

Hardware Maintenance Manual



IBM IntelliStation Types 6849 and 6231

Hardware Maintenance Manual



IBM IntelliStation Types 6849 and 6231

Notes

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 133.

Third Edition (January 2004)

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About this manual

This manual contains diagnostic information, a Symptom-to-FRU index, service information, error indications, and configuration information for the IBM IntelliStation Type 6849 and 6231 computers.

Attention: This manual is intended for trained servicers who are familiar with IBM PC computer products.

Important safety information

Be sure to read all caution and danger statements in this book 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.

Online support

Use the World Wide Web (WWW) to download Diagnostic, BIOS Flash, and Device Driver files, and Documents.

The Web address is:

<http://www.ibm.com/pc/support>

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Chapter 1. General checkout

This general checkout procedure is for Type 6849 and 6231 computers.

Attention: The drives in the computer you are servicing might have been rearranged or the drive startup sequence changed. Be extremely careful during write operations such as copying, saving or formatting. Data or programs can be overwritten if you select an incorrect drive.

Diagnostic error messages appear when a test program finds a problem with a hardware option. For the test programs to properly determine if a test *Passed*, *Failed* or *Aborted*, the test programs check the error-return code at test completion. See Chapter 3, "Diagnostics," on page 5.

General error messages appear if a problem or conflict is found by an application program, the operating system, or both. For an explanation of these messages, refer to the information supplied with that software package.

Notes:

- Type 6849 and 6231 computers default to come up quiet (no beep and no memory count and checkpoint code display) when no errors are detected by POST.
- To enable beep and memory count and checkpoint code display when a successful POST occurs, do the following:
 1. Select **Start Options** in the Configuration/Setup Utility program (see "Using the BIOS Setup Utility program" on page 19).
 2. Set **Power-On Self-Test** to **Enhanced**.
- Before replacing any FRUs, ensure that the latest level of BIOS is installed on the system. A down-level BIOS might cause false errors and unnecessary replacement of the system board.
- If multiple error codes are displayed, diagnose the first error code displayed.
- If the computer hangs and no error is displayed, go to "Undetermined problems" on page 86.
- If an installed device is not recognized by the diagnostics program, that device might be defective.

001

1. Power-off the computer and all external devices.
2. Check all cables and power cords.
3. Make sure the system board is seated properly.
4. Set all display controls to the middle position.
5. Power-on all external devices.
6. Power-on the computer.
7. Check for the following response:
 - Readable instructions or the Main Menu.

DID YOU RECEIVE THE CORRECT RESPONSE?

If NO, continue to **002** .

If YES, proceed to **003** .

002

If the Power Management feature is enabled, do the following:

1. Start the Configuration/Setup Utility program (see “Starting the BIOS Setup Utility program” on page 19.)
2. Select **Power Management** from the Configuration/Setup Utility program menu.
3. Select **APM**.
4. Be sure **APM BIOS Mode** is set to **Disabled**. If it is not, press Left Arrow (“”) or Right Arrow (“”) to change the setting.
5. Select **Automatic Hardware Power Management**.
6. Set **Automatic Hardware Power Management** to **Disabled**.
7. If the problem persists, continue to **003** .

003

Run the Diagnostic programs. If necessary, refer to “Starting the diagnostic programs” on page 7.

- If you receive an error, replace the part that the diagnostic program calls out or go to Chapter 3, “Diagnostics,” on page 5.
- If the test stops and you cannot continue, replace the last device tested.

Chapter 2. General information

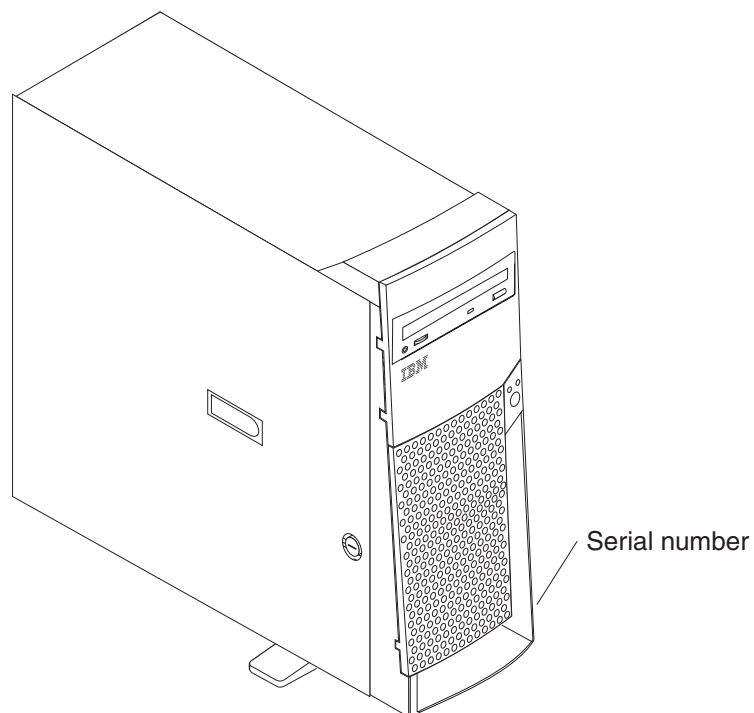
Introducing the IntelliStation M Pro

The IBM IntelliStation M Pro Professional Workstation incorporates many of the latest advances in computing technology, making it easy to expand and upgrade.

If you have access to the World Wide Web, you can obtain up-to-date information about the IntelliStation M Pro model and other IBM computer products at <http://www.ibm.com/pc/us/intellistation/>.

The computer model and serial numbers are located on labels on the bottom of the lower right side of the machine.

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



Features and specifications

The following table provides a summary of the features and specifications. Some features and specifications might not apply.

