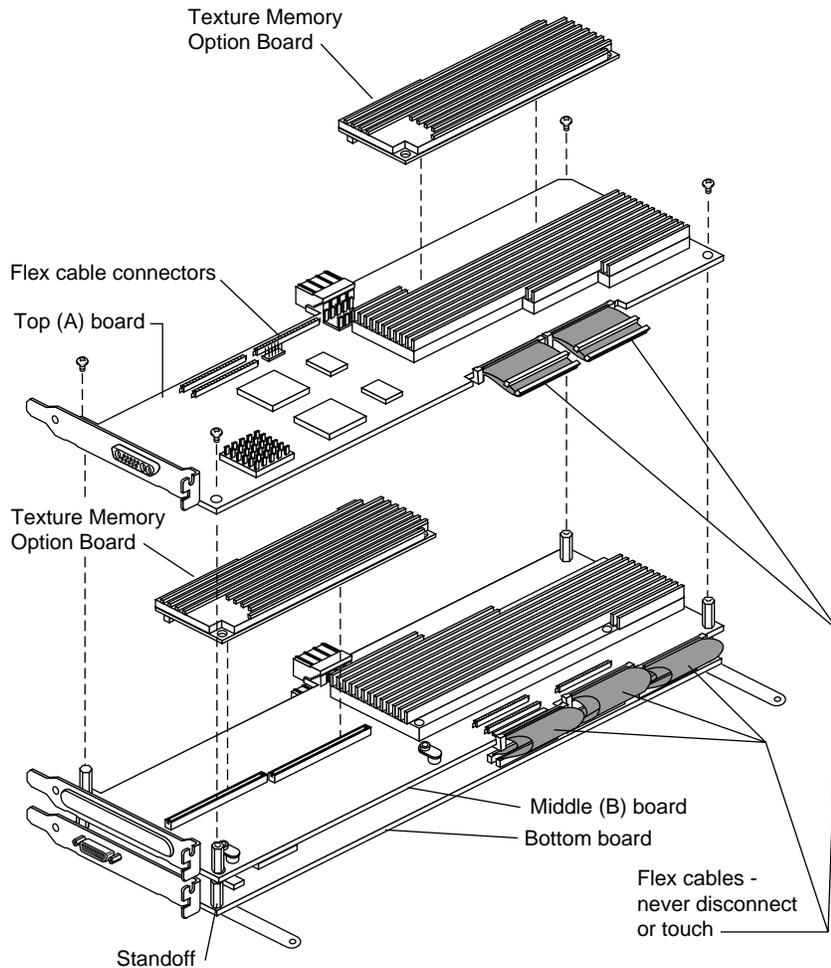
If you have only a High IMPACT graphics board set with no option boards, go to step 11 on page 54



**Figure 2-13** High IMPACT Graphics Board Set with Connected Option Boards

Figure 2-13 shows the maximum number of option boards that can be attached to the High IMPACT graphics board set by standoffs and cables. You may see one option, an option with a daughter board, or two option boards as other possible connected combinations.

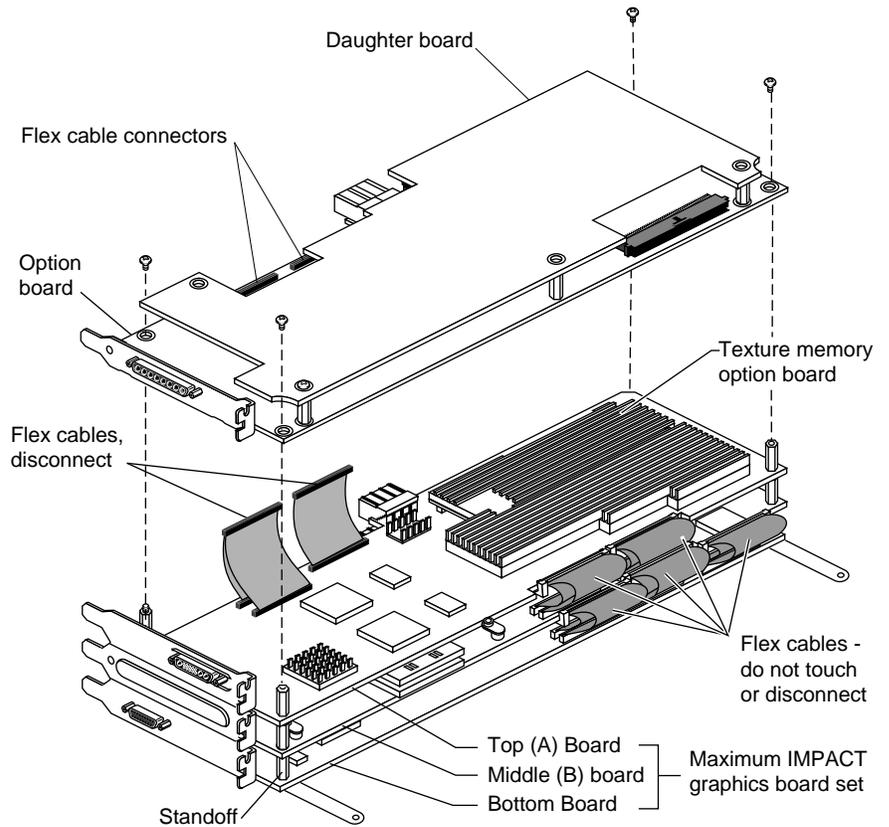
If you have a High IMPACT graphics board set with options, go to “Removing Option Boards” on page 50.



**Figure 2-14** Maximum IMPACT Graphics Board Set with Texture Memory Option Boards

**Tip:** Your pull straps will be labeled 3 board pull strap for the Maximum IMPACT graphics board set.

If you have only a Maximum IMPACT graphics board set with no option boards, go to step 11 on page 54.



**Figure 2-15** Maximum IMPACT Graphics Board Set with Texture Memory Option Boards and Connected Option Board

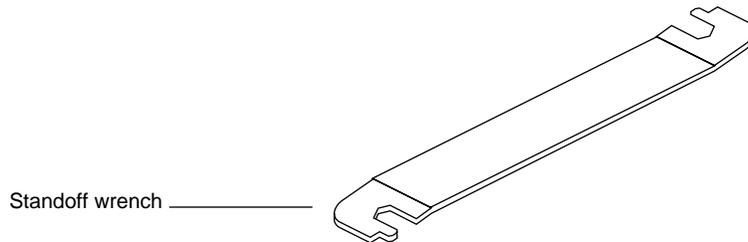
The Maximum IMPACT Graphics Board Set can be attached by standoffs to one option board, or one option board and daughter board.

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

If you have a Maximum IMPACT graphics board set with options, turn to page 50.

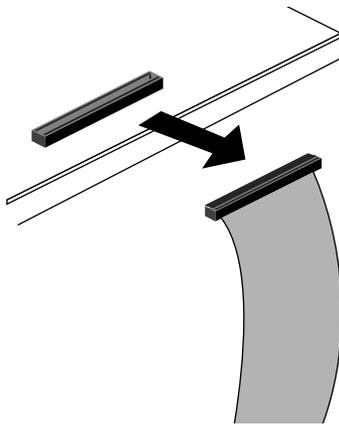
### Removing Option Boards

This section tells you how to remove standoffs and cables connecting the option boards and graphics board sets. You will need a Phillips screwdriver to complete the task. You may find a standoff wrench, shown in Figure 2-16 useful.



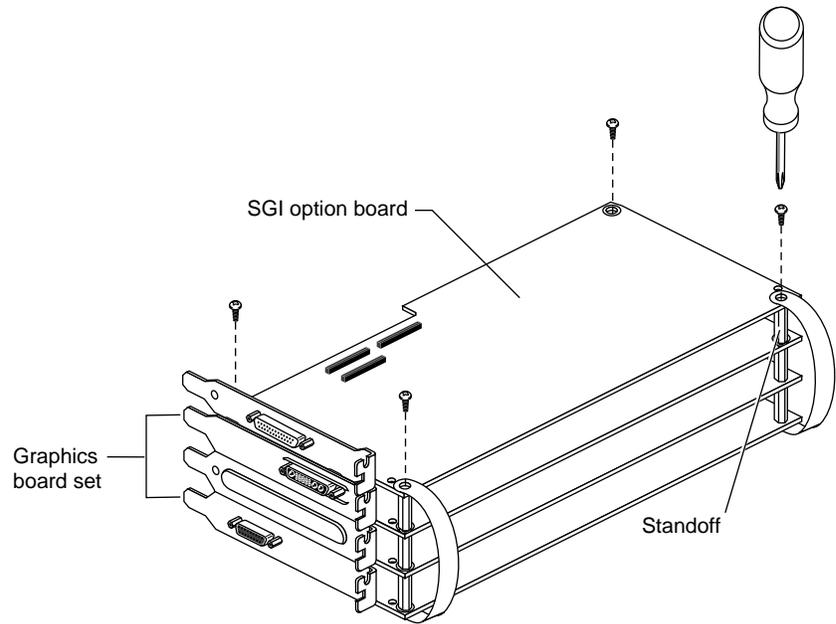
**Figure 2-16** Standoff Wrench

1. Decide on a pattern for laying the boards you remove on an antistatic surface so that you can replace them in the proper order.
2. Disconnect any ribbon cable from the top board. See Figure 2-17. If you have no ribbon cable, go to step 3. Ribbon cable connectors push together and pull apart.
  - Pinch the connector on the sides and pull away. See Figure 2-17.



**Figure 2-17** Disconnecting the Ribbon Cable

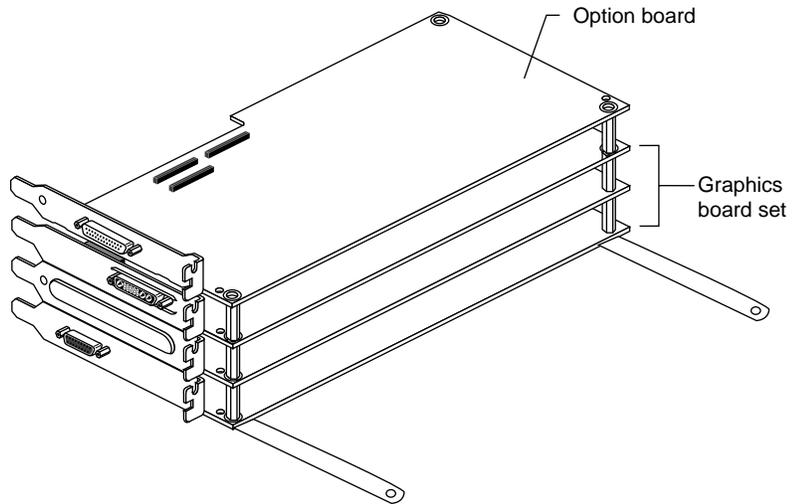
3. Unscrew the corner standoff screws from the top four corners. See Figure 2-18. If the standoff beneath the screw spins, hold it steady with the standoff wrench.



