

IBM TotalStorage™ Network Attached Storage  
Models 200 and 225



# Service Guide



IBM TotalStorage™ Network Attached Storage  
Models 200 and 225



# Service Guide

**NOTE:** Before using this information and the product it supports, be sure to read the general information and safety notices in "Appendix D. Notices" on page 119.

**First Edition (June 2001)**

This edition applies to Version 1, Release 1, of the IBM TotalStorage Network Attached Storage 200 and to all subsequent releases and modifications until otherwise indicated in new editions.

Order publications through your IBM representative or the IBM branch office servicing your locality. Publications are not stocked at the address below.

IBM welcomes your comments. A form for reader's comments is provided at the back of this publication. If the form has been removed, you may address your comments to:

International Business Machines Corporation  
Design & Information Development  
Department CGFA  
PO Box 12195  
Research Triangle Park, NC 27709-9990  
U.S.A.

You can also submit comments to [www.ibm.com/networking/support/feedback.nsf/docsoverall](http://www.ibm.com/networking/support/feedback.nsf/docsoverall).

When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

© Copyright International Business Machines Corporation 2001. All rights reserved.

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

---

# Contents

<b>About this book</b> . . . . .	vii
Who should read this guide . . . . .	vii
Safety precautions. . . . .	vii
Frequently used terms . . . . .	viii
Publications . . . . .	ix
Hardcopy publications shipped with the Network Attached Storage Models 200 and 225 . . . . .	ix
Related publications . . . . .	ix
Accessibility . . . . .	ix
Web sites . . . . .	ix
Getting help online. . . . .	ix
Other helpful sites . . . . .	ix
<b>Figures.</b> . . . . .	xi
<b>Tables.</b> . . . . .	xiii
<b>Chapter 1. Troubleshooting</b> . . . . .	1
Appliance controls and indicators . . . . .	1
Operator information panel . . . . .	5
Diagnostic tools overview . . . . .	6
POST beep codes, error messages, and error logs . . . . .	6
Light-path diagnostics . . . . .	6
AC and DC Power LEDs. . . . .	7
Diagnostics panel . . . . .	7
Light-path diagnostics table. . . . .	7
Diagnostic programs and error messages . . . . .	7
Error code format . . . . .	8
Text messages . . . . .	8
Starting the diagnostic programs . . . . .	9
Viewing the test log . . . . .	10
Diagnostic error message tables . . . . .	10
Ethernet controller messages. . . . .	11
NDIS 4.0 (Windows NT) driver messages . . . . .	11
Power checkout . . . . .	11
Temperature checkout . . . . .	12
Troubleshooting the IDE drive . . . . .	12
Symptoms . . . . .	12
Running IDE diagnostics . . . . .	12
<b>Chapter 2. Using the Recovery Enablement Diskette and Recovery CD</b> . . . . .	13
<b>Chapter 3. Symptom-to-part index</b> . . . . .	15
Beep codes and their meanings . . . . .	15
Symptoms that have no beep codes . . . . .	18
Information panel System Error LED . . . . .	18
Diagnostic error codes . . . . .	21
Error symptoms . . . . .	26
Power Supply LED errors . . . . .	27
POST error codes. . . . .	29
SCSI error codes . . . . .	36
Temperature error messages. . . . .	37
Fan error messages . . . . .	37

Power error messages . . . . .	38
System shutdown . . . . .	39
Voltage related system shutdown . . . . .	39
Temperature related system shutdown . . . . .	39
DASD checkout . . . . .	40
Host Built-In Self-Test (BIST). . . . .	40
Bus fault messages . . . . .	40
Undetermined Problems . . . . .	41
<b>Chapter 4. Adding and replacing components . . . . .</b>	<b>43</b>
Before you begin . . . . .	43
Safety information . . . . .	43
System reliability considerations . . . . .	43
Working inside an appliance while power is on . . . . .	44
Major components of the Network Attached Storage 200 . . . . .	45
Adding or removing internal hardware components . . . . .	51
Removing the cover (Model 200) . . . . .	51
Removing the cover (Model 225) . . . . .	53
Removing the door and bezel (Model 200). . . . .	54
Removing the bezel (Model 225) . . . . .	55
Installing internal drives. . . . .	55
Installing a non-hot-swap drive or CD-ROM . . . . .	60
Replacing hot-swap power supplies . . . . .	62
Replacing the ServeRAID controller . . . . .	66
Installing adapters. . . . .	71
Installing or replacing a microprocessor . . . . .	75
Replacing the battery . . . . .	76
Replacing the fan assembly . . . . .	78
Replacing the cover, door, and bezel . . . . .	80
Connecting external options . . . . .	83
Installation procedure . . . . .	83
Input/output connector locations . . . . .	83
Input/output ports . . . . .	84
Removing the external LED card . . . . .	86
Removing the power reset card. . . . .	87
Removing the rear cable bracket . . . . .	88
Removing the DASD backplane assembly . . . . .	89
Removing the power supply backplane . . . . .	90
Removing the system board . . . . .	91
<b>Chapter 5. Configuring the appliance . . . . .</b>	<b>93</b>
Starting and stopping the appliance . . . . .	93
Starting the appliance . . . . .	93
Stopping the appliance . . . . .	94
Using the Configuration/Setup Utility program . . . . .	94
Starting the Configuration/Setup Utility program . . . . .	95
Choices available from the Configuration/Setup main menu . . . . .	96
Using passwords . . . . .	99
Bypassing an unknown power-on password . . . . .	101
Using the SCSISelect utility program . . . . .	101
Starting the SCSISelect utility program. . . . .	101
Choices available from the SCSISelect menu . . . . .	101
<b>Appendix A. Rack Installation Instructions . . . . .</b>	<b>105</b>
<b>Appendix B. Parts Listings . . . . .</b>	<b>109</b>

Assembly 1: 5194 - 200 Network Attached Storage Appliance . . . . .	110
Assembly 2: 5194 - 225 Network Attached Storage Appliance . . . . .	112
Assembly 3: 5194 - EXU Network Attached Storage Expansion Unit . . . . .	115
<b>Appendix C. Specifications</b> . . . . .	<b>117</b>
Dimensions . . . . .	117
Weight . . . . .	117
Operating environment . . . . .	117
Nonoperating (power-off) environment . . . . .	117
Heat output . . . . .	117
Power requirements . . . . .	117
<b>Appendix D. Notices</b> . . . . .	<b>119</b>
Safety and environmental notices . . . . .	120
Safety notices . . . . .	120
Environmental notices . . . . .	156
Trademarks. . . . .	158
<b>Index</b> . . . . .	<b>159</b>





---

## About this book

This guide describes the service procedures for the IBM TotalStorage™ Network Attached Storage 200.

---

## Who should read this guide

This guide is intended for trained service personnel.

---

## Safety precautions

Be sure to read all caution and danger statements in this publication before performing any of the instructions.

Leia todas as instruções de cuidado e perigo antes de executar qualquer operação.

---

### 注意和危险声明 (简体中文)

重要事项:

本书中的所有注意和危险声明之前都有编号。该编号用于英语的注意或危险声明与 *Safety Information* 一书中可以找到的翻译版本的注意或危险声明进行交叉引用。

例如，如果一个注意声明以编号 1 开始，那么对该注意声明的翻译出现在 *Safety Information* 一书中的声明 1 中。

在按说明执行任何操作前，请务必阅读所有注意和危险声明。

---

### 注意及危險聲明 (中文)

重要資訊:

本書中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用，英文「注意」或「危險」聲明可在「安全資訊」(Safety Information) 一書中找到相同內容的「注意」或「危險」聲明的譯文。

例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在「安全資訊」(Safety Information) 一書的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Accertarsi di leggere tutti gli avvisi di attenzione e di pericolo prima di effettuare qualsiasi operazione.

### 주의 및 위험 경고문(한글)

#### 중요:

이 책에 나오는 모든 주의 및 위험 경고문은 번호로 시작됩니다. 이 번호는 *Safety Information* 책에 나오는 영문판 주의 및 위험 경고문과 한글판 주의 및 위험 경고문을 상호 참조하는데 사용됩니다.

예를 들어 주의 경고문이 번호 1로 시작되면 *Safety Information* 책에서 이 주의 경고문은 경고문 1번 아래에 나옵니다.

지시를 따라 수행하기 전에 먼저 모든 주의 및 위험 경고문을 읽도록 하십시오.

Lea atentamente todas las declaraciones de precaución y peligro ante de llevar a cabo cualquier operación.

---

## Frequently used terms

The following list of terms, used within this document, have these specific meanings:

Term	Definition in this document
<b>Drive bay</b>	A receptacle into which you insert a hard disk drive in an appliance. The bays could be physically located in a separate rack from the appliance.
<b>Engine</b>	The processor that responds to requests for data from clients. This is where the operating software for the Network Attached Storage 200 appliance resides.
<b>Storage unit</b>	Hardware that contains one or more drive bays, power supplies, and a network interface. Some storage units contain a RAID controller. There are no other components in a storage unit, and it is accessed by a NAS appliance.
<b>Notes</b>	These notices provide important tips, guidance, or advice.
<b>Attention</b>	These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
<b>Caution</b>	These notices indicate situations that can be potentially hazardous to you. A caution notice is placed just before descriptions of potentially hazardous procedure steps or situations.
<b>Danger</b>	These notices indicate situations that can be potentially lethal or extremely hazardous to you. A danger notice is placed just before descriptions of potentially lethal or extremely hazardous procedure steps or situations.

---

## Publications

### Hardcopy publications shipped with the Network Attached Storage Models 200 and 225

The following publications are shipped in hardcopy and are also provided in softcopy form at [www.ibm.com/storage/support/nas](http://www.ibm.com/storage/support/nas):

- *IBM TotalStorage Network Attached Storage 200 Hardware Installation Guide*, GA27-4262

This publication provides procedures for setting up, cabling, and replacing components of the IBM TotalStorage Network Attached Storage Models 200 and 225.

- *Release Notes*

This document provides any changes that were not available at the time this publication was produced.

### Related publications

The following publications contain additional information about the Network Attached Storage 200:

- *IBM TotalStorage Network Attached Storage 200 User's Reference*, GA27-4263
- *IBM TotalStorage Network Attached Storage 200 Installation Guide*, GA27-4262
- *Safety Information*, 44L2247

### Accessibility

The softcopy version of this guide and the other related publications are all accessibility-enabled for the IBM Home Page Reader.

---

## Web sites

### Getting help online

[www.ibm.com/storage/support/nas](http://www.ibm.com/storage/support/nas)

Here you can visit a support page that is specific to your hardware, complete with FAQs, parts information, technical hints and tips, technical publications, and downloadable files, if applicable.

### Other helpful sites

[www.ibm.com](http://www.ibm.com)

[www.ibm.com/storage](http://www.ibm.com/storage)

[www.ibm.com/storage/support/nas](http://www.ibm.com/storage/support/nas)

[www.ibm.com/storage/nas](http://www.ibm.com/storage/nas)

[www.tivoli.com](http://www.tivoli.com)

[www.cdpi.com](http://www.cdpi.com)

Main IBM home page

IBM Storage home page

IBM NAS Support home page

IBM NAS products

Tivoli

Columbia Data Products



---

## Figures

1. Model 200 front view . . . . .	1
2. Model 225 front view . . . . .	2
3. Model 200 rear view . . . . .	3
4. Model 225 rear view . . . . .	4
5. Operator information panel. . . . .	5
6. Diagnostics panel . . . . .	7
7. Locations of major components . . . . .	45
8. System-board options connectors. . . . .	46
9. System-board internal cable connectors . . . . .	47
10. System board external port connectors. . . . .	48
11. System board switches and jumpers . . . . .	49
12. System board LED locations . . . . .	50
13. Removing the cover of the Model 200 . . . . .	51
14. Removing the cover of the Model 225 . . . . .	53
15. Removing the appliance door of the Model 200 . . . . .	54
16. Removing the bezel of the Model 225 . . . . .	55
17. Installing internal drive bays for the Model 200 . . . . .	56
18. Installing internal drive bays for the Model 225 . . . . .	56
19. Installing a hot-swap drive . . . . .	57
20. Replacing a drive in a hot-swap drive bay in the Model 200 . . . . .	58
21. Installing a non-hot-swap drive. . . . .	60
22. Replacing a hot-swap power supply . . . . .	62
23. Removing a hot-swap power supply . . . . .	64
24. Installing a hot-swap power supply . . . . .	65
25. ServeRAID-4H controller . . . . .	66
26. ServeRAID-4L controller . . . . .	67
27. Inserting a ServeRAID-4H controller into the PCI expansion slot . . . . .	68
28. Connecting a ServeRAID-4H controller internal channel connector . . . . .	69
29. Connecting a ServeRAID-4H controller external channel connector . . . . .	70
30. Location of the PCI expansion slots . . . . .	72
31. Installing the adapter . . . . .	74
32. Installing an additional microprocessor . . . . .	75
33. Replacing the battery . . . . .	78
34. Installing the battery. . . . .	78
35. Replacing the fan assembly . . . . .	79
36. Replace the Model 200 cover . . . . .	80
37. Replacing the Model 225 cover . . . . .	81
38. Replacing the Model 200 bezel . . . . .	82
39. Replacing the Model 225 bezel . . . . .	83
40. Input/output connectors (ports) and expansion slots . . . . .	84
41. Setup main menu . . . . .	96
42. Rack mounting template. . . . .	105



---

## Tables

1. NDIS (Windows NT) driver messages for the Ethernet controller . . . . .	11
2. Beep codes and suggested actions . . . . .	15
3. Symptoms that have no beep codes. . . . .	18
4. Panel system error LED settings . . . . .	19
5. Diagnostic error codes . . . . .	22
6. Error symptoms and suggested actions . . . . .	26
7. Power Supply LED errors and actions . . . . .	27
8. POST error codes . . . . .	29
9. SCSI error codes and actions . . . . .	36
10. Temperature errors and actions . . . . .	37
11. Fan errors and actions. . . . .	37
12. Power errors and actions . . . . .	38
13. Voltage related shutdown messages and actions . . . . .	39
14. Temperature related shutdown messages and suggested actions . . . . .	39
15. DASD checkout message and action . . . . .	40
16. Host built-in self-test message and suggested actions . . . . .	40
17. Bus fault messages and suggested actions . . . . .	40
18. Switches 1 - 8 . . . . .	49
19. Standard features of ServeRAID-4L and ServeRAID-4H . . . . .	73
20. Keyboard connector pin-number assignments . . . . .	84
21. Power-on and administrator password features . . . . .	100





# Chapter 1. Troubleshooting

This chapter provides basic troubleshooting information to help you resolve some common problems that might occur with your appliance.

## Appliance controls and indicators

Figure 1, Figure 2 on page 2, Figure 3 on page 3, and Figure 4 on page 4 illustrate the various controls and indicators on the appliance models.

**Note:** The Model 200 is also known as the tower model. The Model 225 is also known as the rack model.

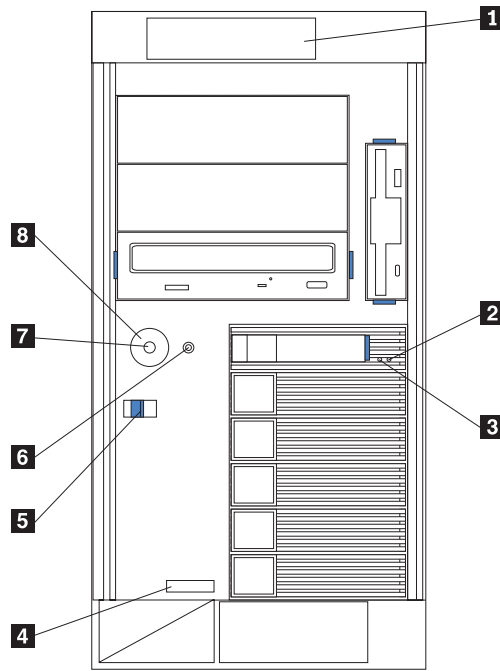


Figure 1. Model 200 front view

- 1** Operator Information panel
- 2** Hard Drive Status LED
- 3** Hard Drive Activity LED
- 4** Serial Number
- 5** Cover Release Latch
- 6** Reset Button
- 7** Power Control Button
- 8** Power Control Button Shield (if installed)

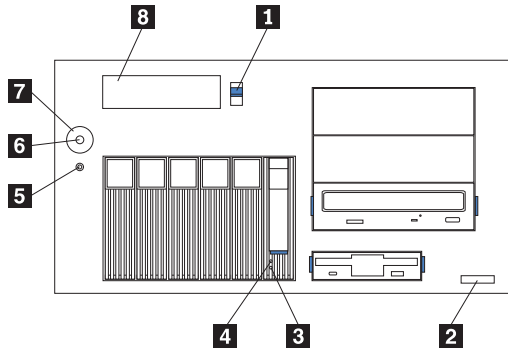


Figure 2. Model 225 front view

- 1** Cover-release latch
- 2** Serial Number
- 3** Hard Drive Status LED
- 4** Hard Drive Activity LED
- 5** Reset Button
- 6** Power Control Button
- 7** Power Control Button Shield (if installed)
- 8** Operator Information panel

**Reset Button** Press this button to reset the appliance and run the POST.

**Attention:** Press this button only when the appliance is hung. Pressing this button when the appliance is booting up or operating may make the appliance non-operational or corrupt the drives.

#### Operator Information panel

The LEDs on this panel give status information for your appliance. See “Operator information panel” on page 5 for more information.

#### Hard Drive Status LED

Each of the hot-swap drives has a Hard Drive Status LED. When this amber LED is on continuously, the drive has failed. When the LED flashes slowly (one flash per second), the drive is being rebuilt. When the LED flashes rapidly (three flashes per second), the controller is identifying the drive.

#### Hard Drive Activity LED

Each of the hot-swap drives has a Hard Drive Activity LED. When this green LED is flashing, the controller is accessing the drive.

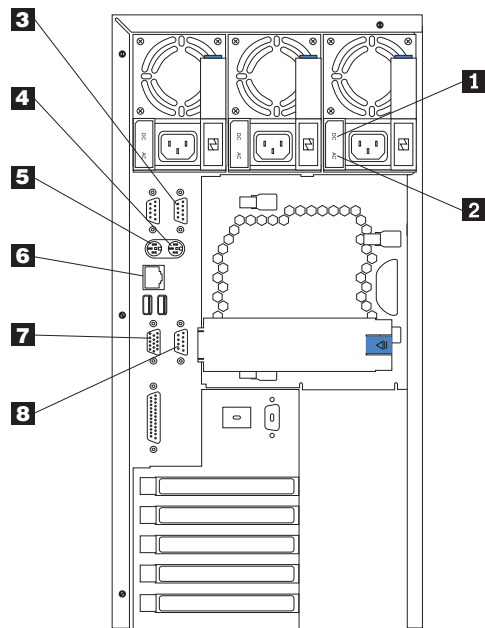


Figure 3. Model 200 rear view

**1** AC Power LED

This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on. For any other combination of LEDs, see “AC and DC Power LEDs” on page 7.

**2** DC Power LED

This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on. For any other combination of LEDs, see “AC and DC Power LEDs” on page 7.

**3** Serial Port A

**4** Mouse

**5** Keyboard

**6** Ethernet port

**7** Video

**8** Management

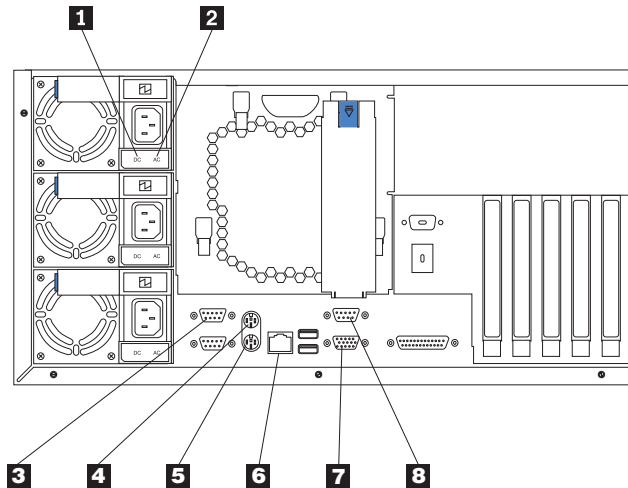


Figure 4. Model 225 rear view

**1** AC Power LED

This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on. For any other combination of LEDs, see “AC and DC Power LEDs” on page 7.

**2** DC Power LED

This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on. For any other combination of LEDs, see “AC and DC Power LEDs” on page 7.

**3** Serial Port A

**4** Mouse

**5** Keyboard

**6** Ethernet port

**7** Video

**8** Management

---

## Operator information panel

The operator information panel on the front of the appliance contains status LEDs.

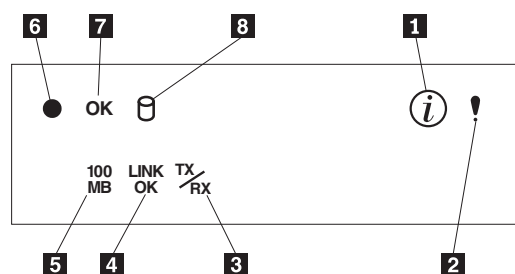


Figure 5. Operator information panel

- 1** Information LED
- 2** System Error LED
- 3** Ethernet Transmit/Receive Activity (TX/RX) LED
- 4** Ethernet Link Status (LINK OK) LED
- 5** Ethernet Speed (100 MB) LED
- 6** Power-on LED
- 7** POST Complete (OK) LED
- 8** SCSI Hard Drive In-use LED

### Information LED

This amber LED is on when the information log contains information about certain conditions in your appliance that might affect performance. For example, the LED is on if your appliance does not have redundant power. A LED on the diagnostic panel on the system board will also be on.

### System Error LED

This amber LED is on when a system error occurs. A LED on the diagnostic panel on the system board will also be on to further isolate the error.

### Ethernet Transmit/Receive Activity LED

This green LED is on when there is transmit or receive activity to or from the appliance on the Service Ethernet port.

### Ethernet Link Status LED

This green LED is on when there is an active connection on the Service Ethernet port.

### Ethernet Speed LED

This green LED is on when the Service Ethernet LAN speed is 100 Mbps.

### Power-on LED

This green LED is on when system power is present in the appliance. When this LED flashes, the appliance is in standby mode (the system power supply is turned off and AC current is present). If this LED is not on, the power cord is not connected, the power supply has failed, or this LED has failed.

### **POST Complete LED**

This green LED is on when the appliance completes the POST without any errors.

### **SCSI Hard Drive In-use LED**

This green LED is on when there is activity on a hard drive.

---

## **Diagnostic tools overview**

The following tools are available to help you identify and resolve hardware-related problems:

- POST beep codes, error messages, and error logs
- Light-path diagnostics
- Diagnostic programs and error messages

## **POST beep codes, error messages, and error logs**

**Note:** You will need to connect a keyboard and monitor to your appliance in order to see error messages.

When you switch on the appliance, it performs a series of tests to check the operation of appliance components and some of the options installed in the appliance. This series of tests is called the power-on self-test (POST).

If POST finishes without detecting any problems, a single beep sounds and the POST Complete (OK) LED on the operator information panel is on.

If POST detects a problem, more than one beep sounds and an error message appears on your screen. See “Beep codes and their meanings” on page 15 and “POST error codes” on page 29 for more information.

### **Notes:**

1. If you have a power-on password or administrator password set, you must type the password and press **Enter**, when prompted, before POST will continue.
2. A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After you correct the cause of the first error message, the other error messages usually will not occur the next time you run the test.

### **Event/error logs**

The POST error log contains the three most-recent error codes and messages that the system generated during POST. The System Event/Error Log contains all error messages issued during POST and all system status messages from the Advanced System Management Processor.

To view the contents of the error logs, start the Configuration/Setup Utility program and then select **Event/Error Logs** from the main menu.

---

## **Light-path diagnostics**

If the System Error LED on the operator information panel is on, one or more LEDs inside the appliance or on the power supplies will be on. Use the light-path diagnostics to identify the type of error that occurred.

You can use the light-path diagnostics built into your appliance to quickly identify the type of system error that occurred. Your appliance is designed so that any LEDs

that are illuminated remain that way when the appliance shuts down, provided the ac power source is good and the power supplies can supply +5V dc to the appliance. This feature helps you isolate the problem if an error causes the appliance to shut down. See “Light-path diagnostics table”.

## AC and DC Power LEDs

The AC and DC Power LEDs on the power supply provide status information about the power supply. See “Power Supply LED errors” on page 27.

## Diagnostics panel

Figure 6 shows the LEDs on the diagnostics panel on the system board. See “Information panel System Error LED” on page 18 for information on identifying problems using these LEDs.

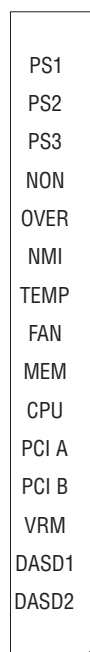


Figure 6. Diagnostics panel

## Light-path diagnostics table

The System Error LED on the operator information panel is on when certain system errors occur. If the System Error LED on your appliance is on, use the table in “Information panel System Error LED” on page 18 to help determine the cause of the error, and the action you should take.

---

## Diagnostic programs and error messages

**Note:** You will need to connect a keyboard and monitor to your appliance in order to see error messages.

The appliance diagnostic programs are stored in upgradable read-only memory (ROM) on the system board. These programs are the primary method of testing the major components of your appliance.

Diagnostic error messages indicate that a problem exists; they are not intended for use in identifying a failing part.

Sometimes the first error to occur causes additional errors. In this case, the appliance displays more than one error message. Always follow the suggested action instructions for the *first* error message that appears.

## Error code format

The error code format is as follows:

*fff-ttt-iii-date-cc-text message*

where:

*fff* is the three-digit function code that indicates the function being tested when the error occurred. For example, function code 089 is for the microprocessor.

*ttt* is the three-digit failure code that indicates the exact test failure that was encountered.

*iii* is the three-digit device ID.

*date* is the date when the diagnostic test was run and the error recorded.

*cc* is the check digit that is used to verify the validity of the information.

*text message*

is the diagnostic message that indicates the reason for the problem.

## Text messages

The diagnostic text message format is as follows:

*Function Name: Result (test-specific string)*

where:

*Function Name*

is the name of the function being tested when the error occurred. This corresponds to the function code (fff) given in the previous list.

*Result* can have one of the following values:

**Passed:** The diagnostic test completed without any errors.

**Failed:** The diagnostic test discovered an error.

**User Aborted:** You stopped the diagnostic test before it was complete.

**Not Applicable:** You specified a diagnostic test for a device that is not present.

**Aborted:** The test could not proceed because of the system configuration.

**Warning:** A possible problem was reported during the diagnostic test, such as when a device that was to be tested was not installed.

*Test-specific string*

is additional information that you can use to analyze the problem.



## Starting the diagnostic programs

Press **F1** while running the diagnostic programs to obtain Help information. You also can press **F1** from within a help panel to obtain online documentation from which you can select different categories. To exit Help and return to where you left off, press **Esc**.

To start the diagnostic programs:

1. Switch ON the appliance.
2. When the message F2 for Diagnostics appears, press **F2**.

**Note:** To run the diagnostic programs, you must start the appliance with the highest-level password that is set. That is, if an administrator password is set, you must enter the administrator password, not the power-on password, to run the diagnostic programs.

3. Type the appropriate password; then, press **Enter**.
4. Select either **Extended** or **Basic** from the top of the panel.
5. When the Diagnostic Programs panel appears, select the test you want to run from the list that appears; then, follow the instructions on the panel.

### Notes:

- a. If the appliance stops during testing and you cannot continue, restart the appliance and try running the diagnostic programs again.
- b. The keyboard and mouse (pointing device) tests assume that a keyboard and mouse are attached to the appliance.
- c. If you run the diagnostic programs with either no mouse or a USB mouse attached to your appliance, you will not be able to navigate between test categories using Next Cat and Prev Cat. All other functions provided by mouse-selectable buttons are also available using the function keys.
- d. You can test the USB keyboard and USB mouse by using the regular keyboard and mouse tests. Also, you can run the USB hub test only if there are no USB devices attached.
- e. You can view appliance configuration information (such as system configuration, memory contents, interrupt request [IRQ] use, direct memory access [DMA] use, device drivers, and so on) by selecting **Hardware Info** from the top of the panel.

When the tests have completed, you can view the Test Log by selecting **Utility** from the top of the panel.

If the hardware checks out OK, but the problem persists during normal appliance operations, an error might be the cause. If you suspect a problem, refer to the information that comes with the software package.

## Viewing the test log

The test log does not contain any information until after the diagnostic program has run.

**Note:** If you are already running the diagnostic programs, begin with step 3.

To view the test log:

1. Switch ON the appliance.  
If the appliance is on, shut down your operating system and restart the appliance.
2. When the message F2 for Diagnostics appears, press **F2**.  
If a power-on password or administrator password is set, the appliance prompts you for it. Type in the appropriate password; then, press **Enter**.
3. When the Diagnostic Programs panel appears, select **Utility** from the top of the panel.
4. Select **View Test Log** from the list that appears; then, follow the instructions on the panel.

The system maintains the test-log data while the appliance is powered on. When you switch off the appliance, the test log is cleared.

## Diagnostic error message tables

The tables in “Diagnostic error codes” on page 21 provide descriptions of the error messages that might appear when you run the diagnostic programs.

**Note:** If diagnostic error messages appear that are not listed in the tables, make sure that your appliance has the latest levels of BIOS, Advanced System Management Processor, and diagnostics microcode installed.

---

## Ethernet controller messages

The integrated Ethernet controller might display messages from the following device drivers:

- NDIS Adapter for level 4.0 (Windows NT)

## NDIS 4.0 (Windows NT) driver messages

This section contains the error messages for the NDIS 4.0 drivers. The explanation and recommended action are included with each message.

Table 1. NDIS (Windows NT) driver messages for the Ethernet controller

Message	Explanation	Action
No Secondary Adapter Found. Grouping Mode is disabled.	The failover option requires an adapter that is compatible with the device driver of the Ethernet controller on the system board. No such adapter was found.	Make sure the correct adapter is installed.
Problem Occurs on the Primary Adapter. Switching over to the Secondary Adapter.	The system detected a problem with the primary Ethernet connection and has transferred all network traffic to the secondary Ethernet controller	Identify the cause of the failure on the primary Ethernet connection. Restoring the operational state of the primary connection will cause the network traffic to automatically transfer to the primary Ethernet controller.
Switching back to Primary Adapter.	The primary Ethernet connection is now operating correctly. Network traffic will automatically transfer to the primary Ethernet controller.	None needed, message is for information only.

---

## Power checkout

Power problems can be difficult to troubleshoot. For example, a short circuit can exist anywhere on any of the power distribution buses. Usually, a short circuit will cause the power subsystem to shut down because of an overcurrent condition.

A general procedure for troubleshooting power problems is as follows:

1. Switch OFF the system and disconnect the ac cords.
2. Check for loose cables in the power subsystem. Also check for short circuits; for example, if there is a loose screw causing a short circuit on a circuit board.
3. Remove adapters and disconnect the cables and power connectors to all internal and external devices until the system is at the minimum configuration required for power-on (see page 41).
4. Reconnect the ac cord and switch ON the system. If the system starts successfully, replace adapters and devices one at a time until the problem is isolated. If the system does not start from minimal configuration, replace parts of the minimal configuration one at a time until the problem is isolated.

To use this method it is important to know the minimum configuration required for a system to start (see page 27). For specific problems, see “Power error messages” on page 38.

---

## Temperature checkout

Proper cooling of the system is important for proper operation and system reliability. For a typical appliance, you should make sure that:

- Each of the drive bays has either a drive or a filler panel installed.
- Each of the power supply bays has either a power supply or a filler panel installed.
- The top cover is in place during normal operation.
- There is at least 50 mm (2 in.) of ventilated space at the sides of the appliance and 100 mm (4 in.) at the rear of the appliance.
- The top cover is removed for no longer than 30 minutes while the appliance is operating.
- The processor housing cover covering the processor and memory area is removed for no longer than 10 minutes while the appliance is operating.
- A removed hot-swap drive is replaced within 2 minutes of removal.
- Cables for optional adapters are routed according to the instructions provided with the adapters (ensure that cables are not restricting air flow).
- The fans are operating correctly and the air flow is good.
- A failed fan is replaced within 48 hours.

In addition, ensure that the environmental specifications for the system are met. See “Appendix C. Specifications” on page 117.

For more information on specific temperature error messages, see “Temperature error messages” on page 37.

---

## Troubleshooting the IDE drive

This section describes symptoms and diagnostics. See “Installing a non-hot-swap drive or CD-ROM” on page 60 for information on replacing an IDE drive.

### Symptoms

The following symptoms may indicate a problem with your IDE drive:

- You can no longer ping the appliance from the management workstation.
- The system appears to be hung.

### Running IDE diagnostics

Follow these steps to run IDE diagnostics:

1. Attach a monitor and keyboard to the appliance.
2. Start the appliance.
3. Press **F2** for System Diagnostics. Wait until it boots. A panel saying
4. If the non-hot-swap (IDE) drive fails, you will need to replace it (see “Installing a non-hot-swap drive or CD-ROM” on page 60).
5. Download a new system image from [www.ibm.com/storage/support/nas](http://www.ibm.com/storage/support/nas) and install the new image on the network’s FTP server.
6. Run the Recovery CD (see ).

---

## Chapter 2. Using the Recovery Enablement Diskette and Recovery CD

The Recovery CD is a startable CD that contains the preload image for your Network Attached Storage 200 Models 200 and 225 and is used to recover the preloaded image on your server. You must start your appliance using the Recovery Enablement Diskette before you will be able to use the Recovery CD.

### Important

The Recovery Enablement Diskette enables the Network Attached Storage 200 Models 200 and 225 to start from the CD-ROM drive. You will not be able to restore the preload image from the Recovery CD without first restarting the appliance using the Recovery Enablement Diskette.

To recover the preloaded image on your appliance:

1. Insert the diskette into the diskette drive and restart the appliance.  
When the Recovery Enablement Diskette has completed loading and reconfiguring your appliance startup sequence the appliance will begin beeping. Do not continue with this procedure until the appliance begins beeping.
2. Remove the Recovery Enablement Diskette from the diskette drive.
3. Place the Recovery CD in the CD-ROM drive and restart the appliance.