<p>Microprocessor:</p> <ul style="list-style-type: none"> • Intel® Pentium® 4 with 256 KB Level-2 cache <p>Memory:</p> <ul style="list-style-type: none"> • Minimum: 128 MB • Maximum: 2.0 GB • Type: PC600 or PC800 Rambus RIMMs only • Slots: 4 dual inline <p>Internal Drives:</p> <ul style="list-style-type: none"> • Hard disk drive: IDE/SCSI • CD-ROM: IDE <p>One of the following:</p> <ul style="list-style-type: none"> • CD-ROM: IDE • DVD-ROM: IDE • CD-RW: IDE <p>Expansion bays:</p> <ul style="list-style-type: none"> • Two 5.25-in. bays (1 CD-ROM drive installed) • Five 3.5-in. bays (1 diskette drive installed) <p>PCI expansion slots:</p> <ul style="list-style-type: none"> • Five 33 MHz/32-bit slots on the system board <p>Power supply:</p> <p>340 watt (90-240 V ac)</p>	<p>Video Adapter: (depending on your model)</p> <ul style="list-style-type: none"> • Matrox Millennium G450 with 16 MB SDRAM video memory • Nvidia Quadro2 MXR with 32 MB SDRAM video memory • Fire GL2 (DVI-D and VGA) with 64 MB DDR SGRAM video memory • Fire GL4 (dual DVI-I) with 128 MB DDR SGRAM video memory <p>Size and weight:</p> <ul style="list-style-type: none"> • Height: 470 mm (18.5 in.) • Depth: 508 mm (19.9 in.) • Width: 165 mm (6.5 in.) • Weight: approximately 19.5 Kg (43 lb.) when fully configured or 15.9 Kg (35 lb.) minimum <p>Integrated functions:</p> <ul style="list-style-type: none"> • 10BASE-T/100BASE-TX Ethernet controller on the system board with RJ45 Ethernet port • Two serial ports • One parallel port • Two USB ports • Keyboard port • Mouse port • Audio ports <ul style="list-style-type: none"> – Line out – Line in – Mic • Dual-channel bus mastering IDE controller <p>Acoustical noise emissions:</p> <ul style="list-style-type: none"> • Sound power, idling: 5.1 bel maximum • Sound power, operating: 5.2 bel maximum 	<p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Computer on: 10° to 35° C (50.0° to 95.0° F). Altitude: 0 to 914 m (2998.7 ft.) – Computer on: 10° to 32° C (50.0° to 89.6° F). Altitude: 914 m (2998.7 ft.) to 2133 m (6998.0 ft.) – Computer off: 10° to 43° C (50.0° to 109.4° F). Maximum altitude: 2133 m (6998.0 ft.) • Humidity: <ul style="list-style-type: none"> – Computer on: 8% to 80% – Computer off: 8% to 80% <p>Heat output:</p> <p>Approximate heat output in British Thermal Units (Btu) per hour</p> <ul style="list-style-type: none"> • Minimum configuration: 341 Btu (100 watts) • Maximum configuration: 1604 Btu (470 watts) <p>Electrical input:</p> <ul style="list-style-type: none"> • Sine-wave input (50-60 Hz) required • Input voltage low range: <ul style="list-style-type: none"> – Minimum: 90 V ac – Maximum: 137 V ac • Input voltage high range: <ul style="list-style-type: none"> – Minimum: 180 V ac – Maximum: 265 V ac • Input kilovolt-amperes (kVA) approximately: <ul style="list-style-type: none"> – Minimum: 0.08 kVA – Maximum: 0.52 kVA
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Chapter 3. Diagnostics

POST

When you turn on the computer, it performs a series of tests to check the operation of system components and some of the options that are installed in the computer. This series of tests is called the power-on self-test or POST.

If POST finishes without detecting any problems, the first window of the operating system or application program appears.

Notes:

1. If you have a power-on 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.

POST beep code descriptions

The possible types of beep codes that the system might emit are:

Repeating long beeps

Indicates that a memory error has occurred. Ensure that all RIMMs are correctly installed.

One long beep and two short beeps

Indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. Ensure that the video adapter is correctly installed.

Small computer system interface messages (some models)

The following table lists actions to take if you receive any error message.

Note: If the system does not have a hard disk drive, ignore any message that indicates that the BIOS is not installed.

You will get these messages only when running the SCSISelect Utility.

Table 1. SCSI messages

SCSI Messages	Description
All	<p>One or more of the following might be causing the problem.</p> <ul style="list-style-type: none">• A failing SCSI device (adapter or drive)• An improper SCSI configuration• Duplicate SCSI IDs in the same SCSI chain• An improperly installed SCSI terminator• A defective SCSI terminator• An improperly installed cable• A defective cable <p>Action: Verify that:</p> <ul style="list-style-type: none">• The external SCSI devices are turned on. External SCSI devices must be turned on <i>before</i> the computer.• The cables for all external SCSI devices are connected correctly.• The last device in each SCSI chain is terminated properly.• The SCSI devices are configured correctly. <p>If the above items are correct, run the diagnostic programs to obtain additional information about the failing device.</p>

IBM Enhanced Diagnostics

The system diagnostic programs are stored on the *Device Drivers and IBM Enhanced Diagnostics* CD. These programs are the primary method of testing the major components of the computer.

Diagnostic error messages indicate that a problem exists; they are not intended to be used to identify a failing part. Troubleshooting and servicing of complex problems that are indicated by error messages should be performed by trained service personnel.

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

The following sections contain the error codes that might appear in the detailed test log and summary log, when running the diagnostic programs.

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. (These codes are for trained service personnel and are described in the *Hardware Maintenance Manual*.)

- iii** is the three-digit device ID. (These codes are for trained service personnel and are described in the *Hardware Maintenance Manual*.)
- date** is the date that the diagnostic test was run and the error recorded.
- cc** are the check digits that are 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 be one of the following:

Passed

This result occurs when the diagnostic test completes without any errors.

Failed This result occurs when the diagnostic test discovers an error.

User Aborted

This result occurs when you stop the diagnostic test before it is complete.

Not Applicable

This result occurs when you specify a diagnostic test for a device that is not present.

Aborted

This result occurs when the test could not proceed because of the system configuration.

Warning

This result occurs when a possible problem is reported during the diagnostic test, such as when a device that is to be tested is not installed.

Test Specific String

is additional information that is used to analyze the problem.

Starting the diagnostic programs

The IBM Enhanced Diagnostics programs will isolate the computer hardware from software that you have installed on the hard disk drive. The programs run independently of the operating system, and *must be run either from a CD or diskette*. This method of testing is generally used when other methods are not accessible or have not been successful in isolating a problem suspected to be hardware related.

A Device Drivers and IBM Enhanced Diagnostics CD comes with the computer. You can also download the latest diskette image of the diagnostics from <http://www.ibm.com/pc/support/> on the World Wide Web.

Using the Device Driver and IBM Enhanced Diagnostics CD

Complete the following steps to run the *Device Driver and IBM Enhanced Diagnostics* CD:

1. Turn off the computer and any attached devices.
2. Insert the *Device Driver and Enhanced Diagnostics* CD into the CD-ROM drive.
3. Turn on all attached devices; then, turn on the computer.
4. Follow the instructions on the screen.
5. When you finish running the IBM Enhanced Diagnostics and Utilities program, exit the program and remove the CD from the drive.
6. If you used the BIOS Setup Utility to change the first Boot Device, restore it to the original setting.