**Figure 2-18** Removing Standoff Screws

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

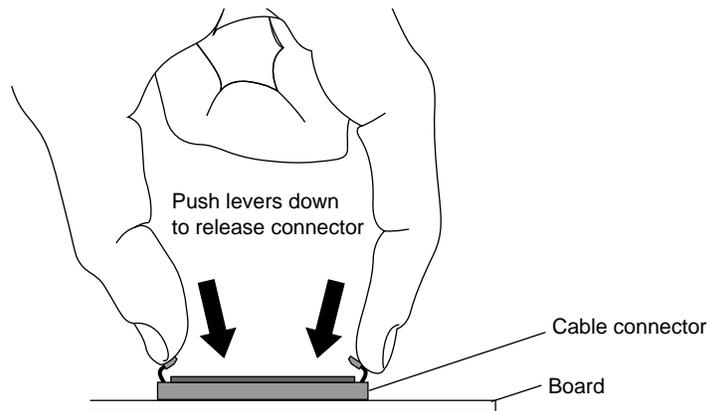
- Disconnect the pull straps from the top of the board by peeling the adhesive-backed strap from the board. See Figure 2-19.



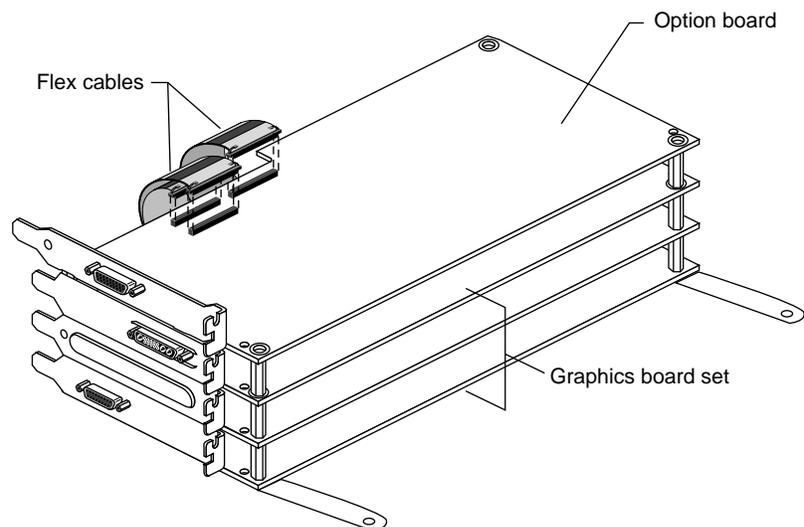
**Figure 2-19** Disconnecting the Pull Straps

4. If you have flex cables that attach to option boards, go to step 7.
5. Remove the board and put it on an antistatic surface.
6. If you have no flex connectors on the next board, go to step 11.

7. Disconnect any flex cables from the top of the board
  - Flex cables push together and pull apart, but have levers to press for removal. See Figure 2-20. Press down on the levers to release the connector. Then grasp the sides of the connector and pull up. See Figure 2-21.



**Figure 2-20** Releasing Flex Connectors



**Figure 2-21** Removing Flex Cable from Connector

8. If you have no standoffs to remove, go to step 10.
9. Remove the corner standoffs. Use the wrench if necessary.
10. Remove the board and place it on an antistatic surface.
11. Go to the appropriate section in your installation manual to complete your task or to the appropriate sections of this manual to do one of the following:
  - To reinstall your High IMPACT or Maximum IMPACT graphics board set, turn to page 74 or page 75.
  - To install a texture memory option board on the top board of your High or Maximum IMPACT graphics board set, turn to page 57.
  - To install a texture memory option board on the middle board of your Maximum IMPACT graphics board set, turn to page 63.

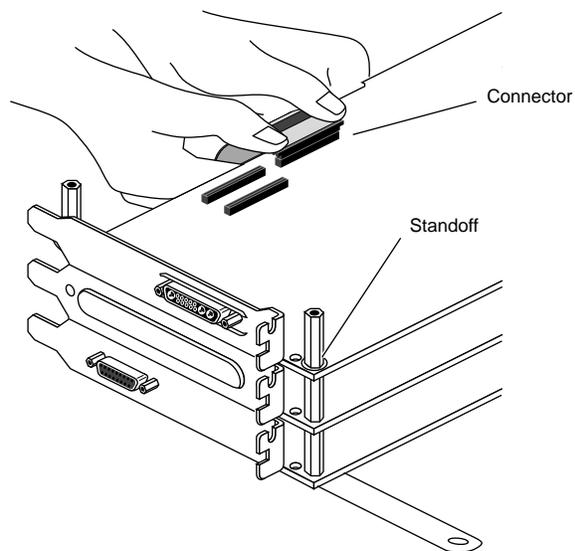
If you have option boards, return to “Installing Cables, Standoffs, and Option Boards” on page 54 for help in reinstalling the cables and standoffs.

### **Installing Cables, Standoffs, and Option Boards**

To reconnect cables and standoffs, follow these instructions:

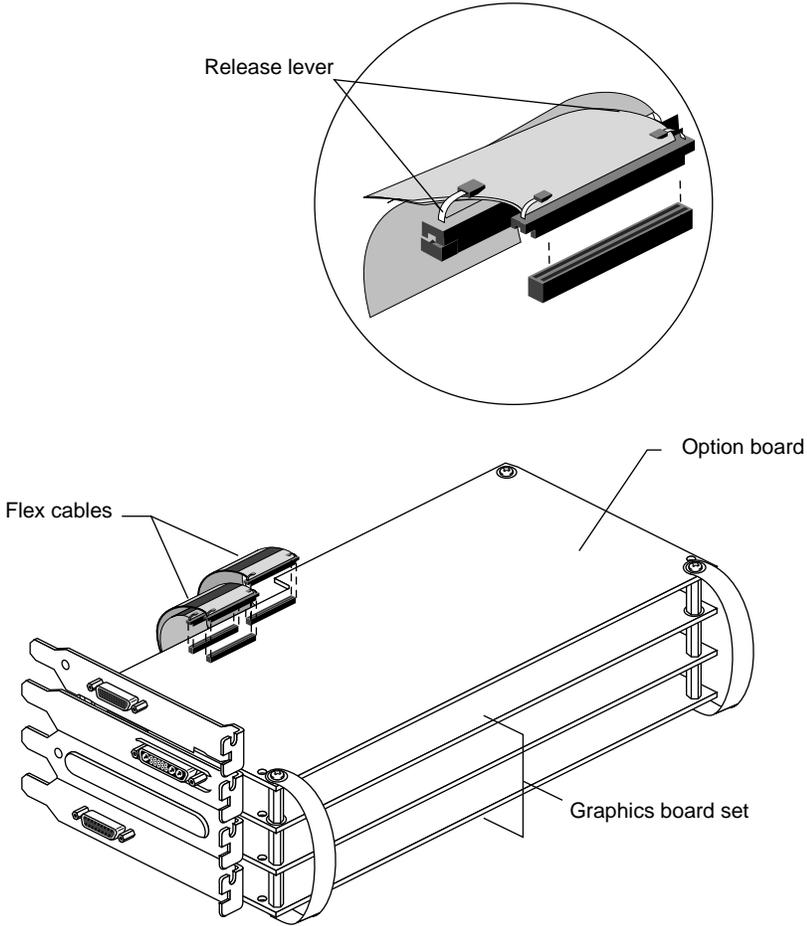
1. Place the board on the standoffs attached to the board below. If the standoffs were removed, replace them.
2. Insert the standoffs through the holes in the corner of the board to the standoffs below. Tighten the standoff to the one below.

3. Reconnect the cable after the board has been attached to the standoffs.
  - Press the connectors together with your fingers. Try to support the board from beneath with your fingers, so the connectors seat tightly. If possible check visually to be sure the connectors are properly seated.



**Figure 2-22** Seating Connectors

- 4. The cable of the second pair of a flex cables must be reinserted beneath the release levers of the first flex cable connector before it is reconnected. See Figure 2-23.



**Figure 2-23** Reattaching the Flex Connectors

5. Continue attaching boards, standoffs, and cables, until the top level is reached.
6. At the top board level, reattach the pull straps to the top board.
  - Align the holes in the pull straps with the holes in the board.
  - Press down on the top of the pull strap to reattach the adhesive on the back of the strap to the board.
7. Insert the screws through the pull strap and corner holes of the board and into the standoffs. Tighten using a Phillips screwdriver.

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

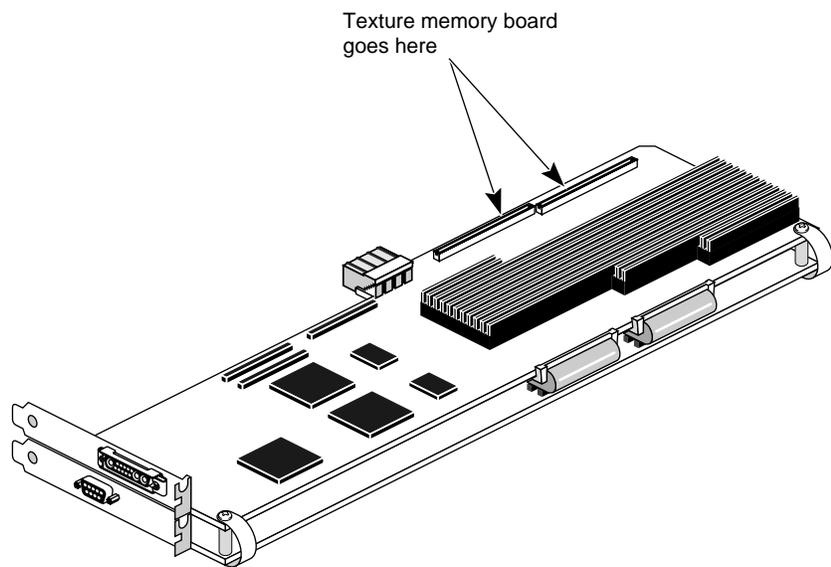
## Installing the Texture Memory Option Board on the Top Board of the Board Set

**Note:** If you have a Maximum IMPACT graphics board set, you must also install a texture memory option board on the middle board. See “Installing the Texture Memory Option Board on the Middle Board of the Maximum IMPACT Board Set” on page 63.

To install the texture memory option board on the top (RA) board of the High IMPACT or Maximum IMPACT board set, follow these steps:

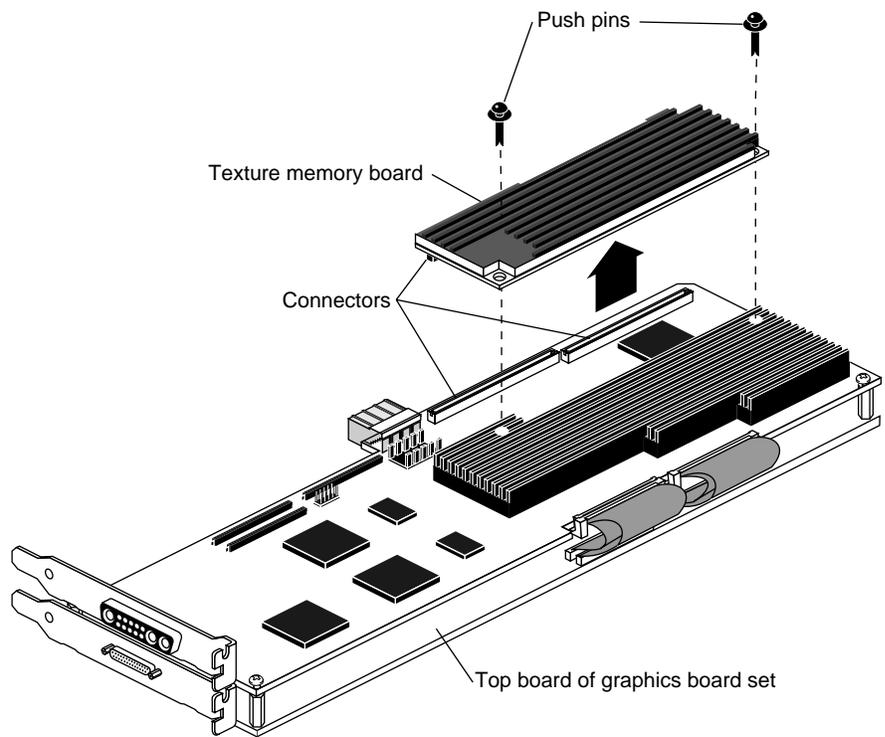
The illustrations show a High IMPACT graphics board set. Installation procedures are the same for the High and Maximum IMPACT board sets.