The recovery process will begin automatically and the original manufacturing preload will be restored. After the preload image is restored the system restarts automatically and all final operating system configuration changes are performed.

### Important

After the appliance restarts a series of configuration and system preparation programs that finish configuring the NOS are run automatically. These programs must finish running before you use any included applications (such as the IBM Advanced Appliance Configuration Utility or the Terminal Services Client) to connect to or configure your Network Attached Storage 200 Models 200 and 225. Do not connect to or configure the Network Attached Storage 200 Models 200 and 225 for at least 15 minutes after system restart. This notice applies only to the first time the Network Attached Storage 200 Models 200 and 225 is started after using the Recovery CD.

**Note:** Logical Disk 0 will be configured to a 2GB NTFS boot partition. Any other previously configured logical disk drives will be left unchanged.

### Important

The Network Attached Storage 200 Models 200 and 225 is a “headless” system, meaning that there is no keyboard or mouse is attached to the appliance. Because of this, the preload image restore process cannot require interaction. Starting the Recovery CD will, without prompting the user, automatically destroy all data on the system drive. Use the Recovery Enablement Diskette and Recovery CD only when it is absolutely necessary to restore the preloaded system image.



---

## Chapter 3. Symptom-to-part index

This index lists symptoms, errors, and the possible causes. The most likely part that needs to be replaced is listed first. Use this Symptom-to-part index to help you decide which parts to have available when servicing the product.

The POST BIOS displays POST error codes and messages on the panel.

---

### Beep codes and their meanings

A beep code is an audio signal consisting of a short tone or a series of short tones separated by pauses. For example, beep code **1-2-3** consists of:

- One beep
- A pause
- Two beeps
- A pause
- Three beeps

**Note:** One beep after the POST completes successfully indicates that the system is operating correctly.

Table 2 lists the beep codes, their meanings, the suspected parts, and the suggested actions.

**Note:** The most likely suspected part is listed first.

*Table 2. Beep codes and suggested actions*

Beep code	Meaning	Possible cause
1-1-2	Processor register test failed	1. Optional processor (if installed) 2. Processor
1-1-3	CMOS write/read test failed	1. Battery 2. System board
1-1-4	BIOS ROM checksum failed	System Board
1-2-1	Programmable Interval Timer failed	1. System Board 2. Processor Board
1-2-2	DMA initialization failed	1. System Board 2. Processor Board
1-2-3	DMA page register write/read failed	1. System Board 2. Processor Board
1-2-4	RAM refresh verification failed	1. DIMM 2. Processor/PCI board 3. System Board
1-3-1	First 64K RAM test failed	1. DIMM 2. Processor/PCI Board 3. System Board

Table 2. Beep codes and suggested actions (continued)

1-3-2	First 64K RAM parity test failed	<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. Processor</li> <li>3. System Board</li> </ol>
2-1-1	Secondary DMA register failed	<ol style="list-style-type: none"> <li>1. System Board</li> <li>2. Processor Board</li> </ol>
2-1-2	Primary DMA register failed	<ol style="list-style-type: none"> <li>1. System Board</li> <li>2. Processor Board</li> </ol>
2-1-3	Primary interrupt mask register failed	<ol style="list-style-type: none"> <li>1. System Board</li> <li>2. Processor Board</li> </ol>
2-1-4	Secondary interrupt mask register failed	<ol style="list-style-type: none"> <li>1. System Board</li> <li>2. Processor Board</li> </ol>
2-2-2	Keyboard controller failed	System Board
2-2-3	CMOS power failure and checksum checks failed	<ol style="list-style-type: none"> <li>1. Battery</li> <li>2. System Board</li> </ol>
2-2-4	CMOS configuration into validation failed	<ol style="list-style-type: none"> <li>1. Battery</li> <li>2. System Board</li> </ol>
2-3-1	Screen initialization failed	<ol style="list-style-type: none"> <li>1. Jumper on J14</li> <li>2. System Board</li> </ol>
2-3-2	Screen memory failed	System Board
2-3-3	Screen retrace failed	System Board
2-3-4	Search for video ROM failed	System Board
2-4-1	Search for video ROM failed	System Board
3-1-1	Timer tick interrupt failed	System Board
3-1-2	Interval timer channel 2 failed	System Board
3-1-3	RAM test failed above address OFFFFH	<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. Processor Board</li> <li>3. System Board</li> </ol>
3-1-4	Time-of-day clock failed.	<ol style="list-style-type: none"> <li>1. Battery</li> <li>2. System Board</li> </ol>
3-2-1	Serial port failed	System Board
3-2-2	Parallel port failed	System Board
3-2-4	Failure comparing CMOS memory size against actual	<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. Processor Board</li> <li>3. Battery</li> </ol>
3-3-1	Memory size mismatch occurred	<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. Processor Board</li> <li>3. Battery</li> </ol>



Table 2. Beep codes and suggested actions (continued)

3-3-2	Critical SMBUS error occurred	Disconnect the appliance cord from the outlet, wait 30 seconds, and retry. If the symptom persists, suspect the following parts: <ol style="list-style-type: none"> <li>1. System Board</li> <li>2. Processor/PCI Board</li> <li>3. DIMMs</li> <li>4. DASD Backplane</li> <li>5. Power Supply</li> <li>6. Power Supply Backplane</li> <li>7. 12C Cable</li> </ol>
3-3-3	No operational memory in system	<ol style="list-style-type: none"> <li>1. DIMMs</li> <li>2. Processor/PCI Board</li> <li>3. System Board</li> </ol>
Two short beeps	Information only, the configuration has changed	<ol style="list-style-type: none"> <li>1. Run Diagnostics</li> <li>2. Run Configuration/Setup</li> </ol>
Three short beeps		<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. Processor/PCI Board</li> <li>3. System Board</li> </ol>
One continuous beep		<ol style="list-style-type: none"> <li>1. Processor</li> <li>2. Optional Processor (if installed)</li> <li>3. Processor/PCI Board</li> <li>4. System Board</li> </ol>
Repeating short beeps		<ol style="list-style-type: none"> <li>1. Keyboard</li> <li>2. Repeating Board</li> </ol>
One long and one short beep		<ol style="list-style-type: none"> <li>1. Video adapter (if installed)</li> <li>2. System Board</li> </ol>
One long and two short beeps		<ol style="list-style-type: none"> <li>1. Video adapter (if installed)</li> <li>2. System Board</li> </ol>
Two long and two short beeps		Video adapter

---

## Symptoms that have no beep codes

Table 3 lists symptoms with no beep codes and suggested actions.

Table 3. Symptoms that have no beep codes

No Beep System	Meaning	Suspected Parts/Suggested Actions
No beep but the system operates correctly.		Check speaker cables. If the problem persists, suspect the following parts: <ol style="list-style-type: none"><li>1. Speaker</li><li>2. System Board</li></ol>
No beeps occur after successfully completing POST.	The Power-on Status is disabled	Rerun the BIOS Configuration and Update diskette.
No ac power	Power Supply AC LED is off	Suspected parts: <ul style="list-style-type: none"><li>• Power Backplane</li><li>• Hot-Swap Power AC Inlet Box</li></ul> Suggested actions: <ol style="list-style-type: none"><li>1. Check the power cord.</li><li>2. Exchange the unlit power supply with a power supply that has a Power Supply AC LED on. This will determine if the unlit power supply is defective.</li></ol>
No beep and no video		Refer to “Undetermined Problems” on page 41.
System will not power-on	AC Power LED is on	Refer to “Power Supply LED errors” on page 27.

---

## Information panel System Error LED

The System Error LED is switched on when an error is detected. If the System Error LED is on, remove the cover and check the diagnostic panel LEDs (in the upper right corner of the system board). Table 4 on page 19 is a complete list of diagnostic panel LEDs and the suggested action.

**Note:** If a diagnostic panel LED is on and the information LED panel system error LED is off, there is probably an LED problem. Run the light-panel diagnostics by pressing **F2** (see “Light-path diagnostics” on page 6).

**Notes:**

1. To locate the LEDs on the processor board see “System board” on page 46.
2. Check the System Error Log for additional information before replacing a part.
3. The DIMM error LEDs, processor error LEDs, and VRM error LEDs turn off when the system is switched off.

Table 4 describes panel system error LED settings, their meanings, and suspected parts/suggested actions.

Table 4. Panel system error LED settings

Diagnostic Panel LED	Meaning	Suspected Part/Suggested Action
All LEDs off	The System Error Log is 75% full.	Suggested actions: 1. Clear the log 2. PFA alert a. Clear PFA alert b. Remove ac power for at least 20 seconds c. Reconnect d. Switch on the system 3. Run Information Panel diagnostics
CPU LED is on	The LED next to the failing CPU should be on.	Suspected parts: 1. Processor 1 or 2 2. Processor/PCI Board
VRM LED is on	The LED next to the failing VRM should be on.	Suspected parts: 1. Voltage regulator module indicated by the VRM LED on the processor board that is switched on 2. Processor/PCI Board 3. Processor indicated by the Processor LED
DASD1 LED is on	The LED located next to the drive bay that the failing drive is installed in should be on.	Suspected parts: 1. SCSI Backplane 2. Failing drive: SCSI channel A has failed (This is the SCSI channel for the hot-swap hard disk drives)  Suggested actions: 1. Check amber drive LED for failing hard drive 2. Ensure that the fans are operating correctly and the air flow is good
DASD2 LED is on	The LED located next to the drive bay that the failing drive is installed in is on.	Suspected parts: 1. SCSI Backplane 2. Failing drive: SCSI channel B has failed  Suggested actions: 1. Check amber drive LED for failing hard drive 2. Ensure the fans are operating correctly and the air flow is good
FAN LED is on		Suspected parts: 1. Fan Cable 2. Processor/PCI Board 3. System Board 4. Power Backplane Board  Suggested actions: 1. Check individual fan LEDs 2. Replace respective fan
MEM LED is on	The LED next to the failing DIMM is on.	Suspected parts: 1. Failing DIMM in slot J1 - J4 2. Processor/PCI Board

Table 4. Panel system error LED settings (continued)

Diagnostic Panel LED	Meaning	Suspected Part/Suggested Action
NMI LED is on		Suggested actions: 1. Reboot the system 2. Check the System Error Log
PCI A LED is on		Suspected parts: 1. PCI Card in slot 5 2. Processor/PCI Board 3. System Board  Suggested action: Remove all PCI adapters from slots 1–5
PCI B LED is on		Suspected parts: 1. System Board 2. Processor/PCI Board 3. Card in slots 3–5  Suggested action: Remove all PCI adapters from slots 1–5
PCI C LED is on		Suspected parts: 1. Processor/PCI Board 2. I/O Legacy Board Suggested action: Remove all PCI adapters from slots 1–5
PS1 LED is on		Suspected part: Power Backplane Suggested action: Check the DC Power LED on power supply 1. If it is off, replace power supply 1.
PS2 LED is on		Suspected part: Power Backplane Suggested action: Check the DC Power LED on power supply 2. If off, replace power supply 2.
OVER LED is on		Suggested action: Install an optional additional power supply, or remove optional devices from the appliance.
SMI LED is on		Suggested action: Reboot the system

Table 4. Panel system error LED settings (continued)

Diagnostic Panel LED	Meaning	Suspected Part/Suggested Action
TEMP LED is on	Look at the test cases.	<p>Suspected parts:</p> <ol style="list-style-type: none"> <li>1. Processor/PCI Board</li> <li>2. I/O Legacy Board</li> </ol> <p>Suggested actions:</p> <ol style="list-style-type: none"> <li>1. Ambient temperature is within normal operating specifications. See "Appendix C. Specifications" on page 117.</li> <li>2. Ensure that fans are operating correctly.</li> <li>3. Examine the System Error Log.               <ol style="list-style-type: none"> <li>a. System is over the recommended temperature.                   <ol style="list-style-type: none"> <li>1) Information LED Panel.</li> <li>2) I/O Legacy Board.</li> </ol> </li> <li>b. DASD is over the recommended temperature (the DASD LED is also on).                   <ol style="list-style-type: none"> <li>1) Overheating hard drive</li> <li>2) DASD Backplane.</li> <li>3) I/O Legacy Board.</li> </ol> </li> <li>c. System is over the recommended temperature for CPU X (where X is CPU 1, 2, 3, or 4) (CPU LED also on).                   <ol style="list-style-type: none"> <li>1) CPU X.</li> <li>2) Processor/PCI Board</li> </ol> </li> <li>d. The I/O Legacy Board is over the recommended temperature.</li> </ol> </li> <li>4. If the CPU LED on the diagnostics panel is also on, one of the microprocessors has caused the error.</li> </ol>

## Diagnostic error codes

**Note:** In the following error codes, if *XXX* is 000, 195, or 197, *do not* replace a part. These error codes have the following meanings:

**000** The test passed.

**195** **Esc** was pressed to end the test.

**197** This is a warning error and may not indicate a hardware failure.

For all other error codes, replace the part or perform the actions indicated.

Table 5 describes diagnostic error codes and their suggested actions.

Table 5. Diagnostic error codes

Error Code	Meaning	Suspected Part/Suggested Actions
001-XXX-000	Failed core tests	Suspected part: 1. Processor/PCI Board 2. System Board
001-XXX-001	Failed core tests	Suspected part: Processor/PCI Board
001-250-000	Failed System Board ECC	Suspected part: 1. Processor/PCI Board 2. System Board
001-250-001	Failed Processor Board ECC	Suspected part: 1. Processor/PCI Board 2. System Board
005-XXX-000	Failed Video test	Suspected part: 1. System Board 2. Processor Board
011-XXX-000	Failed COM1 Serial Port test	Suspected part: System Board
011-XXX-001	Failed COM2 Serial Port test	Suspected part: System Board
014-XXX-000	Failed Parallel Port test	Suspected part: System Board
015-XXX-001	Failed USB test	Suspected part: System Board
020-XXX-000	Failed PCI Interface test	Suspected part: 1. Processor/PCI Board 2. System Board
020-XXX-001	Failed Hot-Swap Slot 1 LED Latch test.	Suspected part: 1. PCI Hot-Swap Latch Assembly 2. System Board
020-XXX-002	Failed Hot-Swap Slot 2 PCI Latch test	Suspected part: 1. PCI Hot-Swap Latch Assembly 2. System Board
020-XXX-003	Failed Hot-Swap Slot 3 PCI Latch test	Suspected part: 1. PCI Hot-Swap Latch Assembly 2. System Board
020-XXX-004	Failed Hot-Swap Slot 4 PCI Latch test	Suspected part: 1. PCI Hot-Swap Latch Assembly 2. System Board
030-XXX-000	Failed Internal SCSI interface test	Suspected part: System Board
030-XXX-00N	Failed SCSI test on PCI slot N	Suspected part: Adapter Suggested action: Check system error log before replacing a part.

Table 5. Diagnostic error codes (continued)

Error Code	Meaning	Suspected Part/Suggested Actions
035-XXX-099	No adapters were found	Suggested action: If the adapter is installed, re-check connection.
035-XXX-S99	Failed RAID test on PCI slot S	<b>Note:</b> Check the System Error Log before replacing a part. Suspected part: 1. Cable 2. SCSI Backplane 3. Adapter
035-XXX-SNN	NN = SCSI ID of failing hard disk	<b>Note:</b> Check the System Error Log before replacing a part. Suspected part: Hard Disk with SCSI ID NN on RAID adapter in PCI slot S.
035-253-S99	RAID adapter initialization failure; ServeRAID Adapter in slot S is not configured properly	Suspected part: 1. Cable 2. SCSI Backplane 3. Adapter  Suggested action: Obtain the basic and extended configuration status and refer to the <i>ServeRAID Hardware Maintenance Manual</i> for more information.
075-XXX-000	Failed Power Supply test	Suspected part: Power Supply
089-XXX-001	Failed Microprocessor test	Suspected part: 1. VRM 1 2. Microprocessor 1
089-XXX-002	Failed Microprocessor test	Suspected part: 1. VRM 2 2. Microprocessor 2
165-XXX-000	Failed Service Processor test	Suspected part: 1. System Board. <b>Note:</b> Before replacing the System Board, ensure that System Board jumper J-45 (the default) is not installed when the error occurs. 2. Processor Board 3. Power Backplane 4. Hot-Swap Drive Backplane
180-XXX-000	Diagnostics LED failure	Suspected part: Power Switch Assembly  Suggested action: Run the light-path diagnostics test for the failing LED (see "Light-path diagnostics" on page 6).
180-XXX-001	Failed information LED panel test	Suspected part: 1. Information LED panel 2. Diagnostic LED panel
180-XXX-002	Failed Diagnostics LED Panel test	Suspected part: 1. Diagnostics LED Panel 2. Power Switch Assembly
180-XXX-003	Failed System Board LED test	Suspected part: System Board

Table 5. Diagnostic error codes (continued)

Error Code	Meaning	Suspected Part/Suggested Actions
180-XXX-004	Failed Processor Board LED test	Suspected part: 1. Processor/PCI Board 2. System Board
180-XXX-005	Failed SCSI Backplane LED test	Suspected part: 1. SCSI Backplane 2. SCSI Backplane Cable 3. System Board
180-XXX-006	Memory Board LED test	Suspected part: 1. Memory 2. Processor/PCI Board 3. System Board
201-XXX-0NN	Failed Memory test	Suspected part: 1. DIMM Location DIMM1 - DIMM4 where <i>NN</i> can be a value from 01 to 04. 01 = DIMM2, 02 = DIMM1, 03 = DIMM4, 04 = DIMM3 2. System Board
201-XXX-999	Multiple DIMM failure; see error text for failing DIMMs	Suspected part: System Board
202-XXX-001	Failed System Cache test	Suspected part: 1. VRM 1 2. Microprocessor 1
202-XXX-002	Failed System Cache test	Suspected part: 1. VRM 2 2. Microprocessor 2
206-XXX-000	Failed Diskette Drive test	Suspected part: 1. Cable 2. Diskette Drive 3. System Board
215-XXX-000	Failed IDE CD-ROM test	Suspected part: 1. CD-ROM Drive Cables 2. CD-ROM Drive 3. System Board
217-XXX-000	Failed BIOS Hard Disk test <b>Note:</b> If RAID is configured, the hard disk number refers to the RAID logical array.	Suspected part: Hard Disk 1
217-XXX-001	Failed BIOS Hard Disk test <b>Note:</b> If RAID is configured, the hard disk number refers to the RAID logical array.	Suspected part: Hard Disk 2
217-XXX-002	Failed BIOS Hard Disk test. <b>Note:</b> If RAID is configured, the hard disk number refers to the RAID logical array	Suspected part: Hard Disk 3



Table 5. Diagnostic error codes (continued)

Error Code	Meaning	Suspected Part/Suggested Actions
217-XXX-003	Failed BIOS Hard Disk test <b>Note:</b> If RAID is configured, the hard disk number refers to the RAID logical array.	Suspected part: Hard Disk 4
217-XXX-004	Failed BIOS Hard Disk test <b>Note:</b> If RAID is configured, the hard disk number refers to the RAID logical array.	Suspected part: Hard Disk 5
264-XXX-0NN	Failed Tape Drive test	Suspected part: <ol style="list-style-type: none"> <li>1. Tape Cartridge, if user executed the Read/Write Tape Drive test (XXX = 256)</li> <li>2. SCSI or Power Cable connected to tape drive with SCSI ID NN.</li> <li>3. Tape Drive with SCSI ID NN (Refer to the Help and Service Information appendix of the tape drive's user guide).</li> <li>4. System Board or SCSI Controller (Run SCSI Controller Diagnostic to determine if the SCSI bus is functioning properly.)</li> </ol>
264-XXX-999	Errors on multiple tape drives	Suggested action: See error messages/text in the PC Doctor error log for detailed information on each individual tape drive error.
301-XXX-000	Failed Keyboard test	Suspected part: Keyboard
405-XXX-000	Failed Ethernet test on controller on the System Board	Suspected part: System Board  Suggested action: Verify that Ethernet is not disabled in BIOS
405-XXX-00N	Failed Ethernet test on adapter in PCI slot N	Suspected part: <ol style="list-style-type: none"> <li>1. Adapter in PCI slot N.</li> <li>2. System Board</li> </ol>
415-XXX-000	Failed Modem test	Suspected part: <ol style="list-style-type: none"> <li>1. Cable</li> <li>2. Modem <b>Note:</b> Ensure that the modem is present and attached to appliance.</li> <li>3. System Board</li> </ol>

## Error symptoms

Table 6 contains information on error symptoms and suggested actions.

Table 6. Error symptoms and suggested actions

Error Symptom	Suspected Part/Suggested Action
CD is not working properly	Suggested action 1. Clean the CD 2. Run CD-ROM Diagnostic
CD-ROM drive tray is not working	Suspected part: CD-ROM Drive  Suggested action: 1. Ensure the appliance is switched ON 2. Insert the end of a paper clip into the manual tray-release opening 3. Run CD-ROM Diagnostic
CD-ROM drive is not recognized	Suspected part: 1. CD-ROM Drive 2. System Board  Suggested action: 1. Run Configuration/Setup, enable primary IDE channel 2. Check cables and jumpers 3. Check for correct device driver 4. Run CD-ROM diagnostics
Power switch does not work and reset button does work.	Suspected part: 1. Power Switch Assembly 2. System Board  Suggested action: Verify that the power-on control jumper on J23 extension cable is on pins 1 and 2
Diskette drive in-use LED stays on, or the system bypasses the diskette drive, or the diskette drive does not work.	Suspected part: 1. Cable 2. Diskette Drive 3. System Board  Suggested action: 1. If there is a diskette in the drive, verify that: a. The diskette drive is enabled in the Configuration/Setup utility program b. The diskette is good and not damaged (try another diskette if you have one) c. The diskette is inserted correctly in the drive d. The diskette contains the necessary files to start the appliance e. The program is OK f. The cable is installed correctly (proper orientation) 2. Run Diskette Drive Diagnostics

Table 6. Error symptoms and suggested actions (continued)

Error Symptom	Suspected Part/Suggested Action
Monitor problems (general)	<p>Suspected part: Monitor</p> <p><b>Note:</b> Some IBM monitors have their own self-tests. If you suspect a problem with the monitor, refer to the information that comes with the monitor for adjusting and testing instructions.</p> <p>Suggested action:</p> <ol style="list-style-type: none"> <li>1. Run Video Diagnostics</li> </ol> <p><b>Note:</b> If the diagnostics pass, the problem may be a video driver</p> <ol style="list-style-type: none"> <li>2. Display Adapter/System Board</li> </ol>

## Power Supply LED errors

Use the Power Supply LED information in the following section to troubleshoot power supply problems.

- Minimum configuration requirements:** The minimum configuration required for the DC Power LED to come on is:
- Power Supply
  - Power Backplane
  - Processor/PCI Board (With pins 2 and 3 on J23 extension cable connected together to bypass the power switch.
  - Processor/PCI Board (Verify that Processor/PCI Board and System Board are properly connected together.

Table 7 describes Power Supply LED errors and actions.

Table 7. Power Supply LED errors and actions

AC Power LED	DC Power LED	Description	Part/Action
Off	Off	No power to system or ac problem	<p>Suspected part:</p> <ol style="list-style-type: none"> <li>1. Power Supply</li> <li>2. Power Backplane</li> <li>3. Power ac Inlet Box</li> </ol> <p>Suggested action: Check ac power to system</p>

Table 7. Power Supply LED errors and actions (continued)

AC Power LED	DC Power LED	Description	Part/Action
On	Off	Standby mode or dc problem	<p>Suspected part:</p> <ol style="list-style-type: none"> <li>1. Power Supply</li> <li>2. Power Backplane</li> <li>3. System Board</li> <li>4. Processor Board</li> </ol> <p>Suggested action:</p> <ol style="list-style-type: none"> <li>1. Check processor board cable connector, J33. Move jumper on the J32 extension cable to pins 2 and 3 to bypass power control. If the DC Good LED comes on, press <b>Ctrl+Alt+Delete</b>. Watch the screen for any POST errors. Check the System Error Log for any listed problems. If the system powers up with no errors:               <ol style="list-style-type: none"> <li>a. Power Switch Assembly</li> <li>b. System Board</li> </ol> </li> <li>2. Remove the adapters and disconnect the cables and power connectors to all internal and external devices. Power-on the system. If the DC Power LED comes on, replace the adapters and devices one at a time until you isolate the problem.</li> </ol>
On	On	Power is OK	N/A

## POST error codes

Table 8 describes POST error codes and their suggested actions. *X* can be any number or letter.

Table 8. POST error codes

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
062	Three consecutive boot failures using the default configuration	Suspected part: 1. Battery 2. System Board 3. Processor/PCI Board 4. Processor Suggested action: Run Configuration/Setup
101, 102	System and processor error	Suspected part: 1. System Board 2. Processor/PCI Board
106	System and processor error	Suspected part: 1. System Board 2. Processor/PCI Board
111	Channel check error	Suspected part: 1. Failing ISA Adapter 2. Memory DIMM 3. System Board
114	Adapter read-only memory error	Suspected part: 1. Failing Adapter 2. Run Diagnostics
129	Internal cache error	Suspected part: 1. Processor 2. Optional Processor (if installed) 3. Processor Board
151	Real time clock error	Suspected part: 1. Battery 2. System Board Suggested action: Run Diagnostics
161	Real time clock battery error	Suspected part: 1. Battery 2. System Board Suggested action: Run Configuration/Setup
162	Device Configuration error	Suspected part: 1. Battery 2. Failing Device 3. System Board Suggested action: Run Configuration/Setup <b>Note:</b> Be sure to load the default settings and any additional desired settings; then, <i>save the configuration</i> .

Table 8. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
163	Real-Time Clock error	Suspected part: 1. Battery 2. System Board  Suggested action: Run Configuration/Setup
164	Memory configuration changed	Suspected part: 1. DIMM 2. Processor/PCI Board  Suggested action: Run Configuration/Setup
175	Hardware error	Suspected part: 1. System Board 2. Processor/PCI Board
176	Computer cover or cable cover was removed without a key being used	Suspected part: 1. System Board 2. C2 Security Switch  Suggested action: Run Configuration/Setup
177, 178	Security hardware error	Suspected part: System Board  Suggested action: Run Configuration/Setup
184	Power-on password corrupted	Suspected part: System Board  Suggested action: Run Configuration/Setup
185	Drive startup sequence information corrupted	Suspected part: System Board  Suggested action: Run Configuration/Setup
186	Security hardware control logic failed	Suspected part: System Board  Suggested action: Run Configuration/Setup
187	VPD serial number not set	Suspected part: System Board  Suggested action: Set serial number in Setup
188	Bad EEPROM CRC #2	Suspected part: System Board  Suggested action: Run Configuration/Setup
189	An attempt was made to access the appliance with invalid passwords	Suggested action: Run Configuration/Setup, enter the administrator password
201	Memory test error	Suspected part: 1. DIMM 2. Processor/PCI Board 3. System Board  Suggested action: If the appliance does not have the latest level of BIOS installed, update the BIOS to the latest level and run the diagnostic program again.

Table 8. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
229	Cache error	Suspected part: 1. Processor 2. Second Processor 3. Processor/PCI Board  Suggested action: Run Configuration/Setup
262	DRAM parity configuration error	Suspected part: 1. Battery 2. System Board
289	DIMM has been disabled by the user or system	Suspected part: Processor/PCI Board  Suggested action: 1. Run Configuration/Setup, if disabled by user 2. Disable DIMM, if not disabled by user
301	Keyboard or keyboard controller error	Suspected part: 1. Keyboard 2. System Board
303	Keyboard controller error	Suspected part: 1. System Board 2. Keyboard
602	Invalid diskette boot record	Suspected part: 1. Diskette 2. Diskette Drive 3. Cable 4. System Board
604	Diskette drive error	Suspected part: 1. Diskette Drive 2. Drive Cable 3. System Board  Suggested action: Run Configuration/Setup and Diagnostics
605	Unlock failure	Suspected part: 1. Diskette Drive 2. Drive Cable 3. System Board
662	Diskette drive configuration error	Suspected part: 1. Diskette Drive 2. Drive Cable 3. System Board  Suggested action: Run Configuration/Setup and Diagnostics
762	Coprocessor configuration error	Suspected part: 1. Battery 2. Processor  Suggested action: Run Configuration/Setup

Table 8. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
962	Parallel port error	Suspected part: System Board  Suggested action: 1. Disconnect external cable on parallel port. 2. Run Configuration/Setup
11XX	System board serial port 1 or 2 error	Suggested action: 1. Disconnect external cable on serial port. 2. Run Configuration/Setup 3. System Board
0001200	Machine check architecture error	Suspected part: 1. Processor 2. Optional Processor 3. Processor/PCI Board
0001295	ECC circuit check	Suspected part: Processor/PCI Board
1301	I <sup>2</sup> C cable to front panel not found	Suspected part: 1. Cable 2. Front Panel 3. Power Switch Assembly 4. System Board
1302	I <sup>2</sup> C cable from system board to power on and reset switches not found	Suspected part: 1. Cable 2. Power Switch Assembly 3. System Board
1303	I <sup>2</sup> C cable from system board to power backplane not found	Suspected part: 1. Cable 2. Power Backplane 3. System Board
1304	I <sup>2</sup> C cable to diagnostic LED board not found	Suspected part: 1. Cable 2. Diagnostic LED Board 3. Power Switch Assembly 4. System Board
1600	The Service Processor is not functioning	Suspected part: 1. System Board 2. Processor/PCI Board  Suggested action: Do the following before replacing: 1. Ensure that a jumper is not installed on J-51 2. Remove the ac power to the system, wait 20 seconds; then, reconnect the ac power. Wait 30 seconds; then, power-on the system.



Table 8. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
1601	The system is able to communicate to the Service Processor, but the Service Processor failed to respond at the start of POST	Suspected part: <ol style="list-style-type: none"> <li>1. System Board</li> <li>2. Processor/PCI Board</li> </ol> Suggested action: Do the following before replacing a part: <ol style="list-style-type: none"> <li>1. Remove the ac power to the system, wait 20 seconds; then, reconnect the ac power. Wait 30 seconds; then, power-on the system.</li> <li>2. Flash update the Service Processor.</li> </ol>
1762	Hard Disk Configuration error	Suspected part: <ol style="list-style-type: none"> <li>1. Hard Disk Cables</li> <li>2. Hard Disk Adapter</li> <li>3. Hard Disk Drive</li> <li>4. SCSI Backplane</li> <li>5. System Board</li> </ol> Suggested action: Run Configuration/Setup
178X	Hard Disk error	Suspected part: <ol style="list-style-type: none"> <li>1. Hard Disk Cables</li> <li>2. Hard Disk Adapter</li> <li>3. Hard Disk Drive</li> <li>4. System Board</li> </ol> Suggested action: Run Diagnostics
1800	No more hardware interrupt available for PCI adapter	Suspected part: <ol style="list-style-type: none"> <li>1. Failing Adapter</li> <li>2. System Board</li> </ol> Suggested action: Run Configuration/Setup
1962	Drive does not contain a valid boot sector	Suspected part: <ol style="list-style-type: none"> <li>1. Hard Disk Drive</li> <li>2. SCSI Backplane</li> <li>3. Cable</li> <li>4. System Board</li> </ol> Suggested action: <ol style="list-style-type: none"> <li>1. Verify a bootable operating system is installed.</li> <li>2. Run Diagnostics</li> </ol>
2400	Video controller test failure	Suspected part: <ol style="list-style-type: none"> <li>1. Video Adapter (if installed)</li> <li>2. System Board</li> </ol>
2462	Video memory configuration error	Suspected part: <ol style="list-style-type: none"> <li>1. Video Adapter (if installed)</li> <li>2. System Board</li> </ol>

Table 8. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
<b>5962</b>	IDE CD-ROM configuration error	Suspected part: 1. CD-ROM Drive 2. CD-ROM Power Cable 3. IDE Cable 4. System Board 5. Battery  Suggested action: Run Configuration/Setup
<b>8603</b>	Pointing Device error	Suspected part: 1. Pointing Device 2. System Board
<b>00019501</b>	Processor 1 is not functioning	Suspected part: 1. VRM 1, VRM 2 2. Processor 1 3. Processor Board 4. System Board  Suggested action: Check VRM and processor LEDs
<b>00019502</b>	Processor 2 is not functioning	Suspected part: 1. VRM 2 2. Processor 2 3. Processor Board 4. System Board  Suggested action: Check VRM and processor LEDs
<b>00019701</b>	Processor 1 failed BIST	Suspected part: 1. Processor 1 2. Processor/PCI Board 3. System Board
<b>00019702</b>	Processor 2 failed BIST	Suspected part: 1. Processor 2 2. Processor/PCI Board 3. System Board
<b>00180100</b>	No room for PCI option ROM	Suspected part: 1. Failing Adapter 2. System Board  Suggested action: Run Configuration/Setup
<b>00180200</b>	No more I/O space available for PCI adapter	Suspected part: 1. Failing Adapter 2. System Board  Suggested action: Run Configuration/Setup

Table 8. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
00180300	No more memory (above 1 MB for PCI adapter)	Suspected part: 1. Failing Adapter 2. System Board  Suggested action: Run Configuration/Setup
00180400	No more memory (below 1 MB for PCI adapter)	Suspected part: 1. Failing Adapter 2. System Board  Suggested action: 1. Move the failing adapter to slot 1 or 2 2. Run Configuration/Setup
00180500	PCI option ROM checksum error	Suspected part: System Board Suggested action: Remove Failing PCI Card
00180600	PCI built-in self-test failure; PCI to PCI Bridge error	Suspected part: 1. Failing Adapter 2. System Board  Suggested action: 1. Run Configuration/Setup 2. Move the failing adapter to slot 1 or 2
00180700, 00180800	General PCI error	Suspected part: 1. System Board 2. PCI Card
01295085	ECC checking hardware test error	Suspected part: 1. Processor/PCI Board 2. Processor
01298001	No update data for processor 1	Suspected part: Processor 1  Suggested action: Ensure all processors are the same stepping level and cache size.
01298002	No update data for processor 2	Suspected part: Processor 2  Suggested action: Ensure all processors are the same stepping level and cache size.
01298101	Bad update data for processor 1	Suspected part: Processor 1  Suggested action: Ensure all processors are the same stepping level and cache size.
01298102	Bad update data for processor 2	Suspected part: Processor 2  Suggested action: Ensure all processors are the same stepping level and cache size.