Downloading the diagnostics program

Complete the following steps to download the latest image of the IBM Enhanced Diagnostics from the World Wide Web and create a startable Enhanced Diagnostics diskette:

1. Go to the following World Wide Web site: <http://www.ibm.com/pc/support/>.
2. Download the diagnostics file for the computer to a hard disk drive directory (not to a diskette).
3. Go to a DOS prompt and change to the directory where the file was downloaded.
4. Insert a blank high-density diskette in diskette drive A.
5. Type in the following, and then press Enter: *filename a:* where *filename* is the name of the file you downloaded from the Web.

The downloaded file is self-extracting and will be copied to the diskette. When the copy completes, you have a startable IBM Enhanced Diagnostics diskette.

Using the diagnostic diskette

Complete the following steps to start the IBM Enhanced Diagnostics using the diagnostics diskette:

1. Turn off the computer and any attached devices.
2. Insert the *IBM Enhanced Diagnostics* diskette into the diskette drive.
3. Turn on all attached devices; then, turn on the computer.
4. Follow the instructions on the screen.

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

Viewing the test log

The test log records data about system failures and other pertinent information. The test log will not contain any information until after the diagnostic program has run.

Note: If you already are running the diagnostic programs, begin with step 4.

Complete the following steps to view the test log:

1. Insert the Enhanced Diagnostics diskette or the *Device Drivers and IBM Enhanced Diagnostics* CD.
2. Turn on the computer and watch the screen.

If the system is on, shut down the operating system and restart the system.

3. If a power-on password is set, the system prompts you for it. Type in the appropriate password; then, press Enter.
4. Run the appropriate diagnostics program and when the Diagnostic Programs screen appears, select **Utility**.
5. Select **View Test Log** from the list that appears; then, follow the instructions on the screen.
6. You can save the test log to a file on a diskette or to the hard disk drive.

Note: The system maintains the test-log data while the system is powered on. When you turn off the power to the computer, the test log is cleared.

Using Access IBM

Your Windows Desktop provides an Access IBM icon. Access IBM provides an interface through which you can quickly access information or perform specific tasks.

The Access IBM program provides links to selected IBM Web sites and IBM Assistant, a help system for many end-user tasks such as getting started, viewing documentation, customizing, upgrading, maintaining, and solving problems. Shortcuts are also provided to help accomplish many of these tasks. You can also view the IBM International License Agreement for Non-Warranted Programs, which applies to:

- All software preinstalled by IBM on the hard disk drive that does not have its own license agreement
- Software on the *Software Selections CD*
- Software on the *Device Driver and IBM Enhanced Diagnostics CD*
- View the *IBM International License Agreement for Non-Warranted Programs*

Your use of these programs indicates the acceptance of the license agreement.

Installing other operating systems

If you install another operating system, you might need additional software or device drivers. Drivers for devices that came with your computer are available on the *Device Driver and IBM Enhanced Diagnostics CD*. You can obtain the latest device drivers at <http://www.ibm.com/pc/support> on the World Wide Web.

Before installing any operating system, be sure you obtain the latest program release. Contact the operating system manufacturer or, if applicable, check the manufacturer's World Wide Web site to obtain the updates.

To install an operating system, follow the instructions in the documentation provided with the operating system CDs or diskettes. Additional information about operating systems is posted periodically on the IBM Web site at <http://www.ibm.com/pc/support>.

Using the Product Recovery Program

The Product Recovery Program is preinstalled on the hard disk that comes with your IBM computer. The Product Recovery Program is designed to be hidden from view to protect it from accidental damage.

If you are using FDISK, NT Disk Administrator, or another utility to reformat the hard disk drive, you might see the partition where the Product Recovery Program is stored. Do not delete this partition or the Product Recovery Program will be lost.

If your hard disk drive, including the partition where the Product Recovery Program resides, becomes damaged or you replace the hard disk drive, go to <http://www.ibm.com/pc/support> for information on ordering a replacement Product Recovery CD for your computer.

Creating emergency diskettes

At your earliest opportunity, create the following diskettes. Store them in a safe place.

Creating a recovery repair diskette

It is important that you create this diskette. In the unlikely event your desktop becomes unusable, the emergency repair diskette will enable you to access the Product Recovery Program. Additional information about the diskette is in Access IBM. To see how to use this diskette, refer to "Using the Recovery Repair diskette" on page 12.

Do the following to create the Recovery Repair diskette:

1. From the Access IBM menu, select **Maintain**.
2. Click **Creating emergency diskettes**.
3. Follow the instructions on the screen.

Creating a Norton AntiVirus Rescue diskette

The Norton AntiVirus program periodically checks your drives for computer viruses. Additional information about creating and using the diskette is in Access IBM.

Do the following to create the Norton AntiVirus Rescue diskettes:

1. From the Access IBM menu, select **Maintain**.
2. Click **Creating emergency diskettes**.
3. Follow the instructions on the screen.

Creating an IBM Enhanced Diagnostics diskette

The IBM Enhanced Diagnostics diskette is used to test hardware components of your computer.

Do the following to create the diagnostics diskette:

1. From the Access IBM menu, select **Maintain**.
2. Click **Creating emergency diskettes**.
3. Follow the instructions on the screen.

You can also download the diagnostic program image from the IBM Web site at <http://www.ibm.com/pc/support>. See "Using the diagnostic diskette" on page 8.

Recovering the operating system and preinstalled software

This section contains instructions for recovering BIOS, device drivers, operating system, and other support software.

Notes:

1. The Product Recovery program is provided on the computer to assist you with recovery operations.
2. The recovery process replaces all information stored on the C:\ drive. If possible, back up the data files before starting the process.

Recovering or installing device drivers

Restoring the factory-preinstalled device drivers is part of the Product Recovery program, and the *Device Drivers and IBM Enhanced Diagnostics CD*.

On some IBM computers, device drivers are located in the C:\IBMTOOLS\DRIVERS directory. Other device drivers are on the software media that come with individual devices.

Notes:

1. Before you can recover or install device drivers, the operating system must be installed on the computer.
2. Before you start recovering or installing device drivers, make sure you have the documentation and software media for the device.
3. Device drivers for IBM devices and the instructions to install them (README.TXT) are located on the *Device Drivers and IBM Enhanced Diagnostics CD* and in the C:\IBMTOOLS\DRIVERS directory.
4. The latest device drivers are also available on the World Wide Web at <http://www.ibm.com/pc/support>.

Recovering the operating system

The IBM computer has the Product Recovery program on a hidden partition of the hard disk drive.