1. Locate the connectors on the board that will attach to the texture memory board. When installed, the texture memory board sits on the top board of the graphics board set in the right rear corner. See Figure 2-24.



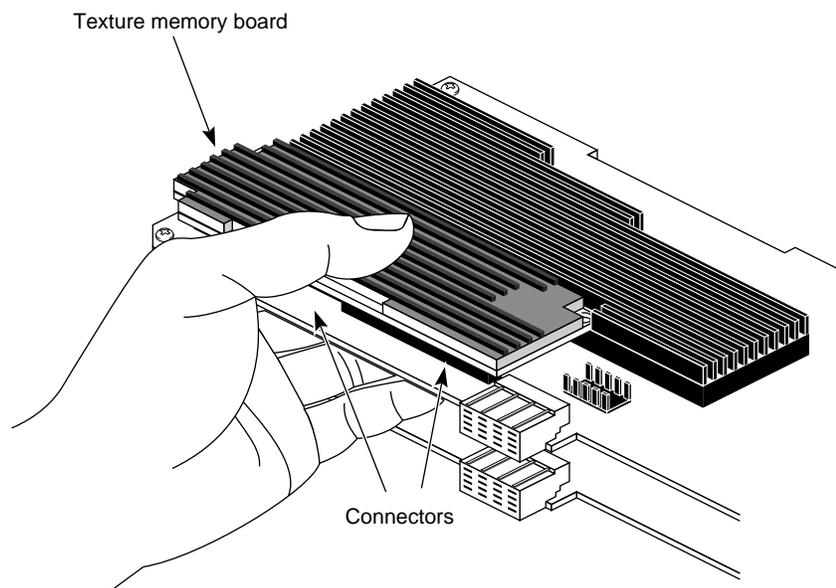
**Figure 2-24** Placement of the Texture Memory Board

2. Place the texture memory board on the top graphics board.
  - Align the connectors on the underside of the texture memory board with the connectors on the top graphics board. See Figure 2-25.



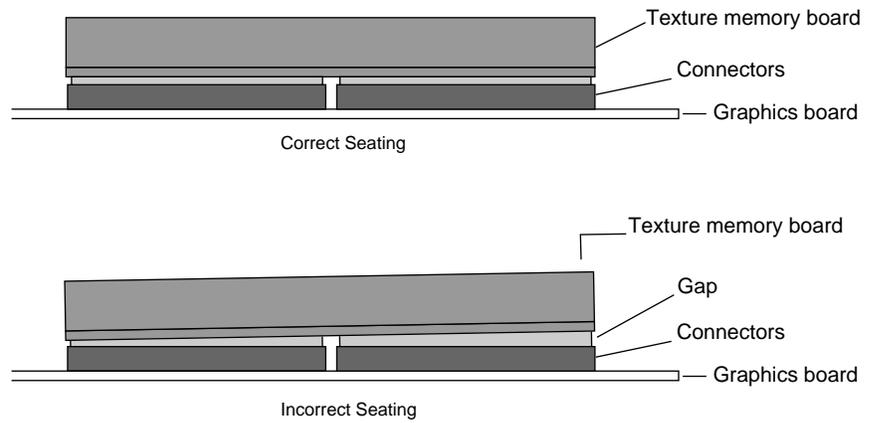
**Figure 2-25** Aligning the Texture Memory Board

3. Turn the board set so that you are facing the long side of the board set that connects to the midplane.
4. Seat the texture memory board.
  - Place your fingers under the top graphics board and your thumb on top of the texture memory board. See Figure 2-26.
  - Pinch the texture memory board into the connectors, running your thumb along the edge of the texture memory board as you press the boards together.



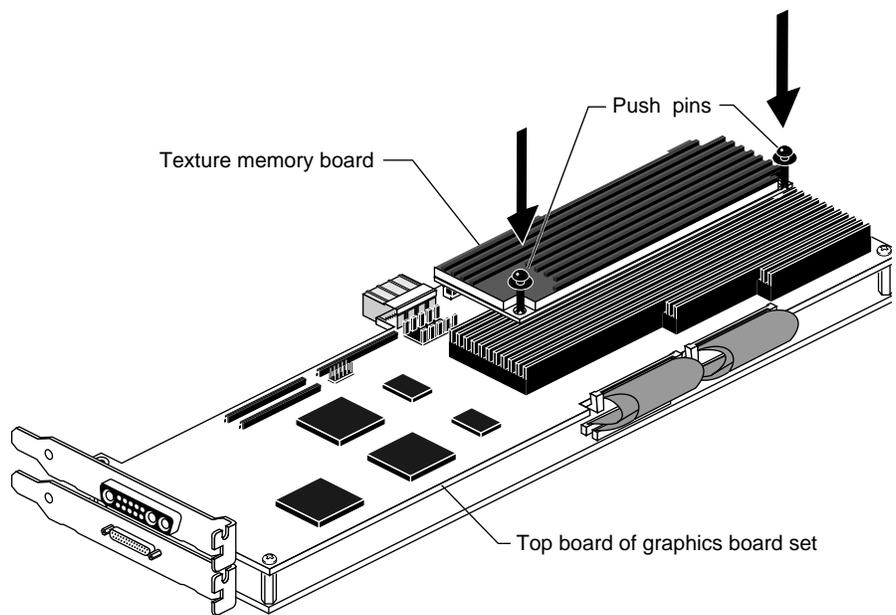
**Figure 2-26** Seating the Texture Memory Board

- Check visually to see that the connectors are fully seated along their full length.



**Figure 2-27** Checking the Connectors

5. Use the push pins to connect the other ends of the texture memory board to the top graphics board. See Figure 2-28.
  - Place each pin in a hole at the edge of the texture memory board.
  - Push the pin into place. The pins snap into place when properly seated.



**Figure 2-28** Seating the Push Pins

You are now finished installing the texture memory option board on the top board of the graphics board set. Go to “Replacing Option Boards and the Graphics Board Sets” on page 72, or turn to the next page for information on installing the texture memory option board on the middle board of the Maximum IMPACT graphics board set.

## Installing the Texture Memory Option Board on the Middle Board of the Maximum IMPACT Board Set

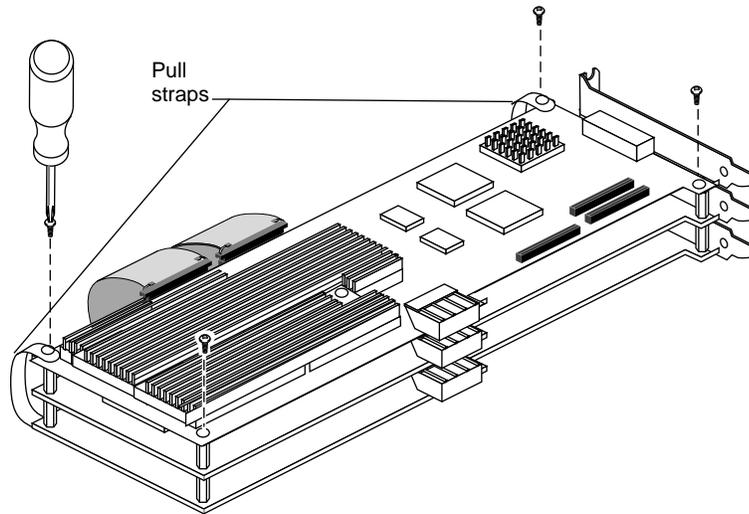
To install the texture memory option board on the middle (B) board of the Maximum IMPACT board set, follow these steps:

**Note:** You must have a texture memory option board installed on the top board of the maximum board set as well as the middle board, or your workstation will not function properly.

1. Turn the board set so the long board edge with the pull straps is facing away from you.
2. Use a Phillips screwdriver to remove the screws from the standoffs as shown in Figure 2-29.

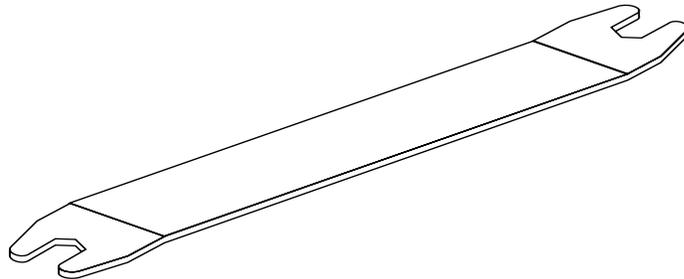
**Note:** If the standoffs spin as you unscrew the screws, use the wrench that comes with your texture memory option board to hold the standoffs steady.

3. Remove the pull straps from the top board. They are attached with adhesive.
  - Pull sideways and upward to remove the pull straps from the board. Allow the straps to rest on the antistatic surface.
  - Do not detach the pull straps from the bottom of the board set.



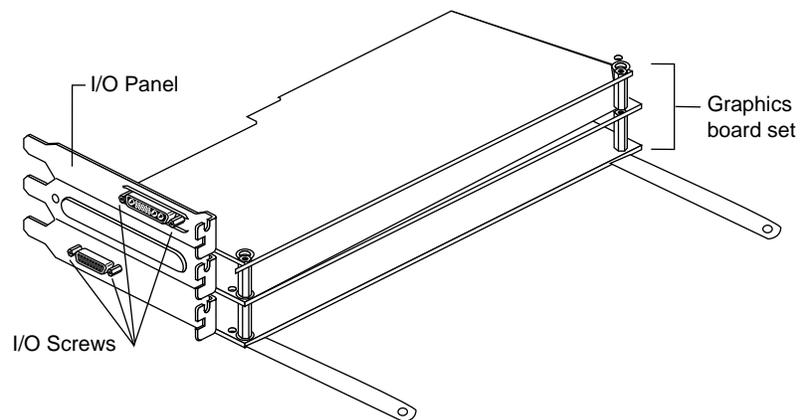
**Figure 2-29** Removing the Screws from the Standoffs

4. Remove the I/O panel from the side of the board set. See Figure
  - Use the I/O wrench to remove the screws from the I/O panel.