Table 8. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
<b>I9990301</b>	Fixed boot sector error	Suspected part: <ol style="list-style-type: none"> <li>1. Hard Disk Drive</li> <li>2. SCSI Backplane</li> <li>3. Cable</li> <li>4. System Board</li> </ol>
<b>I9990305</b>	Fixed boot sector error, no operating system installed	Suggested action: Install the operating system to the hard disk drive
<b>I9990650</b>	AC power has been restored	Suspected part: Power Cable  Suggested action: <ol style="list-style-type: none"> <li>1. Check cable</li> <li>2. Check for interruption of power supply</li> </ol>

## SCSI error codes

Table 9 describes SCSI error codes and their suggested actions.

Table 9. SCSI error codes and actions

Error Code	Meaning	Suggested Action
<b>All SCSI Errors</b>	One or more of the following might be causing the problem: <ul style="list-style-type: none"> <li>• A failing SCSI device (adapter, drive, or controller)</li> <li>• An improper SCSI configuration or SCSI termination jumper setting</li> <li>• Duplicate SCSI IDs in the same SCSI chain</li> <li>• A missing or improperly installed SCSI terminator</li> <li>• A defective SCSI terminator</li> <li>• An improperly installed cable</li> <li>• A defective cable</li> </ul>	<ol style="list-style-type: none"> <li>1. Ensure the external SCSI devices were powered-on before the appliance was powered-on.</li> <li>2. Ensure the cables for all external SCSI devices are connected correctly.</li> <li>3. If you have attached an external SCSI device to the appliance, make sure the external SCSI termination is set to automatic.</li> <li>4. Ensure the last device in each SCSI chain is terminated correctly.</li> <li>5. Ensure the SCSI devices are configured correctly.</li> </ol>

---

## Temperature error messages

Table 10 describes temperature error messages, their meanings, and suggested actions.

Table 10. Temperature errors and actions

Error Message	Meaning	Suggested Action
<b>DASD X Over Temperature</b>	Level-critical; Direct Access Storage Device bay X was over temperature	Ensure system is being properly cooled; see "Appendix C. Specifications" on page 117.
<b>DASD X Over recommended Temperature</b>	Level-warning; DASD bay X had over temperature condition	Ensure system is being properly cooled; see "Appendix C. Specifications" on page 117.
<b>DASD X under recommended temperature</b>	Level-warning; direct access storage device bay X had under temperature condition	Ambient temperature must be within normal operating specifications; see "Appendix C. Specifications" on page 117.
<b>DASD 1 Over Temperature</b>	Level-critical; sensor for DASD1 reported temperature over recommended range	Ensure system is being properly cooled; see "Appendix C. Specifications" on page 117.
<b>Power Supply X Temperature Fault</b>	Level-critical; power supply X had over temperature condition	<ol style="list-style-type: none"><li>1. Ensure system is being properly cooled; see "Appendix C. Specifications" on page 117.</li><li>2. Replace Power Supply X.</li></ol>
<b>System board is over recommended temperature</b>		<ol style="list-style-type: none"><li>1. Ensure system is being properly cooled; see "Appendix C. Specifications" on page 117.</li><li>2. Replace the system board.</li></ol>
<b>System board is under recommended temperature</b>		Ambient temperature must be within normal operating specifications; see "Appendix C. Specifications" on page 117.
<b>System over temperature for CPU X</b>	Level-warning; CPU X reporting over temperature condition	Ensure system is being properly cooled; see "Appendix C. Specifications" on page 117.
<b>System under recommended CPU X temperature</b>	Level-warning; system reporting under temperature condition for CPU X	Ambient temperature must be within normal operating specifications; see "Appendix C. Specifications" on page 117.

---

## Fan error messages

Table 11 describes fan error messages and their suggested actions.

Table 11. Fan errors and actions

Message	Meaning	Suggested Action
<b>Fan X failure</b>	Level-critical; fan X had a failure	<ol style="list-style-type: none"><li>1. Check connections to fan X</li><li>2. Replace fan X</li></ol>
<b>Fan X fault</b>	Level-critical; fan X beyond recommended RPM range	<ol style="list-style-type: none"><li>1. Check connections to fan X</li><li>2. Replace fan X</li></ol>

## Power error messages

Table 12 describes power error messages and their suggested actions.

Table 12. Power errors and actions

Message	Meaning	Action
<b>Power supply X current fault</b>	Level-critical; excessive current demand on power supply X	See "Power checkout" on page 11.
<b>Power supply X DC good fault</b>	Level-critical; power good signal not detected for power supply X	Replace power supply X.
<b>Power supply X fan fault</b>	Level-critical; fan fault in power supply X	Replace power supply X
<b>Power supply X fault</b>	Level-critical; overcurrent condition exists	See "Power checkout" on page 11.
<b>Power supply X 12V fault</b>	Level-critical; overcurrent condition detected	See "Power checkout" on page 11.
<b>Power supply X 3.3V fault</b>	Level-critical; 3.3V power supply X had an error	See "Power checkout" on page 11.
<b>Power supply X 5V fault</b>	Level-critical; 5V power supply X had an error	See "Power checkout" on page 11.
<b>System over recommended X current</b>	Level-non-critical; system running too much current on that voltage	See "Power checkout" on page 11.
<b>System running non-redundant power</b>	Level-non-critical; system does not have redundant power	<ol style="list-style-type: none"> <li>1. Add another power supply</li> <li>2. Remove options from system</li> </ol> <p><b>Note:</b> The system can continue to operate without redundancy protection if steps 1 and 2 are not followed.</p>
<b>System under recommended voltage for X v</b>	Level-warning; indicated voltage supply under nominal value; value for X can be +12, -12, or +5	<ol style="list-style-type: none"> <li>1. Check connections to power subsystem</li> <li>2. Replace power supply</li> <li>3. Replace power backplane</li> </ol>
<b>System under recommended voltage on 3.3 v</b>	Level-warning; 3.3 volt supply under nominal value	<ol style="list-style-type: none"> <li>1. Check connections to power subsystem</li> <li>2. Replace power supply</li> <li>3. Replace power backplane</li> </ol>
<b>System under recommended X current</b>	Level-non-critical; system drawing less current than recommended on voltage X	See "Power checkout" on page 11.
<b>X V bus fault</b>	Level-critical; overcurrent condition on X voltage bus	<ol style="list-style-type: none"> <li>1. Check for short circuit on X voltage bus</li> <li>2. See "Power checkout" on page 11.</li> </ol>
<b>12V X bus fault</b>	Level-critical; overcurrent condition on 12-V X voltage bus	<ol style="list-style-type: none"> <li>1. Check for short circuit on 12-V X voltage bus</li> <li>2. See "Power checkout" on page 11.</li> </ol>
<b>5V fault</b>	Level-critical; overcurrent condition on 5-V subsystem	<ol style="list-style-type: none"> <li>1. Check for short circuit on 5-V bus.</li> <li>2. See "Power checkout" on page 11.</li> </ol>
<b>240 VA bus fault</b>	Level-critical; overcurrent or overvoltage condition in power subsystem.	See "Power checkout" on page 11.

---

## System shutdown

Refer to Table 13, Table 14, Table 15 on page 40, Table 16 on page 40, and Table 17 on page 40, when experiencing system shutdown related to voltage or temperature problems.

## Voltage related system shutdown

Table 13 describes voltage related system shutdowns, their meanings, and suggested actions.

Table 13. Voltage related shutdown messages and actions

Message	Meaning	Suggested Action
<b>System shutoff due to X current over max value</b>	Level-critical; system drawing too much current on voltage X bus	See "Power checkout" on page 11.
<b>System shutoff due to X current over min value</b>	Level-critical; current on voltage bus X under minimum value	See "Power checkout" on page 11.
<b>System shutoff due to X V over voltage</b>	Level-critical; system shutoff due to X supply over voltage	<ol style="list-style-type: none"><li>1. Check power supply connectors</li><li>2. Replace power supply</li><li>3. Replace power backplane</li></ol>
<b>System shutoff due to X V under voltage</b>	Level-critical system shutoff due to X supply under voltage	<ol style="list-style-type: none"><li>1. Check power supply connectors.</li><li>2. Replace power supply</li><li>3. Replace power backplane</li></ol>
<b>System shutoff due to VRM X over voltage</b>		<ol style="list-style-type: none"><li>1. Replace power supply</li><li>2. Replace power supply backplane</li></ol>

## Temperature related system shutdown

Table 14 describes temperature-related shutdown messages and suggested actions.

Table 14. Temperature related shutdown messages and suggested actions

Message	Meaning	Suggested Action
<b>System shutoff due to board over temperature</b>	Level-critical; board is over temperature	<ol style="list-style-type: none"><li>1. Ensure system is being properly cooled, see "Appendix C. Specifications" on page 117.</li><li>2. Replace board</li></ol>
<b>System shutoff due to CPU X over temperature</b>	Level-critical; CPU X is over temperature	<ol style="list-style-type: none"><li>1. Ensure system is being properly cooled, see "Appendix C. Specifications" on page 117.</li><li>2. Replace CPU X</li></ol>
<b>System shutoff due to CPU X under temperature</b>	Level-critical; CPU X is under temperature	Ambient temperature must be within normal operating specifications; see "Appendix C. Specifications" on page 117.
<b>System shutoff due to DASD temperature (sensor X)</b>	Level-critical; DASD area reported temperature outside recommended operating range	Ensure system is being properly cooled, see "Appendix C. Specifications" on page 117.
<b>System shutoff due to high ambient temperature</b>	Level-critical; high ambient temperature	Ambient temperature must be within normal operating specifications; see "Appendix C. Specifications" on page 117.

Table 14. Temperature related shutdown messages and suggested actions (continued)

Message	Meaning	Suggested Action
<b>System shutoff due to system board under temperature</b>	Level-critical; system board is under temperature	Ambient temperature must be within normal operating specifications; see "Appendix C. Specifications" on page 117.

---

## DASD checkout

Table 15 describes a DASD checkout message and its suggested action.

Table 15. DASD checkout message and action

Message	Meaning	Suggested Action
<b>Hard drive X removal detected</b>	Level-critical; hard drive X has been removed	Information only, take action as appropriate

---

## Host Built-In Self-Test (BIST)

Table 16 describes a BIST message and its suggested action.

Table 16. Host built-in self-test message and suggested actions

Message	Meaning	Suggested Action
<b>Host BIST fail</b>	Level-informational; host's built-in self-test failed	<ol style="list-style-type: none"> <li>1. Reseat CPU</li> <li>2. Reseat VRM</li> <li>3. Replace CPU</li> </ol>

---

## Bus fault messages

Table 17 describes bus fault messages and their suggested actions.

Table 17. Bus fault messages and suggested actions

Message	Suggested Action
<b>Failure reading 12C device</b>	<ol style="list-style-type: none"> <li>1. Check devices on bus 0</li> <li>2. Replace system board</li> </ol>
<b>Failure reading 12C device</b>	<ol style="list-style-type: none"> <li>1. Check devices on bus 1</li> <li>2. Reseat Power Supply</li> <li>3. Replace Power Supply</li> <li>4. Replace Power Supply backplane</li> <li>5. Replace system board</li> </ol>
<b>Failure reading 12C device</b>	<ol style="list-style-type: none"> <li>1. Check devices on bus 2</li> <li>2. Replace DASD backplane</li> <li>3. Replace system board</li> </ol>
<b>Failure reading 12C device</b>	<ol style="list-style-type: none"> <li>1. Check devices on bus 3</li> <li>2. Replace system board</li> </ol>
<b>Failure reading 12C device</b>	<ol style="list-style-type: none"> <li>1. Check devices on bus 4</li> <li>2. Replace DIMM</li> <li>3. Replace system board</li> </ol>



---

## Undetermined Problems

Read this section if the diagnostic tests did not identify the failure, the devices list is incorrect, or the system is inoperative.

**Note:** A corrupt CMOS can cause undetermined problems.

Check the LEDs on all the power supplies (see “AC and DC Power LEDs” on page 7.) If the LEDs indicate the power supplies are working correctly, return here and go through the following steps:

1. Power off the computer.
2. Be sure that the system is cabled correctly.
3. Remove or disconnect the following devices and parts (one at a time) until you find the failure (power on the computer and reconfigure each time):
  - a. Any external devices
  - b. Surge suppressor device (on the computer)
  - c. Modem, printer, mouse, or non-IBM devices
  - d. Each adapter
  - e. Drives
  - f. Memory modules (Minimum requirement = 256 MB)

### **Minimum operating requirements**

- Three power supplies
  - Power backplane
  - Processor/PCI board (with pins 2 and 3 on J-23 extension cable connected together to bypass the power switch; default is pins 1 and 2)
  - System Board (Verify that connection to Processor/PCI Board is secure.)
  - One Microprocessor and VRM
  - Three Terminator cards
  - Memory module (with a minimum of 1 bank of 256-MB DIMMs)
4. Power-on the computer. If the problem remains, suspect the following parts in the order listed:
    - a. Power Supply
    - b. Power Backplane
    - c. Processor/PCI Board
    - d. System Board

### **Notes:**

1. If the problem goes away when you remove an adapter from the system, and replacing that adapter does not correct the problem, suspect the Processor/PCI board, then the system board.
2. If you suspect a networking problem and all the system tests pass, it could be a network cabling problem external to the system.



---

## Chapter 4. Adding and replacing components

This chapter instructs you on how to add and replace components, informs you about safety and system reliability, and shows you the location of the major components.

---

### Before you begin

Before you begin to install options in your Models 200 and 225, read the following information:

- Become familiar with the safety and handling guidelines specified under “Handling electrostatic discharge-sensitive devices” on page 124.
- You do not need to switch off the Models 200 and 225 or remove covers to install or replace hot-swap power supplies or hot-swap hard drives.
- The blue color on components and labels inside your Models 200 and 225 identifies touch points where a component can be gripped, a latch moved, and so on.
- Make sure that you have an adequate number of properly grounded electrical outlets for Models 200 and 225 and any other options that you intend to install.
- Back up all important data before you make changes to hard drives.
- Have a small, flat-blade screwdriver available.

### Safety information

Before you begin installing components, read the safety information found in “Translated safety notices” on page 124. For translations of the safety notices that are included in this guide, refer to *Safety Information*.

### System reliability considerations

Adding options to the base configurations could increase power requirements beyond the limit for redundancy. To ensure that redundancy is maintained, check the status of the NON LED on the system board after you install any option.

To help ensure proper cooling and system reliability, make sure that:

- Each of the drive bays has either a drive or a filler panel installed.
- The cover is in place during normal operations, or is removed for no longer than 30 minutes while the appliance is operating.

**Note:** The front door (Model 200) can be removed permanently without affecting system reliability.

- There is space around the appliance to allow the appliance cooling system to work properly.
  - For Model 200, leave about 127 mm (5 in.) of space around the front and rear of the appliance.
  - For Model 225, refer to the documentation that comes with the rack.
- A removed hot-swap drive is replaced within 2 minutes of removal.
- Cables for optional adapters are routed according to the instructions provided with the adapters.
- A failed fan is replaced within 48 hours.

## Working inside an appliance while power is on

Your appliance is designed to operate safely while switched on with the cover removed. Follow these guidelines when you work inside an appliance that is switched on:

- Avoid loose-fitting clothing on your forearms. Button long-sleeved shirts before working inside the appliance; do not wear cuff links while you are working inside the appliance.
- Do not allow your necktie or scarf to hang inside the appliance.
- Remove jewelry, such as bracelets, rings, necklaces, and loose-fitting wrist watches.
- Remove items from your shirt pocket (such as pens or pencils) that could fall into the appliance as you lean over it.
- Take care to avoid dropping any metallic objects, such as paper clips, hair pins, or screws, into the appliance.

# Major components of the Network Attached Storage 200

Figure 7 shows the locations of major components in your appliance.

**Note:** The illustrations in this document might differ slightly from your hardware.

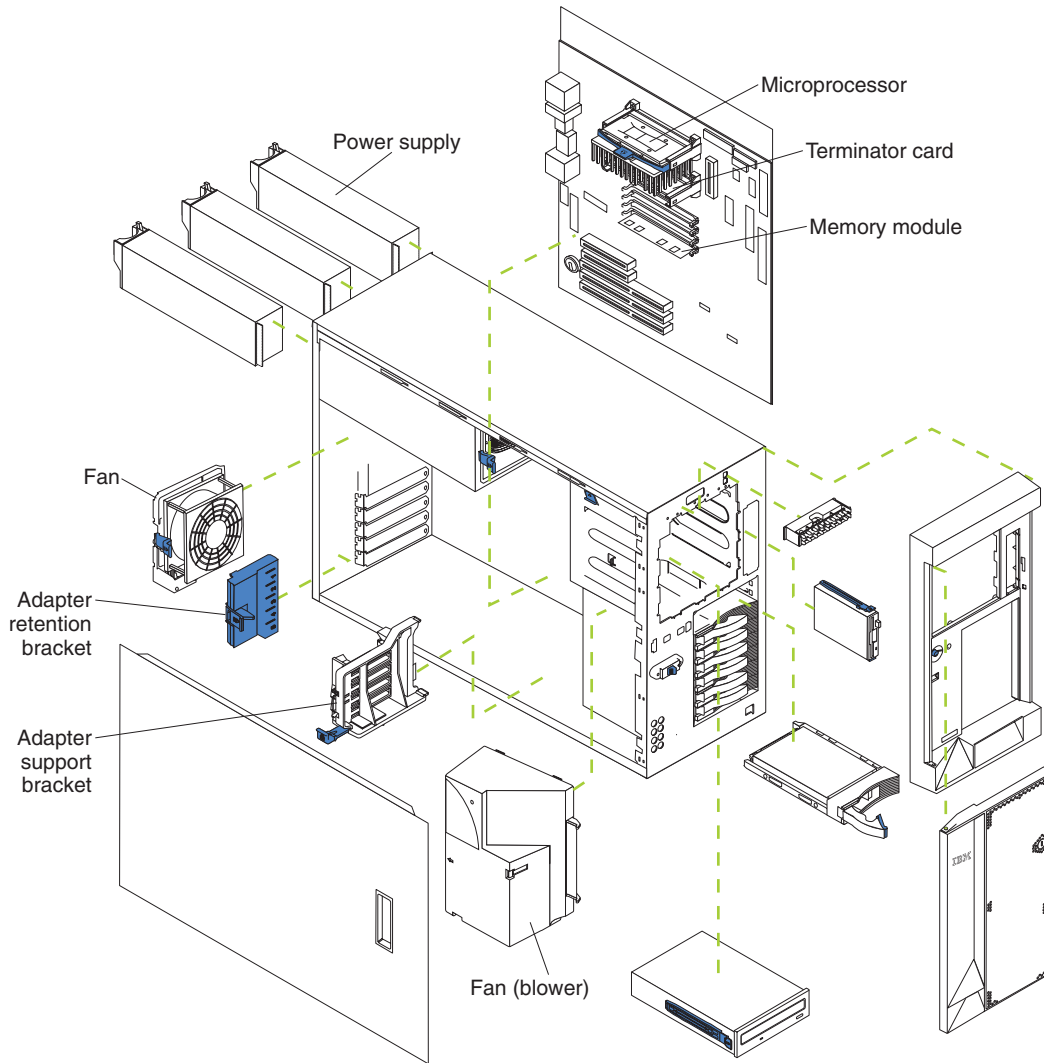


Figure 7. Locations of major components

## System board

Figure 8 identifies system-board connectors for user-installable options.

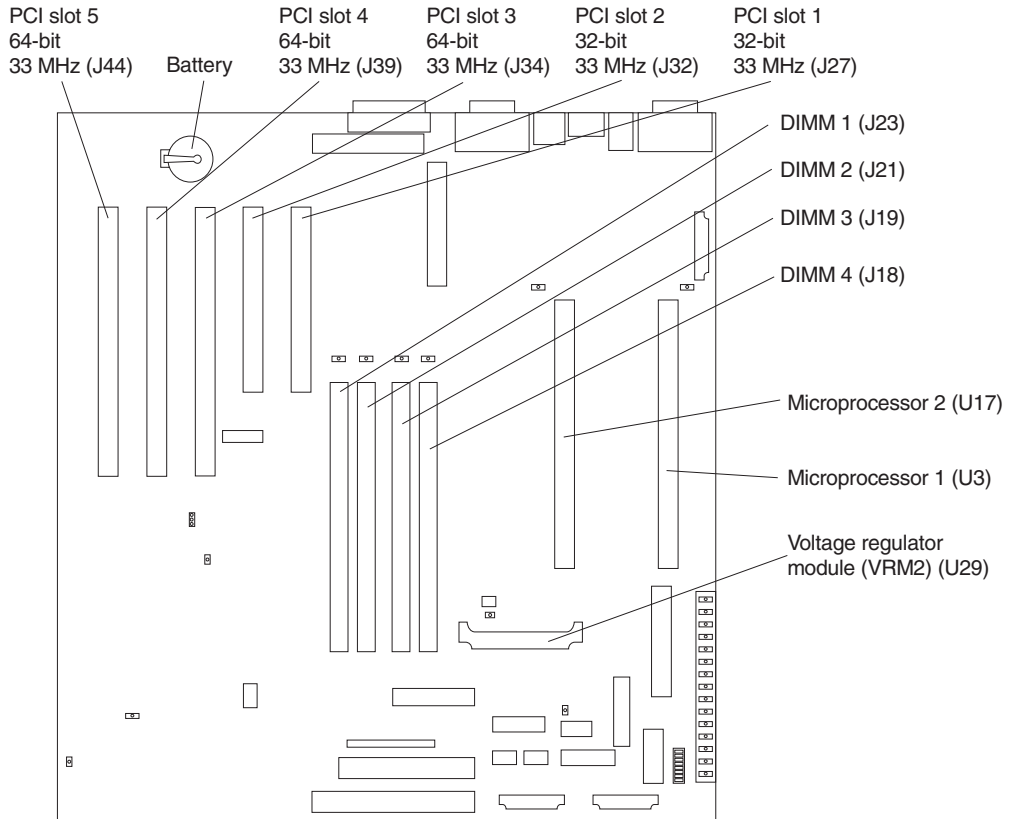


Figure 8. System-board options connectors

Figure 9 identifies system-board connectors for internal cables.

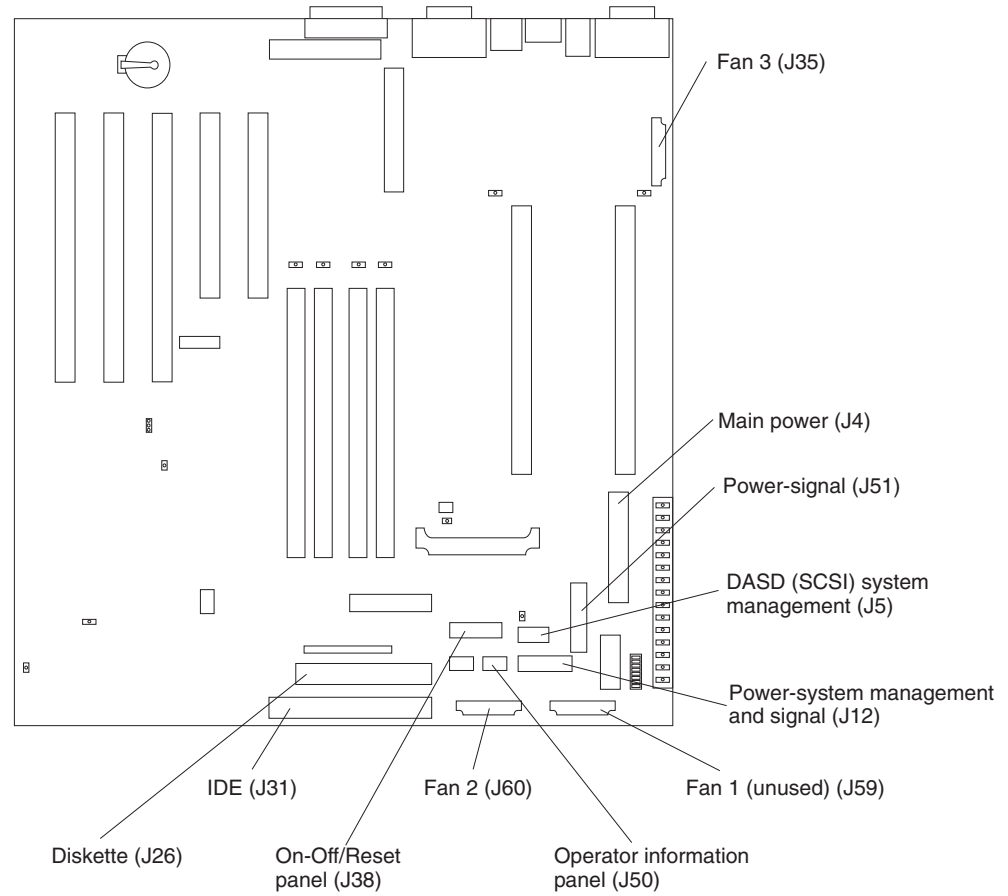


Figure 9. System-board internal cable connectors

Figure 10 identifies system-board connectors for external devices.

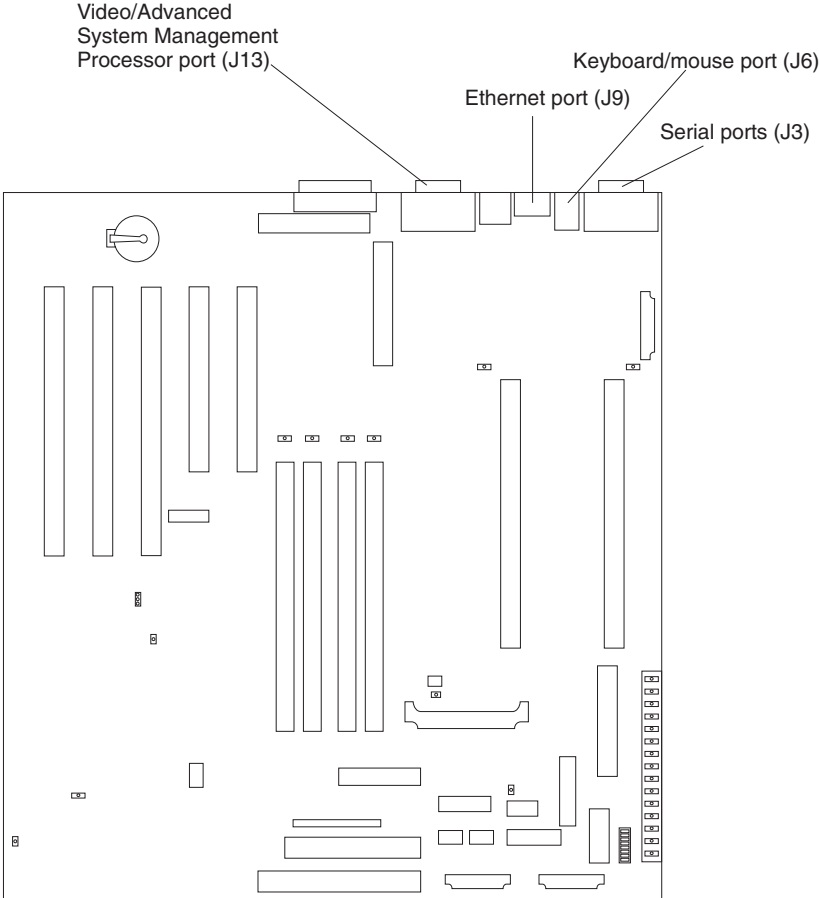


Figure 10. System board external port connectors



Figure 11 identifies the switches and jumpers on the system board.  
**System board jumper blocks**

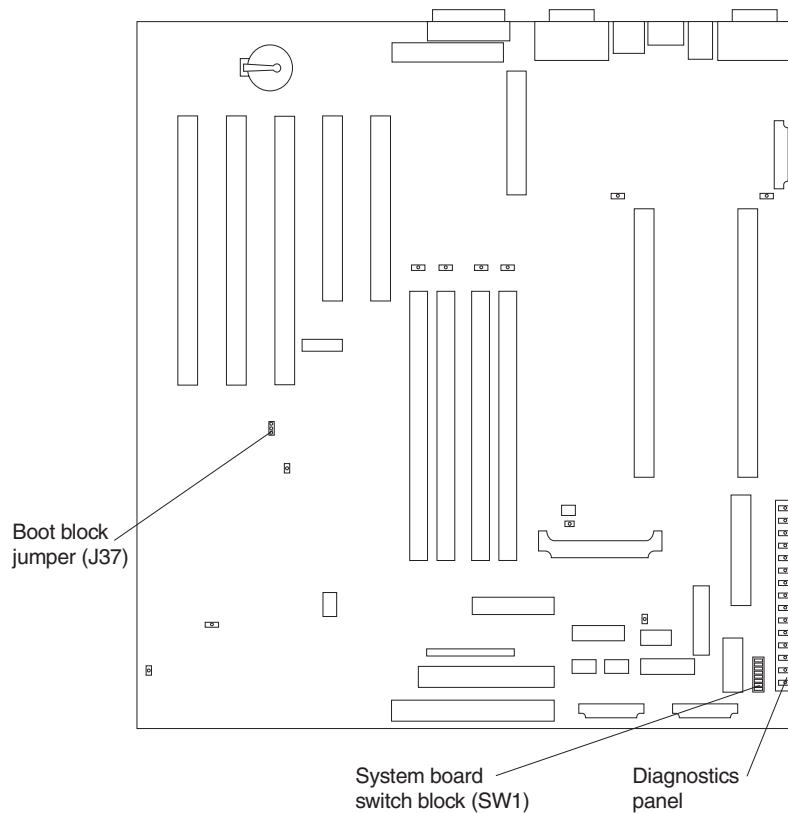


Figure 11. System board switches and jumpers

Any jumper blocks on the system board that are not shown in the illustration are reserved. For normal operation of the system, no jumpers should be installed on any of the jumper blocks. See Figure 11 for information about the boot block jumper.

**System board switch block**

The switch block contains microswitches 1 - 8. Switch 8 is at the top of the switch block and switch 1 is at the bottom. The Off position for each switch is the side nearer the diagnostics panel.

Table 18 describes the function for each switch.

Table 18. Switches 1 - 8

Switch number	Switch description
8	Bypass power-on password. The default setting is Off.  When toggled to the On position and back to Off, clears the power-on password, if one is set.
7	Reserved. The default setting is Off.
6	Clock frequency selection. The default setting is Off.  When On, sets the host bus speed to 100 MHz. When Off, the host bus speed is 133 MHz.

Table 18. Switches 1 - 8 (continued)

Switch number	Switch description
5	Power-on override. The default setting is Off (disabled). When On, overrides the power-on switch and forces power-on mode. The system will always boot without the use of the power-on switch.
4	Reserved.
3	Reserved.
2	Reserved.
1	Reserved.

Figure 12 identifies system-board LEDs. You might need to refer to this figure when troubleshooting a problem.

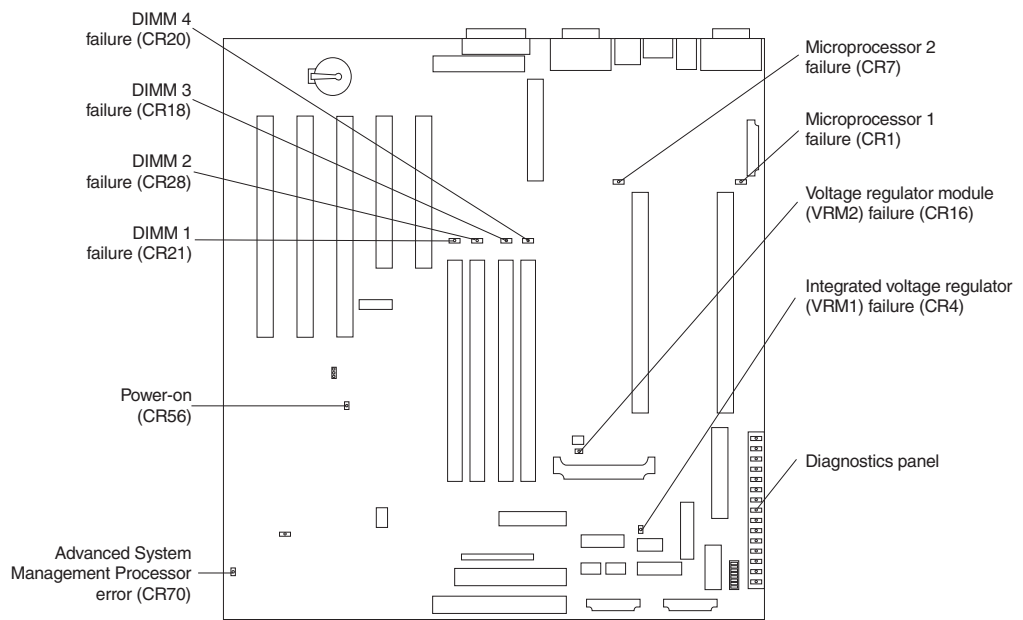


Figure 12. System board LED locations

**Note:** The power-on indicator (CR56) is on when system power is present in the appliance. When this LED flashes, the appliance is in standby mode (the system power supply is turned off and current is present).

Diagnostics panel LEDs:

- PS1** Power supply 1 failure.
- PS2** Power supply 2 failure.
- PS3** Power supply 3 failure.
- NON** Non-redundant power.
- OVER** Overspec. The system has exceeded the power capabilities of the installed power supply units.
- NMI** Non-maskable-interrupt occurred.
- TEMP** System temperature exceeded maximum rating.
- FAN** A fan failed or is operating slowly.
- MEM** Memory failure. One or more memory DIMMS have failed.
- CPU** Microprocessor failure. One or both microprocessors have failed.
- PCI A** Error on PCI channel A or system board.

**Note:** PCI bus A is often referred to as PCI bus 0.  
**PCI B** Error on PCI channel B or system board.

**Note:** PCI bus B is often referred to as PCI bus 1.  
**VRM** Error on voltage regulator module or on integrated voltage regulator.

**DASD1** A hot-swap disk drive, backplane, or other part of SCSI channel A has failed.

**DASD2** A SCSI device on SCSI channel B has failed.

---

## Adding or removing internal hardware components

This section describes how to add or remove internal hardware components.