Attention

The Product Recovery program will erase all files on the C drive only. A *full recovery* will restore the operating system, device drivers, and applications. A *partial recovery* will restore your operating system and device drivers without restoring applications.

Do the following to recover the operating system:

1. If you are recovering the software using a *Product Recovery CD*, insert the CD into the CD-ROM drive and continue at the next step. If you are using the Product Recovery Program on the hard disk drive, continue at the next step.

Important

If you are recovering your operating system from a *Product Recovery CD* and you have more than one CD, always start with *Product Recovery CD 1*.

2. If possible, shut down the operating system normally.
3. If the computer is still on, turn it off.

Note: If the computer will not turn off after you hold down the power button for at least four seconds, unplug the power cord and wait a few seconds before reconnecting it.

4. Turn on your computer. Wait for the prompt:
To start the Product Recovery program, press F11.
Quickly press F11; the prompt displays for only a few seconds. Wait for the program menu.
If you are unable to see the DOS command prompt or the F11 prompt, See "Using the Recovery Repair diskette"
5. You might have a choice of operating systems to recover. Select the operating system you want.
6. Select the recovery options you want and follow the instructions on the screen.
7. When recovery is complete, exit the program. If necessary, remove the CD from the CD-ROM drive.
8. Restart the computer.

Note: If you recover Windows NT Workstation, the hard disk must be partitioned before all hard disk drive space is available. For information on how to partition the remainder of your hard disk, go to Access IBM.

Using the Recovery Repair diskette

In some circumstances, files on the hard disk might become unusable so that you do not see the F11 prompt when you start up the computer. Using the following procedure, you will be able to access the Product Recovery Program on the hard disk drive.

1. Turn off the computer and insert the Recovery Repair diskette.
2. Turn on the computer and follow the directions on the screen.

Using ConfigSafe

Before making any changes to the computer configuration, use ConfigSafe to take a snapshot of the current operating system configuration. ConfigSafe automatically takes a snapshot of the operating system configuration the first time you start the computer. ConfigSafe can be used as a troubleshooting tool, especially if problems occur after installing a new application or option. ConfigSafe can take regular snapshots on a regular schedule of the choosing of the computer configuration. You can use the snapshot feature to restore configuration settings.

If you need assistance from an IBM technical support representative, use ConfigSafe to generate a report about recent changes in the configuration before you call the IBM HelpCenter™. The IBM technical support representative will use the information in this report to help you.

To use ConfigSafe, do the following:

1. From the Windows desktop, press **Start > ConfigSafe > ConfigSafe**.
2. Follow the instructions on the screen.
3. When finished, exit ConfigSafe.

ConfigSafe save our system (SOS) feature

ConfigSafe has an SOS feature that can be used in DOS if the Windows desktop becomes unusable. Do the following to use the SOS feature of ConfigSafe:

1. Access a DOS command prompt.
2. At the command prompt, type `cd/cfgsafe`
3. Press Enter.
4. Type `sos`
5. Press Enter.
6. Select the most recent configuration dated before the start of the problem.
Press Enter.
7. Restart the computer.

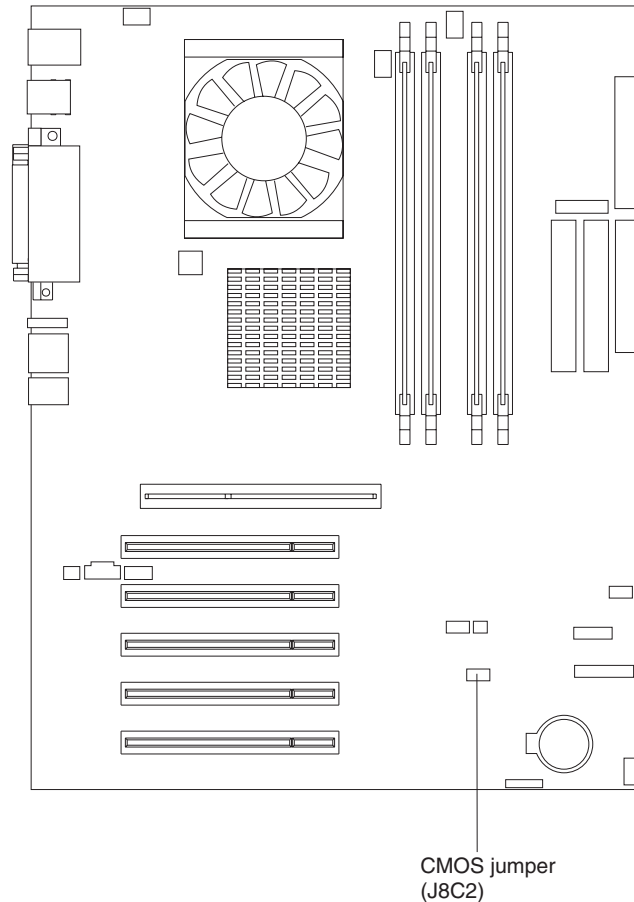
Note: If the problem does not resolve, repeat these steps selecting a different saved configuration.

ConfigSafe has an online Help system. Look for the pull-down menu for online Help at the top of the screen.

Erasing a lost or forgotten password (clearing CMOS)

To erase a lost or forgotten password, do the following:

1. Turn off the computer and all attached devices.
2. Unplug the power cord.
3. Remove the cover. See “Removing the side cover” on page 28.
4. See the illustration below for the CMOS jumper location.



5. Move the jumper from the standard position on pins 1 and 2 to the maintenance, or configure position (pins 2 and 3).
6. Replace the cover and connect the power cord. See “Replacing the cover” on page 41.
7. Once you restart the computer, the BIOS Setup Utility screen is displayed.
8. In the maintenance screen, you can clear CMOS settings.
9. Press Esc.
10. Select **Exit** from the menu.
11. Select **Exit Saving Changes**.
12. Follow the directions on the screen.

Note: You must remove the cover again to place the jumper to the standard position (pins 1 and 2).