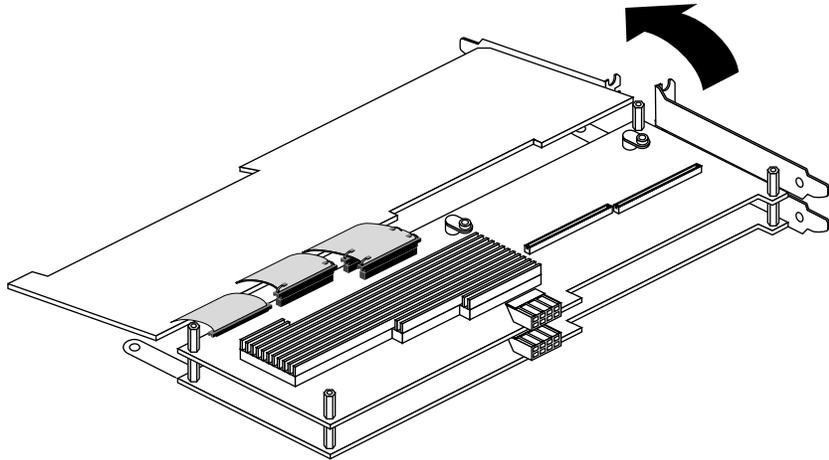
**Figure 2-30** I/O Wrench

- Slide the I/O panel off the connectors.



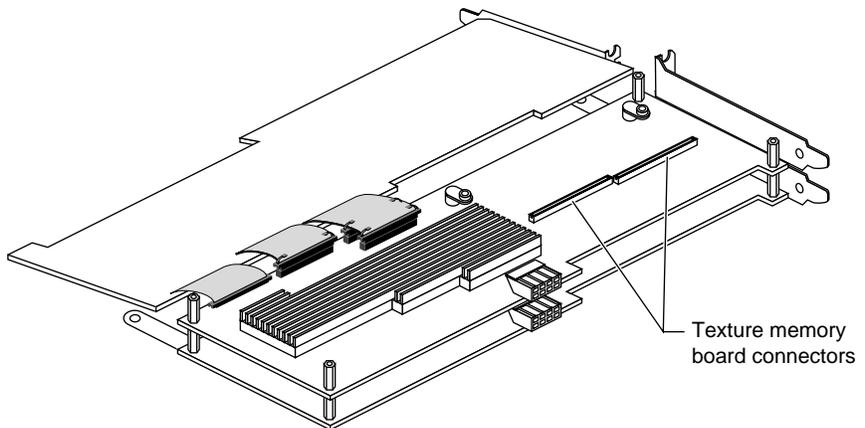
**Figure 2-31** Removing I/O Panel Screws

5. To gain access to the middle board, grasp the top board on the back edge, opposite the side with pull straps, and gently rotate it until it rests on the antistatic surface. See Figure 2-32.



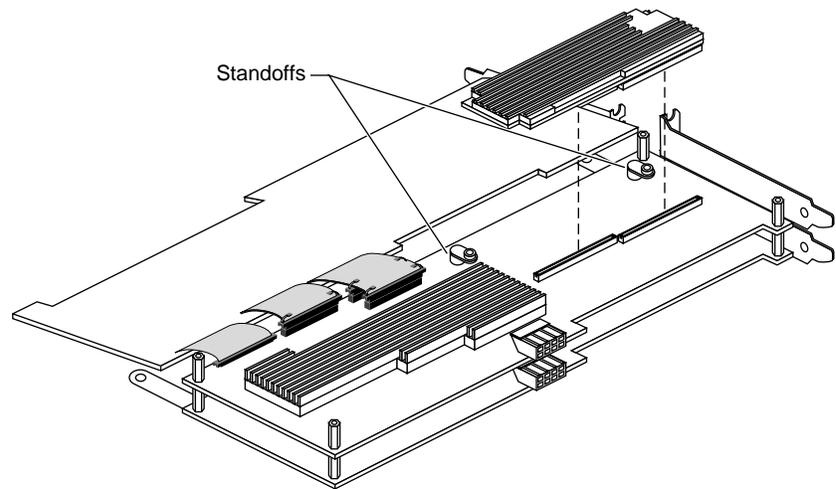
**Figure 2-32** Rotating the Top Board Back and Down

6. Determine the location of the texture memory option board connectors. See Figure 2-33.



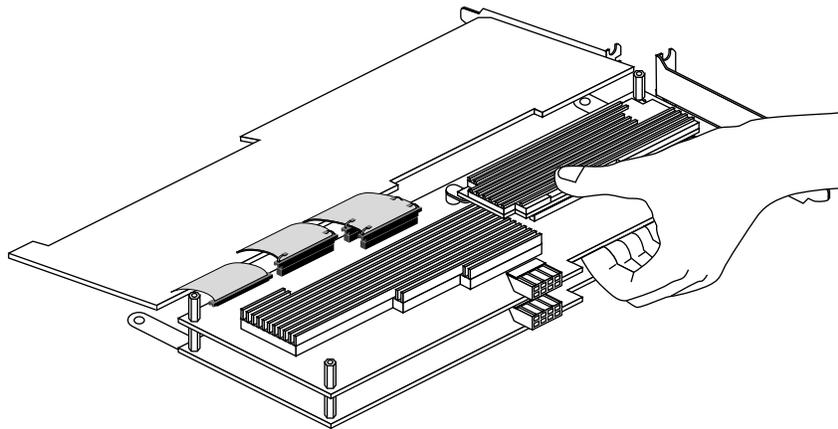
**Figure 2-33** Location of Texture Memory Board Connectors on the Middle Board

7. Place the texture memory board on the middle graphics board.
8. Align the connectors on the underside of the texture memory board with the connectors on the middle graphics board. See Figure 2-34.



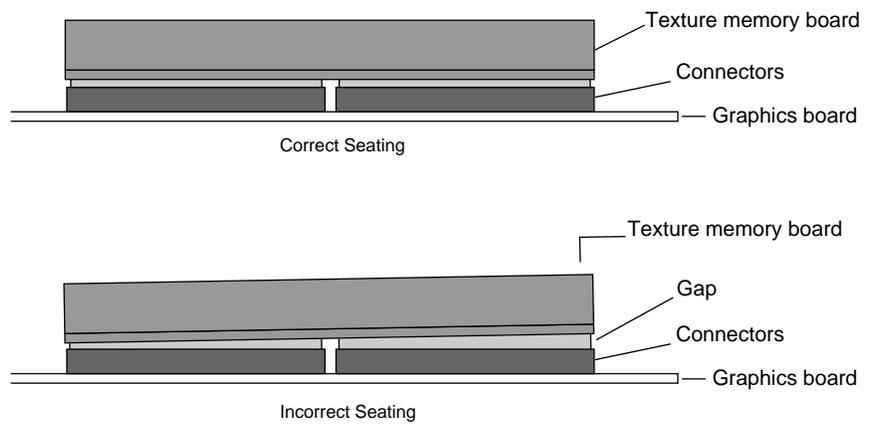
**Figure 2-34** Aligning the Texture Memory Board on the Middle Board

9. Seat the texture memory board.
  - Place your fingers under the middle graphics board and your thumb on top of the texture memory board. See Figure 2-35.



**Figure 2-35** Seating the Texture Memory Option Board

- Pinch the texture memory board into the connectors, running your thumb along the edge of the texture memory board as you press the boards together.
- Check visually to see that the connectors are fully seated along their full length. See Figure 2-36.



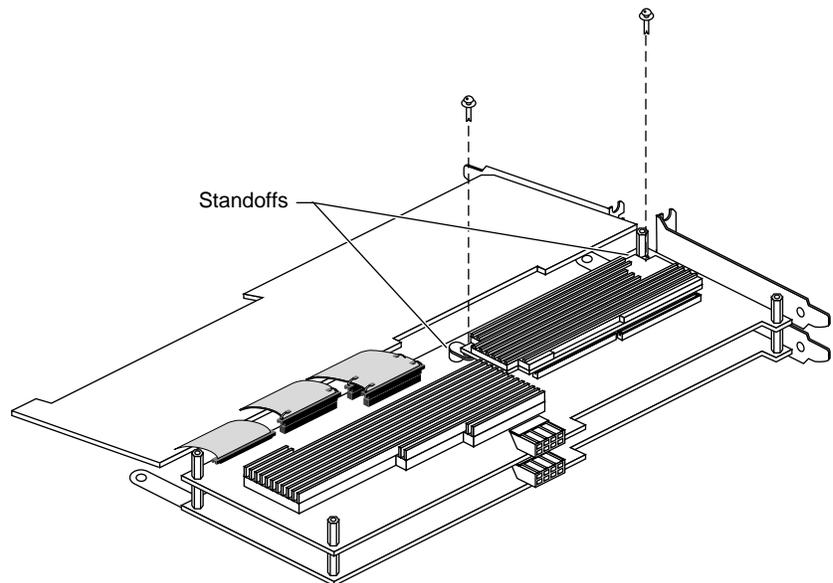
**Figure 2-36** Correctly Seating the Texture Memory Option Board

10. Use the push pins to attach the texture memory option board to the standoffs on the middle graphics board. See Figure 2-37.

**Note:** If the push pins do not snap into standoffs beneath the edge of the texture memory board, check to make sure you have not placed the board in backwards. See Figure 2-25.

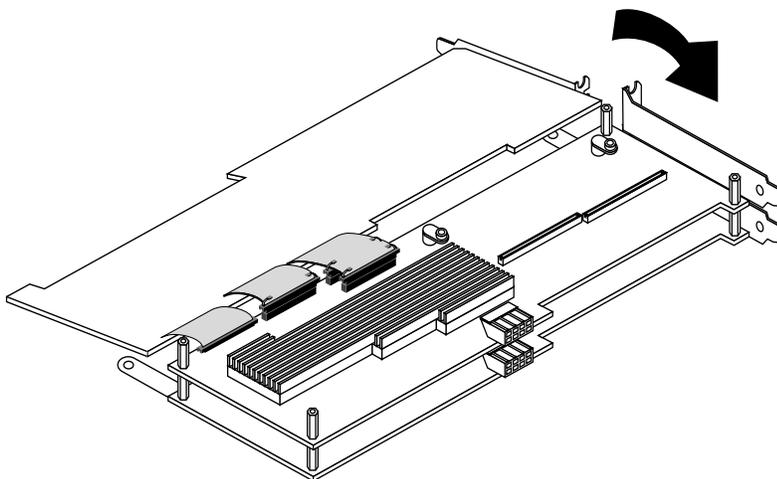
Place each pin in a hole at the edge of the texture memory board.

- Push the pin into place. The pins snap into place when properly seated.



**Figure 2-37** Seating the Push Pins

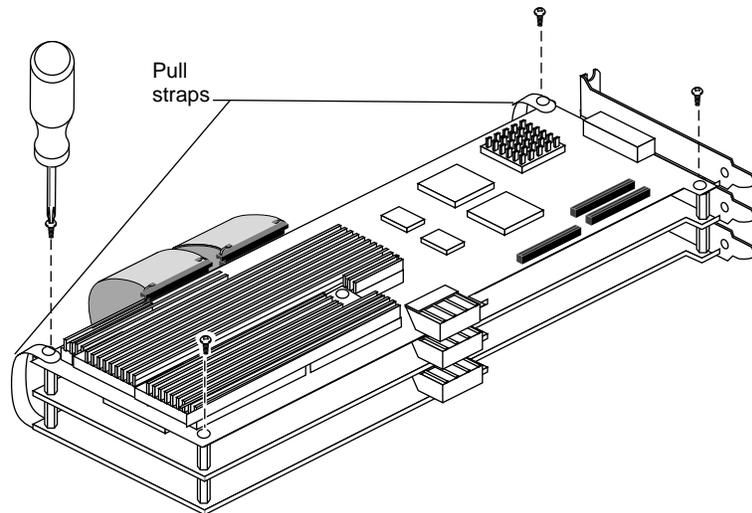
11. Rotate the top board into place above the middle board. See Figure 2-38.