### Removing the cover (Model 200)

The following sections describe how to remove the cover, the door (for the Model 200), and the bezel.

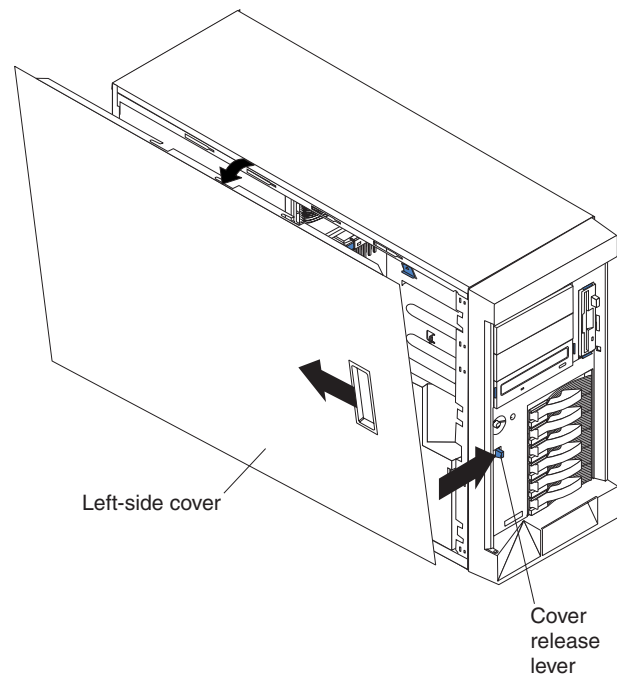


Figure 13. Removing the cover of the Model 200

To remove the left-side cover of the Model 200:

1. Review the information in “Before you begin” on page 43.
2. If you are planning to install or remove any part other than a hot-swap hard disk drive or hot-swap power supply, switch off the appliance and all attached devices and disconnect all external cables and power cords.
3. Slide the cover-release lever on the front of the appliance to release the cover; then, slide the cover toward the rear of the appliance about 25 mm (1 in.). Move the top edge of the cover out from the appliance; then, lift the cover off the appliance. Set the cover aside.

**Attention:** For proper cooling and airflow, replace the cover before switching on the appliance. Operating the appliance for extended periods of time (over 30 minutes) with the cover removed might damage appliance components.

## Removing the cover (Model 225)

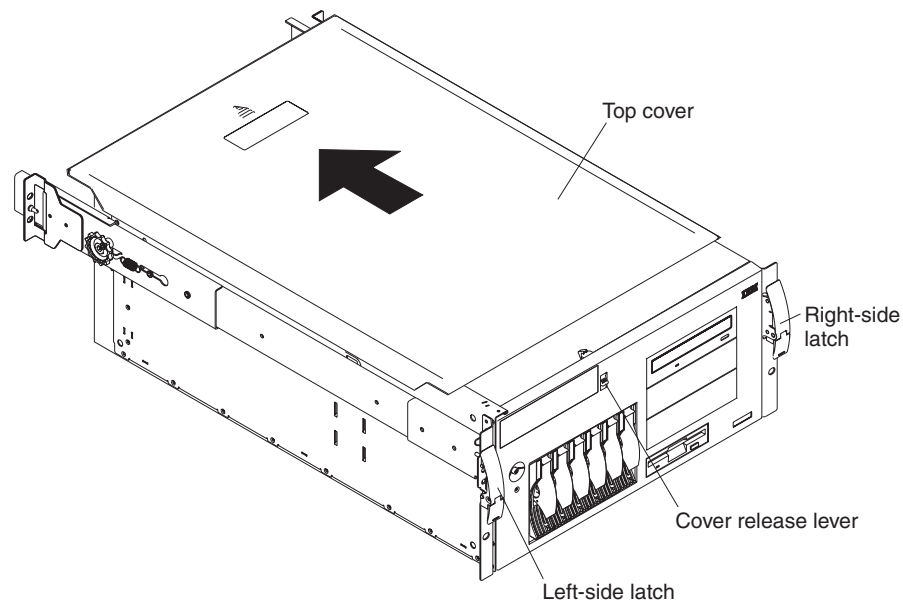


Figure 14. Removing the cover of the Model 225

To remove the appliance top cover:

1. Review the information in “Before you begin” on page 43.
2. If you are planning to install or remove any part other than a hot-swap hard disk drive or hot-swap power supply, switch OFF the appliance and all attached devices and disconnect all external cables and power cords.
3. Release the left and right side latches and pull the appliance out of the rack enclosure until both slide rails lock.

**Note:** When the appliance is in the locked position, you can reach the cables on the back of the appliance.

4. Move the cover-release lever down while sliding the top cover toward the rear of the appliance about 25 mm (1 in.). Lift the cover off the appliance and set the cover aside.

**Attention:** For proper cooling and airflow, replace the cover before switching on the appliance. Operating the appliance for extended periods of time (over 30 minutes) with the cover removed might damage appliance components.

## Removing the door and bezel (Model 200)

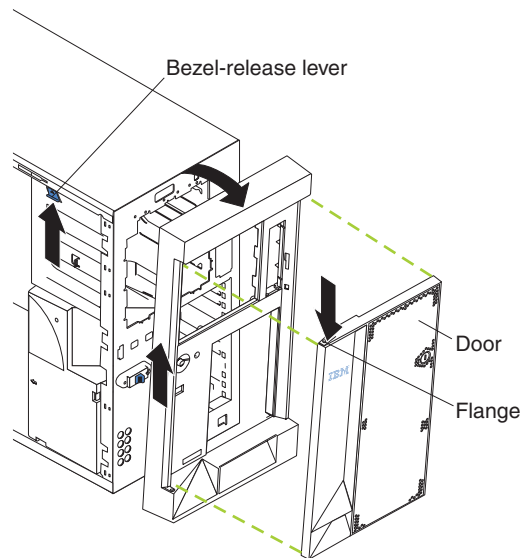


Figure 15. Removing the appliance door of the Model 200

To remove the appliance door:

1. Unlock and open the appliance door.
2. Locate the flange on the top edge of the door.
3. Press down on the flange while pressing out on the door; then, lift the appliance door up and off the hinge. Set the door aside in a safe place.

To remove the bezel:

1. Move the blue bezel-release lever, following the curve of the lever opening.
2. Lift the bezel tabs out of the slots and pull the bezel away from the appliance front. Store the bezel in a safe place.

## Removing the bezel (Model 225)

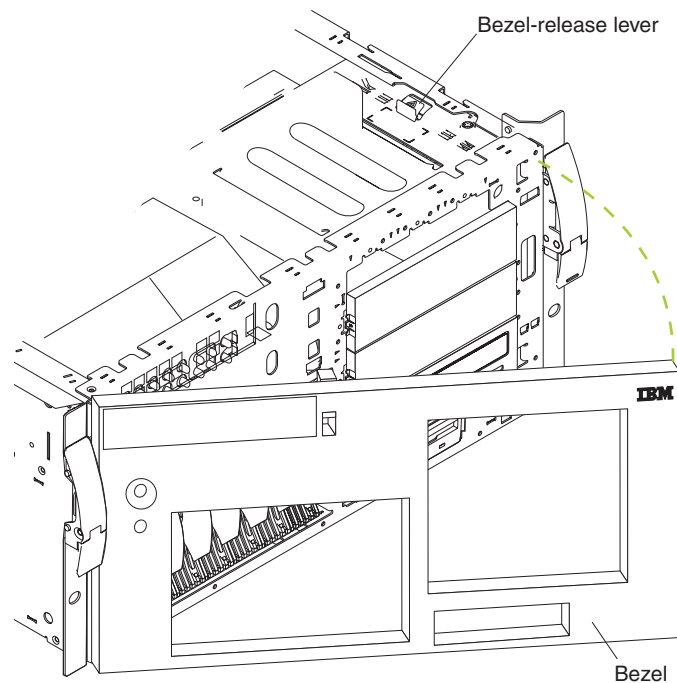


Figure 16. Removing the bezel of the Model 225

To remove the bezel:

1. Move the blue bezel-release lever, following the curve of the lever opening.
2. Lift the bezel tabs out of the slots and pull the bezel away from the appliance front. Store the bezel in a safe place.

## Installing internal drives

You can install a tape drive to store more data. You can see a list of supported tape drives at [www.storage.ibm.com](http://www.storage.ibm.com).

### Installing internal drive bays

Internal hard drives are installed in *bays*. The drive bays of the Network Attached Storage 200 are in the front of the appliance, as shown in the following illustrations.

**Attention:** If you are going to install additional hard drives in the non-hot-swap drive bays, you must install the power supply backplane option and additional power supplies.

**Model 200:**

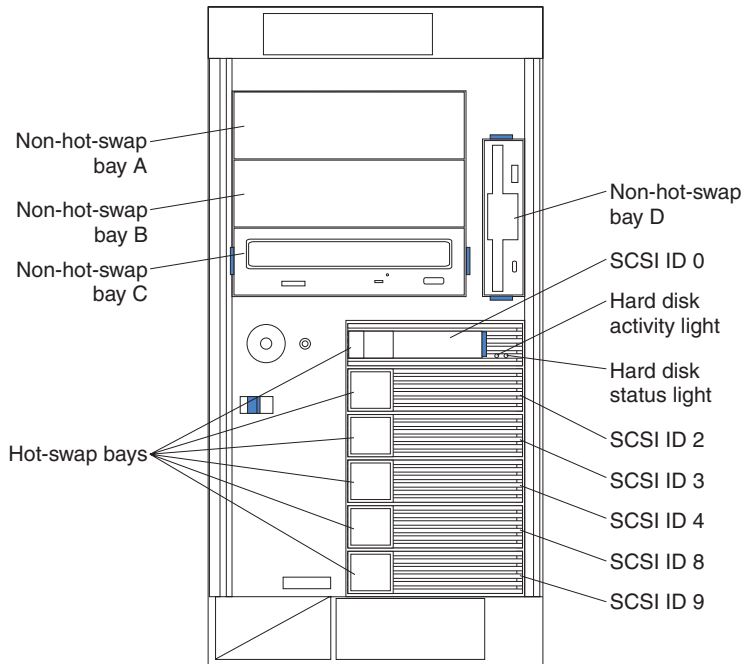


Figure 17. Installing internal drive bays for the Model 200

**Note:** The SCSI IDs for the slim-high and half-high hot-swap hard drives are on a label on the bezel, immediately adjacent to the hot-swap hard drive bays.

**Model 225:**

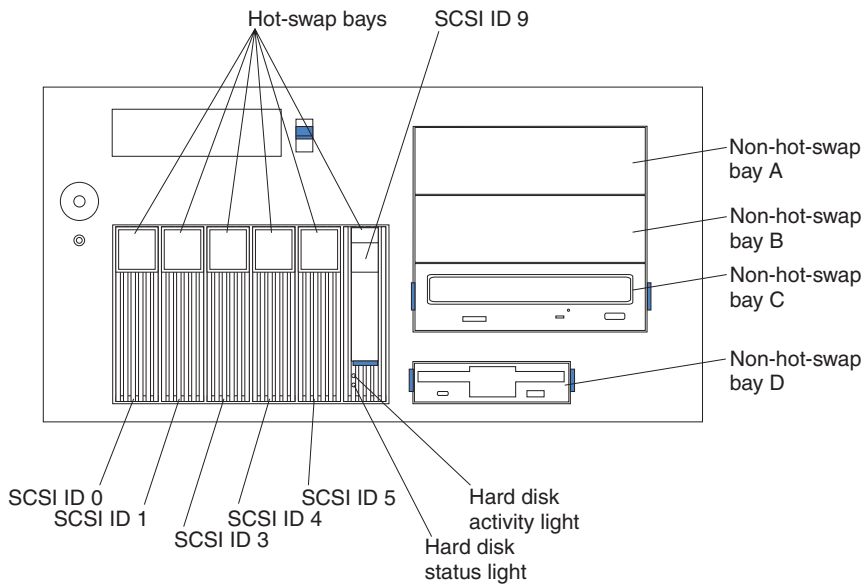


Figure 18. Installing internal drive bays for the Model 225

**Installing and replacing hot-swap hard drives**

Your appliance contains hardware that lets you continue to operate your system while a hard drive is removed or installed. These hard drives are known as *hot-swappable* hard drives. They are also referred to as *hot-swap* hard drives.



Each hot-swap hard drive that you plan to install must have a hot-swap hard drive tray attached. The hard drive must have a single connector attachment (SCA) connector. Hot-swap hard drive trays come with the hot-swap drives.

- Your appliance supports up to six slim 25-mm (1-in.) hot-swap hard drives in the hot-swap bays.
- The hot-swap hard drive bays connect to a SCSI *backplane*. This backplane is the printed circuit board behind the bay.
- The backplane controls the SCSI IDs for the hot-swap hard drives.

**Installing a hot-swap hard drive:**

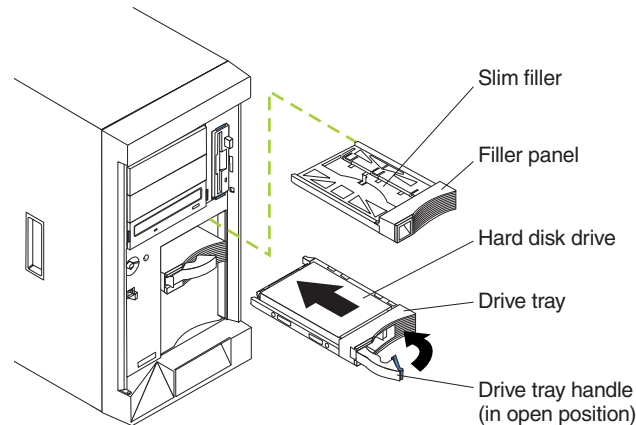


Figure 19. Installing a hot-swap drive

To install a drive in a hot-swap hard drive bay:

**Attention:**

- To maintain proper system cooling, do not operate the appliance for more than two minutes without either a hard drive or a filler panel installed for each bay. Therefore, if you are replacing a defective hot-swap drive, either leave the defective drive in place or put in a filler panel until you have a replacement drive.
  - When you handle electrostatic discharge-sensitive devices (ESDs), take precautions to avoid damage from static electricity. For details on handling these devices, refer to “Handling electrostatic discharge-sensitive devices” on page 124.
1. Remove the filler panel from one of the empty hot-swap drive bays by inserting your finger into the depression at the left side of the filler panel and pulling it away from the appliance.
  2. Install the hard drive in the hot-swap drive bay:
    - a. Ensure the tray handle is open (that is, perpendicular to the hard drive).
    - b. Align the rails on the hard drive assembly with the guide rails in the drive bay.
    - c. Gently push the hard drive assembly into the drive bay until the hard drive connects to the backplane.
    - d. Push the tray handle toward the closed position until it locks the hard drive in place.
  3. Check the hard drive status indicators to verify that the hard drives are operating properly (the Hard Drive Status LED is immediately to the right of the hard disk drive).
    - When the amber LED is on continuously, the hard drive has failed.

- When the green LED flashes slowly (one flash per second), the hard drive is being rebuilt.
  - When the green LED flashes rapidly (three flashes per second), the controller is identifying the hard drive.
4. Refer to the *Network Attached Storage 200 User's Reference* for information about using the ServeRAID™ utility to configure the hot-swap drive.

**Replacing a hot-swap hard drive:** You do not have to switch off the appliance to remove or install the hot-swap hard drives.

**Attention:**

1. Before you replace a hot-swap hard drive, check the Hard Drive Status LED on the front of the drive to see if the drive is defective (if the drive is defective, the LED will be amber). If you partially or completely remove a good drive instead of a defective one, you might lose valuable data.

This situation is especially relevant because your appliance has a RAID adapter installed. The RAID adapter can rebuild the data that you need, provided that certain conditions are met.

2. Before you remove a hot-swap hard drive that is not defective, back up all important data.
3. To avoid damage to a hard drive, pull on the release lever to disengage the hard drive connector from the backplane at the back of the drive bay, wait approximately 30 seconds to allow the hard drive to spin down, and then completely remove it from the bay.

Refer to Figure 20 while you perform the steps in this procedure.

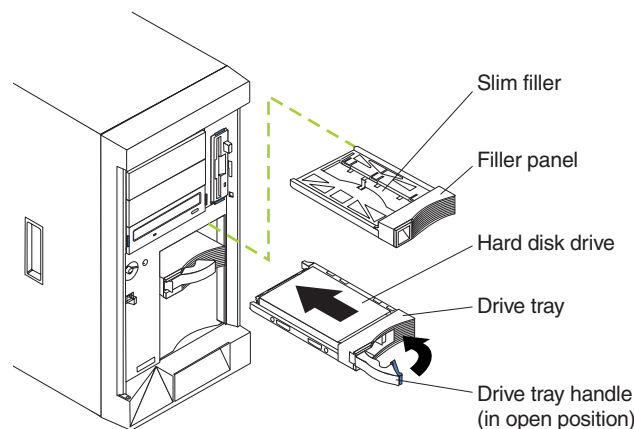


Figure 20. Replacing a drive in a hot-swap drive bay in the Model 200

To replace a drive in a hot-swap drive bay:

1. Before you begin, read the documentation that comes with your hard drive.
2. If your appliance is a Model 200, unlock and open the appliance door.

**Attention:** To maintain proper system cooling, do not operate the appliance for more than two minutes without either a hard drive or a filler panel installed for each drive bay.

3. Locate the defective hard drive (look for an amber Hard Drive Status LED on the front of the drive).

4. Remove the defective hard drive: move the handle on the hard drive to the open position (perpendicular to the hard drive) and pull the hot-swap hard drive assembly from the drive bay.
5. Install the replacement hard drive in the hot-swap drive bay:
  - a. Ensure the tray handle is open (that is, perpendicular to the hard drive).
  - b. Align the rails on the hard drive assembly with the guide rails in the drive bay.
  - c. Gently push the hard drive assembly into the drive bay until the hard drive connects to the backplane.
  - d. Push the tray handle toward the closed position until it locks the hard drive in place.
6. Check the hard drive status indicators to verify that the hard drive is installed properly (the Hard Drive Status LED is located to the immediate right of the hard disk drive).
  - When the amber LED is on continuously, the hard drive has failed.
  - When the green LED flashes slowly (one flash per second), the hard drive is being rebuilt.
  - When the green LED flashes rapidly (three flashes per second), the controller is identifying the hard drive.
7. If your appliance is a Model 200, close and lock the appliance door.

## Installing a non-hot-swap drive or CD-ROM

**Note:** The appliance's electromagnetic interference (EMI) integrity and cooling are both protected by having the non-hot-swap drive bays covered or occupied. When you install a drive, save the filler panel from the bay in case you later remove the drive and do not replace it with another.

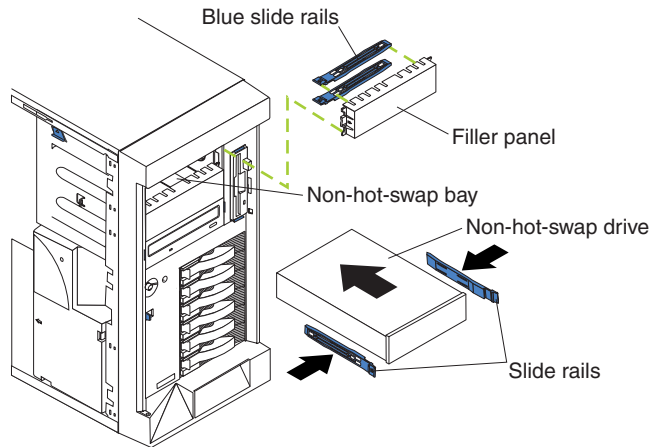


Figure 21. Installing a non-hot-swap drive

To install a non-hot-swap drive (5.25-inch, removable media) in one of the non-hot-swap drive bays:

1. Review the safety precautions in “Translated safety notices” on page 124.
2. Switch off the appliance and peripheral devices and then remove the cover and the bezel (see “Removing the cover (Model 200)” on page 51 for details).
3. Remove the filler panel from the bay opening by pulling the filler panel away from the appliance. You do not need the filler panel when you have a drive installed in the drive bay.
4. If the drive is a laser product, observe the following safety precaution:

### Statement 3



#### CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



5. Touch the static-protective bag containing the drive to any unpainted metal surface on the appliance; then, remove the drive from the bag and place it on a static-protective surface.

6. Set any jumpers or switches on the drive according to the documentation that comes with the drive.
7. Install rails on the drive. If you are installing a standard-size drive:
  - a. Pull the blue slide rails off the back of the filler panel.
  - b. Clip the rails onto the sides of the drive.
8. Align the rails on the drive with the guide rails in the drive bay.
9. Push the drive into the bay until it clicks into place.
10. If the drive is an IDE device:
  - Make sure the drive is not a hard disk drive.
  - Plug a connector on the IDE cable into the back of the drive.
  - Make sure the other end of the IDE cable is plugged into the IDE connector on the system board.
  - Go to step 12.
11. If the drive is a SCSI device:
  - a. Make sure the drive is not a hard disk drive.
  - b. Obtain a 16-bit SCSI cable to connect the device to the connector for SCSI channel B on the system board, or to an optional SCSI adapter. A suitable cable usually comes with your SCSI device.
  - c. Connect one of the connectors on the SCSI cable to the back of the drive.
  - d. Connect the other end of the SCSI cable to the SCSI channel B connector on the system board, or to an optional SCSI adapter, as appropriate. See Figure 8 on page 46 for the location of the SCSI connectors.
12. Connect a power cable to the back of the drive. Power cables for non-hot-swap drives come installed in your appliance. The connectors are keyed and can be inserted only one way.
13. If you are installing another non-hot-swap drive, do so at this time; otherwise, continue with the next step.
14. If you have other options to install or remove, do so now; otherwise, replace the cover (see “Replacing the cover” on page 80 for details).

## Replacing hot-swap power supplies

Your appliance comes with three hot-swap power supplies, installed in bays 1, 2, and 3. The third power supply provides additional redundancy. Each power supply has two status indicators; see the following illustration for information about the status indicators and power supply bay locations.

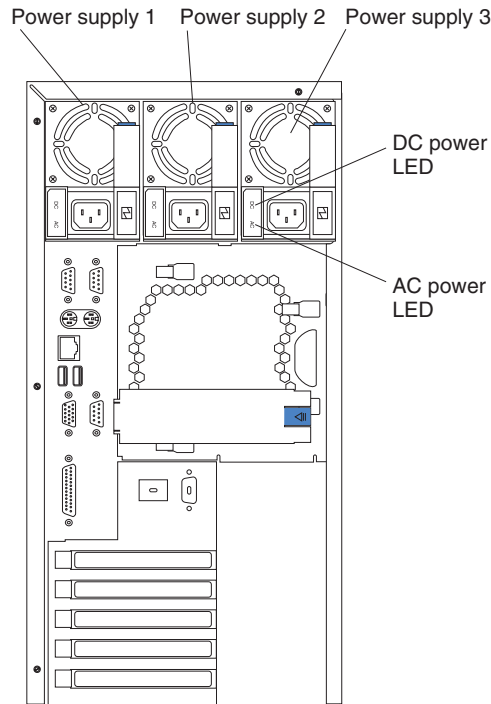


Figure 22. Replacing a hot-swap power supply

### Power Supply 1

LED PS1 on the system board diagnostics panel refers to this power supply. See Figure 12 on page 50 for more information about the diagnostics panel.

### Power Supply 2

LED PS2 on the system board diagnostics panel refers to this power supply. See Figure 12 on page 50 for more information about the diagnostics panel.

### Power Supply 3

LED PS3 on the system board diagnostics panel refers to this power supply. See Figure 12 on page 50 for more information about the diagnostics panel.

### AC Power LED

This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on. Refer to the Power Supply LEDs section in the *IBM TotalStorage IP Storage 200i Administrator's Guide* for more information.

### DC Power LED

This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on. Refer to the Power Supply LEDs section in the *IBM TotalStorage IP Storage 200i Administrator's Guide* for more information.

## Removing a hot swap power supply

### Statement 8



#### CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

**Note:** For translations of this safety notice, refer to *Safety Information*.

**Attention:** If you remove a power supply while the system is running, when you do not have power redundancy, your system will abruptly cease to function.

To remove a hot swap power supply

1. Check the LEDs on the power supplies to determine which power supply has failed. If a power supply has failed, go to step 4 on page 64.
2. Remove the engine covers.
3. Check the LEDs on the diagnostics panel on the system board.
  - a. If the NON (non-redundant) LED is on, you do not have redundancy: **switch OFF the appliance** and peripheral devices; then, continue with step 4 on page 64.

**Note:** The Information LED on the operator information panel on the front of the appliance also will be on. See “Appliance controls and indicators” on page 1 for the location and contents of the operator information panel.

- b. If the NON LED is not lit, you have redundancy and do not need to switch off the appliance. Continue with step 4 on page 64.

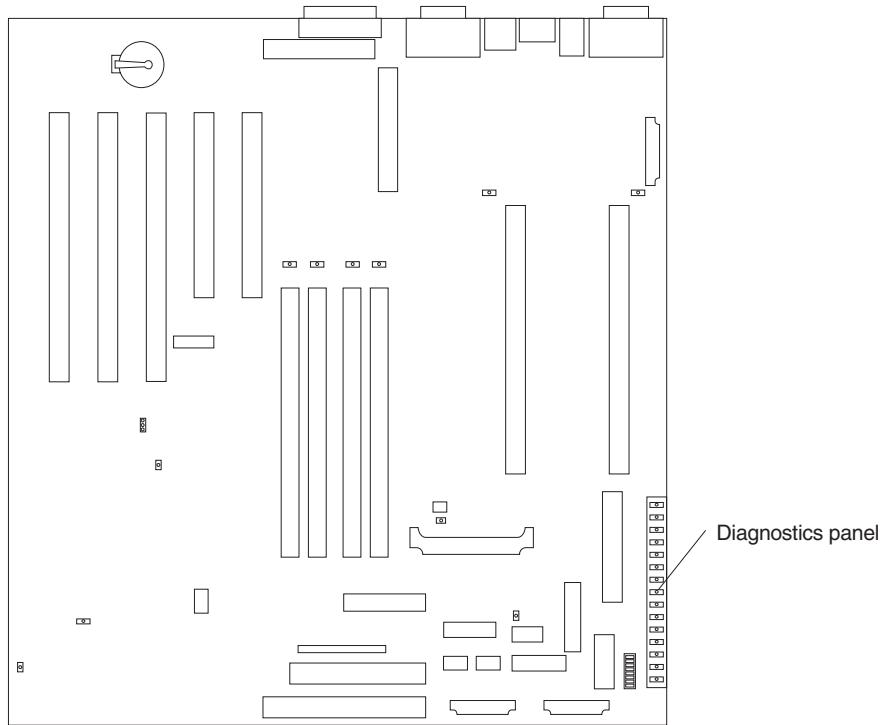


Figure 23. Removing a hot-swap power supply

4. Unplug the power cord from the power supply.

**Statement 12**



**CAUTION:**  
The following label indicates a hot surface nearby.



**Note:** For translations of this safety notice, refer to *Safety Information*.

5. Remove the defective power supply.
6. Install a replacement power supply (see “Replacing a hot-swap power supply” on page 65).
7. Plug the power cord for the power supply into the power cord connector.
8. Verify that the AC Power LED and DC Power LED are on, indicating that the power supply is operating correctly.
9. If you switched the appliance off in step 3.3a on page 63, switch ON the appliance and peripheral devices.



## Replacing a hot-swap power supply

After you replace a power supply, verify that the power-supply status indicators (AC Power LED and DC Power LED) are on, indicating that the power supply is operating properly.

### Notes:

1. You do not need to switch off the power to the appliance to install hot-swap power supplies.
2. When replacing a power supply, do not remove the power supply until you are ready to install its replacement.

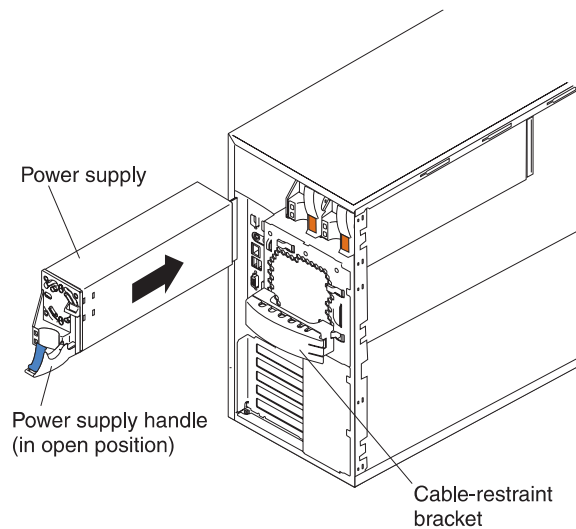


Figure 24. Installing a hot-swap power supply

To replace a hot-swap power supply:

1. Remove the power supply that you want to replace.
2. Install the replacement power supply in the bay:
  - a. Place the handle on the power supply in the open position (that is, perpendicular to the power supply) and slide the power supply into the chassis.
  - b. Gently close the handle to seat the power supply in the bay.
3. Plug the power cord for the power supply you just installed into the power cord connector.
4. Route the power cord through the cable-restraint bracket.
5. Plug the power cord into a properly grounded electrical outlet.
6. Verify that the DC Power LED and AC Power LED on the power supply are on, indicating that the power supply is operating correctly.

## Replacing the ServeRAID controller

This section provides illustrations of the SCSI channel connectors and cable connectors for the ServeRAID-4H and ServeRAID-4L controllers.

### ServeRAID-4H controller connector locations

The ServeRAID-4H controller has four independent SCSI channel connectors: Channel 1, Channel 2, Channel 3, and Channel 4. Each of these SCSI channels supports up to 15 physical devices.

**Note:** The battery-backup cache protects the data being stored in the ServeRAID cache memory during a power outage or failure when using the write-back mode.

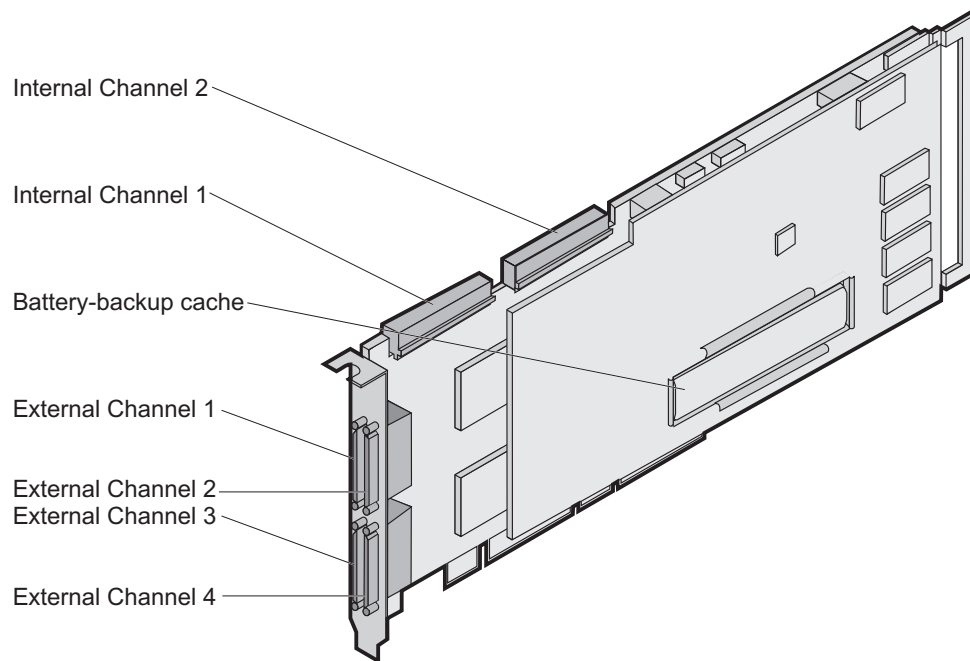


Figure 25. ServeRAID-4H controller

In the ServeRAID-4H controller, an internal SCSI device is attached to channel 1. This means you cannot attach an external SCSI device to channel 1.

**Note:** The ServeRAID-4H controller uses the module (P/N 38L3386) containing a lithium battery.

Statement 2



### CAUTION:

**When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.**

**Do not:**

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

**Note:** For translations of this safety notice, refer to *Safety Information*.

**ServeRAID-4L controller connector locations**

The ServeRAID-4L controller has one independent SCSI channel connector: Channel 1. This SCSI channels supports up to 15 physical devices.

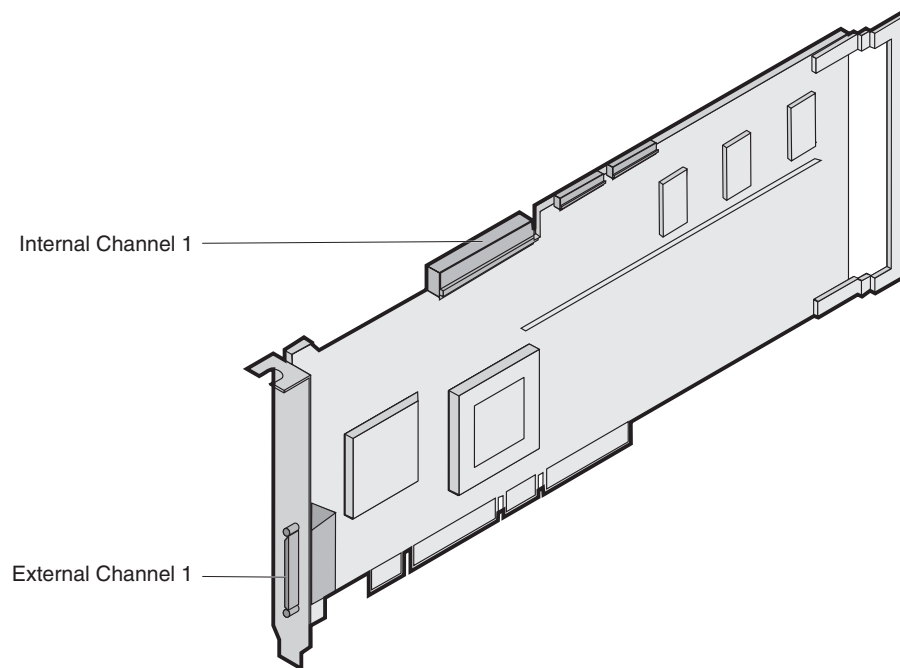


Figure 26. ServeRAID-4L controller

You cannot attach any external devices to the ServeRAID-4L controller.