Recovering from a POST/BIOS update failure

If power to the computer is interrupted while POST/BIOS is being updated (flash update), the computer might not restart correctly or might not display video (no video). If this happens, perform the following procedure to recover:

1. Using another computer, open the config.sys file on the BIOS flash diskette, with a text editor.
2. Find the line:
`shell = flash2.exe`
3. Change this line to:
`shell = flash2.exe /U`
4. Save this file to the diskette. Now you can use this BIOS flash diskette to update the computer.
5. Turn off the computer and all attached devices, such as printers, monitors, and external drives.
6. Unplug all power cords from electrical outlets, and remove the cover. See “Removing the side cover” on page 28.
7. Locate the CMOS configuration jumper on the system board, removing any adapters that impede access to the jumper. See the system board label inside the computer for the location of the jumper. See also the illustration in “Erasing a lost or forgotten password (clearing CMOS)” on page 14.
8. Remove the jumper from the system board.
9. Replace the cover. See “Replacing the cover” on page 41. Reconnect the power cords for the computer and monitor to electrical outlets.
10. Insert the BIOS update (flash) diskette into drive A, and turn on the computer and monitor.
11. After the update session is completed, remove the diskette from the diskette drive, and turn off the computer and monitor.
12. Unplug the power cords from electrical outlets.
13. Unplug all power cords from electrical outlets, and remove the cover. See “Removing the side cover” on page 28.
14. Remove any adapters that impede access the CMOS configuration jumper.
15. Replace the CMOS configuration jumper to its original position.
16. Replace any adapters that were removed.
17. Replace the cover, see “Replacing the cover” on page 41, and reconnect all cables that were disconnected.
18. Turn on the computer to restart the operating system.
19. Restore the config.sys file on the diskette back to:
`shell = flash2.exe`

Replacing the battery

When replacing the battery, you must replace it with a lithium battery of the same type from the same manufacturer. To avoid possible danger, read and follow the following safety statement.

Statement 2

CAUTION:



When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If the 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

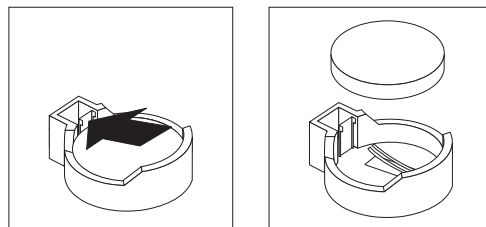
Dispose of the battery as required by local ordinances or regulations.

To order replacement batteries, call 1-800-772-2227 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call the IBM reseller or IBM marketing representative.

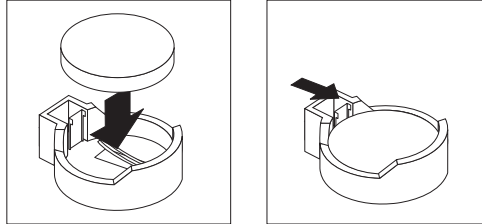
Note: After you replace the battery, you must reconfigure the system and reset the system date and time.

Do the following to replace the battery:

1. Follow any special handling and installation instructions supplied with the replacement battery.
2. Turn off the computer and all attached devices. Disconnect all external cables and power cords; then, remove the computer cover.
3. Do the following to remove the battery:
 - a. Use one fingernail to press the top of the battery clip away from the battery. The battery pops up when released.
 - b. Use your thumb and index finger to lift the battery from the socket.



4. Do the following to insert the new battery:
 - a. Tilt the battery so that you can insert it into the socket on the side opposite the battery clip.
 - b. Press the battery down into the socket until it clicks into place. Make sure the battery clip holds the battery securely.



5. Replace the cover and connect the cables.
6. Turn on the system.
7. Start the BIOS Setup Utility program and set configuration parameters.
 - Set the system date and time.
 - Set passwords if necessary.
 - Save the configuration.

Chapter 4. Configuration

The following configuration programs are provided with the computer:

- **BIOS Setup Utility program**

This program is part of the BIOS code that comes with the computer. This program enables you to configure parallel port assignments, change the device startup sequence, set the date and time, and set passwords.

- **SCSISelect Utility program** (some models)

With the built-in SCSISelect Utility program, you can configure the devices that are attached to the optional SCSI adapter. See “Using the SCSISelect Utility program” on page 20 for more information.

Using the BIOS Setup Utility program

This section provides the instructions for starting and using the BIOS Setup Utility program.

Starting the BIOS Setup Utility program

The prompt, Hit <F2> if you want to run SETUP, might not be displayed when you start the computer. Do the following to start the BIOS Setup Utility program:

Notes:

1. If the computer is already on when you start this procedure, shut down the operating system, turn off the computer, and wait a few seconds until all in-use lights turn off.
2. Turn on the power. Immediately press and hold down the F1 or F2 key until you see either the BIOS Setup Utility menu or a password prompt.

If you have set neither a supervisor nor a user password, the BIOS Setup Utility menu opens on the screen. If you have set a password, the BIOS Setup Utility menu will not open until you type the password and press Enter.

After the BIOS Setup Utility program is started

Once the BIOS Setup Utility is started, help information and instructions for using the keyboard are displayed on the right side of the screen. You can find more information about using the BIOS Setup Utility by using Access IBM.

To display the Hit <F2> if you want to run SETUP prompt every time you start computer, do the following from within the BIOS Setup Utility:

1. Select **Boot** from the main menu across the top of the screen.
2. Set **Quiet Boot** to **[Disabled]**.
3. Set **Intel[®] Rapid BIOS Boot** to **[Disabled]**.
4. Select **Exit** from the menu.
5. Select **Exit Saving Changes**.

The next time you start the computer, Hit <F2> if you want to run SETUP will be displayed.

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

The following sections provide the instructions for starting the SCSISelect Utility program and descriptions of the menu choices that are available.

Starting the SCSISelect Utility program

Do the following to start the SCSISelect Utility program:

1. Turn on the computer.
2. When the <<< Press <CTRL><A> for SCSISelect Utility! >>> prompt appears, press Ctrl+A.
3. When the prompt, Would you like to configure the host adapter or run the SCSI disk utilities?, is displayed, make the selection, and press Enter.
4. Use the arrow keys to make a selection from the menu.
 - Press Esc to exit the SCSISelect Utility program.
 - Press the F5 key to switch between color and monochrome modes (if the monitor permits).
5. Follow the instructions on the screen to change the settings of the selected items; then, press Enter.

Selections available from the SCSISelect menu

The following selections appear on the SCSISelect Utility menu:

- **Configure/View Host Adapter Settings**

Use this selection to view or change the SCSI controller settings. To reset the SCSI controller to its default values, press F6; then, follow the on-screen instructions.

You can view or change the following controller settings:

- **Host Adapter SCSI ID**

Use this selection to view the SCSI controller identification (ID), which is usually 7.

- **SCSI Parity Checking**

Use this selection to view the assigned value of *Enabled*.

- **Host Adapter SCSI Termination**

Use this selection to view the assigned value of *Automatic*.

- **Boot Device Options**

Use this selection to configure startable-device parameters. To make changes, you must know the ID of the device you want to configure.

– **SCSI Device Configuration**

Use this selection to configure SCSI-device parameters. To make changes, you must know the ID of the device you want to configure.