**Figure 2-38** Rotating the Top Board Into Place

12. Reconnect the pull straps to the top board.
  - Align the pull strap holes over the screw holes to the standoffs.
  - Press on the end of each pull strap, causing the strap to adhere to the board. See Figure 2-39.

13. Replace the screws in the standoffs as shown in Figure 2-39.



**Figure 2-39** Replacing the Screws in the Standoffs

14. Reconnect the I/O panel to the board set.

- Place the I/O panel over the connectors.
- Replace and tighten the screws with the standoff wrench.

You are now finished installing the texture memory board on the Maximum IMPACT graphics board set and are ready to replace the Maximum IMPACT graphics board set in the chassis.

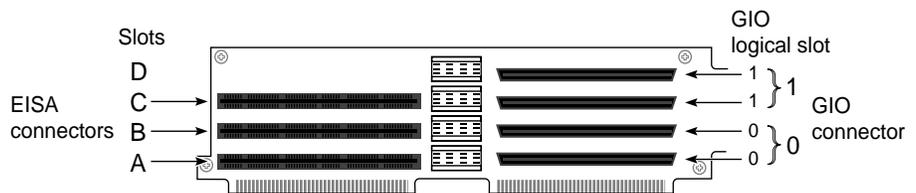
## Replacing Option Boards and the Graphics Board Sets

If you need help replacing option boards and the graphics board sets, see Table 2-1 or Table 2-2. Then follow the instructions in the steps that follow the tables.

**Table 2-1** Placement of Indigo<sup>2</sup> High IMPACT Board Set and Option Boards

If you have this combination of Indigo <sup>2</sup> High IMPACT and Option Boards:	Use these slots:
Indigo <sup>2</sup> High IMPACT (2-board set) plus 1 GIO option boards	Place Indigo <sup>2</sup> High IMPACT Board Set in Slots A and B, and GIO option board in Slot C
Indigo <sup>2</sup> High IMPACT board set plus 1 EISA option board	Place EISA option board in Slot A, and Indigo <sup>2</sup> High IMPACT board set in Slots B and C
Indigo <sup>2</sup> High IMPACT board set plus 2 EISA option boards	Place EISA boards in Slots A and B and the Indigo <sup>2</sup> High IMPACT board set in Slots C and D
Indigo <sup>2</sup> High IMPACT board set plus 1 GIO option board and 1 EISA option board	Place EISA option board in Slot A, Indigo <sup>2</sup> High IMPACT board set in Slots B and C, and GIO option board in Slot D

**Note:** Although there are four GIO connectors, only one of each pair of GIO connectors 0-0 or 1-1, may be used. You may connect only one GIO board or board set to one "0" connector in the pair 0-0, or to one "1" connector in the pair 1-1 (The exceptions are Silicon Graphics GIO option boards that connect by standoffs and cables to the top board of the graphics board set.) See Figure 2-40.



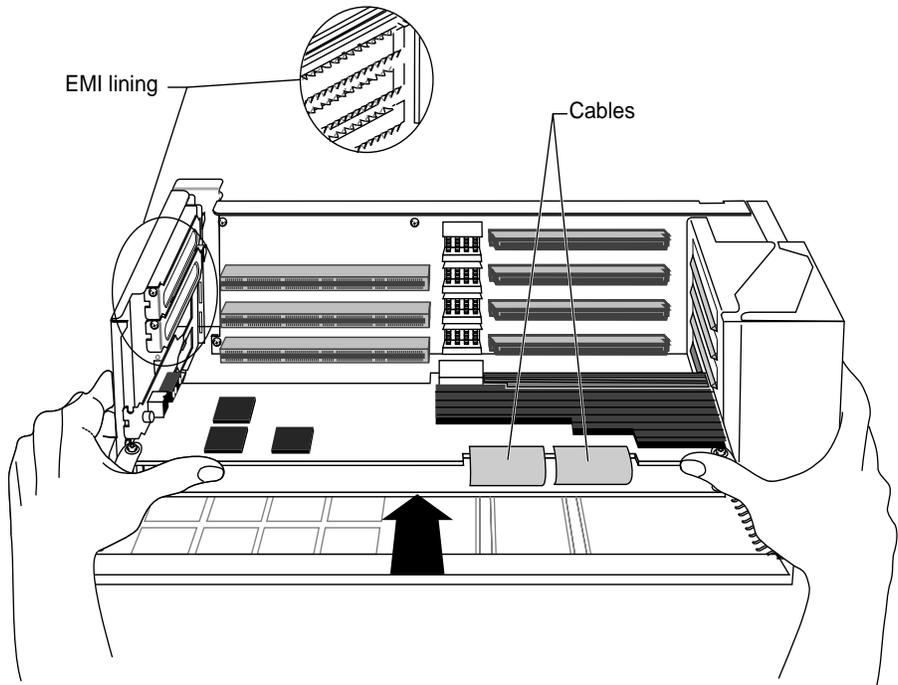
**Figure 2-40** Identifying Option Slots

**Table 2-2** Placement of Maximum IMPACT Board Set and Option Boards

<b>If you have this combination of Indigo<sup>2</sup> Maximum Board Set and Option Boards:</b>	<b>Use these slots:</b>
Maximum IMPACT board set plus 1 GIO option board	Place Maximum IMPACT board set in Slots A,B, and C and GIO option board in Slot D
Maximum IMPACT board set plus 1 EISA option board	Place EISA option board in Slot A and Maximum IMPACT board set in Slots B, C, and D

1. For the High IMPACT graphics board set replacement:
  - Grasp the chassis with your fingers and push the board set into place with your thumbs. See Figure 2-41.
  - Insert the board carefully so that the board edge does not catch on the EMI lining along the inner left cutout area. Make sure the EMI lining is not damaged and remains between the chassis and the graphics board's metal extension.
  - Push the board set into the slot until the connector on the back of the board is securely connected to the connector on the midplane.

**Caution:** Do not press on the flex cables that connect your Indigo<sup>2</sup> High IMPACT or Maximum IMPACT boards. See "cables" in Figure 2-41.

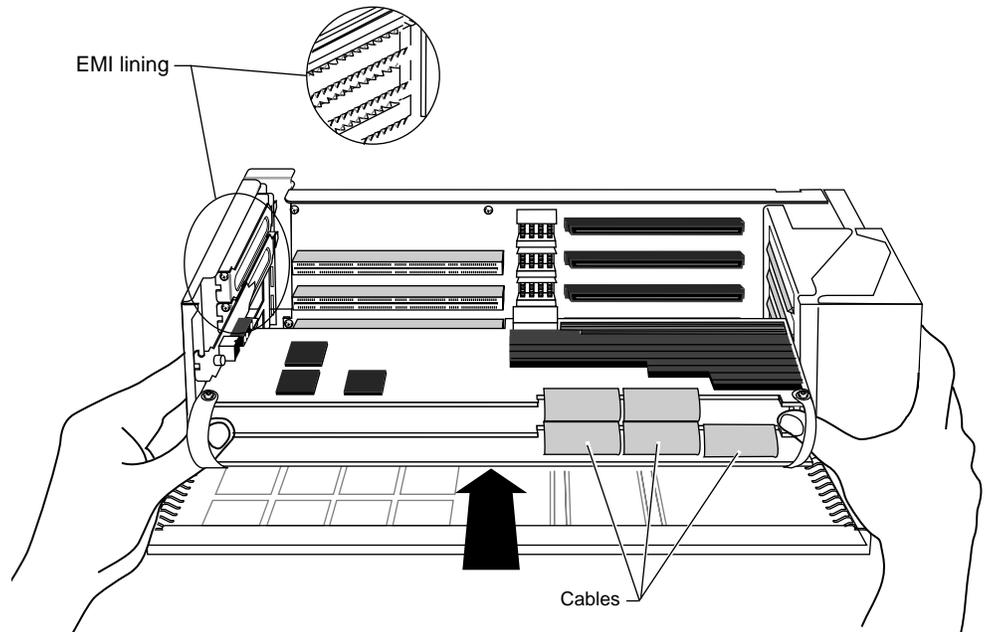


**Figure 2-41** Reconnecting the High IMPACT Graphics Board Set to the Midplane

2. Go to step 4 on page 76.

3. For the Maximum IMPACT graphics board set replacement:
  - Position your right thumb so that it is behind the pull strap, pushing on the standoff between the top and middle boards. See Figure 2-42. Position your left thumb so that it is behind the pull strap and is pushing on the middle board.

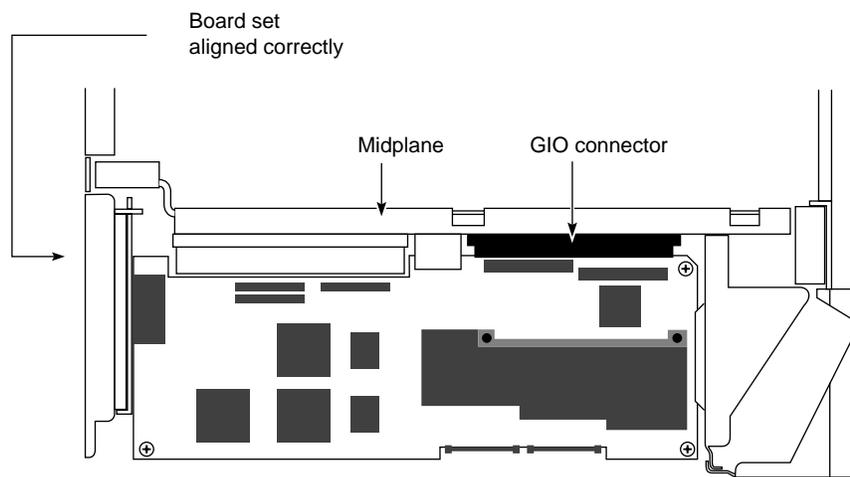
**Caution:** Do not press on the flex cables that connect your Indigo<sup>2</sup> High IMPACT or Maximum IMPACT boards. See “cables” in Figure 2-42.



**Figure 2-42** Reconnecting the Maximum IMPACT Graphics Board Set to the Midplane

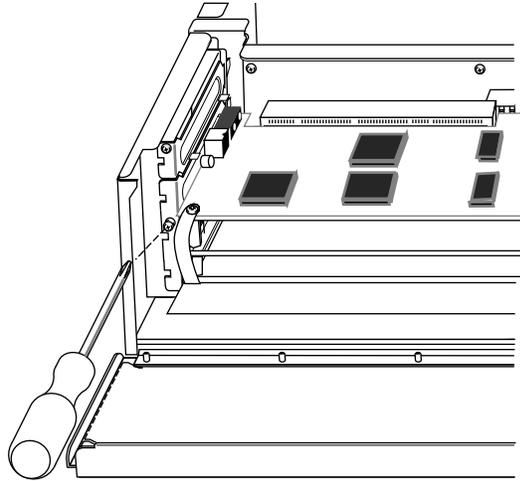
- Grasp the chassis with your fingers. See Figure 2-42.
- Insert the board carefully so that the board edge does not catch on the EMI lining along the inner left cutout area. Make sure the EMI lining is not damaged and remains between the chassis and the graphics board’s metal extension.