**Note:** The ServeRAID-4L controller uses the module (P/N 38L3386) containing a lithium battery.

Statement 2



**CAUTION:**

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

**Do not:**

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

**Note:** For translations of this safety notice, refer to *Safety Information*.

**Installing the ServeRAID controller**

During the installation, you might need a small, flat-blade screwdriver.

To install the ServeRAID-4H or ServeRAID-4L controller:

1. Review the *Safety Information* book provided with your appliance.
2. Switch off the appliance and disconnect all power cords and cables from the appliance.
3. Remove the appliance cover.
4. Remove the expansion-slot cover.
5. Touch the static-protective package containing the controller to an unpainted metal expansion-slot cover on the appliance. This discharges any static electricity from the package and from your body.
6. Remove the controller from the static-protective package holding the controller by the edges. Do not touch any exposed components on the controller.
7. Insert the controller in the PCI expansion slot. Press the controller firmly into the slot so that it is fully seated.

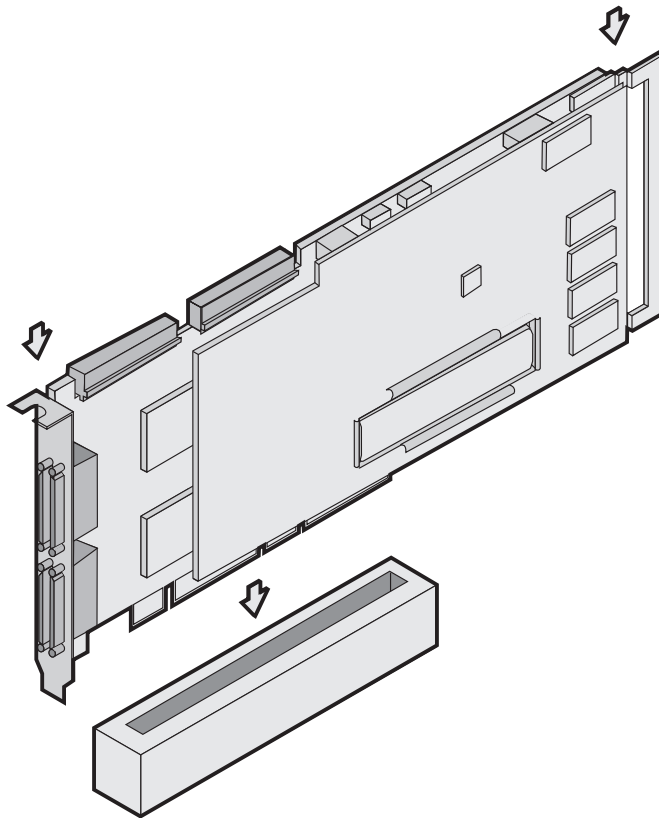


Figure 27. Inserting a ServeRAID-4H controller into the PCI expansion slot

8. Secure the controller by either tightening the expansion-slot screw on the top of the controller or closing the latch, depending on your appliance.
9. Connect the internal SCSI cable to the controller. If you intend to attach external devices only, go to step 13. Otherwise, continue with 10.
10. Connect one end of a 68-pin ANSI standard cable to the internal channel connector on the ServeRAID controller.

**Note:** Refer to “ServeRAID-4L controller connector locations” on page 67 for the channel connector locations.

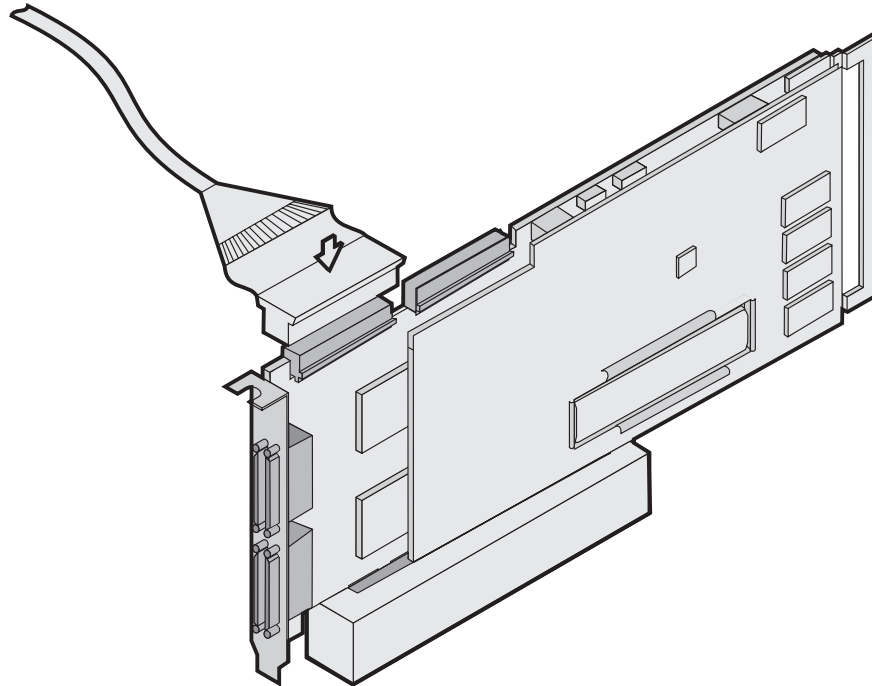


Figure 28. Connecting a ServeRAID-4H controller internal channel connector

11. Make sure that the other end of the SCSI cable is attached to the SCSI backplane.
12. If you have physical drives to install, install them now. See your appliance documentation for drive installation instructions.

**Note:** The ServeRAID controllers use SCSI ID 7.

13. Install the appliance cover.
14. If you disconnected the cables and power cords in 2 on page 68, reconnect the cables and cords. See your appliance documentation if you need detailed instructions.
15. If you want to attach an external SCSI device to the ServeRAID controller, continue with “Connecting external devices”. Otherwise, go to “Updating BIOS and firmware code” on page 70.

### Connecting external devices

**Note:** The ServeRAID-4L does not support external connection. The ServeRAID-4H supports external connection on Channels 2, 3, and 4.

To attach SCSI devices to an external channel connector on the ServeRAID-4H controller:

1. Connect one end of a 68-pin very high density connector interface (VHDCI) SCSI cable to an external channel connector on the ServeRAID controller.

**Note:** Refer to “ServeRAID-4H controller connector locations” on page 66 for the channel connector locations.

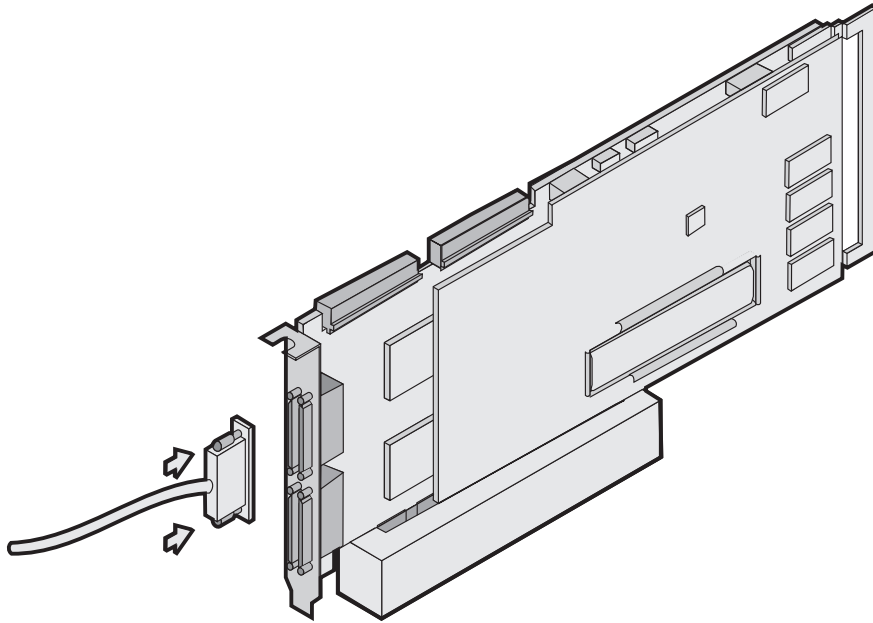


Figure 29. Connecting a ServeRAID-4H controller external channel connector

2. Connect the other end of the SCSI cable to the external SCSI device.
3. Continue with “Updating BIOS and firmware code”.

### Updating BIOS and firmware code

Before configuring the ServeRAID controller, you must have the latest BIOS and firmware code installed on your appliance.

1. Attach a keyboard and monitor to the appliance.
2. Start a browser.
3. Go to [www.ibm.com/storage/support/nas](http://www.ibm.com/storage/support/nas)
4. Select **BIOS and firmware code for the ServeRAID controller**.
5. Boot the diskettes as directed and follow the instructions on the screen.
6. Remove the diskette and reboot the appliance.

### Configuring the ServeRAID Controller

Follow these instructions to configure a ServeRAID Controller:

1. Attach a keyboard and a monitor to the appliance; then, switch on the appliance.

**Note:** A ServeRAID BIOS message appears. If the BIOS detects a mismatch in the configuration, it shows a status of Fail and prompts you to press a function key to continue. Press **F10** to continue without changing the configuration.

2. When prompted to start the Mini-Configuration Program, press **Ctrl-I**.

3. Select **Advanced functions**.
4. Select **Copy the configuration from drives to the controller**.
5. Confirm the action by typing **y**. Wait until prompted to Press any key to continue.
6. From the **Advanced functions** menu, select **Configure BIOS settings**.
7. Select **Bypass read/verify operations** and ensure that it says Yes. If it says No, then press **Enter** to change the option to Yes.
8. Select **Save configuration to the ServeRAID controller**.
9. Select **Exit**; then, select **Exit** again. This will terminate the Mini-Configuration program.
10. Press **Ctrl-Alt-Del** to reboot the appliance.

## Installing adapters

You can install up to three peripheral component interconnect (PCI) adapters in the available expansion connectors, called slots, on the system board of the Model 200; you can install up to four PCI adapters in the Model 225.

Your appliance comes with an integrated video controller, which is a component on the system board. Both Network Attached Storage 200 contain a ServeRAID adapter in PCI slot 3 (ServeRAID- 4L Ultra160 for Model 200 and ServeRAID-4H Ultra160 for Model 225). For Model 200 only, PCI slot 1 contains 10/100 Ethernet adapter.

Figure 30 shows the location of the 33-MHz PCI expansion slots on the system board.

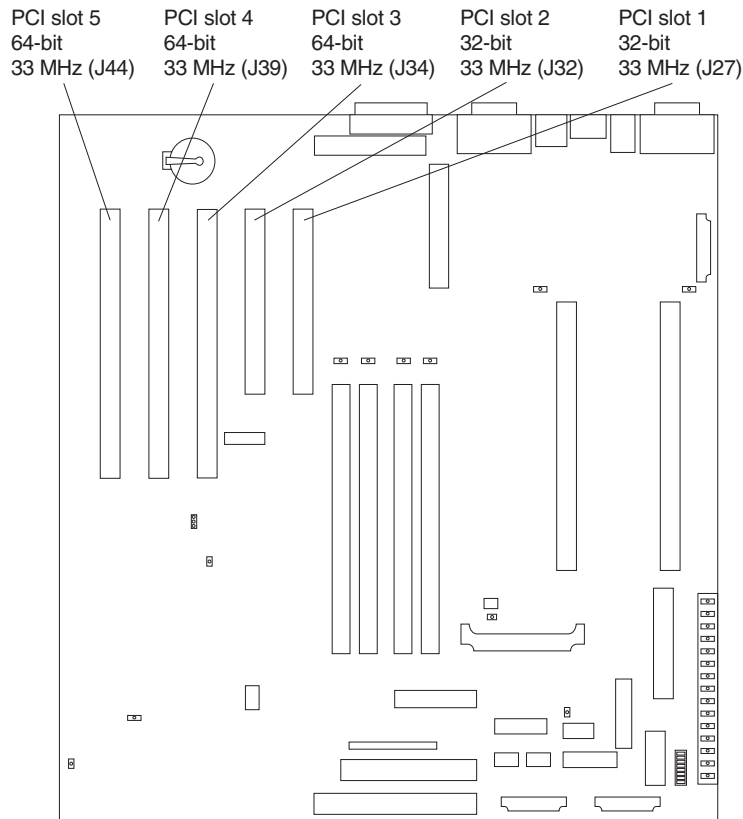


Figure 30. Location of the PCI expansion slots

### Adapter considerations

Before you install adapters, review the following guidelines:

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions given in this chapter. If you need to change the switch or jumper settings on your adapter, follow the instructions that are included with the adapter.
- Refer to the *Network Attached Storage 200 User's Reference* for information about configuring the adapter after it is installed.
- You can install full-length adapters in all expansion slots.
- You can install a 32-bit adapter in any of the PCI slots, but you might want to install it in a 32-bit slot and use the 64-bit slots for 64-bit adapters.
- Your appliance uses a rotational interrupt technique to configure PCI adapters. Because of this technique, you can install a variety of PCI adapters that currently do not support sharing of PCI interrupts.
- PCI slots 1 and 2 are on PCI bus A and PCI slots 3, 4, and 5 are on PCI bus B.

**Note:** PCI bus A is often referred to as bus 0; PCI bus B is often referred to as bus 1.

The system scans PCI slots 1 through 5 to assign system resources; then the system starts (boots) the PCI devices in the following order, if you have not changed the default boot precedence: PCI slots 1 and 2, system board SCSI devices, and then PCI slots 3 through 5.



This section provides illustrations of the SCSI channel connectors and cable connectors for the ServeRAID-4L and ServeRAID 4-H adapters. The LEDs on the adapters indicate activity on the SCSI channels and provide diagnostic information for trained service technicians. Table 19 lists the standard features of the ServeRAID adapter installed for each model.

*Table 19. Standard features of ServeRAID-4L and ServeRAID-4H*

Feature	ServeRAID-4L (Model 200)	ServeRAID-4H (Model 225)
Arrays (maximum)	8	8
Battery-backup cache	No	Yes
Cache memory	16 MB	128 MB
Logical drives (maximum)	8	8
SCSI channels	1	4
SCSI transfer speed (maximum)	160 MB/s	160 MB/s
Supported RAID levels	0, 1, 5, Enhanced-1 (1E), and Enhanced-5 (E5), 00, 10, 1E0, 50	0, 1, 5, Enhanced-1 (1E), and Enhanced-5 (E5), 00, 10, 1E0, 50
System PCI data bus	64-bit at 33 MHz	64-bit at 33 MHz

To install an adapter:

**Attention:** When you handle electrostatic discharge-sensitive devices (ESDs), take precautions to avoid damage from static electricity. For details on handling these devices, refer to “Handling electrostatic discharge-sensitive devices” on page 124.

1. Review the safety precautions listed in Statement 1 and Statement 5 in “Translated safety notices” on page 124.
2. Switch off the appliance and peripheral devices and disconnect all external cables and power cords; then, remove the cover. See “Removing the cover (Model 200)” on page 51 for details.
3. Determine which expansion slot you will use for the adapter.

**Note:** Check the instructions that come with the adapter for any requirements or restrictions.

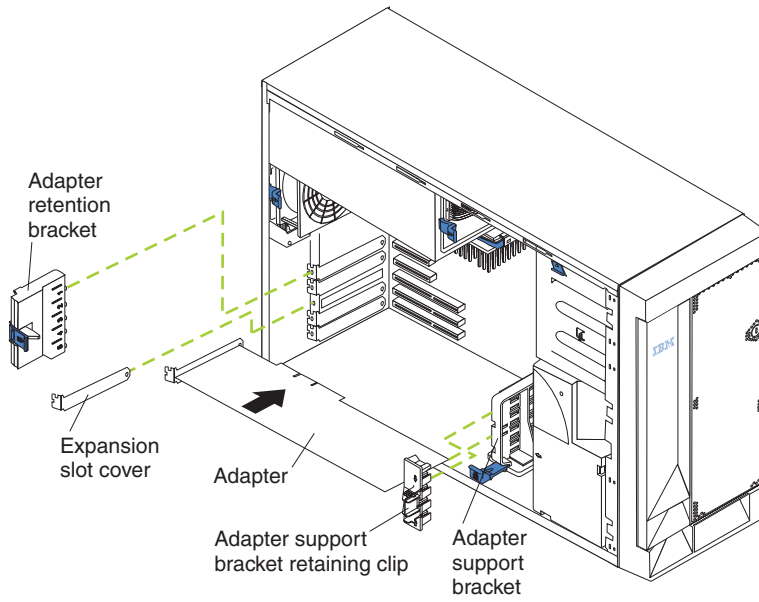


Figure 31. Installing the adapter

4. Remove the expansion-slot cover:
  - a. Press the arrow on the adapter-retention bracket release tab and remove the bracket.
  - b. Slide the expansion-slot cover out of the appliance. Store it in a safe place for future use.

**Attention:** Expansion-slot covers must be installed on all vacant slots. This maintains the electromagnetic emissions characteristics of the system and ensures proper cooling of system components.

5. Refer to the documentation that comes with your adapter for any cabling instructions. It might be easier for you to route any cables before you install the adapter.
6. Remove the adapter from the static-protective package.

**Attention:** Avoid touching the components and gold-edge connectors on the adapter.

7. Place the adapter, component-side up, on a flat, static-protective surface.
8. Set any jumpers or switches as described by the adapter manufacturer.
9. Install the adapter:

- a. If necessary, remove the adapter support bracket retaining clip.
- b. Carefully grasp the adapter by its top edge or upper corners and align it with the expansion slot on the system board.
- c. Press the adapter **firmly** into the expansion slot.

**Attention:** When you install an adapter in the appliance, be sure that it is completely and correctly seated in the system-board connector before you apply power. Incomplete insertion might cause damage to the system board or the adapter.

- d. Replace the retaining clip on the adapter support bracket, if you opened it.
- e. Align the bottom tabs of the adapter retention bracket with the holes at the top of the expansion slots, and press the adapter retention bracket toward the back of the appliance until it clicks into the locked position.

10. Connect any needed cables to the adapter.

**Attention:** Route cables so that they do not block the flow of air from the fans.

11. If you have other options to install or remove, do so now; otherwise, go to “Replacing the cover, door, and bezel” on page 80.

## Installing or replacing a microprocessor

The Model 200 has one microprocessor installed on the system board. If you install an additional microprocessor to the Model 200, your appliance can operate as a symmetric multiprocessing (SMP) appliance. This can enhance performance. For the Model 200, use these instructions to add a microprocessor. The Model 225 has two microprocessors; use these instructions to replace a microprocessor.

**Attention:** To avoid damage and ensure proper appliance operation when you install a new or an additional microprocessor, use microprocessors that have the same cache size and type, and the same clock speed. Microprocessor internal clock frequencies and external clock frequencies must be identical.

### Model 200

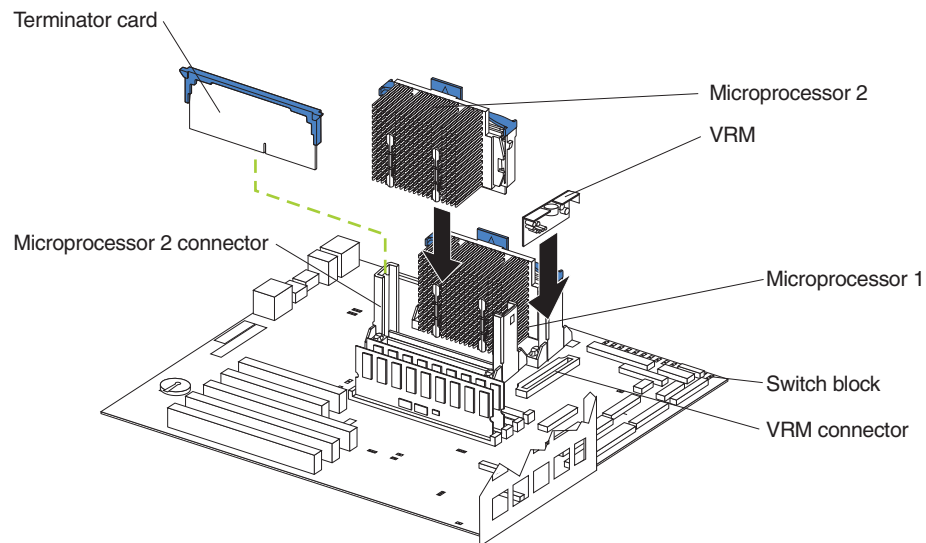


Figure 32. Installing an additional microprocessor

**Attention:** When you handle electrostatic discharge-sensitive devices (ESDs), take precautions to avoid damage from static electricity. For details on handling these devices, refer to “Handling electrostatic discharge-sensitive devices” on page 124.

1. Review the safety precautions listed in Statement 1 and Statement 5 in “Translated safety notices” on page 124.
2. Switch off the appliance and peripheral devices and disconnect all external cables and power cords; then remove the cover (see “Removing the cover (Model 200)” on page 51 for details).
3. Remove the terminator card from the microprocessor connector. Store the terminator card in a safe place in the static-protective package that your new microprocessor is shipped in; you will need to replace the terminator card if you remove the microprocessor.
4. Install the microprocessor:

- a. Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface on the appliance; then remove the microprocessor from the package.
  - b. Center the microprocessor over the microprocessor connector and carefully press the microprocessor into the connector.
5. Install the voltage regulator module (VRM) included in the microprocessor kit.
- Attention:** Use of other VRMs might cause your appliance to overheat.
- a. Center the VRM over the VRM connector. Make sure that the VRM is oriented and aligned correctly.
  - b. Press the VRM into the connector.
- Note:** If you remove the microprocessor later, remember to install the terminator card in the appropriate microprocessor connector and to remove the VRM.
6. If you have other options to install or remove, do so now; otherwise, go to “Replacing the cover” on page 80.

## Model 225

**Attention:** When you handle electrostatic discharge-sensitive devices (ESDs), take precautions to avoid damage from static electricity. For details on handling these devices, refer to “Handling electrostatic discharge-sensitive devices” on page 124.

1. Review the safety precautions listed in Statement 1 and Statement 5 in “Translated safety notices” on page 124.
2. Switch off the appliance and peripheral devices and disconnect all external cables and power cords; then remove the cover (see “Removing the cover (Model 225)” on page 53 for details).
3. Remove the bad microprocessor.

**Note:** To remove a microprocessor, pull upward on the microprocessor handle tab.

4. Install the new microprocessor:
  - a. Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface on the appliance; then remove the microprocessor from the package.
  - b. Center the microprocessor over the microprocessor connector and carefully press the microprocessor into the connector.
5. If you have other options to install or remove, do so now; otherwise, go to “Replacing the cover” on page 80.

## Replacing the battery

IBM has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.

**CAUTION:**

When replacing the battery, use only IBM Part Number 10L6432 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

*Do not:*

- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

**Dispose of the battery as required by local ordinances or regulations.**

**Note:** For translations of this safety notice, refer to *Safety Information*.

**Note:** In the U.S., call 1-800-IBM-4333 for information about battery disposal.

If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner. To order replacement batteries, call 1-800-772-2227 within the United States.

Before you begin:

- Read “Before you begin” on page 43.
- Follow any special handling and installation instructions supplied with the replacement battery.

**Note:** After you replace the battery, you must reconfigure your appliance and reset the system date and time.

To replace the battery:

1. Switch OFF the appliance and peripheral devices and disconnect all external cables and power cords; then, remove the appliance cover.
2. Remove the battery:
  - a. Use one finger to lift the battery clip over the battery.
  - b. Use one finger to slightly slide the battery out from its socket. The spring mechanism will push the battery out toward you as you slide it from the socket.
  - c. Use your thumb and index finger to pull the battery from under the battery clip.
  - d. Ensure that the battery clip is touching the base of the battery socket by pressing gently on the clip.

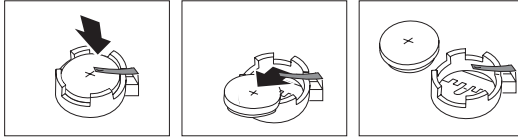


Figure 33. Replacing the battery

3. Insert the new battery:
  - a. Tilt the battery so that you can insert it into the socket, under the battery clip.
  - b. As you slide it under the battery clip, press the battery down into the socket.

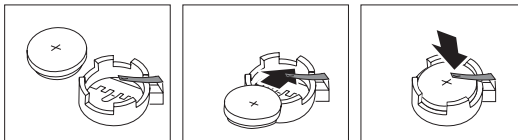


Figure 34. Installing the battery

4. Reinstall the appliance cover and connect the cables.

**Note:** Wait approximately 20 seconds after you plug the power cord of your appliance into an electrical outlet for the Power Control button to become active.

5. Switch on the appliance.
6. Start the Configuration/Setup Utility program and set configuration parameters.
  - Set the system date and time.
  - Set the power-on password.
  - Reconfigure your appliance.

## Replacing the fan assembly

Your appliance comes with two fan assemblies.

**Attention:** Replace a fan that has failed within 48 hours to help ensure proper cooling.

Figure 35 on page 79 shows the replacement of a fan assembly.

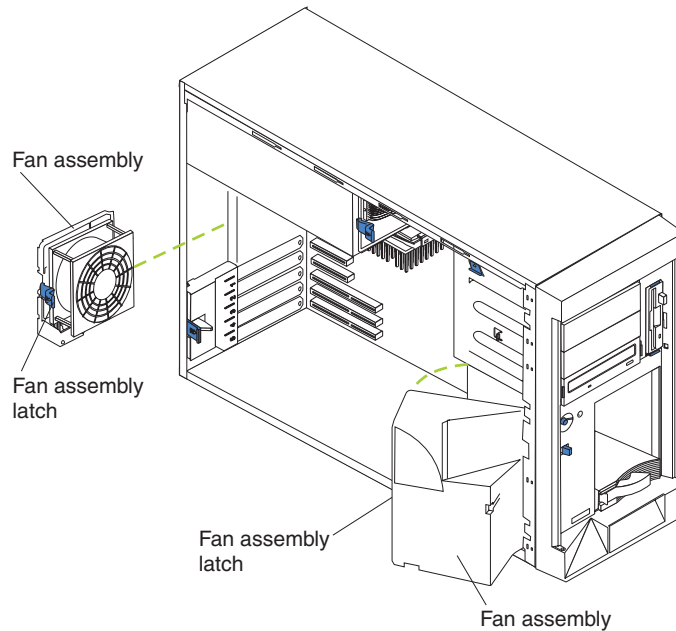


Figure 35. Replacing the fan assembly

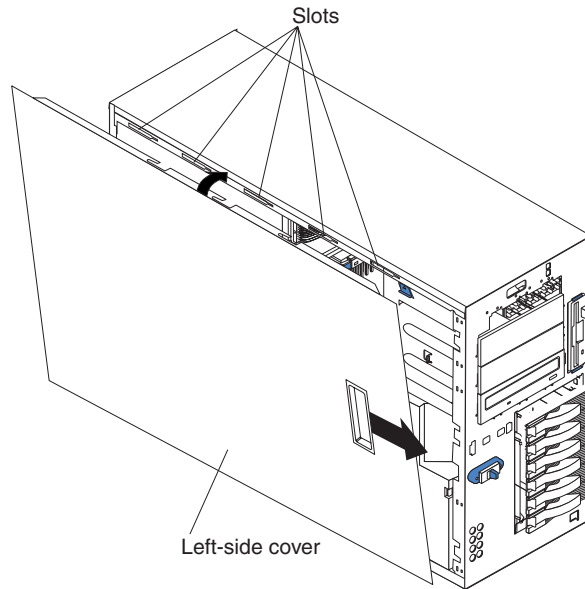
To replace the fan assembly:

1. Review the safety precautions listed in Statement 1 and Statement 5 in “Translated safety notices” on page 124.
2. Switch off the appliance and peripherals.
3. Remove the cover. See “Removing the cover (Model 200)” on page 51 for details.
4. Determine which fan assembly to replace by checking the LED on each fan; a LED that is on indicates the fan you need to replace.
5. Remove the fan assembly from the appliance:
  - a. Disconnect the fan cable from the system board.
  - b. Press the blue release latch for the fan and pull the fan away from the appliance.
6. Slide the replacement fan assembly into the appliance until it clicks into place.
7. Connect the fan cable to the system board.
8. Verify that the FAN LED on the diagnostic panel is not on. If the FAN LED is on, reseat the fan.
9. If you have other options to install or remove, do so now; otherwise, go to “Replacing the cover” on page 80.

## Replacing the cover, door, and bezel

### Replacing the cover

*Model 200:*



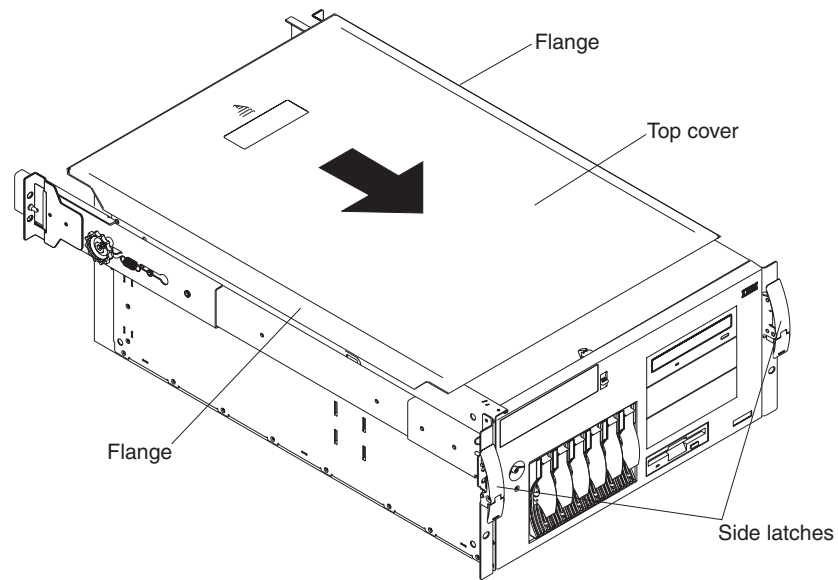
*Figure 36. Replace the Model 200 cover*

To replace the appliance left-side cover:

1. Align the cover with the left side of the appliance, about 25 mm (1 in.) from the front of the appliance; place the bottom of the cover on the bottom rail of the chassis.
2. Insert the tabs at the top of the cover into the slots at the top of the appliance.
3. Hold the cover against the appliance and slide the cover toward the front of the appliance until the cover clicks into place.



**Model 225:**



*Figure 37. Replacing the Model 225 cover*

To replace the appliance top cover:

1. Align the top cover with the top of the appliance, about 25 mm (1 in.) from the front of the appliance; the flanges on the left and right sides of the cover should be on the outside of the appliance chassis.
2. Hold the cover against the appliance and slide the cover toward the front of the appliance until the cover clicks into place.

## Replacing the door and bezel

### Model 200:

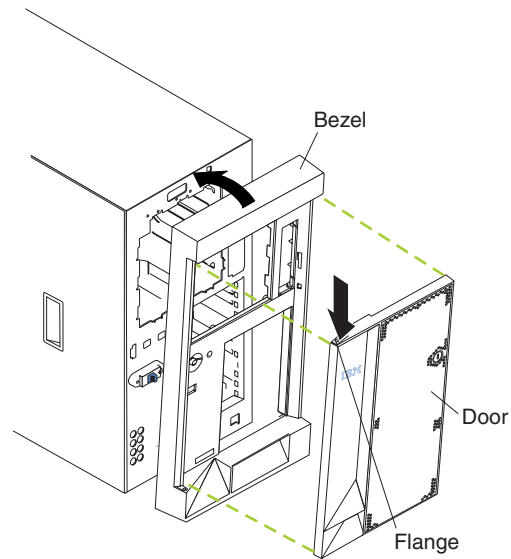


Figure 38. Replacing the Model 200 bezel

To replace the bezel:

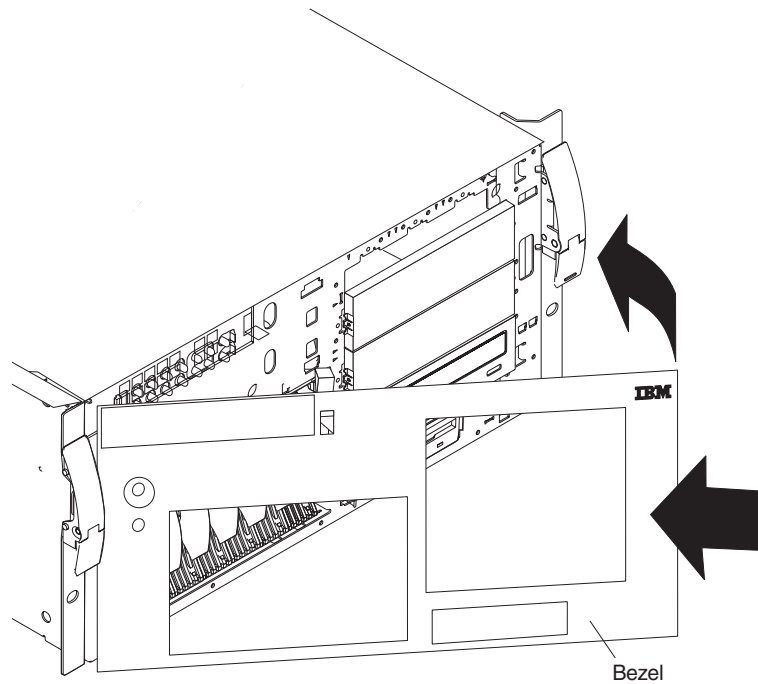
1. Place the tabs at the bottom edge of the bezel in the slots at the bottom front of the appliance.
2. Press the top of the bezel toward the appliance until it clicks into place.

To install the appliance door:

1. Set the door on the bottom hinge.
2. Press the flange downward while pressing the top of the door toward the appliance, until the flange connects with the top hinge. Then, release the flange.
3. Close and lock the appliance door.

**Attention:** Be sure to maintain a clearance of at least 127 mm (5 in.) on the front and rear of the appliance to allow for air circulation.

**Model 225:**



*Figure 39. Replacing the Model 225 bezel*

To replace the bezel:

1. Place the tabs on the left side of the bezel in the slots at the left front of the appliance.
2. Press the right end of the bezel toward the appliance until the bezel clicks into place.