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

- The transfer rate for Ultra 160 low voltage differential (LVD) devices is 160.0 Mbps.
- The transfer rate for Ultra2 SCSI LVD devices is 80.0 Mbps.
- The transfer rate for Fast SCSI devices is 20.0 Mbps.

– **Advanced Configuration Options**

Use this selection to view or change settings such as enabling support for large hard disk drives and support for drives with Ultra SCSI speeds.

• **SCSI Disk Utilities**

Select this choice 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 on-screen instructions carefully before making a selection.

Note: If you press Ctrl+A before the selected drives are ready, an Unexpected SCSI Command Failure screen might appear. Restart the computer and watch the SCSISelect messages as each drive starts. After the drive that you want to view or format starts, press Ctrl+A.

Chapter 5. Installing options

Before you begin

Before you begin to install options in the computer, read the following information:

- Become familiar with the safety and handling guidelines specified under “Handling static sensitive devices” on page 104, and read the safety statements in “Safety information” on page 101. These guidelines will help you work safely with the computer or options.
- Make sure that you have an adequate number of properly grounded electrical outlets for the computer, monitor, and any other options that you intend to install.
- Back up all important data before you make changes to hard disk drives.
- Have a small, flat-blade screwdriver available.
- For a list of supported options for the computer, refer to <http://www.ibm.com/pc/support> on the World Wide Web.

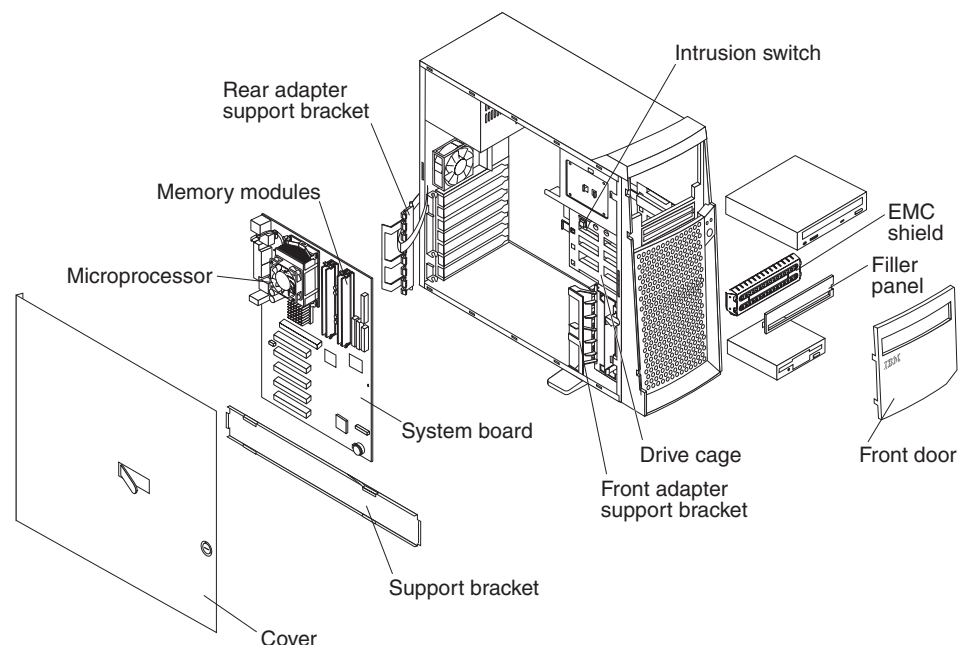
System reliability considerations

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

- Each of the drive bays either has a drive, or a filler panel and electromagnetic compatibility (EMC) shield installed.
- There is space around the computer to allow the computer cooling system to work properly. Leave about 127 mm (5 in.) of space around the front and rear of the computer.
- Cables for optional adapters are routed according to the instructions that are provided with the adapters.
- A failed fan is replaced within 1 hour.

Major components of the IntelliStation M Pro Types 6229

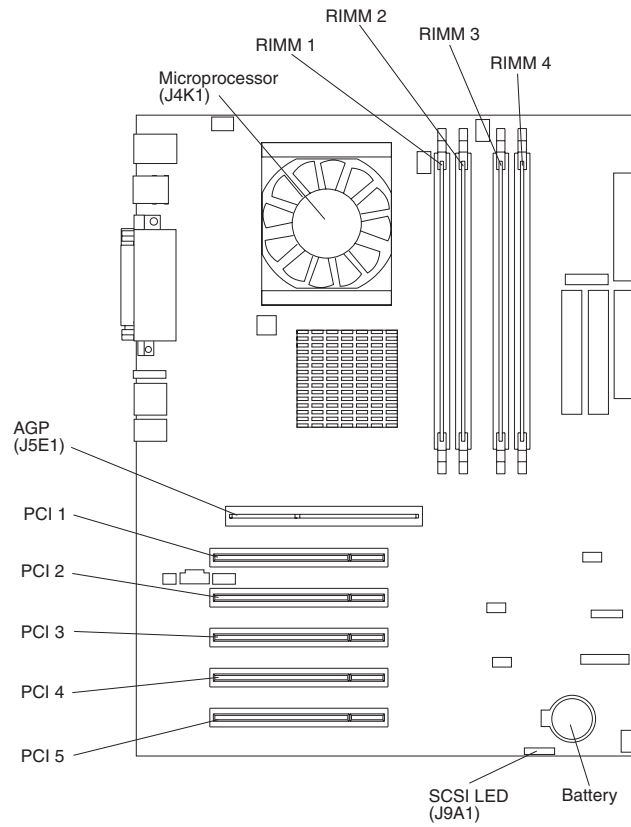
The following illustration shows the locations of major components in the computer.