- Push the board set into the slot until the connector on the back of the board is securely connected to the connector on the midplane. You will need to use some force.
4. Visually check to be sure the boards are completely seated in their connectors. The board set should not look tilted when viewed from above. See Figure 2-43.



**Figure 2-43** Board Set, Correctly Aligned, Viewed From Above

5. Insert and tighten the screws that hold the board set to the chassis. The screw openings are located on the metal extension on the left side of each board. See Figure 2-44.

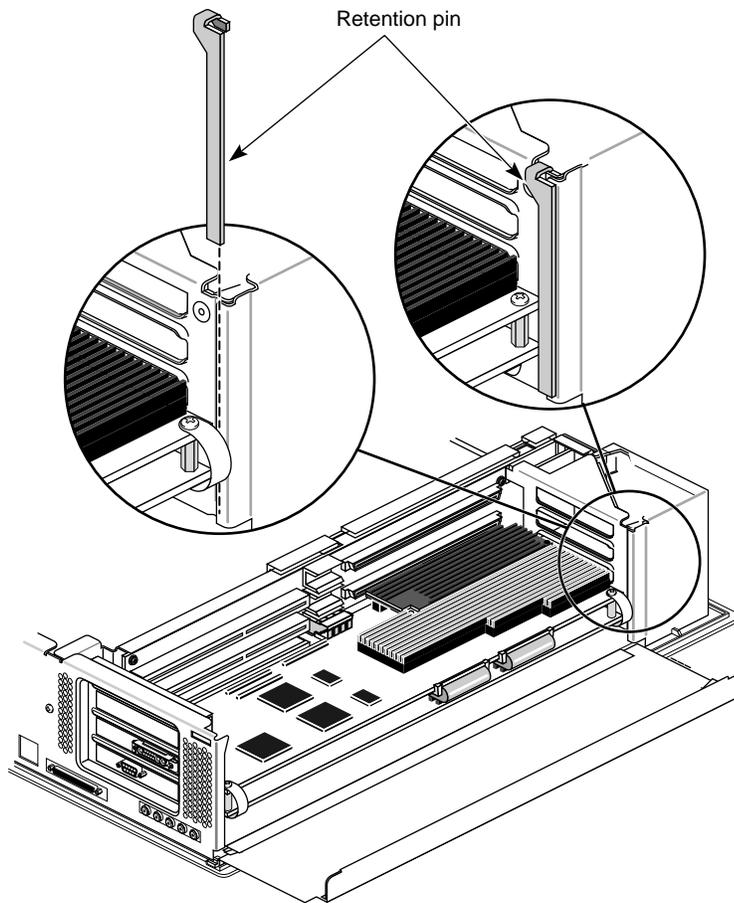


**Figure 2-44** Replacing the Screws of the Graphics Board Set

**Note:** You have one screw to insert and tighten for the Maximum IMPACT graphics board set.

6. Replace any option board or boards. Follow the directions found in the option board's installation manual.

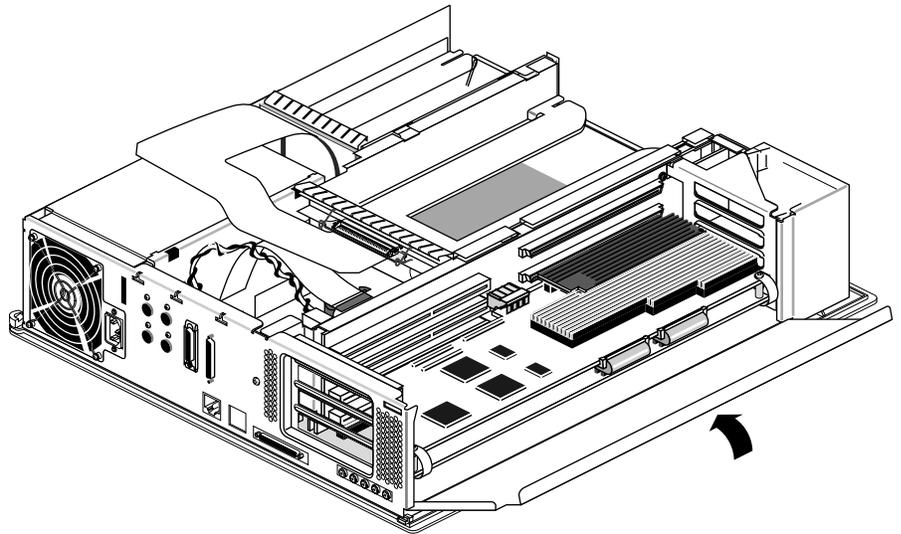
7. Replace the retention pin along the right end of the board set. The retention pin sits in front of the board. See Figure 2-45.



**Figure 2-45** Replacing the Retention Pin

**Tip:** Use the retention pin as a plumb line to determine if the board set is properly seated. If the retention pin hangs at a 90° angle to the top of the workstation, the board set is properly installed. If the pin is tilted, push on the board set until it is properly connected.

8. Tip up the metal panel until it snaps into place. See Figure 2-46.



**Figure 2-46** Closing the Metal Panel in Front of the Option Slots

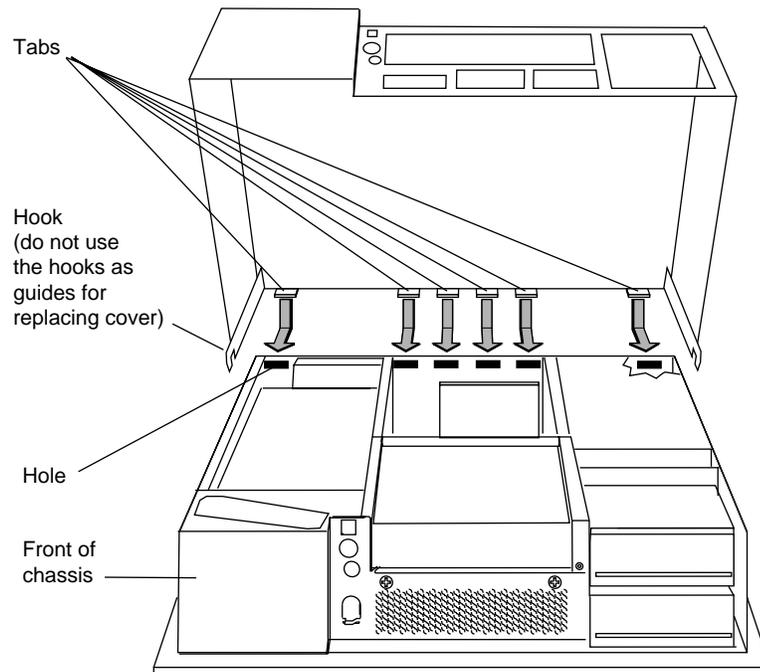
9. Remove the antistatic wrist strap.

You have finished installing the texture memory option board.

## Replacing the Cover

To replace the top cover, follow these steps:

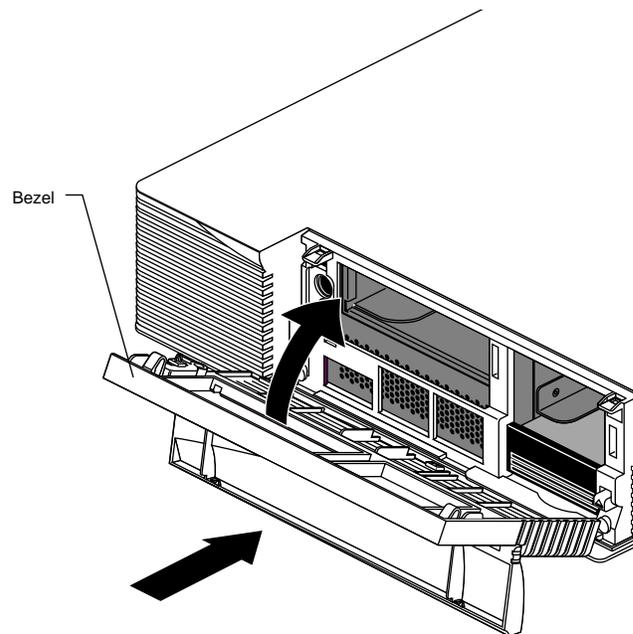
1. Locate the tabs on the inside and back of the top cover and the holes on the back of the workstation. See Figure 2-47.
2. Face the front of the workstation.
  - Look through the holes as you lower the cover to move the tabs into place.



**Figure 2-47** Replacing the Cover

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

3. Replace the bezel.
  - Place the tabs on the bottom of the bezel in the grooves in the front of the chassis, as shown in Figure 2-48.
  - Tilt the bezel up until it snaps into place.



**Figure 2-48** Replacing the Bezel

4. Replace the lockbar if you removed it.
5. Close the front cover.
6. Reconnect the cables to the ports on the back of the Indigo<sup>2</sup> IMPACT workstation.

You are now ready to turn on your Indigo<sup>2</sup> IMPACT workstation.

## Turning On the Indigo<sup>2</sup> IMPACT Workstation

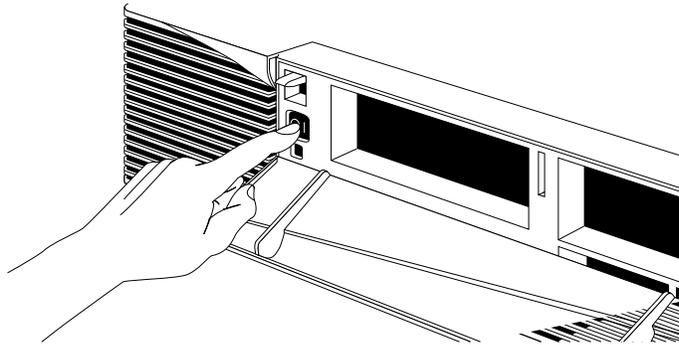
Once you've connected the cables to the rear of the system, power on and log in to your workstation by following these steps:

1. Turn on the monitor.

The monitor's power switch is on the front of the monitor in the lower right corner. The LED next to the switch lights up when you turn on the monitor.

2. Turn on the system power.

- Open the front cover by snapping it away from the top edge of the chassis and tipping it down.
- Press the power switch to turn on the system, as shown in Figure 2-49.



**Figure 2-49** Turning On the Indigo<sup>2</sup> IMPACT Workstation

When you power on your system, you hear the boot “tune” and see the LED on the front of the machine turn on. While the system is running power-on diagnostics, you see an orange light. You should see the orange light for a few seconds. If the system passes all of the diagnostics tests, the light will turn green, and the system will continue booting. If you do not hear the boot tune or the LED does not turn green, there may be a problem.

If there seems to be a problem, turn off the system power, remove the cover, and make sure the boards are seated correctly. Read the installation instructions again to check that you have completed all the steps.

For additional troubleshooting, see Chapter 7, “Troubleshooting,” in the *Indigo<sup>2</sup> Workstation Owner’s Guide*.



## Removing the Texture Memory Option Board

This chapter explains how to remove the Texture Memory Option Board from the High IMPACT or Maximum IMPACT graphics boards in an Indigo<sup>2</sup> IMPACT workstation.