---

## Connecting external options

This section shows you the location of the parts to which you can connect any external devices.

### Installation procedure

To attach an external device:

1. Read “Before you begin” on page 43 and the documentation that comes with your options.
2. Switch off the appliance and all attached devices.
3. Follow the instructions that come with the option to prepare it for installation and to connect it to the appliance.

### Input/output connector locations

The following illustration shows the input/output connectors (ports) and the expansion slots on the rear of the appliance. For pin assignments and other details about these connectors, see “Input/output ports” on page 84.

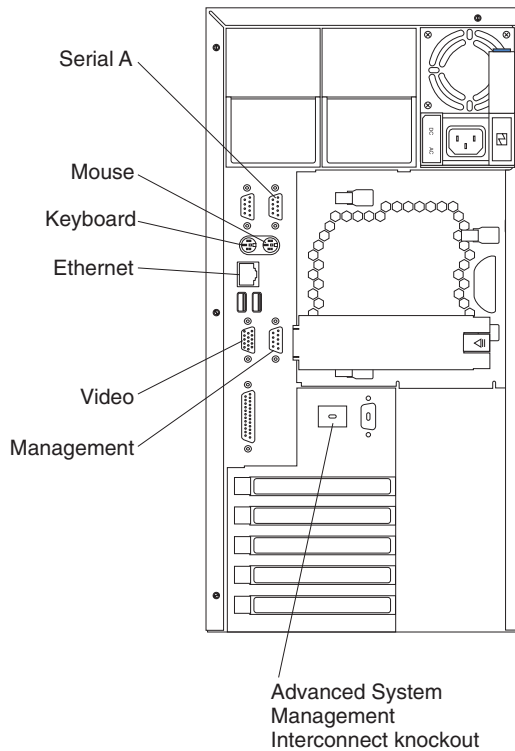


Figure 40. Input/output connectors (ports) and expansion slots

**Note:** The Management connector is dedicated for use by the Advanced System Management processor.

## Input/output ports

This section provides information about the input/output (I/O) ports on your appliance. These ports include the following:

- One integrated Ethernet port (used for configuration and service only)
- One Advanced System Management port
- ServeRAID ports
- Additional Ethernet PCI port

### Keyboard port

There is one keyboard port on the rear of your appliance.

The following table shows the pin-number assignments for the keyboard connector on the rear of your appliance.

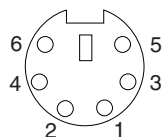


Table 20. Keyboard connector pin-number assignments

Pin	I/O	Signal
1	I/O	Data
2	N/A	Reserved
3	N/A	Ground

Table 20. Keyboard connector pin-number assignments (continued)

Pin	I/O	Signal
4	N/A	+5 V dc
5	I/O	Keyboard clock
6	N/A	Reserved

### Video port

Your appliance comes with an integrated super video graphics array (SVGA) video controller. This controller is not removable, but you can disable it by installing a PCI video adapter.

### Ethernet port

Your appliance comes with an integrated 10/100 Ethernet controller. This controller provides an interface for connecting to 10-Mbps or 100-Mbps networks and provides full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN).

To access the Ethernet port, connect a Category 3, 4 or 5 unshielded twisted-pair (UTP) cable to the RJ-45 connector on the rear of your appliance.

#### Notes:

1. The 100BASE-TX Fast Ethernet standard requires that the cabling in the network be Category 5 or higher.
2. If you plan to use the IBM Advanced Appliance Configuration Utility to configure and manage your appliance, be sure to connect the built-in Ethernet connector to the same physical network as your systems management console.

**Configuring the Ethernet controller:** When you connect your appliance to the network, the Ethernet controller automatically detects the data-transfer rate (10 Mbps or 100 Mbps) on the network and then sets the controller to operate at the appropriate rate. That is, the Ethernet controller will adjust to the network data rate, whether the data rate is standard Ethernet (10BASE-T), Fast Ethernet (100BASE-TX), half duplex (HDX), or full duplex (FDX). The controller supports half-duplex (HDX) and full-duplex (FDX) modes at both speeds.

The Ethernet controller is a PCI Plug and Play device. You do not need to set any jumpers or configure the controller for your operating system before you use the Ethernet controller.

**Failover for redundant Ethernet:** The Ethernet adapter that is on the planar does not support a failover function. However, if you install two or more 10/100 Ethernet PCI optional adapters or two or more Gigabit Ethernet adapters, and you connect them to the same logical segment as an additional (primary) Ethernet adapter, you can configure the appliance to support a failover function. In failover mode, if the primary Ethernet controller detects a link failure, all Ethernet traffic associated with it is switched to the redundant (secondary) controller. This switching occurs without any user intervention. When the primary link is restored to an operational state, the Ethernet traffic switches back to the primary Ethernet controller. The switch back to the primary Ethernet controller can be automatic or manually controlled, depending on the setup and operating system.

### Advanced systems management (service) port

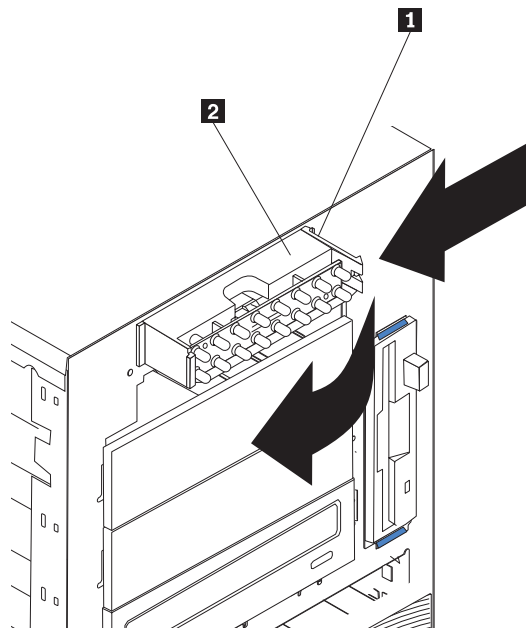
Your appliance has one communication port dedicated to the Netfinity® Advanced System Management Processor. This port uses a standard D-shell serial-port connector, labeled "Management."

You can attach a dedicated modem to the D-shell system-management connector on the rear of your appliance to communicate with the integrated Netfinity Advanced System Management Processor.

If you install the Advanced System Management Interconnect cable option, it provides two additional ports, which are used for the RS-485 function. These two ports use a dual RJ-45 connector. The RS-485 function enables you to connect the Advanced System Management Processors of several rack-mounted appliances so that they can communicate with each other in half-duplex mode.

---

## Removing the external LED card



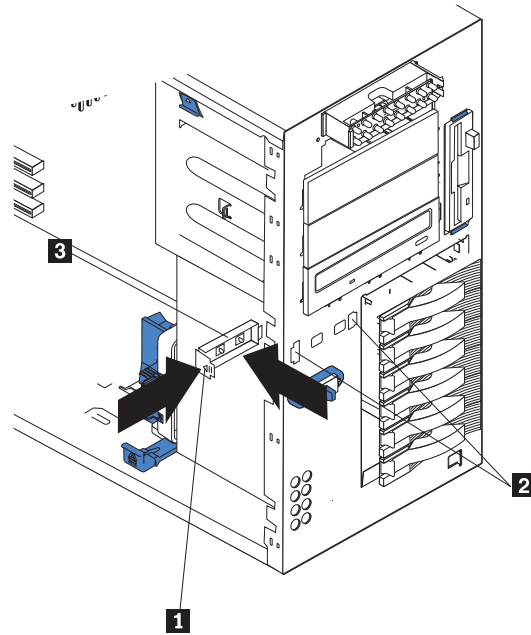
- 1** Tab
- 2** External LED card

To remove the external LED card, go through the following steps:

1. Power OFF the appliance.
2. Disconnect all external cables.
3. Remove the cover. See “Removing the cover (Model 200)” on page 51.
4. Remove the blower fan assembly. See “Replacing the fan assembly” on page 78.
5. Disconnect cables.
6. Press the arrow on the tab **1** to release the bracket.
7. Rotate the LED card **2** away from the front bezel to slide the card out of the slot.

---

## Removing the power reset card



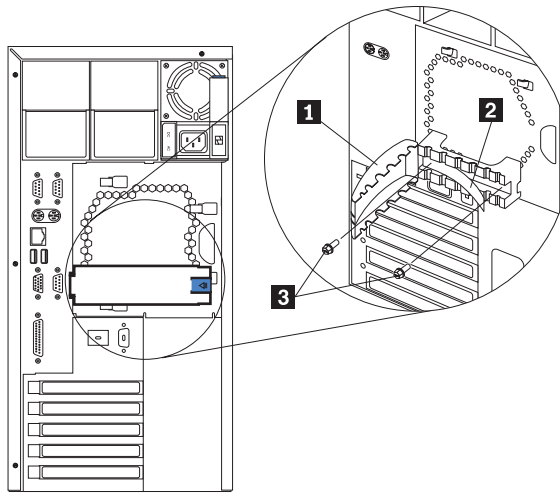
- 1** Tab
- 2** Slots (2)
- 3** Power reset card

To remove the on/off reset board:

1. Power OFF the appliance
2. Disconnect cables.
3. Press the arrow on the tab **1** to release.
4. Gently pull the power reset card **3** out of slots **2** to remove it from the front panel.

---

## Removing the rear cable bracket



- 1** Rear cable bracket
- 2** Adhesive strip
- 3** Screws (2)

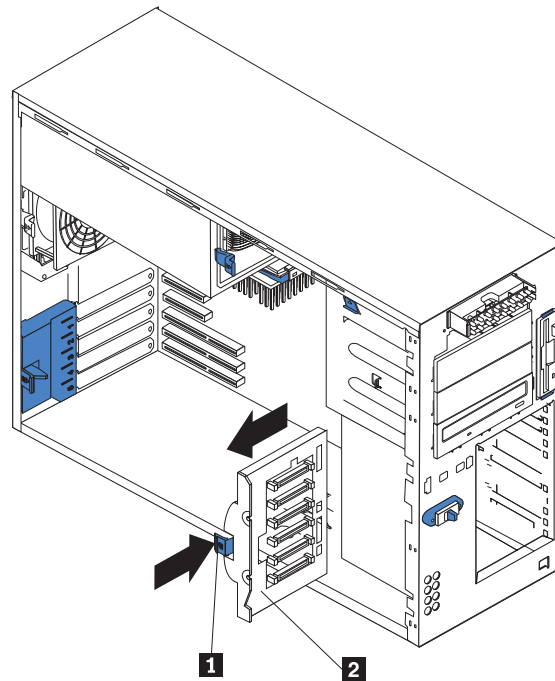
To remove the on/off reset board:

1. Power OFF the appliance
2. Disconnect cables.
3. Press the arrow on the tab of the rear cable bracket **1** to release the bracket arm.
4. Carefully peel away the adhesive strip **2**.
5. Remove the screws **3**.
6. Gently pull the rear cable bracket **1** to remove it.



---

## Removing the DASD backplane assembly



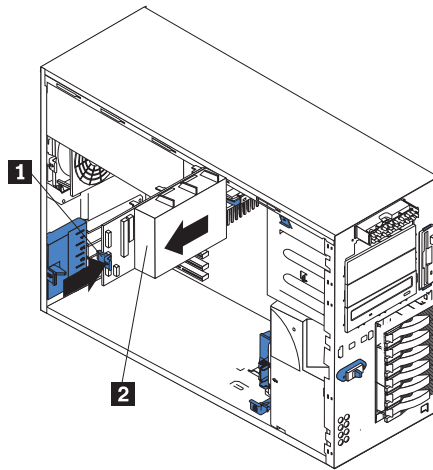
- 1** Tab
- 2** DASD backplane

To remove the DASD backplane assembly:

1. Power OFF the appliance.
2. Disconnect all external cables from the appliance.
3. Pull out the hot-swap drives far enough to remove the DASD backplane assembly.
4. Remove the cover. See “Removing the cover (Model 200)” on page 51.
5. Disconnect cable.
6. Press the arrow on the tab **1** to release the backplane.
7. Carefully slide out the DASD backplane **2** to remove it.

---

## Removing the power supply backplane



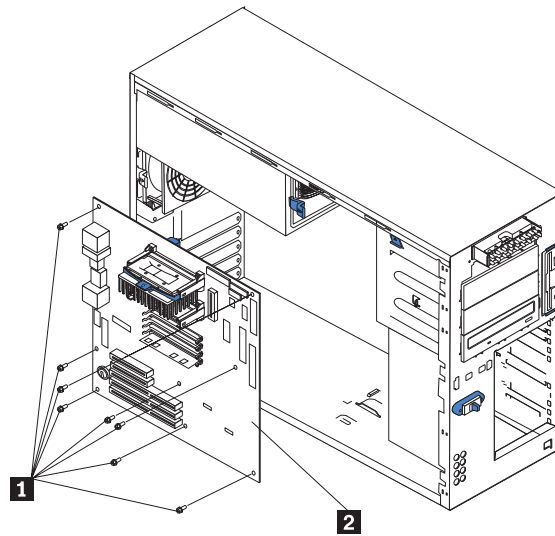
- 1** Tab
- 2** Power supply backplane

To remove the power supply backplane:

1. Power OFF the appliance.
2. Disconnect all external cables from the appliance.
3. Pull the power supplies out far enough to remove the power supply backplane.
4. Remove the cover. See “Removing the cover (Model 200)” on page 51.
5. Disconnect cables from the backplane.
6. Press the arrow on the tab **1** to release the backplane.
7. Slide out the power supply backplane **2** to remove it.

---

## Removing the system board



- 1** Screws (9)
- 2** System Board

To remove the system board:

1. Power OFF the appliance.
2. Disconnect all external cables from the appliance.
3. Remove the cover. See “Removing the cover (Model 200)” on page 51.
4. Remove the rear air flow fan. See “Replacing the fan assembly” on page 78.
5. Remove the DASD backplane assembly. See “Removing the DASD backplane assembly” on page 89.
6. Remove the power supply backplane. See “Removing the power supply backplane” on page 90.
7. Disconnect the system board cables.
8. Remove the screws (9) **1**.
9. Gently pull out the system board **2** to remove it.



---

## Chapter 5. Configuring the appliance

The following configuration programs are provided with your appliance:

- **Configuration/Setup Utility**

This program Configuration/Setup Utility is part of the *basic input/output system (BIOS)* that comes with your appliance. You can use this program to configure serial and parallel port assignments, change interrupt request (IRQ) settings, change the drive startup sequence, set the date and time, and set passwords. See “Using the Configuration/Setup Utility program” on page 94 for more information.

- **SCSISelect Utility**

With the built-in SCSISelect Utility program, you can configure the devices attached to the integrated SCSI controller. See “Using the SCSISelect utility program” on page 101 for more information.

- **ServeRAID programs**

The ServeRAID programs come with the appliance. You must use the ServeRAID Configuration program to define and configure your disk-array subsystem.

---

## Starting and stopping the appliance

This section provides instructions for starting and stopping the appliance.

### Starting the appliance

After you plug the power cord of your appliance into the power supply and an electrical outlet, the appliance can be started in several ways:

- Press the Power control button on the front of the appliance (see “Appliance controls and indicators” on page 1) to start the appliance.

**Note:** After you plug the power cord into an electrical outlet, wait approximately 20 seconds before pressing the Power control button. During this time, the system-management processor is initializing and the Power control button does not respond.

Figure 1 on page 1 and Figure 2 on page 2 show the controls and indicators on the front of the appliance.

- If the appliance is turned on, a power failure occurs and unattended-start mode is enabled in the Configuration/Setup utility program, the appliance starts automatically when power is restored.
- If ac power is present, the appliance is off and the wake-up feature is enabled in the Configuration/Setup utility program, the wake-up feature turns on the appliance at the set time.
- If ac power is present, the appliance is off, and ring signal detect is enabled in the Configuration/Setup utility program, turn ON the appliance by telephone input.
- The Netfinity Advanced System Management Processor also can turn on the appliance.

**Note:** The first time you start the appliance, a series of configuration and system preparation programs that configure the network operating system are run automatically. These programs must finish running before you use any included applications to connect to or configure the Network Attached Storage 200. Do not connect to or configure the Network Attached Storage

200 for at least 15 minutes after the initial system start. This notice applies only to the first time the Network Attached Storage 200 is started.

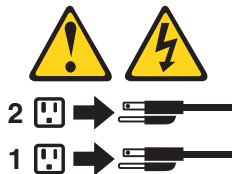
After the appliance is started successfully, the Power-on and the POST complete (see Figure 5 on page 5) are lit. If a failure occurs during start up, refer to the troubleshooting chapter in the *Network Attached Storage 200 User's Reference* to identify and resolve the problem.

- Statement 5



**CAUTION:**

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



**Note:** For translations of this safety notice, refer to *Safety Information*.

## Stopping the appliance

There are also several ways to shut down the appliance:

- Press the Power control button on the front of the appliance. This starts an orderly shutdown of the operating system, if this feature is supported by your operating system, and places the appliance in standby mode.

**Note:** After turning off the appliance, wait at least 5 seconds before you press the Power control button to power the appliance on again.

- Press and hold the Power control button for more than 4 seconds to cause an immediate shutdown of the appliance and place the appliance in standby mode. You can use this feature if the operating system ceases to function.
- Disconnect the appliance power cords from the electrical outlets to shut off all power to the appliance.

**Note:** Wait about 15 seconds after disconnecting the power cords for your system to stop running. Watch for the Power-on on the operator information panel to stop blinking.

---

## Using the Configuration/Setup Utility program

This section provides the instructions needed to start the Configuration/Setup Utility program and descriptions of the menu choices available.

**Important**

Before you can start any diagnostic test, you must attach a keyboard and monitor to the appliance. These items are not provided with the appliance and must be obtained separately.

## Starting the Configuration/Setup Utility program

To start the Configuration/Setup Utility program:

1. Switch on the appliance and watch the monitor screen.
2. When the message Press F1 for Configuration/Setup appears, press **F1**.

**Note:** If you have set both levels of passwords (user and administrator), you must enter the administrator password to access the full Configuration/Setup menu.

3. Follow the instructions that appear on the panel.

## Choices available from the Configuration/Setup main menu

From the Configuration/Setup Utility main menu, you can select settings that you want to change. The Configuration/Setup Utility main menu is similar to the one shown in Figure 41.

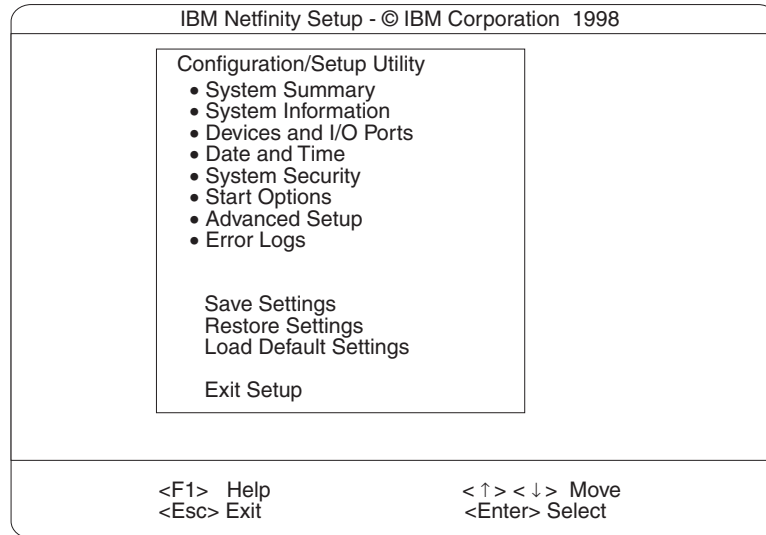


Figure 41. Setup main menu

### Notes:

1. You can press F1 to display Help information for a selected menu item.
2. The choices on some menus might differ slightly, depending on the BIOS version in your appliance.

Selections available from the main menu are as follows:

### System Summary

Select this to display configuration information. This includes the type and speed of the microprocessors and the amount of memory installed.

Changes that you make to configuration settings appear on the summary panel. You cannot edit the fields.

This choice appears on both the full and limited Configuration/Setup Utility menus.

### System Information

Select this to display information about your appliance. Changes that you make on other menus might appear on the summary panel. You cannot edit any fields. The System Information choice appears only on the full Configuration/Setup Utility main menu.

- **Product Data**

Select this to view system information, such as the machine type and model, the appliance serial number, and the revision level or issue date of the BIOS stored in the flash electronically erasable programmable ROM (EEPROM).

- **System Card Data**

Select this to view vital product data (VPD) for some appliance components.



### Devices and I/O Ports

Select this to view or change the assignments for devices and input/output ports. This choice appears only on the full Configuration/Setup Utility main menu.

### Date and Time

Select this to set the system date and time and to change the system time sent to the Advanced System Management Processor (service processor) when the appliance is started. This choice appears only on the full Configuration/Setup Utility main menu.

The system time is in a 24-hour format: hour:minute:second.

You can set a time delta to be added or subtracted from the system time that is sent to the service processor (Configuration/Setup Utility) each time the appliance is started. Use the number keys to enter the hours and minutes and + or – to add or subtract from the system time. If you want the system clock time to be the same as the Configuration/Setup Utility clock time, leave the value set at its default of 0.

### System Security

Select this to set passwords or a system owner's name. This choice appears only on the full Configuration/Setup Utility main menu.

You can implement two levels of password protection:

- **Power-on Password**

Select this choice to set or change a power-on password. See “Using passwords” on page 99 for more information.

- **Administrator Password**

Select this choice to set or change an administrator password.

**Attention:** If an administrator password is set and then forgotten, it **cannot** be overridden or removed. You must replace the system board.

The administrator password provides access to all choices on the Configuration/Setup Utility main menu. You can set, change, or delete both the administrator and power-on passwords, and allow a power-on password to be changed by the user.

See “Using passwords” on page 99 for more information.

- **System Owner's Name**

Select this to specify a system owner's name, which will display during POST. You can remove or change the name only from the System Security menu. You can use any combination of up to 16 characters for the system owner's name.

### Start Options

Select this to view or change the start options. This selection appears only on the full Configuration/Setup Utility main menu. Start options take effect when you start your appliance.

You can select keyboard operating characteristics, such as the keyboard speed. You also can specify whether the keyboard number lock starts on or off. You also can enable the appliance to run without a diskette drive, monitor, or keyboard.

The appliance uses a startup sequence to determine the device from which the operating system loads. For example, you can define a startup sequence that checks for a startable diskette in the diskette drive, checks the hard disk drive in bay 1, and then checks a network adapter.

You also can select which PCI SCSI adapter is given boot precedence. The first drive that is attached to the selected adapter will be assigned drive number 80L and the operating system will start from that drive. The default for boot precedence is Disabled. The range of choices depends upon the number of PCI SCSI adapters installed in the appliance.

You can enable a virus-detection test that checks for changes in the master boot record at startup. You also can choose to run POST in the enhanced mode or the quick mode.

### **Advanced Setup**

Select this to change values for advanced hardware features, such as cache control, and PCI configuration. This selection appears only on the full Configuration/Setup Utility main menu.

A warning message appears above the selections on this menu to alert you that the system might malfunction if these options are configured incorrectly. Follow the instructions on the screen carefully.

- **Processor Serial Number Access**

Select this to identify if the microprocessor serial number in the microprocessor is readable.

- **Core Chipset Control**

Select this to modify settings that control features of the core chip set on the system board.

- **Cache Control**

Select this to enable or disable the microprocessor cache. In addition, you can define the microprocessor cache type as write-back (WB) or write-through (WT). Selecting write-back mode will provide the maximum system performance.

- **PCI Slot/Device Information**

Select this to view and identify system resources used by PCI devices. PCI devices automatically communicate with the appliance configuration information. This usually results in automatic configuration of a PCI device.

**Attention:** You must use the menu selections to save custom settings for the PCI Slot/Device Information choice. The save, restore and load default settings on the main menu of the Configuration/Setup Utility do not save the PCI Slot/Device Information settings.

After making changes, select:

- **Save and exit the PCI Utility** to save the changes and return to the Advanced Setup choice.
- **Exit the PCI Utility without saving changes** to ignore the changes, restore the previous settings, and return to the Advanced Setup menu.

**PCI Device Control** allows you to enable or disable the integrated SCSI, video, and Ethernet controllers. You can also enable or disable PCI slots from this menu.

- The default setting is Enable for all the controllers and PCI slots. If you select Disable, the system will not configure the disabled device and the operating system will not see the device. (This is equivalent to unplugging the device.)
- If the on-board SCSI controller is disabled and no other controller and mass storage device are installed, operating system startup cannot occur.

- If the video controller is disabled and no video adapter is installed, the appliance will have no video capability. However, switching the appliance off and on three times results in a default startup that enables video again.

- **Memory Settings**

Select this to manually disable or enable a bank of memory.

If a memory error is detected during POST or memory configuration, the appliance can automatically disable the failing memory bank and continue operating with reduced memory capacity. If this occurs, you must manually enable the memory bank after the problem is corrected.

1. Select **Memory Settings** from the Advanced Setup menu
2. Use the arrow keys to highlight the bank that you want to enable
3. Use the arrow keys to select **Enable**.

### **System Service Processor Settings**

Select this to view the interrupt-request setting (IRQ) used by the Configuration/Setup Utility (system service processor). You can then use the arrow keys to select a new IRQ setting for the Configuration/Setup Utility.

### **Event/Error Logs**

Select this to view or clear error logs.

- Select **Clear error logs** to clear the error or event log.
- Select **POST Error Log** to view the three most recent error codes and messages that the system generated during POST.
- Select **System Event/Error Log** to view the system event/error log. The system event/error log contains all the system error and warning messages that the system has generated. You can use the arrow keys to move between pages in the system event/error log.

### **Save Settings**

Select this to save your customized settings.

### **Restore Settings**

Select this to delete your changes and restore the previous settings.

### **Load Default Settings**

Select this to cancel your changes and restore the factory settings.

### **Exit Setup**

If you have made any changes, the program will prompt you to save the changes or exit without saving the changes.

## **Using passwords**

**System Security** appears only on the full Configuration/Setup Utility menu. You can implement two levels of protection: power-on password and administrator password.

### **Power-on password**

After you set a power-on password, you can enable the unattended-start mode. This locks the keyboard and mouse but allows the system to start the operating system. The keyboard and mouse remain locked until you enter the correct password.

You can use any combination of up to seven characters (A – Z, a – z, and 0 – 9) for your power-on password. Keep a record of your password in a secure place. If you forget the power-on password, you can regain access to the appliance through one of the following methods:

- If an administrator password is set, enter the administrator password at the power-on prompt. Start the Configuration/Setup Utility program and change the power-on password.
- Change the position of the password override switch as described in “Setting the password override switch”.
- Remove the battery and then install the battery.

**Setting the password override switch:**

**Note:** As shown in Figure 11 on page 49, switch 8 is the one at the top of the switch block (SW1).

To set the password override switch:

1. Review the information in “Before you begin” on page 43.
2. Switch OFF the appliance and peripheral devices and disconnect all external cables and power cords; then, remove the cover. See “Removing the cover (Model 200)” on page 51.
3. Change the setting of the password override switch (switch 8 on switch block 1 on the system board) to ON.
4. Install the appliance cover (see “Removing the cover (Model 200)” on page 51) and connect all external cables and power cords.

**Note:** You can now start the Configuration/Setup utility program and change the power-on password. If you want the appliance to ask for a password when you switch it on, set the password override switch back to the OFF position.

**Administrator password**

Select this to set an administrator password. The administrator password provides access to all choices on the Configuration/Setup Utility main menu. You can set, change, or delete both the administrator and power-on passwords, and allow a power-on password to be changed by the user.

**Attention:** If an administrator password is set and then forgotten, it **cannot** be overridden or removed. You must replace the system board.

Table 21 provides a summary of the password features.

*Table 21. Power-on and administrator password features*

Type of password	Description
Power-on password	<ul style="list-style-type: none"> <li>• Enter the password to complete the system startup.</li> <li>• All choices are available on the Configuration/Setup Utility main menu.</li> </ul>
Administrator password	<ul style="list-style-type: none"> <li>• No password is required to start the system.</li> <li>• Enter the password to access the Configuration/Setup Utility program.</li> <li>• All choices are available on the Configuration/Setup Utility main menu.</li> </ul>
Administrator <i>and</i> power-on password	<ul style="list-style-type: none"> <li>• You can enter either password to complete the system startup.</li> <li>• The administrator password provides access to all choices on the Configuration/Setup Utility main menu. You can set, change, or delete both the administrator and power-on passwords, and allow a power-on password to be changed by the user.</li> <li>• The power-on password provides access to a limited set of choices on the Configuration/Setup Utility main menu. This limited access might include changing or deleting the power-on password.</li> </ul>

---

## Bypassing an unknown power-on password

When a power-on password is set, POST does not complete until you enter the password. If you forget the power-on password, you can regain access to the appliance through any of the following methods:

- Enter the administrator password at the power-on prompt, if an administrator password has been set.
- Start the Configuration/Setup Utility program and change the power-on password.
- Change switch 8 of switch block 1 (SW1) on the system board to the opposite position to bypass the power-on password check. You can then start the Configuration/Setup Utility program and change the power-on password.

---

## Using the SCSISelect utility program

SCSISelect is a built-in, menu-driven configuration utility program that you can use to:

- View the default SCSI IDs
- Locate and correct configuration conflicts
- Perform a low-level format on a SCSI hard disk

The following sections provide the instructions needed to start the SCSISelect Utility and descriptions of the menu choices available.

### Starting the SCSISelect utility program

To start the SCSISelect utility program:

1. Switch the appliance ON.
2. When the <<< Press <CTRL><A> for SCSISelect Utility! >>> prompt appears, press **Ctrl+A**.

**Note:** If an administrator password has been set, a prompt appears asking you to enter the password to start the SCSISelect Utility program.

3. When prompted, select either **channel A** (internal) or **channel B** (external).
4. Use the arrow keys to select a choice from the menu.
  - Press **Esc** to return to the previous menu.
  - Press **F5** to switch between color and monochrome modes (if your monitor permits).
5. Follow the instructions on the panel to change the settings of the selected items; then, press **Enter**.

### Choices available from the SCSISelect menu

The following selections appear on the SCSISelect Utility menu:

- **Configure/View Host Adapter Settings**

Select this to view or change the SCSI controller settings. To reset the SCSI controller to its default values, press **F6**; then, follow the instructions that appear on the panel.

You can view or change the following controller settings:

- **Host Adapter SCSI ID**

Select this to view the SCSI controller ID, which is normally 7.

- **SCSI Parity Checking**

Select this to view the assigned value of *Enabled*.

– **Host Adapter SCSI Termination**

Select this to view the assigned value of *Automatic*.

– **Boot Device Options**

Select this to configure startable device parameters. Before you can make updates, you must know the ID of the device whose parameters you want to configure.

– **SCSI Device Configuration**

Select this to configure SCSI device parameters. Before you can make updates, you must know the ID of the device whose parameters you want to configure.

**Note:** The Maximum Sync Transfer Rate represents the transfer rate for Ultra SCSI devices.

- The transfer rate for Ultra3 SCSI LVD devices is 160.0
- The transfer rate for Ultra2 SCSI LVD devices is 80.0
- The transfer rate for Fast SCSI devices is 20.0

– **Advanced Configuration Options**

Select this to view or change the settings for advanced configuration options. These options include enabling support for large hard disk drives and support for drives with UltraSCSI speeds.

• **SCSI Disk Utilities**

Select this to view the SCSI IDs that are assigned to each device or to format a SCSI device.

To use the utility program, select a drive from the list. Read the information on the panels carefully before making a selection.

**Note:** If you press Ctrl+A before the selected drives are ready, restart the appliance and watch the SCSISelect messages as each drive spins up. After the drive that you want to view or format spins up, press **Ctrl+A**.

• **Format Disk**

**Attention:** The Low-Level Format program erases *all* data and programs.

Select this to perform a low-level format on a hard disk drive. Depending on the hard disk drive capacity, the Low-Level Format program could take up to 2 hours.

Use the Low-Level Format program:

- When you are installing software that requires a low-level format
- When you get recurring messages from the diagnostic tests directing you to run the Low-Level Format program on the hard disk drive
- As a last resort before replacing a failing hard disk drive

**Note:** If your appliance has a PCI RAID adapter installed, refer to the RAID adapter documentation for instructions for performing low-level formats on hard disk drives attached to the adapter.

To start the Low-Level Format program:

1. If the hard disk is working, make a backup copy of all the files and programs on the hard disk drive. (See your operating system information for instructions.)
2. Select **Format Disk**; then, follow the instructions on the panel.

**Note:** Hard disks normally contain more tracks than their stated capacity (to allow for defective tracks). A message is displayed if the defect limit is reached. If this happens, have the system serviced.





# Appendix A. Rack Installation Instructions

The following reduced-size illustration in Figure 42 of the front and the back of the rack-mounting template shows where to place the clip nuts or cage nuts when installing your appliance in a rack.