System board

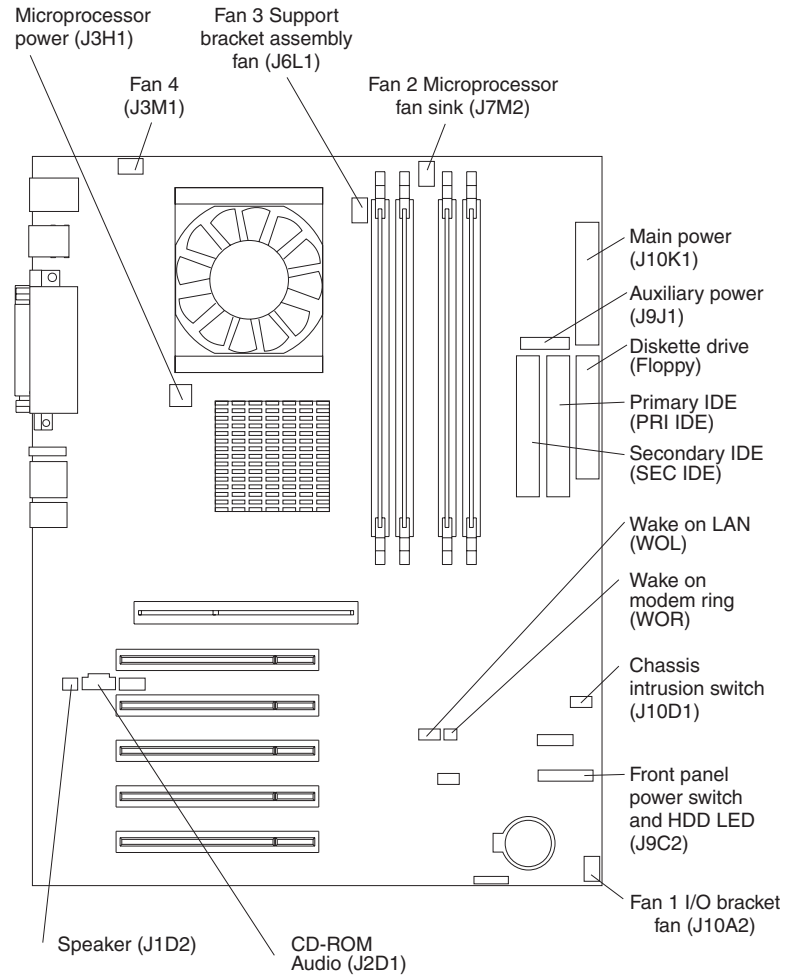
The illustrations in the following sections highlight various components on the system board.

This system board illustration identifies parts of the board. Depending on installed options, your system board might look slightly different.



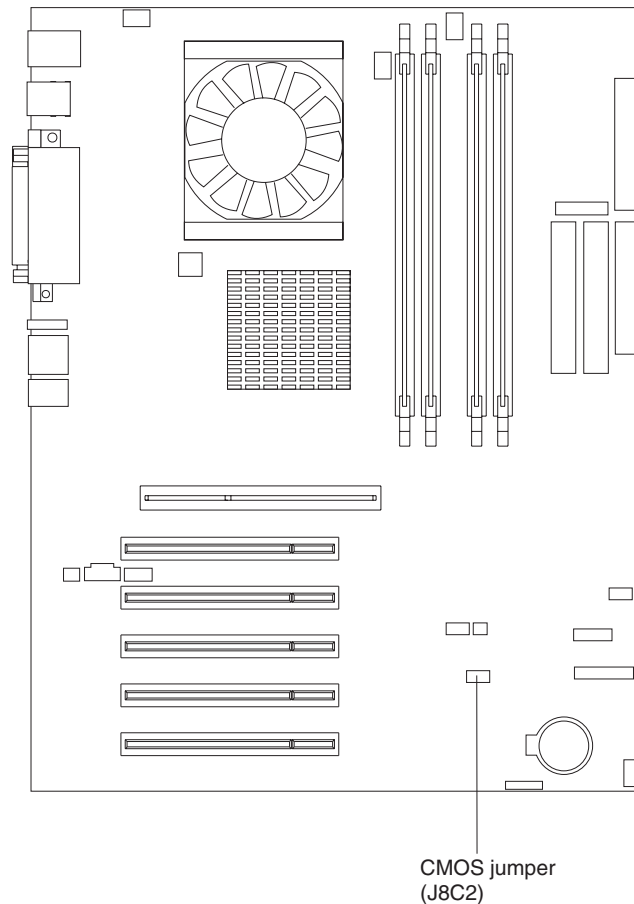
Internal cable connectors

The following illustration identifies system board connectors for internal cables.



CMOS recovery jumper

The following illustration identifies the CMOS recovery jumper on the system board.



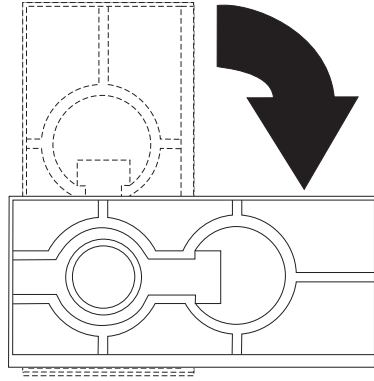
The CMOS recovery jumper can be used to clear CMOS memory in the event you lose your user password. The above illustration shows the location of the CMOS recovery jumper. See “Erasing a lost or forgotten password (clearing CMOS)” on page 14 on how to use the CMOS jumper.

This jumper is also used to recover from a BIOS failure. See “Recovering from a POST/BIOS update failure” on page 15.

Moving the stabilizing feet

The two front feet attached to the bottom of the computer rotate outward 90 degrees to provide additional stability when the computer is upright.

To access the inside of the computer, you might find it easier to lay the computer on its side. Before laying the computer on its side, rotate the feet inward so the weight of the computer does not break them.



When you are finished and have reinstalled the side cover, turn the two front stabilizing feet a quarter turn outward and set the computer carefully back on its feet.

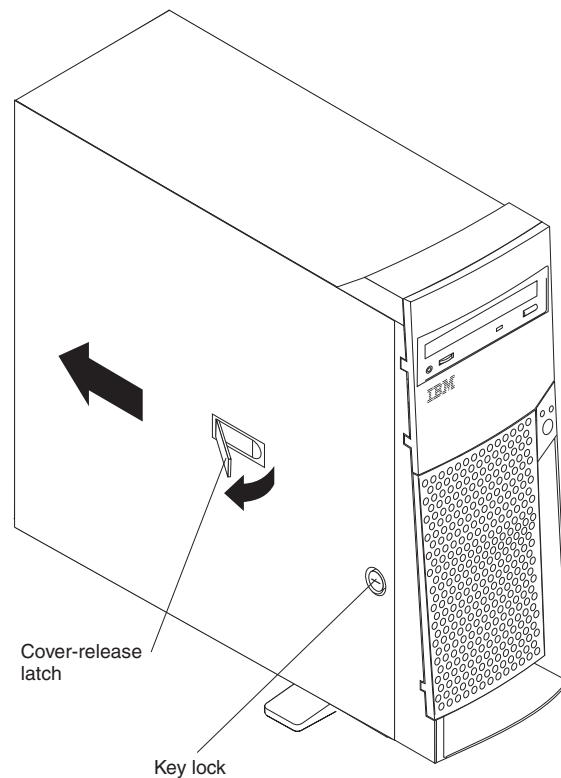
Removing the side cover

The following information describes how to remove the side cover.