To remove the texture memory option board, complete the following steps:

1. Shut down the system.
2. Remove the cover.
3. Identify option boards and graphic board sets.
4. Remove any option boards.
5. Remove the existing graphics board set.
6. Remove the texture memory option board or boards.
7. Replace the existing graphics board set.
8. Replace any option boards.
9. Replace the cover.

## Powering Off Your Indigo<sup>2</sup> IMPACT Workstation

To power off the system and remove the cover, see “Shutting Down and Powering Off Your Indigo<sup>2</sup> IMPACT Workstation” on page 36.

After you have powered off the system and removed the cover, return to this section of the manual.

## Attaching the Wrist Strap

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

**Caution:** The components inside the Indigo<sup>2</sup> IMPACT workstation are extremely sensitive to static electricity. Handle all boards carefully, and wear the wrist strap shipped with the option board while replacing parts inside the system.

To attach the wrist strap, follow these steps:

1. Unwrap the first two folds of the band and wrap the exposed adhesive side firmly around your wrist.
2. Unroll the rest of the band and peel the liner from the copper foil at the opposite end.
3. Attach the copper foil to a convenient and exposed electrical ground, such as a metal part of the Indigo<sup>2</sup> IMPACT workstation.

## Identifying and Removing Option Boards and the Graphics Board Set

See Chapter 2 “Identifying Option Boards and Graphic Boards” on page 45 for help identifying and removing your option board and graphics board set, and reinstalling these boards after you have completed your task.

Any option boards and your Indigo<sup>2</sup> High IMPACT or Maximum IMPACT board set must be replaced in the same slots.

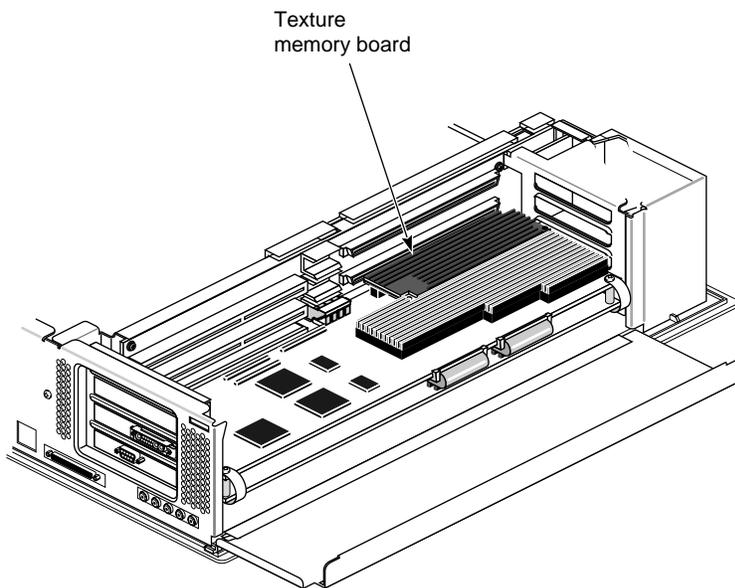
## Removing the Indigo<sup>2</sup> High IMPACT or Maximum IMPACT Graphics Board Set

To remove the Indigo<sup>2</sup> IMPACT graphics board set, see Chapter 2, “Removing the Indigo2 IMPACT Graphics Board Set” on page 41. Then return to this section of the manual.

## Removing the Texture Memory Option Board from the Top Board

To remove the texture memory option board from the top (RA) board of the High IMPACT or Maximum IMPACT board set, follow these steps:

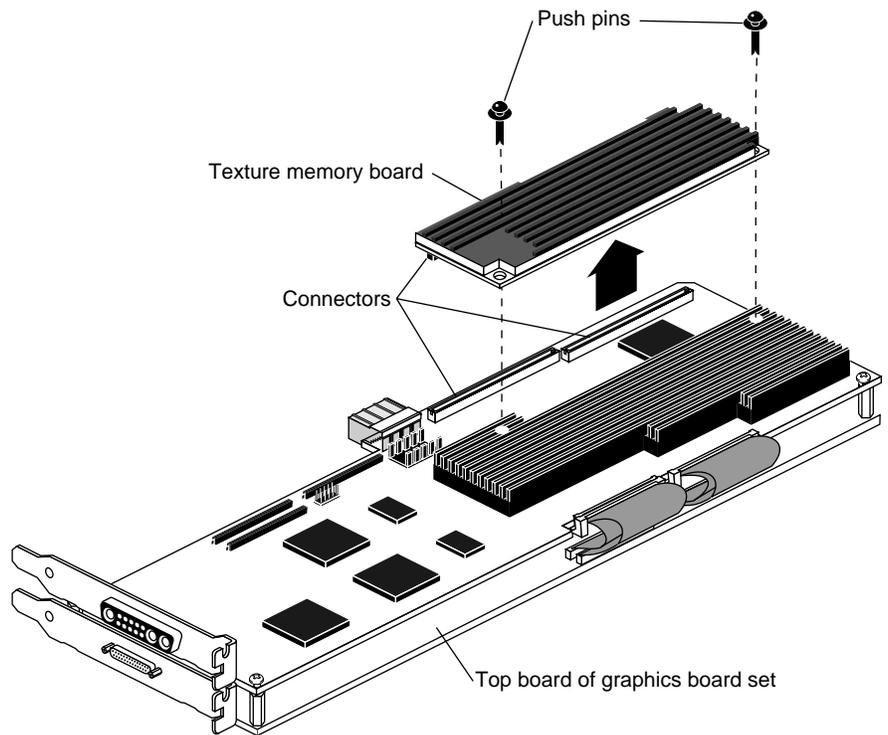
1. Locate the texture memory option board. It sits on the top of the graphics board set in the right rear corner. See Figure 3-1.



**Figure 3-1** Locating Texture Memory Option Board

2. Remove the Texture Memory Option Board from the top of the graphics board set. See Figure 3-2.

- Grasp the pins and pull up to remove them. The pins fit tightly into their sockets and may be hard to pull out.
- Slide your fingers under the long edge of the texture memory board that faces the midplane.
- Push up as you slide your fingers under the edge of the board until the board is disconnected from the graphics board.



**Figure 3-2** Removing the Pins From the Texture Memory Board

You are now finished removing the texture memory option board.

To install a new texture memory option board, replace any option boards and the graphics board set, replace the cover, and turn on your Indigo<sup>2</sup> workstation, see Chapter 1, “Upgrading the Texture Memory Option Board: High IMPACT to Maximum IMPACT.”

## Removing the Texture Memory Option Board from the Middle Board

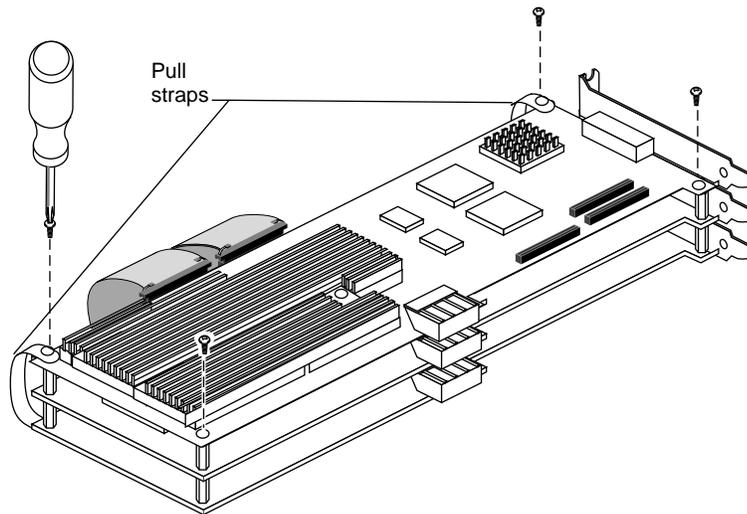
**Note:** Texture memory boards on the top and middle boards of the Maximum IMPACT board set must both be removed if you are not replacing them. The board set will not operate properly with only one texture memory option board.

To remove the texture memory option board from the middle (RB) board of the Maximum IMPACT board set, follow these steps:

1. Turn the board set so the long board edge with the pull straps is facing away from you.
2. Use a Phillips screwdriver to remove the screws from the standoffs. See Figure 3-3.

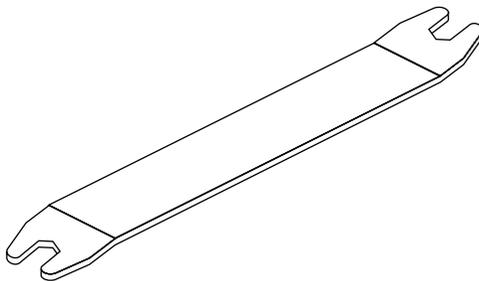
3. Remove the pull straps from the top board. They are attached with adhesive.
  - Pull sideways and upward to remove the pull straps from the board.
  - Do not detach the pull straps from the bottom of the board set.

**Note:** If the standoffs spin as you unscrew the screws, use the wrench that comes with your texture memory option board to hold the standoffs steady.



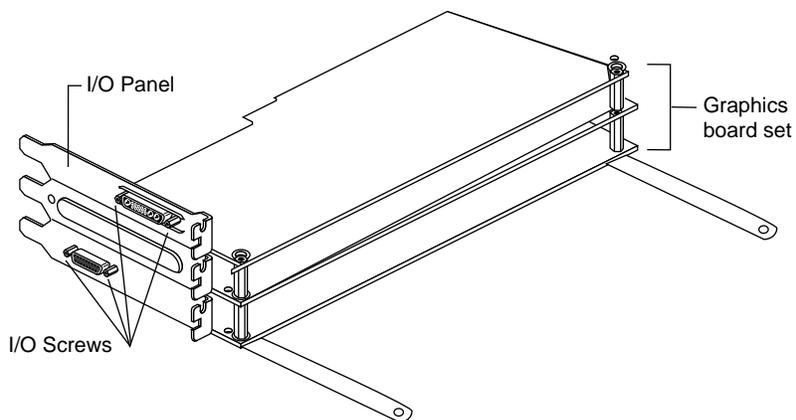
**Figure 3-3** Removing the Standoff Screws

4. Remove the I/O panel from the side of the board set. See Figure
  - Use the I/O wrench to remove the screws from the I/O panel.



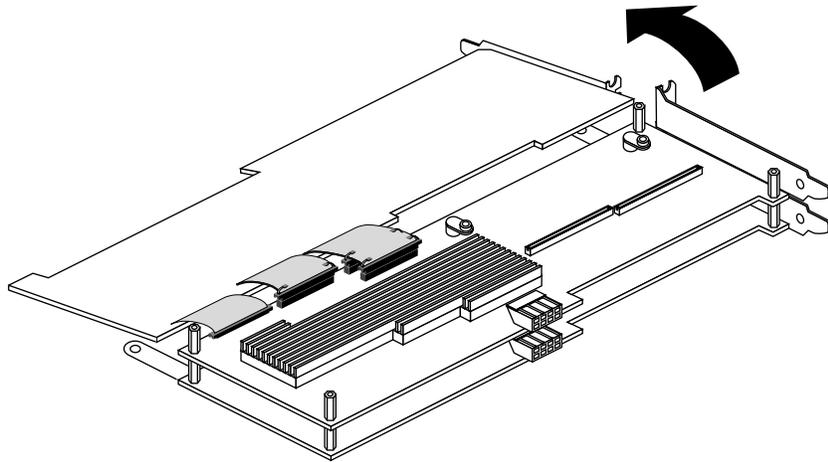
**Figure 3-4** I/O Wrench

- Slide the I/O panel off the connectors.