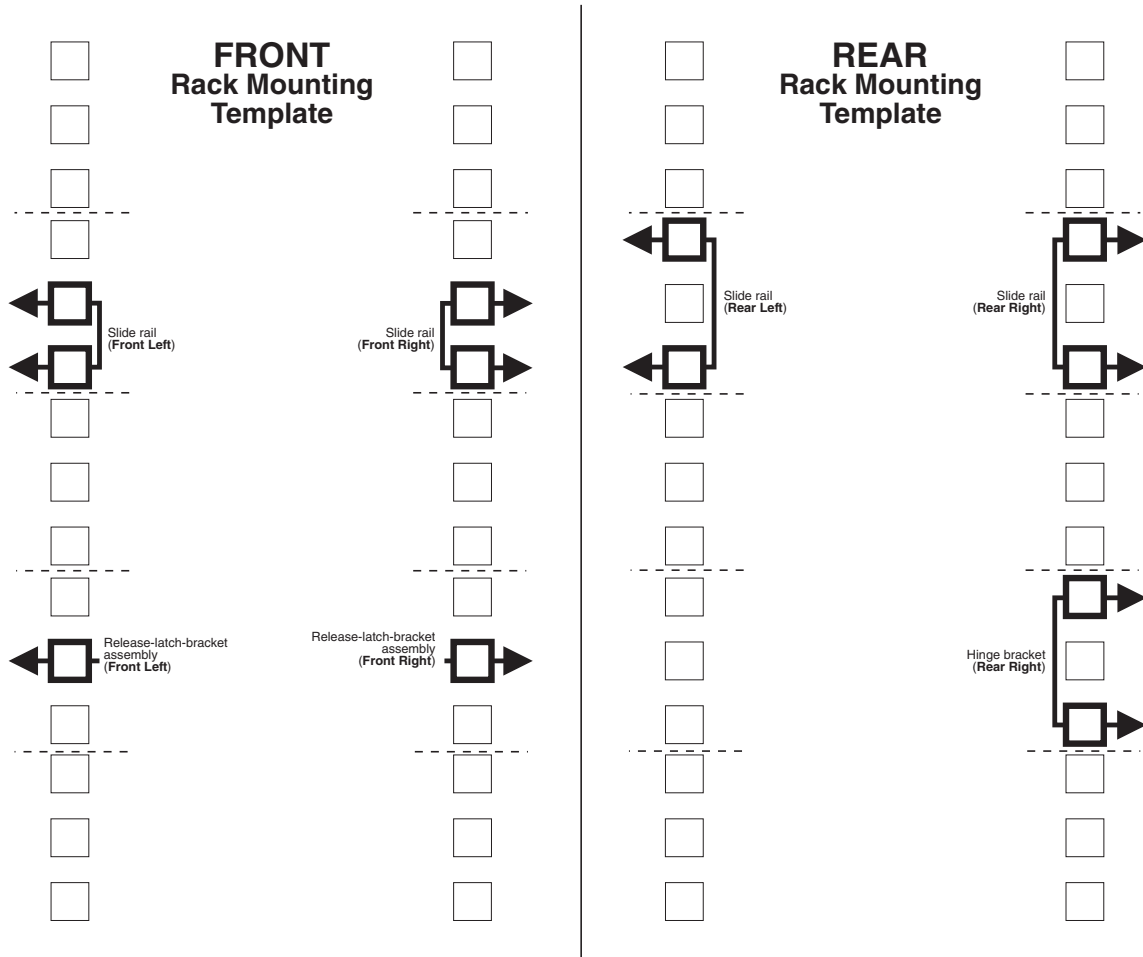
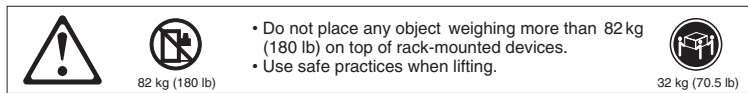


Figure 42. Rack mounting template

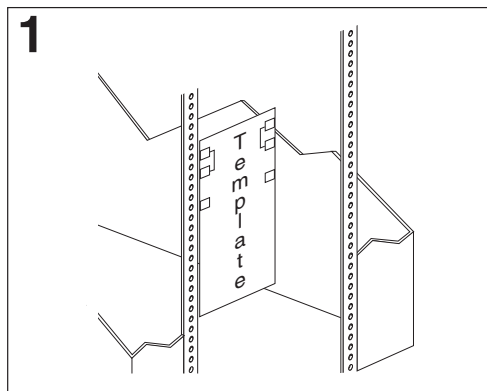
# Rack Mounting Instructions

- Review the documentation that comes with your rack enclosure.
- Maintain 15 cm (6 in.) of clearance around your appliance for air circulation.
- Ensure the room air temperature is below 35°C (95°F).
- Plan the appliance installation working from the bottom of the rack up.
- Remove the rack doors and the side panels during the installation, if necessary.
- Position the template to the rack so that the edges of the template do not overlap any other devices to be installed.
- Connect all power cords on the appliance and on other devices to properly wired and grounded electrical outlets.
- Take precautions to prevent the rack from overloading the power outlets when you install multiple devices in a rack.

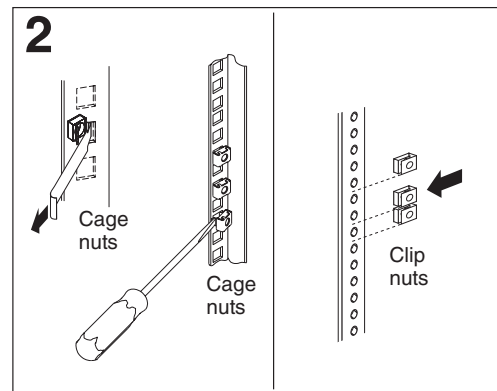


The following is a list of items shipped in your rack installation kit. If any items are missing or damaged, contact your place of purchase.

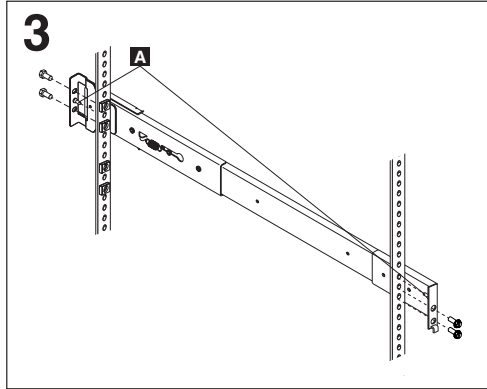
- Cable-management assembly
- Cable straps (7)
- Cable ties (10)
- Cage nuts (12)
- Clip nuts (12)
- Screw packages (2)
- Slide rails (2)



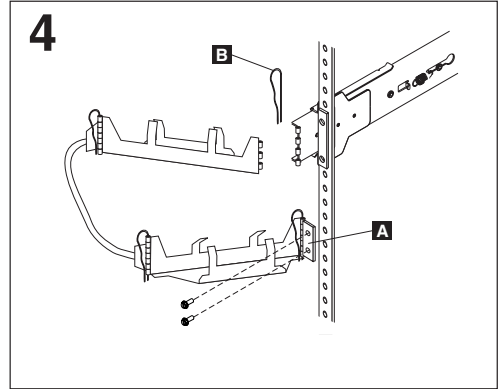
1 Use the attached stickers to mark the holes on the front and the rear of the rack in the locations indicated by the arrows on the template.



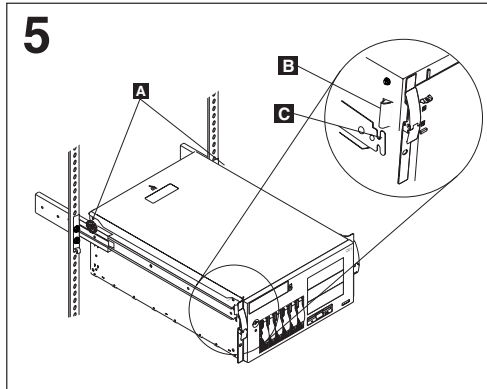
2 Use a screwdriver or the cage-nut-insertion tool to insert the cage nuts, or slide on the clip nuts, as required for your rack, into all the marked holes.



Use the pins **A** on the slide rail to align the slide rail to the rack. Use the M6 screws to bolt the slide rail to the rack (left front of rack shown here). Repeat this step for the other slide rail.



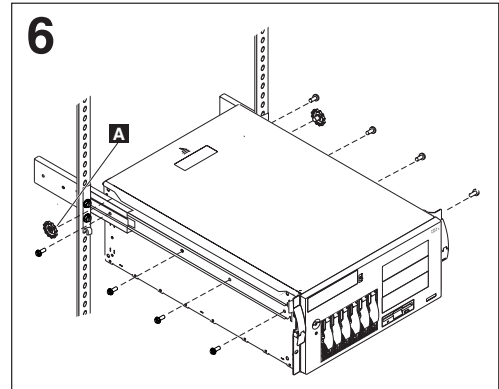
Use the M6 screws to attach the hinge bracket **A** to the rear of the rack. Then, use the hinge pin **B** to attach the cable-management assembly to the slide rail. (Right rear of rack shown here).



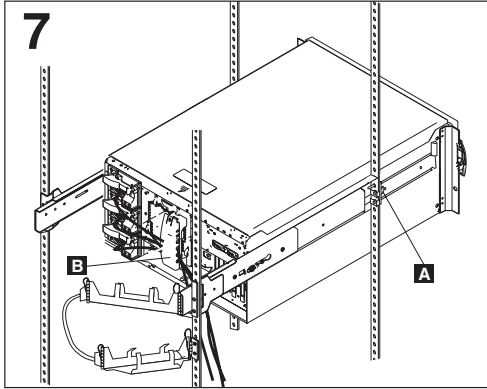
**Caution:** To avoid injury, do not place your fingers around the rack-support wheels when lowering the appliance onto the rails.

Fully extend the slide rails out of the rack. Lift the appliance above the rails; then, rest the rack-support wheels **A** located on the rear of the appliance on the slide rails. Lower the front of the appliance onto the slide rails.

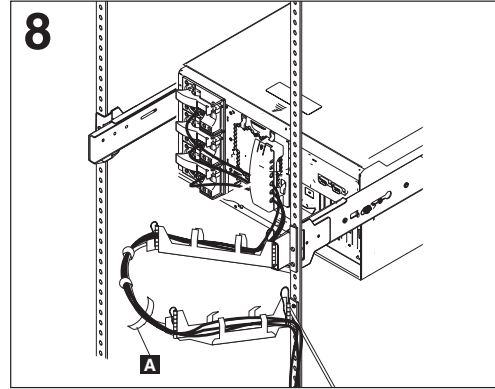
**Note:** Be sure the bracket notches **B** on the front of the appliance fit securely on the tabs **C** located on the front of the slide rails.



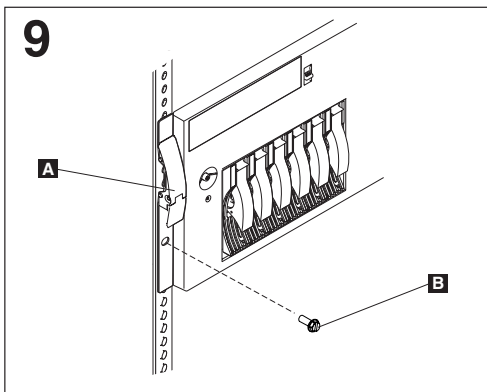
Use the M4 screws to secure the appliance to the rails. Unscrew the rack-support wheels **A** and store them in a safe place.



7 Press in on the safety latches **A** and slide the appliance halfway into the rack. Attach the power, keyboard, mouse, and monitor cables (if required) to the appliance and route them through the cable restraint bracket **B**. Then, attach all other required cables to the appliance.



8 Route all the cables through the cable-management assembly as shown. Then, use the cable straps **A** or the cable ties to secure the cables to the cable-management assembly.



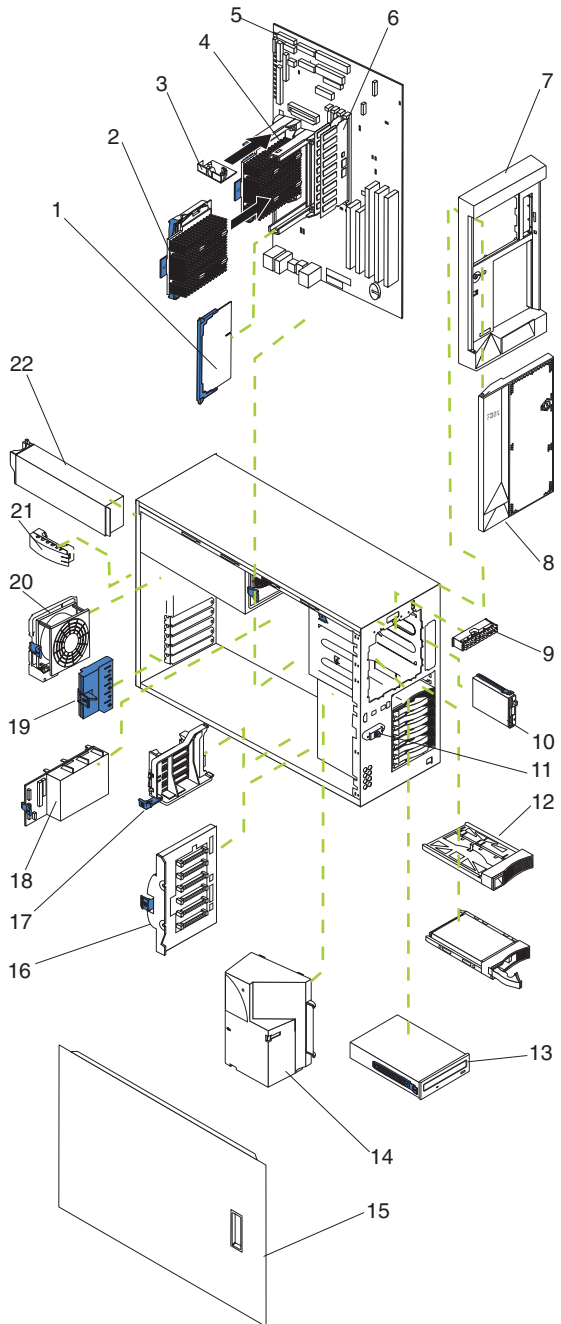
9 Slide the appliance into the rack until the release latches **A** snap shut. Then, insert the M6 screws **B** through the release-latch-bracket assembly.  
**Note:** Inserting the M6 screws **B** is optional, unless you are moving the rack or the rack is in a vibration-prone area.

---

## **Appendix B. Parts Listings**

The following pages contains exploded views and parts lists of the IBM TotalStorage Network Attached Storage Appliance Models 200 and 225.

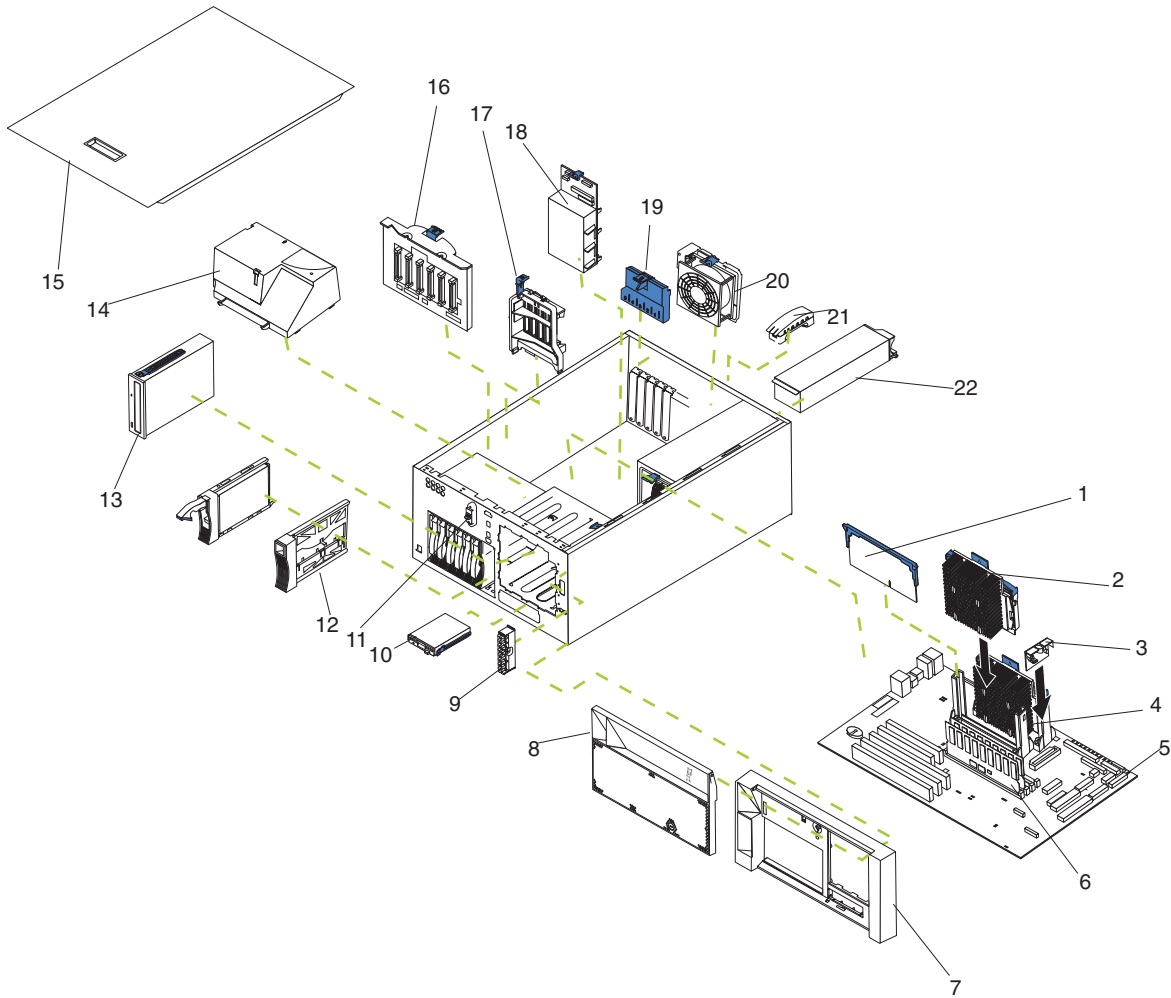
# Assembly 1: 5194 - 200 Network Attached Storage Appliance



Assembly 1: (continued)

Asm-Index	Part Number	Units	Description
1-	38P7559	1	5194 - 200 Network Attached Storage Appliance
-1	37L5949	1	• • Terminator card assembly
-2	22P1797	1	• • 800/133FSB/256 processor (optional)
-3	36L8901	1	• • Voltage regulator card assembly
-4	22P1797	1	• • 800/133FSB/256 processor
-5	25P3289	1	• • System board assembly
-6		4	• • • Memory 256 MB and 1 GB RDIMM is not available for the Model 225
-	33L3126	1	• • • 256 MB 133 MHz ECC SDRAM RDIMM Memory
-	33L3128	1	• • • 512 MB 133 MHz ECC SDRAM RDIMM Memory
-	33L3130	1	• • • 1 GB 133 MHz ECC SDRAM RDIMM Memory
-9	37L6773	1	• • External LED card assembly
-10	76H4091	1	• • Floppy drive, 1.44 MB
-11	00N6377	1	• • Power reset card assembly
-13	36L8756	1	• • CD ROM, 40X
-14	36L9998	1	• • Blower assembly
-16	00N9557	1	• • DASD backplane
-17	00N7056	1	• • PCI adapter card support assembly
-18	00N6391	1	• • Power backplane card assembly
-19	36L9994	1	• • PCI adapter card retainer
-20	36L9995	1	• • Rear fan assembly
-22	36L8819	3	• • Power Supply, 250 Watt
-	19K1469	1	• • 36.4 GB 10K-4 Ultra 160 SCSI Hot-Swap SL hard drive
-		1	• • Adapters
-	06P3609	1	• • • 10/100 Ethernet adapter 2
-	06P3709	1	• • • Gigabit Ethernet SX adapter
-	00N6413	2	• • Floppy disk drive slide
-	00N6407	1	• • 5.25" media blank bezel
-	00N6579	1	• • Cable, Power Backplane to DASD Backplane
-	00N6581	1	• • Cable, Power Backplane to System Board-I2C
-	00N6582	1	• • Cable, Power Backplane to System Board-Signal
-	00N6583	1	• • Cable, Power Backplane to Media
-	37L6777	1	• • Cable, Power Backplane to System Board-Power
-	37L0350	1	• • Cable, LVD SCSI
-	37L6055	1	• • Cable, IDE
-	37L6057	1	• • Cable, floppy disk drive
-		1	• • PCI adapters
-	10L7095	1	• • • PCI Fast/Wide Ultra SCSI adapter
-	06P5436	1	• • • AMS PCI adapter
-		1	• • Miscellaneous parts kit
-	00N7046	1	• • Chassis Weldment
-7	38P7619	1	• Bezel assembly
-8	24P0615	1	• Door assembly
-12	00N7259	1	• Hard disk drive filler blank
-15	00N6401	1	• Cover set assembly
-	00N6393	1	• Key lock assembly
-	00N6411	4	• Foot, Screw-in
-	00N7048	1	• Chassis, mechanical shell

## Assembly 2: 5194 - 225 Network Attached Storage Appliance



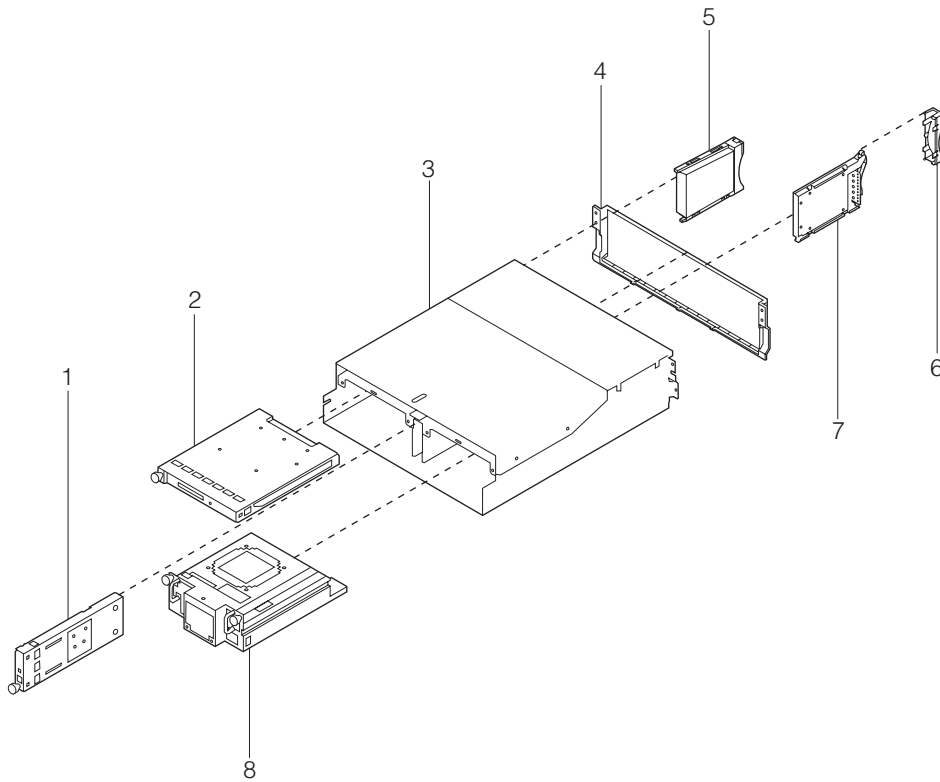


## Assembly 2: (continued)

Asm- Index	Part Number	Units	Description
2-	38P7560	1	5194 - 225 Network Attached Storage Appliance
-1	37L5949	1	• • Terminator card assembly
-2	22P1797	1	• • 800/133FSB/256 processor (optional)
-3	36L8901	1	• • Voltage regulator card assembly
-4	22P1797	1	• • 800/133FSB/256 processor
-5	25P3289	1	• • System board assembly
-6		4	• • • Memory 256 MB and 1 GB RDIMM is not available for the Model 225
-	33L3126	1	• • • 256 MB 133 MHz ECC SDRAM RDIMM Memory
-	33L3128	1	• • • 512 MB 133 MHz ECC SDRAM RDIMM Memory
-	33L3130	1	• • • 1 GB 133 MHz ECC SDRAM RDIMM Memory
-9	37L6773	1	• • External LED card assembly
-10	76H4091	1	• • Floppy drive, 1.44 MB
-11	00N6377	1	• • Power reset card assembly
-13	36L8756	1	• • CD ROM, 40X
-14	36L9998	1	• • Blower assembly
-16	00N9557	1	• • DASD backplane
-17	00N7056	1	• • PCI adapter card support assembly
-18	00N6391	1	• • Power backplane card assembly
-19	36L9994	1	• • PCI adapter card retainer
-20	36L9995	1	• • Rear fan assembly
-22	36L8819	3	• • Power Supply, 250 Watt
-	19K1469	1	• • 36.4 GB 10K-4 Ultra 160 SCSI Hot-Swap SL hard drive
-		1	• • Adapters
-	06P3609	1	• • • 10/100 Ethernet adapter 2
-	06P3709	1	• • • Gigabit Ethernet SX adapter
-	00N6413	2	• • Floppy disk drive slide
-	00N6407	1	• • 5.25" media blank bezel
-	00N6579	1	• • Cable, Power Backplane to DASD Backplane
-	00N6581	1	• • Cable, Power Backplane to System Board-I2C
-	00N6582	1	• • Cable, Power Backplane to System Board-Signal
-	00N6583	1	• • Cable, Power Backplane to Media
-	37L6777	1	• • Cable, Power Backplane to System Board-Power
-	37L0350	1	• • Cable, LVD SCSI
-	37L6055	1	• • Cable, IDE
-	37L6057	1	• • Cable, floppy disk drive
-		1	• • PCI adapters
-	10L7095	1	• • • PCI Fast/Wide Ultra SCSI adapter
-	06P5436	1	• • • AMS PCI adapter
-		1	• • Miscellaneous parts kit
-	00N7046	1	• • Chassis Weldment
-	38P7621	1	• Bezel assembly
-	00N6403	1	• Cover set assembly
-	00N6419	1	• Miscellaneous rack parts kit
-	00N6429	1	• Rack bracket assemblies
-	00N7050	1	• Chassis mechanical shell
-			• ServeRAID-4H Ultra160 card
-	37L6892	1	• • ServeRAID-4H Ultra160 base card
-	37L6902	1	• • ServeRAID-4H Ultra160 daughter card
-	00N6417	1	• Rack kit
-	38P7621	1	• Plastic bezel
-	38P7622	1	• Chassis, mechanical shell
-	00N6419	1	• Miscellaneous rack parts kit



## Assembly 3: 5194 - EXU Network Attached Storage Expansion Unit



### Assembly 3: (continued)

Asm-Index	Part Number	Units	Description
3-	38P7568	1	5194 - EXU Network Attached Storage Expansion Unit
-1	19K1173	1	• Switch card
-2	19K1171	1	• SCSI controller
-3	19K1239	1	• Chassis
-4	38P7623	1	• Plastic bezel
-5	19K1469	14	• 36.4 GB SCSI hard drive
-6		1	• Bridge card bezel
-7	19K1172	1	• Bridge card
-8	07K5985	1	• Power supply
-	09N7276	1	• 2M SCSI cable
-	19K1169	1	• Rack mounting rail kit

---

## Appendix C. Specifications

---

### Dimensions

	<b>Model 200</b>	<b>Model 225</b>	<b>Model EXU</b>
<b>Front</b>	217.3 mm (8.6 in)	426.5 mm (16.8 in)	444.0 mm (17.5 in)
<b>Side</b>	659.3 mm (26.0 in)	629.3 mm (24.8 in)	519.0 mm (20.4 in)
<b>Height</b>	426.5 mm (16.8 in)	217.3 mm (8.6 in)	127.5 mm (5.0 in)

---

### Weight

<b>Model 200</b>	<b>Model 225</b>	<b>Model EXU</b>
Approx. 26.6 kg (58.6 lb) without extra hard drives	Approx. 25.2 kg (55.7 lb) without extra hard drives	
Approx. 37.5 kg (82.7 lb) when fully configured	Approx. 36.2 kg (79.8 lb) when fully configured	Approx. with all hard drives: 34.5 kg (76 lb)

---

### Operating environment

	<b>Models 200 and 225</b>
<b>Air temperature</b>	
at altitudes up to 914 m (2999 ft.)	10° - 35° C (50.0° - 95.0° F)
at altitudes from 914 m (2999 ft.) to 2133 m (6998 ft)	10° - 32° C (50.0° - 89.6° F).
<b>Humidity</b>	8% - 80%

---

### Nonoperating (power-off) environment

	<b>Models 200 and 225</b>
Temperature (at max. altitude of 2133 m [6998 ft])	10° - 43° C (50.0° - 109.4° F)
Humidity	8% - 80%

---

### Heat output

Approximate heat output for Models 200 and 225:	
Minimum configuration	683 BTU (200 watts)
Maximum configuration	2048 BTU (600 watts)

---

### Power requirements

<b>Voltage low range</b>	100 - 127 V ac, 50 - 60 Hz
<b>Voltage high range</b>	200 - 240 V ac, 50 - 60 Hz
<b>Power consumption</b>	0.08 - 0.52 kVA



---

## Appendix D. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering the subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk, NY 10504-1785  
U.S.A.

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Subject to IBM's valid intellectual property or other legally protectable rights, any functionally equivalent product, program, or service may be used instead of the IBM product, program, or service. The evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, are the responsibility of the user.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk, NY 10504-1785  
U.S.A.

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be

incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

---

## Safety and environmental notices

The following sections describe the safety and environmental items you must consider for an IBM Network Attached Storage Appliance.

### Safety notices

#### General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
  1. Ensure you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb.) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

**Remember:** Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.



- Reinstall all covers correctly before returning the machine to the customer.

## Electrical safety



### Caution:

**Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the appliance covers, unless instructed otherwise in the installation and configuration procedures.**

Observe the following rules when working on electrical equipment.

**Important:** Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.  
**Remember:** Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.  
**Remember:** There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
  - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators
  - Similar units

This practice ensures correct grounding of the units.

- If an electrical accident occurs:
  - Use caution; do not become a victim yourself.
  - Switch off power.
  - Send another person to get medical aid.

### **Safety inspection guide**

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
  - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.

- b. The power cord should be the appropriate type as specified in the parts listings.
- c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

### **Handling electrostatic discharge-sensitive devices**

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

#### **Notes:**

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

**Note:** The use of a grounding system is desirable but not required to protect against ESD damage.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
- Use the round ground-prong of the AC plug on AC-operated computers.

### **Grounding requirements**

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

### **Translated safety notices**

The safety notices in this section are provided in the following languages:

- English

- Brazilian Portuguese
- Chinese
- French
- German
- Italian
- Korean
- Spanish

**Important:** All safety notices in the *Appliance Library* begin with a number. This number is used to cross-reference an English caution or danger notice with translated versions of the caution or danger notice in this section.

Be sure to read all safety notices before performing any of the instructions.

Statement 1



**DANGER**

**Electrical current from power, telephone and communication cables is hazardous.**

**To avoid a shock hazard:**

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

**To Connect**

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

**To Disconnect**

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 2



**CAUTION:**

**When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.**

**Do not:**

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Statement 3



**CAUTION:**

When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



**DANGER**

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Statement 4



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

**CAUTION:**  
Use safe practices when lifting.

- Statement 5



**CAUTION:**  
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 10



**CAUTION:**  
Do not place any object weighing more than 82 kg (180 lb.) on top of rack-mounted devices.





### **Importante:**

Todas as instruções de cuidado e perigo da *appliance Library* começam com um número. Este número é utilizado para fazer referência cruzada de uma instrução de cuidado ou perigo no idioma inglês com as versões traduzidas das instruções de cuidado ou perigo encontradas nesta seção.

Por exemplo, se uma instrução de cuidado é iniciada com o número 1, as traduções para aquela instrução de cuidado aparecem nesta seção sob a instrução 1.

Certifique-se de ler todas as instruções de cuidado e perigo antes de executar qualquer operação.

#### Instrução 1



### **PERIGO**

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicações é perigosa.

Para evitar risco de choque:

- Não conecte ou desconecte cabos e não realize instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.
- Conecte todos os cabos de alimentação a tomadas elétricas corretamente instaladas e aterradas.
- Conecte todos os equipamentos ao qual esse produto será conectado a tomadas corretamente instaladas.
- Sempre que possível, utilize apenas uma das mãos para conectar ou desconectar cabos de sinal.
- Nunca ligue qualquer equipamento quando existir evidência de danos por fogo, água ou na estrutura.
- Desconecte cabos de alimentação, sistemas de telecomunicação, redes e modems antes de abrir as tampas dos dispositivos, a menos que especificado de maneira diferente nos procedimentos de instalação e configuração.
- Conecte e desconecte cabos conforme descrito na seguinte tabela, ao instalar ou movimentar este produto ou os dispositivos conectados, ou ao abrir suas tampas.

Para Conectar:	Para Desconectar:
<ol style="list-style-type: none"> <li>1. DESLIGUE Tudo.</li> <li>2. Primeiramente, conecte todos os cabos aos dispositivos.</li> <li>3. Conecte os cabos de sinal aos conectores.</li> <li>4. Conecte os cabos de alimentação às tomadas.</li> <li>5. LIGUE os dispositivos.</li> </ol>	<ol style="list-style-type: none"> <li>1. DESLIGUE Tudo.</li> <li>2. Primeiramente, remova os cabos de alimentação das tomadas.</li> <li>3. Remova os cabos de sinal dos conectores.</li> <li>4. Remova todos os cabos dos dispositivos.</li> </ol>

### Instrução 2



#### **CUIDADO:**

Ao substituir a bateria de lítio, utilize apenas uma bateria IBM, Número de Peça 33F8354 ou uma bateria de tipo equivalente, recomendada pelo fabricante. Se o seu sistema possui um módulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de módulo, do mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada e descartada de maneira correta.

Não:

- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte

Para descartar a bateria, entre em contato com a área de atendimento a clientes IBM, pelo telefone (011) 889-8986, para obter informações sobre como enviar a bateria pelo correio para a IBM.

### Instrução 3



#### **PRECAUCIÓN:**

Quando produtos a laser (unidades de CD-ROM, unidades de DVD, dispositivos de fibra ótica, transmissores, etc.) estiverem instalados, observe o seguinte:

- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Nenhuma peça localizada no interior do dispositivo pode ser consertada.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui pode resultar em exposição prejudicial à radiação.



## PERIGO

Alguns produtos a laser contêm um diodo laser da Classe 3A ou Classe 3B embutido. Observe o seguinte:

Radiação de laser quando aberto. Não olhe diretamente para o raio a olho nu ou com instrumentos óticos, e evite exposição direta ao raio.

Instrução 4



≥18 kg (37 lbs)



≥32 kg (70,5 lbs)



≥55 kg (121,2 lbs)

## CUIDADO:

Ao levantar a máquina, faça-o com segurança.

Instrução 5



## CUIDADO:

Os botões Liga/Desliga localizados no dispositivo e na fonte de alimentação não desligam a corrente elétrica fornecida ao dispositivo. O dispositivo também pode ter mais de um cabo de alimentação. Para remover toda a corrente elétrica do dispositivo, assegure que todos os cabos de alimentação estejam desconectados da fonte de energia elétrica.



**CUIDADO:**

Instrução 10



**CUIDADO:**



Não coloque nenhum objeto com peso superior a 82 kg (180 lbs.) sobre dispositivos montados em rack.