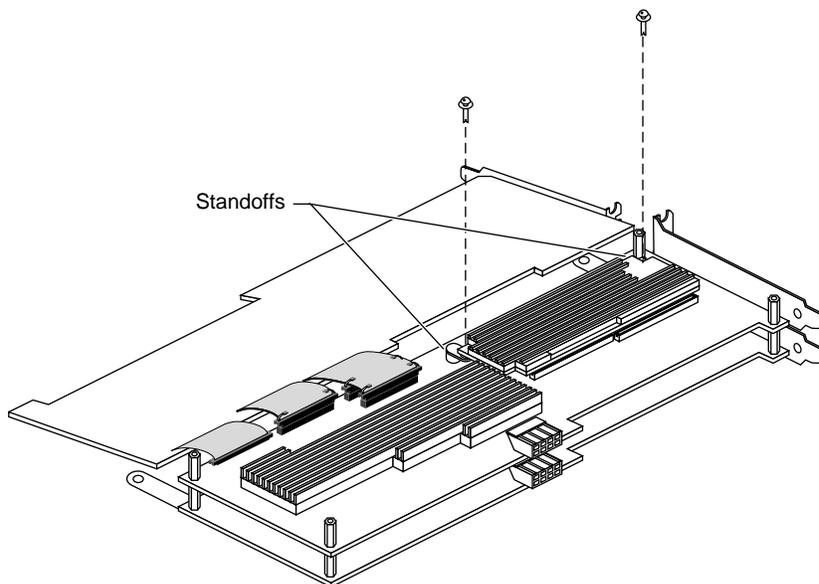
**Figure 3-5** Removing I/O Panel Screws

5. To gain access to the middle board, grasp the top board on the back edge, opposite the side with pull straps, and gently rotate it until it rests on the antistatic surface. See Figure 3-6.



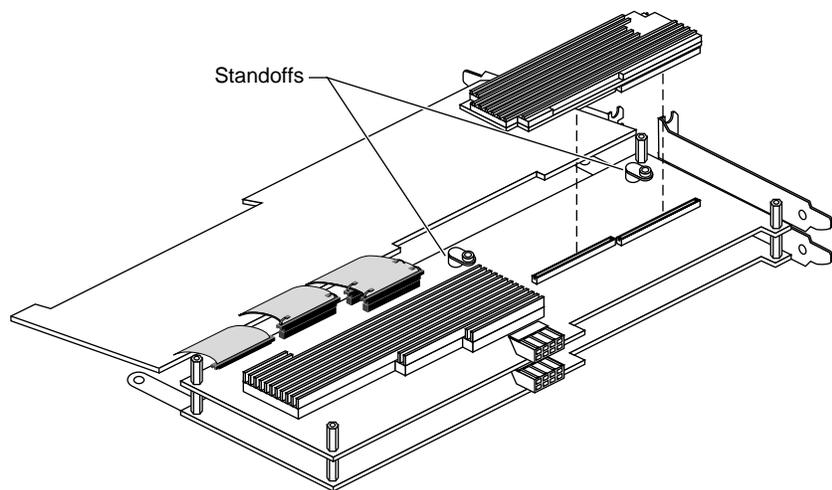
**Figure 3-6** Rotating the Top Board Back and Down

6. Locate the texture memory board. See Figure 3-7
7. Remove the texture memory option board from the middle board of the graphics board set.
  - Remove the push pins by pulling them up. See Figure 3-7.
  - Grasp the pins and pull up to remove them. The pins fit tightly into their sockets and may be hard to pull out.



**Figure 3-7** Locating the Texture Memory Option Board

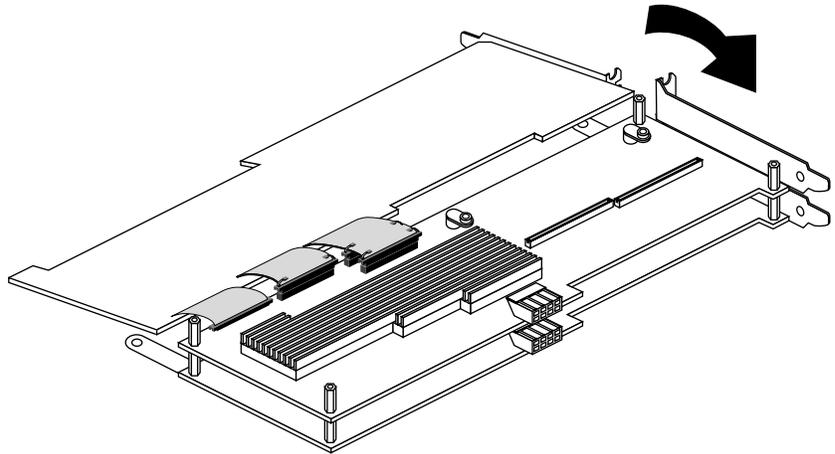
8. Remove the texture memory option board.
  - Slide your fingers under the long edge of the texture memory board that faces the midplane.
  - Push up as you slide your fingers under the edge of the board until the board is disconnected from the graphics board. See Figure 3-8.



**Figure 3-8** Removing the Texture Memory Option Board

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

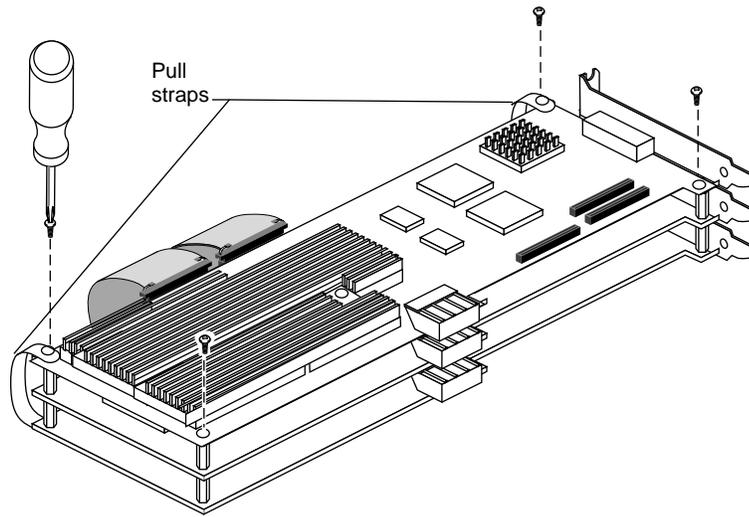
9. Rotate the top board back into place above the middle board. See Figure 3-9.



**Figure 3-9** Rotating the Top Board Into Place

10. Reconnect the pull straps to the top board.
  - Align the pull strap holes over the screw holes to the standoffs.
  - Press on the end of the pull straps, causing the strap to adhere to the board.

11. Replace the screws in the standoffs. See Figure 3-10.
12. Replace the I/O panel.
  - Slide the panel over the connectors.
  - Replace the I/O screws, using the I/O wrench.



**Figure 3-10** Replacing the Screws in the Standoffs

To install a new texture memory option board, replace any option boards and the graphics board set, remove the wrist strap, replace the cover, and turn on your Indigo<sup>2</sup> IMPACT workstation, see Chapter 1, “Upgrading the Texture Memory Option Board: High IMPACT to Maximum IMPACT.”

## Returning Parts to Silicon Graphics

If you are asked by your service representative to return a part, see Chapter 9 of your *Indigo<sup>2</sup> IMPACT Workstation Owner's Guide*



## Regulatory Information

### Manufacturer's Regulatory Declarations for the Indigo<sup>2</sup> IMPACT Graphics Boards

The Indigo<sup>2</sup> IMPACT texture memory option board conforms to several national and international specifications and European Directives listed on the "Manufacturer's Declaration of Conformity," which is included with each product. The CE insignia displayed on each device is an indication of conformity to the aforementioned European requirements.

A new "Manufacturer's Declaration of Conformity" may be provided with upgrade option packages and contains upgraded information pertaining to your new workstation configuration.

**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 Silicon Graphics. If you do, you may lose these approvals and your governmental agency authority to operate this device.

### Electromagnetic Emissions

This device complies with the Class A limits of Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

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

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

This device complies with Class A electromagnetic emissions limits of C.I.S.P.R. Publication 22, Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment, Germany's BZT Class A limits for Information Technology Equipment, and with Japan's VCCI Class 1 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。

### **Radio and Television Interference**

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

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

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

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

- Turn the television or radio antenna until the interference stops.
- Move the workstation to one side or the other of the radio or television.
- Move the workstation farther away from the radio or television.
- Plug the workstation into an outlet that is on a different circuit from the radio or television. (That is, make certain the workstation and the radio or television are on circuits controlled by different circuit breakers or fuses.)

### **Shielded Cables**

The Indigo<sup>2</sup> IMPACT workstation is FCC-compliant under test conditions that include the use of shielded cables between Indigo<sup>2</sup> IMPACT and its peripherals. Your Indigo<sup>2</sup> IMPACT and any peripherals you purchase from Silicon Graphics have shielded cables. Shielded cables reduce the possibility of interference with radio, television, and other devices. If you use any cables that are not from Silicon Graphics, make sure they are shielded. Telephone cables do not need to be shielded.

In Germany, a shielded cable must be used on the Ethernet 10-BASE-T port.

The monitor cable supplied with your system uses additional filtering molded into the cable jacket to reduce radio frequency interference. Always use the cable supplied with your system. If your monitor cable becomes damaged, obtain a replacement cable from Silicon Graphics.

### **Electrostatic Discharge**

Silicon Graphics designs and tests its products to be immune to effects of electrostatic discharge (ESD). ESD is a source of electromagnetic interference and can cause problems ranging from data errors and lockups to permanent component damage.

It is important that while you are operating your Indigo<sup>2</sup> IMPACT workstation you keep all the covers and doors, including the plastics, in

place. The shielded cables that came with the workstation and its peripherals should be installed correctly, with all thumbscrews fastened securely.

An ESD wrist strap is included with some products, such as memory and graphics upgrades. The wrist strap is used when installing these upgrades to prevent the flow of static electricity, and it should protect your system from ESD damage.

---

## Tell Us About This Manual

As a user of Silicon Graphics products, you can help us to better understand your needs and to improve the quality of our documentation.

Any information that you provide will be useful. Here is a list of suggested topics:

- General impression of the document
- Omission of material that you expected to find
- Technical errors
- Relevance of the material to the job you had to do
- Quality of the printing and binding

Please send the title and part number of the document with your comments. The part number for this document is 007-3079-002.

Thank you!

## Three Ways to Reach Us

- To send your comments by **electronic mail**, use either of these addresses:
  - On the Internet: [techpubs@sgi.com](mailto:techpubs@sgi.com)
  - For UUCP mail (through any backbone site): *[your\_site]!sgi!techpubs*
- To **fax** your comments (or annotated copies of manual pages), use this fax number: 650-965-0964
- To send your comments by **traditional mail**, use this address:

Technical Publications  
Silicon Graphics, Inc.  
2011 North Shoreline Boulevard, M/S 535  
Mountain View, California 94043-1389