**重要:**

中的所有提醒和危险条款前都有一个数字标识。该数字是用来交叉引用一个英文的提醒和危险条款及本部分中的与之对应的已翻译成其它文字的提醒和危险条款。

例如，如果一个提醒条款前的数字为 1，则本部分中相应的译文也带有标号 1。

在执行任何指示的操作之前，请确保您已经阅读了全部提醒和危险条款。

## 声明 1



### 危险

电源、电话和通信电缆中带有危险电流。

为避免电击：

雷电期间不要拆接电缆或安装、维修及重新配置本产品。

将所有电源线连接至正确布线并已安全接地的电源插座上。

将与本产品连接的所有设备连接至正确布线的插座上。

尽量只使用单手拆接信号电缆。

有水、火及结构损坏迹象时，请勿打开任何设备。

除非在安装配置过程中有明确指示，否则，打开设备机盖前应先断开与电源线、远程通信系统、网络和调制解调器的所有连接。

安装、移动或打开本产品及其附带设备的机盖时，应按下表所述连接和断开电缆。

#### 连接时：

1. 关闭所有设备。
2. 首先将所有电缆连接至设备。
3. 将信号电缆连接至接口。
4. 将电源线连接至插座。

#### 断开连接时：

1. 关闭所有设备。
2. 首先从插座中拔出电源线。
3. 从接口上拔下信号电缆。

## 声明 2



### 警告:

更换锂电池时，只能使用 IBM 产品号 33F8354 或者是厂商推荐的等同类型的电池。

如果系统模块中含有锂电池，则只能使用同一厂商制造的同类型的模块进行更换。电池中含有锂，如果使用、拿放或处理不当，可能会发生爆炸。

请勿对电池进行下列操作：  
扔入或浸入水中  
加热超过 100 (212 F)  
进行修理或分解  
请按本地法规要求处理电池。

## 声明 3



### 警告:

安装激光产品（如 CD-ROM、DVD 驱动器、光纤设备或送话器）时，应注意以下事项：

不要拆除外盖。拆除激光产品的外盖可能会导致激光辐射的危险，本设备中没有用户可维修的部件。

非此处指定的其它控制、调整或与性能有关的操作都有可能致激光辐射的危险。



### 危险

某些激光产品中包含内嵌的 3A 级或 3B 级激光二极管。请注意以下事项。  
打开时会产生激光辐射。不要直视光束，不要使用光学仪器直接观看光束，避免直接暴露于光束之下。

声明 4



≥18 kg (37 磅)



≥32 kg (70.5 磅)



≥55 kg (121.2 磅)

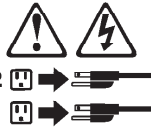
警告：  
抬起时请采用安全操作方法。

声明 5



警告：

使用设备上的电源控制按钮和电源上的开关都不能断开本设备上的电流。  
另外，本设备可能带有多条电源线。如要断开设备上的所有电流，请确  
保所有电源线均已与电源断开连接。



声明 6



警告：

如果在电源线连接设备的一端安装了固定松紧夹，则必须将电源线的另一端连接至  
使用方便的电源。

声明 7



警告:

如果设备带有外门，则在移动或抬起设备前应将其拆除或固定以避免造成人员伤害。外门支撑不了设备的重量。

声明 8



警告:

不要拆除电源外盖或贴有下列标签的任何部件。



贴有此标签的组件内部存在高电压、高电流的危险。这些组件中没有用户可维修的部件。如果怀疑其中的部件存在问题，应与服务技术人员联系。

声明 9



警告:

为避免人员伤害，拆除设备上的风扇前应拨下热插拔风扇电缆。

声明 10



警告:

机柜安装的设备上面不能放置重于 82kg (180 磅) 的物品。



> 82 kg (180 磅)



## 声明 11



**警告：**

下面的标签表明附近有锋利的边、角或接头。



## 声明 12



**警告：**

下面的标签表明附近有高热表面。



### 重要資訊：

中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用，英文「注意」或「危險」聲明可在本節中找到相同內容的「注意」或「危險」聲明的譯文。

例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在本節的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

### 聲明 1



危險

電源、電話及通信電纜上所產生的電流均有危險性。

欲避免電擊危險：

- 在雷雨期間，請勿連接或切斷本產品上的任何電纜線，或安裝、維修及重新架構本產品。
- 請將電源線接至接線及接地正確的電源插座。
- 請將本產品隨附的設備連接至接線正確的插座。
- 儘可能使用單手來連接或切斷信號電纜線。
- 當設備有火燒或泡水的痕跡，或有結構性損害時，請勿開啓該設備的電源。
- 在安裝及架構之時，若非非常熟悉，在開啓裝置蓋子之前，請切斷電源線、電信系統、網路及數據機。
- 在安裝、移動本產品或附加裝置，或開啓其蓋子時，請依照下表中「連接」及「切斷」電纜線的步驟執行。

連接：

1. 關閉所有開關。
2. 先將所有電纜線接上裝置。
3. 將信號電纜接上接頭。
4. 再將電源線接上電源插座。
5. 開啓裝置的電源。

切斷：

1. 關閉所有開關。
2. 先自電源插座拔掉電源線。
3. 拔掉接頭上的所有信號電纜。
4. 再拔掉裝置上的所有電纜線。

#### 聲明 2



注意：

更換鋰電池時，只可使用 IBM 零件編號 33F8354 的電池，或製造商建議之相當類型的電池。若系統中具有包含鋰電池的模組，在更換此模組時，請使用相同廠商製造的相同模組類型。如未正確使用、處理或丟棄含有鋰的電池時，可能會引發爆炸。

請勿將電池：

- 丟入或浸入水中
- 加熱超過 100 °C (212 °F)
- 修理或拆開

請遵照當地法令規章處理廢棄電池。

#### 聲明 3



注意：

安裝雷射產品(如 CD-ROM、DVD 光碟機、光纖裝置或發射器)時，請注意下列事項：

- 請勿移開蓋子。移開雷射產品的蓋子，您可能會暴露於危險的雷射輻射之下。裝置中沒有需要維修的組件。
- 不依此處所指示的控制、調整或處理步驟，您可能會暴露於危險的輻射之下。



危險

有些雷射產品含有內嵌式 Class 3A 或 Class 3B 雷射二極體。請注意下列事項：

開啓時會產生雷射輻射。請勿凝視光束，不要使用光學儀器直接觀察，且應避免直接暴露在光束下。

#### 聲明 4



≥ 18 公斤 (37 磅)



≥ 32 公斤 (70.5 磅)



≥ 55 公斤 (121.2 磅)

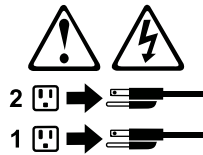
注意：

抬起裝置時，請注意安全措施。

聲明 5



注意：  
裝置上的電源控制按鈕及電源供應器上的電源開關均無法關閉裝置上的電流。  
本裝置可能有一條以上的電源線。如要移除裝置上的所有電流，請確認所有電源線已與電源分離。



聲明 10



注意：  
請勿將任何重量超過 82 公斤 (180 磅) 的物品置於已安裝機架的裝置上方。



> 82 公斤 (180 磅)

**Important:**

Toutes les consignes Attention et Danger indiquées dans la bibliothèque *appliance* sont précédées d'un numéro. Ce dernier permet de mettre en correspondance la consigne en anglais avec ses versions traduites dans la présente section.

Par exemple, si une consigne de type Attention est précédée du chiffre 1, ses traductions sont également précédées du chiffre 1 dans la présente section.

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.



## DANGER

**Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux.**

**Pour éviter tout risque de choc électrique:**

- **Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.**
- **Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.**
- **Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.**
- **Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.**
- **Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.**
- **Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relie aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).**
- **Lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.**

Connexion	Déconnexion
<ol style="list-style-type: none"><li>1. Mettez les unités hors tension.</li><li>2. Commencez par brancher tous les cordons sur les unités.</li><li>3. Branchez les câbles d'interface sur des connecteurs.</li><li>4. Branchez les cordons d'alimentation sur des prises.</li><li>5. Mettez les unités sous tension.</li></ol>	<ol style="list-style-type: none"><li>1. Mettez les unités hors tension.</li><li>2. Débranchez les cordons d'alimentation des prises.</li><li>3. Débranchez les câbles d'interface des connecteurs.</li><li>4. Débranchez tous les câbles des unités.</li></ol>



Notice n° 2

**ATTENTION:**

**Remplacez la pile au lithium usagée par une pile de référence identique exclusivement - voir la référence IBM - ou par une pile équivalente recommandée par le fabricant. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et présente donc un risque d'explosion en cas de mauvaise manipulation ou utilisation.**

- **Ne la jetez pas à l'eau.**
- **Ne l'exposez pas à une température supérieure à 100 °C.**
- **Ne cherchez pas à la réparer ou à la démonter.**

**Pour la mise au rebut, reportez-vous à la réglementation en vigueur.**



Notice n° 3

**ATTENTION:**

**Si des produits laser sont installés (tels que des unités de CD-ROM ou de DVD, des périphériques contenant des fibres optiques ou des émetteurs-récepteurs), prenez connaissance des informations suivantes:**

- **N'ouvrez pas ces produits pour éviter une exposition directe au rayon laser. Vous ne pouvez effectuer aucune opération de maintenance à l'intérieur.**
- **Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent document.**



## DANGER

Certains produits laser contiennent une diode laser de classe 3A ou 3B.  
Prenez connaissance des informations suivantes:

Rayonnement laser lorsque le carter est ouvert. Évitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques. Évitez une exposition directe au rayon.

Notice n° 4



≥18 kg



≥32 kg



≥55 kg

## ATTENTION:

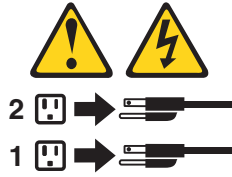
Faites-vous aider pour soulever ce produit.

Notice n° 5



## ATTENTION:

Le bouton de mise sous tension/hors tension de l'unité et l'interrupteur d'alimentation du bloc d'alimentation ne coupent pas l'arrivée de courant électrique à l'intérieur de la machine. Il se peut que votre unité dispose de plusieurs cordons d'alimentation. Pour isoler totalement l'unité du réseau électrique, débranchez tous les cordons d'alimentation des socles de prise de courant.



Notice n° 10



#### **ATTENTION:**

Ne posez pas d'objet dont le poids dépasse 82 kg sur les unités montées en armoire.

#### **Wichtig:**

Alle Sicherheitshinweise in dieser *server-Bibliothek* beginnen mit einer Nummer. Diese Nummer verweist auf einen englischen Sicherheitshinweis mit den übersetzten Versionen dieses Hinweises in diesem Abschnitt.

Wenn z. B. ein Sicherheitshinweis mit der Nummer 1 beginnt, so erscheint die Übersetzung für diesen Sicherheitshinweis in diesem Abschnitt unter dem Hinweis 1.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Hinweis 1



#### **VORSICHT**

Elektrische Spannungen von Netz-, Telefon- und Datenübertragungsleitungen sind gefährlich.

Aus Sicherheitsgründen:

- Bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.

- Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Signalkabel möglichst einhändig anschließen oder lösen.
- Keine Geräte einschalten, wenn die Gefahr einer Beschädigung durch Feuer, Wasser oder andere Einflüsse besteht.
- Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem öffnen des Gehäuses zu unterbrechen. Es sei denn, dies ist in den zugehörigen Installations- und Konfigurationsprozeduren anders angegeben.
- Nur nach den nachfolgend aufgeführten Anweisungen arbeiten, die für Installation, Transport oder öffnen von Gehäusen von Personal Computern oder angeschlossenen Einheiten gelten.

Kabel anschließen:	Kabel lösen:
<ol style="list-style-type: none"> <li>1. Alle Geräte ausschalten und Netzstecker ziehen.</li> <li>2. Zuerst alle Kabel an Einheiten anschließen.</li> <li>3. Signalkabel an Anschlußbuchsen anschließen.</li> <li>4. Netzstecker an Steckdose anschließen.</li> <li>5. Gerät einschalten.</li> </ol>	<ol style="list-style-type: none"> <li>1. Alle Geräte ausschalten.</li> <li>2. Zuerst Netzstecker von Steckdose lösen.</li> <li>3. Signalkabel von Anschlußbuchsen lösen.</li> <li>4. Alle Kabel von Einheiten lösen.</li> </ol>

#### Hinweis 2



#### **ACHTUNG:**

Eine verbrauchte Batterie nur durch eine Batterie mit der IBM Teilenummer 33F8354 oder durch eine vom Hersteller empfohlene Batterie ersetzen. Wenn Ihr System ein Modul mit einer Lithium-Batterie enthält, ersetzen Sie es immer mit dem selben Modultyp vom selben Hersteller. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht:

- mit Wasser in Berührung bringen.
- über 100° C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

#### Hinweis 3





### ACHTUNG:

Wenn ein Laserprodukt (z. B. CD-ROM-Laufwerke, DVD-Laufwerke, Einheiten mit Glasfaserkabeln oder Transmitter) installiert ist, beachten Sie Folgendes:

- Das Entfernen der Abdeckungen des CD-ROM-Laufwerks kann zu gefährlicher Laserstrahlung führen. Es befinden sich keine Teile innerhalb des CD-ROM-Laufwerks, die vom Benutzer gewartet werden müssen. Die Verkleidung des CD-ROM-Laufwerks nicht öffnen.
- Steuer- und Einstellelemente sowie Verfahren nur entsprechend den Anweisungen im vorliegenden Handbuch einsetzen. Andernfalls kann gefährliche Laserstrahlung auftreten.



### VORSICHT

Manche CD-ROM-Laufwerke enthalten eine eingebaute Laserdiode der Klasse 3A oder 3B. Die nachfolgend aufgeführten Punkte beachten.

Laserstrahlung bei geöffneter Tür. Niemals direkt in den Laserstrahl sehen, nicht direkt mit optischen Instrumenten betrachten und den Strahlungsbereich meiden.

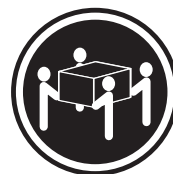
Hinweis 4



≥18 kg



≥32 kg



≥55 kg

### ACHTUNG:

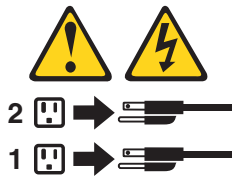
Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

Hinweis 5



### ACHTUNG:

Mit dem Betriebsspannungsschalter an der Vorderseite des Gerätes und dem Betriebsspannungsschalter am Netzteil wird die Stromversorgung für das Gerät nicht unterbrochen. Das Gerät könnte auch mehr als ein Netzkabel aufweisen. Um die gesamte Stromversorgung des Gerätes auszuschalten, muß sichergestellt werden, daß alle Netzkabel aus den Netzsteckdosen herausgezogen wurden.



Hinweis 10



### ACHTUNG:



Keine Gegenstände, die mehr als 82 kg wiegen, auf Rack-Einheiten ablegen.

### Importante:

Tutti gli avvisi di attenzione e di pericolo riportati nella pubblicazione *appliance Library* iniziano con un numero. Questo numero viene utilizzato per confrontare avvisi di attenzione o di pericolo in inglese con le versioni tradotte riportate in questa sezione.

Ad esempio, se un avviso di attenzione inizia con il numero 1, la relativa versione tradotta è presente in questa sezione con la stessa numerazione.

Prima di eseguire una qualsiasi istruzione, accertarsi di leggere tutti gli avvisi di attenzione e di pericolo.

Avviso 1



## PERICOLO

La corrente elettrica circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa.

Per evitare il pericolo di scosse elettriche:

- Non collegare o scollegare i cavi, non effettuare l'installazione, la manutenzione o la riconfigurazione di questo prodotto durante i temporali.
- Collegare tutti i cavi di alimentazione ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Collegare qualsiasi apparecchiatura collegata a questo prodotto ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Quando possibile, collegare o scollegare i cavi di segnale con una sola mano.
- Non accendere qualsiasi apparecchiatura in presenza di fuoco, acqua o se sono presenti danni all'apparecchiatura stessa.
- Scollegare i cavi di alimentazione, i sistemi di telecomunicazioni, le reti e i modem prima di aprire i coperchi delle unità, se non diversamente indicato nelle procedure di installazione e configurazione.
- Collegare e scollegare i cavi come descritto nella seguente tabella quando si effettuano l'installazione, la rimozione o l'apertura dei coperchi di questo prodotto o delle unità collegate.

Per collegare:	Per scollegare:
<ol style="list-style-type: none"><li>1. SPEGNERE tutti i dispositivi.</li><li>2. Collegare prima tutti i cavi alle unità.</li><li>3. Collegare i cavi di segnale ai connettori.</li><li>4. Collegare i cavi di alimentazione alle prese elettriche.</li><li>5. ACCENDERE le unità.</li></ol>	<ol style="list-style-type: none"><li>1. SPEGNERE tutti i dispositivi.</li><li>2. Rimuovere prima i cavi di alimentazione dalle prese elettriche.</li><li>3. Rimuovere i cavi di segnale dai connettori.</li><li>4. Rimuovere tutti i cavi dalle unità.</li></ol>

Avviso 2



## ATTENZIONE:

Quando si sostituisce la batteria al litio, utilizzare solo una batteria IBM con numero parte 33F8354 o batterie dello stesso tipo o di tipo equivalente consigliate dal produttore. Se il sistema di cui si dispone è provvisto di un modulo contenente una batteria al litio, sostituire tale batteria solo con un tipo di modulo uguale a quello fornito dal produttore. La batteria contiene litio e può esplodere se utilizzata, maneggiata o smaltita impropriamente.

Evitare di:

- Gettarla o immergerla in acqua
- Riscaldarla ad una temperatura superiore ai 100°C
- Cercare di ripararla o smontarla

Smaltire secondo la normativa in vigore (D.Lgs 22 del 5/2/9) e successive disposizioni nazionali e locali.

Avviso 3



### ATTENZIONE:

Quando si installano prodotti laser come, ad esempio, le unità DVD, CD-ROM, a fibre ottiche o trasmettitori, prestare attenzione a quanto segue:

- Non rimuovere i coperchi. L'apertura dei coperchi di prodotti laser può determinare l'esposizione a radiazioni laser pericolose. All'interno delle unità non vi sono parti su cui effettuare l'assistenza tecnica.
- L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.



### PERICOLO

Alcuni prodotti laser contengono all'interno un diodo laser di Classe 3A o Classe 3B. Prestare attenzione a quanto segue:

Aperto l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione diretta al fascio.

Avviso 4



≥18 kg



≥32 kg



≥55 kg

### ATTENZIONE:

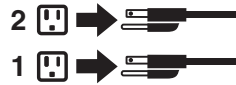
Durante il sollevamento della macchina seguire delle norme di sicurezza.

Avviso 5



**ATTENZIONE:**

Il pulsante del controllo dell'alimentazione situato sull'unità e l'interruttore di alimentazione posto sull'alimentatore non disattiva la corrente elettrica fornita all'unità. L'unità potrebbe disporre di più di un cavo di alimentazione. Per disattivare la corrente elettrica dall'unità, accertarsi che tutti i cavi di alimentazione siano scollegati dalla sorgente di alimentazione.



Avviso 10



**ATTENZIONE:**



Non poggiare oggetti che pesano più di 82 kg sulla parte superiore delle unità montate in rack.

경고문 1



위험

전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다.

전기 충격을 피하려면:

- 뇌우를 동반할 때는 케이블의 연결이나 철수, 이 제품의 설치, 유지보수 또는 재구성을 하지 마십시오.
- 모든 전원 코드를 적절히 배선 및 접지해야 합니다.
- 이 제품에 연결될 모든 장비를 적절하게 배선된 콘센트에 연결하십시오.
- 가능한 한 신호 케이블을 한 손으로 연결하거나 끊으십시오.
- 화재, 수해 또는 구조상의 손상이 있을 경우 장비를 켜지 마십시오.
- 설치 및 구성 프로시저에 다른 설명이 없는 한, 장치 덮개를 열기 전에 연결된 전원 코드, 원거리 통신 시스템, 네트워크 및 모뎀을 끊어 주십시오.
- 제품 또는 접속된 장치를 설치, 이동 및 덮개를 열 때 다음 설명에 따라 케이블을 연결하거나 끊도록 하십시오.

연결하려면:

1. 모든 스위치를 끕니다.
2. 먼저 모든 케이블을 장치에 연결합니다.
3. 신호 케이블을 커넥터에 연결합니다.
4. 콘센트에 전원 코드를 연결합니다.
5. 장치 스위치를 켭니다.

연결을 끊으려면:

1. 모든 스위치를 끕니다.
2. 먼저 콘센트에서 전원 코드를 뽑습니다.
3. 신호 케이블을 커넥터에서 제거합니다.
4. 장치에서 모든 케이블을 제거합니다.

경고문 2



주의:

리튬 배터리를 교체할 때는 IBM 부품 번호 33F8354 또는 제조업체에서 권장하는 동등한 유형의 배터리를 사용하십시오. 시스템에 리튬 배터리를 갖고 있는 모듈이 있으면 동일한 제조업체에서 생산된 동일한 모듈 유형으로 교체하십시오. 배터리에 리튬이 있을 경우 제대로 사용, 처리 또는 처분하지 않으면 폭발할 수 있습니다.

다음은 주의하십시오.

- 던지거나 물에 담그지 않도록 하십시오.
- 100°C(212°F) 이상으로 가열하지 마십시오.
- 수리하거나 분해하지 마십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3



주의:

레이저 제품(CD-ROMs, DVD 드라이브, 광 장치 또는 트랜스미터 등과 같은)이 설치되어 있을 경우 다음을 유의하십시오.

- 덮개를 제거하지 마십시오. 레이저 제품의 덮개를 제거했을 경우 위험한 레이저 광선에 노출될 수 있습니다. 이 장치 안에는 서비스를 받을 수 있는 부품이 없습니다.

- 여기에서 지정하지 않은 방식의 제어, 조절 또는 실행으로 인해 위험한 레이저 광선에 노출될 수 있습니다.



위험

일부 레이저 제품에는 클래스 3A 또는 클래스 3B 레이저 다이오드가 들어 있습니다. 다음을 주의하십시오.

열면 레이저 광선에 노출됩니다. 광선을 주시하거나 광학 기계를 직접 쳐다보지 않도록 하고 광선에 노출되지 않도록 하십시오.

경고문 4



≥18 kg (37 lbs)



≥ 32 kg (70.5 lbs)



≥ 55 kg (121.2 lbs)

주의:

기계를 들 때는 안전하게 들어 올리십시오.

경고문 5



주의:

장치의 전원 제어 버튼 및 전원 공급기의 전원 스위치는 장치에 공급되는 전류를 차단하지 않습니다. 장치에 둘 이상의 전원 코드가 연결되어 있을 수도 있습니다. 장치에서 모든 전류를 차단하려면 모든 전원 코드가 전원으로부터 차단되어 있는지 확인하십시오.



경고문 10



주의:

서랍형 모델의 장치 상단에 82 kg(180 lbs.)이 넘는 물체를 올려 놓지 마십시오.



> 82 kg (180 lbs)

### Importante:

Todas las declaraciones de precaución de esta *Biblioteca del servidor* empiezan con un número. Dicho número se emplea para establecer una referencia cruzada de una declaración de precaución o peligro en inglés con las versiones traducidas que de dichas declaraciones pueden encontrarse en esta sección.

Por ejemplo, si una declaración de peligro empieza con el número 1, las traducciones de esta declaración de precaución aparecen en esta sección bajo Declaración 1.

Lea atentamente todas las declaraciones de precaución y peligro antes de llevar a cabo cualquier operación.

Declaración 1



### PELIGRO

La corriente eléctrica de los cables telefónicos, de alimentación y de comunicaciones es perjudicial.

Para evitar una descarga eléctrica:

- No conecte ni desconecte ningún cable ni realice las operaciones de instalación, mantenimiento o reconfiguración de este producto durante una tormenta.
- Conecte cada cable de alimentación a una toma de alimentación eléctrica con conexión a tierra y cableado correctos.
- Conecte a tomas de alimentación con un cableado correcto cualquier equipo que vaya a estar conectado a este producto.
- Si es posible, utilice una sola mano cuando conecte o desconecte los cables de señal.
- No encienda nunca un equipo cuando haya riesgos de incendio, de inundación o de daños estructurales.
- Desconecte los cables de alimentación, sistemas de telecomunicaciones, redes y módems conectados antes de abrir las cubiertas del dispositivo a menos que se indique lo contrario en los procedimientos de instalación y configuración.



- Conecte y desconecte los cables tal como se describe en la tabla siguiente cuando desee realizar una operación de instalación, de traslado o de apertura de las cubiertas para este producto o para los dispositivos conectados.

Para la conexión	Para la desconexión
<ol style="list-style-type: none"> <li>1. APÁGUELO todo.</li> <li>2. En primer lugar, conecte los cables a los dispositivos.</li> <li>3. Conecte los cables de señal a los conectores.</li> <li>4. Conecte cada cable de alimentación a la toma de alimentación.</li> <li>5. ENCIENDA el dispositivo.</li> </ol>	<ol style="list-style-type: none"> <li>1. APÁGUELO todo.</li> <li>2. En primer lugar, retire cada cable de alimentación de la toma de alimentación.</li> <li>3. Retire los cables de señal de los conectores.</li> <li>4. Retire los cables de los dispositivos.</li> </ol>

#### Declaración 2



#### **PRECAUCIÓN:**

Cuando desee sustituir la batería de litio, utilice únicamente el número de pieza 33F8354 de IBM o cualquier tipo de batería equivalente que recomiende el fabricante. Si el sistema tiene un módulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de módulo, que ha de estar creado por el mismo fabricante. La batería contiene litio y puede explotar si el usuario no la utiliza ni la maneja de forma adecuada o si no se desprende de la misma como corresponde.

No realice las acciones siguientes:

- Arrojarla al agua o sumergirla
- Calentarla a una temperatura que supere los 100°C (212°F)
- Repararla o desmontarla

Despréndase de la batería siguiendo los requisitos que exija el reglamento o la legislación local.

#### Declaración 3



#### **PRECAUCIÓN:**

Cuando instale productos láser (como, por ejemplo, CD-ROM, unidades DVD, dispositivos de fibra óptica o transmisores), tenga en cuenta las advertencias siguientes:

- No retire las cubiertas. Si retira las cubiertas del producto láser, puede quedar expuesto a radiación láser perjudicial. Dentro del dispositivo no existe ninguna pieza que requiera mantenimiento.
- El uso de controles o ajustes o la realización de procedimientos que no sean los que se han especificado aquí pueden dar como resultado una exposición perjudicial a las radiaciones.



## PELIGRO

Algunos productos láser contienen un diodo de láser incorporado de Clase 3A o de Clase 3B. Tenga en cuenta la advertencia siguiente.

Cuando se abre, hay radiación láser. No mire fijamente el rayo ni lleve a cabo ningún examen directamente con instrumentos ópticos; evite la exposición directa al rayo.

Declaración 4



≥18 kg (37 libras)



≥32 kg (70,5 libras)



≥55 kg (121,2 libras)

## PRECAUCIÓN:

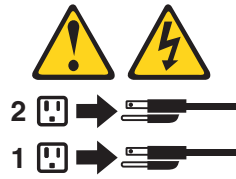
Tome medidas de seguridad al levantar el producto.

Declaración 5



## PRECAUCIÓN:

El botón de control de alimentación del dispositivo y el interruptor de alimentación de la fuente de alimentación no apagan la corriente eléctrica suministrada al dispositivo. Es posible también que el dispositivo tenga más de un cable de alimentación. Para eliminar la corriente eléctrica del dispositivo, asegúrese de desconectar todos los cables de alimentación de la fuente de alimentación.



Declaración 10



**PRECAUCIÓN:**



No coloque ningún objeto que pese más de 82 kg (180 libras) encima de los dispositivos montados en bastidor.

## Environmental notices

### Electronic emission notices

#### ***Federal Communications Commission (FCC) Statement: Federal Communications Commission (FCC) Class A Statement***

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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

***Industry Canada Class A emission compliance statement:*** This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled *Digital Apparatus*, ICES-003 of Industry Canada.

***Avis de Conformité aux normes d'Industrie Canada:*** Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouiller : *Appareils Numériques*, NMB-003 édictée par Industrie Canada.

***Australia and New Zealand Class A statement: Attention:*** This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

#### ***United Kingdom telecommunications safety requirement: Notice to Customers***

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

***European Union (EU) conformity statement:*** This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

**Warning:** This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorized dealers. IBM cannot accept responsibility for any interference caused by using other than recommended cables and connectors.

**EMC Directive 89/336/EEC Statements:** This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

**FCCA (Text für alle in Deutschland vertriebenen EN 55022 Klasse A Geräte.): Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richtlinie 89/336)**

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist Scott Enke, Director, Worldwide Manufacturing Operations, PO Box 12195, 3039 Cornwallis, Research Triangle Park, NC U.S.A. 27709-2195.

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

“Warnung: Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen.”

EN 50082-1 Hinweis:

“Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082-2 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem Fall ist der Abstand bzw. die Abschirmung zu der industriellen Störquelle zu vergrößern.”

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen, sind die Geräte, wie in den IBM Handbüchern angegeben, zu installieren und zu betreiben.

**Taiwan electrical emission statement:**

警告使用者：  
這是甲類的資訊產品，在  
居住的環境中使用時，可  
能會造成射頻干擾，在這  
種情況下，使用者會被要  
求採取某些適當的對策。

**Japanese Voluntary Control Council for Interference (VCCI) statement:**

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

---

## Trademarks

The following are trademarks of the IBM Corporation in the United States or other countries or both:

IBM  
the IBM logo

Netfinity  
ServerGuide

ServeRAID  
TotalStorage

Microsoft, Windows, and Windows NT are trademarks or registered trademarks of Microsoft Corporation.

Other company, product, and service names may be trademarks or service marks of others.

---

# Index

## A

- AC and DC Power LED 7
- adapter
  - considerations 72
  - installing 71
  - PCI 71
  - PCI bus, which 72
- adding components 43

## B

- battery
  - replacing 76
- bezel
  - removing 54
  - replacing 82
- BIOS
  - updating of 70
- boot block jumper 49

## C

- card, external LED
  - removing 86
- card, power reset
  - removing 87
- colors, meaning of 45
- components
  - adding and replacing 43
  - color 45
  - location of 45
  - major 45
- controls and indicators 93
- cover
  - replacing 80
  - Model 200 80
  - Model 225 81

## D

- DASD backplane assembly
  - removing 89
- diagnostic programs
  - error code format 8
  - error message tables 10
  - starting 9
  - text messages 8
  - viewing the test log 10
- diagnostic programs and error messages 7
- diagnostic tools
  - overview 6
- diagnostics
  - event/error logs 6
  - light-path 6
  - panel 7
  - POST beep codes, error messages, and error logs 6
- door
  - removing 54

- door (*continued*)
  - replacing 82

## E

- electrical input 117
- environment
  - humidity 117
- error code format 8
- error message tables 10
- ethernet
  - failover 85
- ethernet controller
  - configuring 85
- Ethernet controller messages 11
- Ethernet Service
  - port 85
- event/error logs 6
- expansion bays
  - location 55
  - type 55
- external options, connecting 83
  - input/output connector locations 83
  - input/output ports 84
  - installing 83

## F

- fan assembly
  - replacing 78
- firmware code
  - updating of 70

## H

- hard drive See hot-swap hard drive 56
- hard drives See hot-swap or non-hot-swap 56
- heat output 117
- hot-swap drive
  - installing 57
- hot-swap hard drive
  - specifications 56

## I

- I/O ports See input/output ports 84
- IDE drive
  - troubleshooting 12
- input/output connector
  - locations 83
- installing
  - microprocessor 75
- installing options 43

## J

- jumper block See boot block jumper 49

## K

keyboard port 84

## L

LED

AC and DC 7

LED card, external

removing 86

LEDs

diagnostic panel 50

front of appliance 93

light-path diagnostics 6

lights See LEDs 93

## M

major components 45

microprocessor

installing 75

replacing 75, 76

VRM 76

## N

non-hot-swap hard disk drive

installing 60

non-hot-swap hard drive

troubleshooting 12

## P

panel

diagnostics 7

PCI

adapters 71

bus A 72

bus B 72

expansion slots 71

port

Ethernet Service 85

keyboard 84

systems management (service) 85

video 85

POST beep codes, error messages, and error logs 6

power

troubleshooting 11

power checkout 11

power problems 11

power reset card 87

power supply

installing 63, 65

removing 63

power supply backplane

removing 90

## R

rear cable bracket

removing 88

replacing

battery 76

replacing (*continued*)

fan assembly 78

replacing components 43

## S

safety information 43

hazardous voltage 63

laser 60

SCSI

adapter boot option 72

Slots See expansion slots 46

starting the appliance 93

stopping the appliance 93, 94

switch block, system board 49

system board

removing 91

system board layout

connectors

external port 46

internal cables 46

options 46

LEDs 50

switches and jumpers 46

system board switch block 49

system image 12

systems management 85

## T

temperature

troubleshooting 12

temperature checkout 12

test log 10

text messages 8

trademarks 158

troubleshooting 1

power 11

temperature 12

turning off the appliance 93, 94

turning on the appliance 93

## V

video controller

disabling 71

video port 85

voltage regulator module

installing 76

VRM See voltage regulator module 76



---

# Readers' Comments — We'd Like to Hear from You

IBM TotalStorage™ Network Attached Storage  
Models 200 and 225  
Service Guide

**Overall, how satisfied are you with the information in this book?**

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Overall satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**How satisfied are you that the information in this book is:**

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Accurate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to find	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Well organized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applicable to your tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Please tell us how we can improve this book:**

Thank you for your responses. May we contact you?  Yes  No

When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute your comments in any way it believes appropriate without incurring any obligation to you.

---

Name

---

Address

---

Company or Organization

---

Phone No.



Fold and Tape

Please do not staple

Fold and Tape



NO POSTAGE  
NECESSARY  
IF MAILED IN THE  
UNITED STATES

# BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

IBM Corp  
Dept. CGFA  
PO Box 12195  
Research Triangle Park, NC 27709-9990



Fold and Tape

Please do not staple

Fold and Tape





Printed in the United States of America  
on recycled paper containing 10%  
recovered post-consumer fiber.