Note: To remove the cover, you might find it easier to lay the computer on its side. The illustrations in this document might differ slightly from your hardware.

Do the following to remove the side cover of the computer:

1. Review the information in “Before you begin” on page 23 and “Safety information” on page 101.
2. Turn off the computer and all attached devices.
3. Disconnect all external cables and power cords.
4. Unlock the computer cover, if necessary.
5. While pressing on the top blue button, pull out the cover-release latch and lock it into an upright position. This action will slide the cover toward the rear of the computer about 12.7 mm (0.5 in.). Then, remove the cover from the computer.



To replace the side cover, see “Replacing the cover” on page 41.

Attention

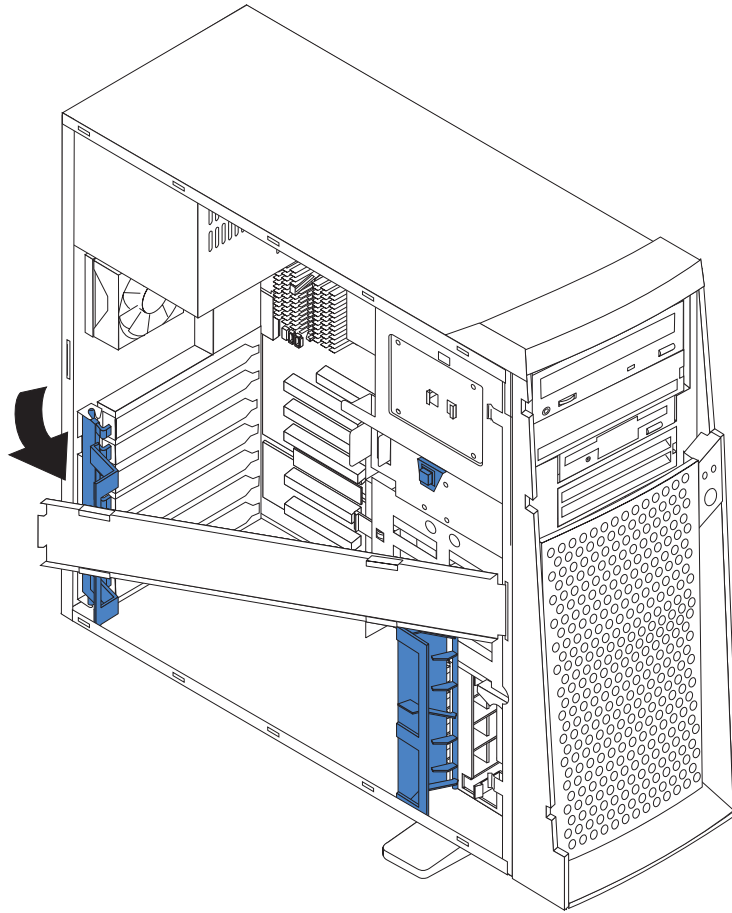
For proper cooling and airflow, replace the cover before turning on the computer. Operating the computer with the cover removed might damage computer components.

Removing the support bracket

When working with some options, such as hard disk drives, adapters, and memory modules, you must first remove the support bracket to access the existing option.

Do the following to remove the support bracket:

1. Pull out, about 152.4 mm (6 in.), on the end of the support bracket located at the rear of the computer.
2. Pull the rear end of the support bracket away from the computer and place the bracket aside.



To reinstall the support bracket, reverse the previous steps.

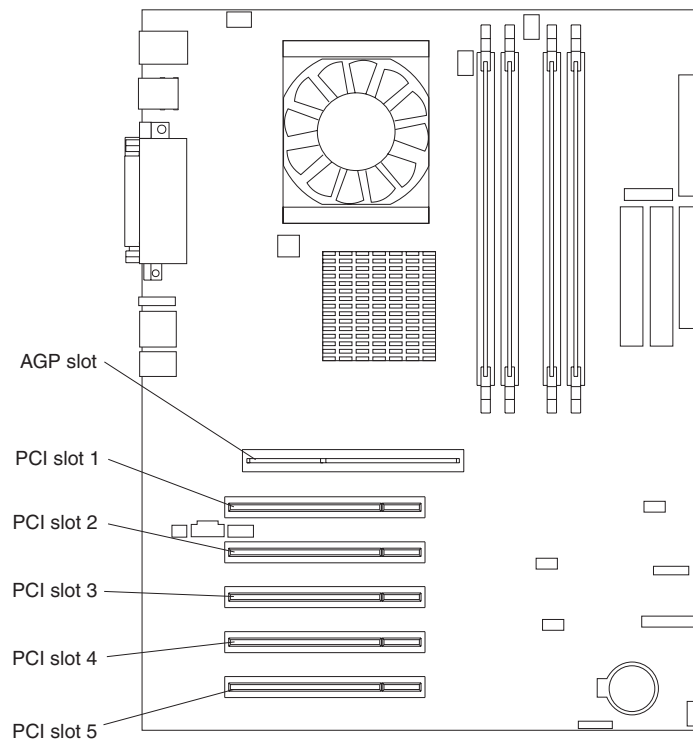
Working with adapters

The computer comes with adapter connectors or *slots*. The AGP video adapter is installed in the AGP slot. You can install up to five PCI adapters in PCI slots 1 through 5. All PCI slots are 32-bit, 33 MHz slots.

Note: Because of its width, the Fire GL4 video adapter requires both the AGP slot and the adjacent PCI slot. If your model contains a Fire GL4 video adapter, you can install up to four PCI adapters in PCI slots 2 through 5.

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

The following illustration shows the location of expansion slots on the system board.



Adapter considerations

Before you install adapters, review the following:

- Follow the instructions that come with the adapter in addition to the instructions in this chapter. If you need to change the switch or jumper settings on your adapter, follow the instructions that come with the adapter.
- You can install full-length adapters in all 5 PCI slots.
- The computer supports 5.0 V and universal PCI adapters; it does not support 3.3 V adapters.
- For a list of supported options for the computer, refer to <http://www.ibm.com/pc/support> on the World Wide Web.

Installing an adapter

Do the following to install an adapter:

Attention: When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For details on handling these devices, see “Handling static sensitive devices” on page 104.

1. Review the information in “Safety information” on page 101.
2. Turn off the computer and attached devices.
3. Disconnect all external cables and power cords; then, remove the side cover. See “Removing the side cover” on page 28.
4. Determine which PCI slot you will use for the adapter.

Note: Check the instructions that come with the adapter for any requirements, restrictions, or cabling instructions. It might be easier to route any cables before you install the adapter.

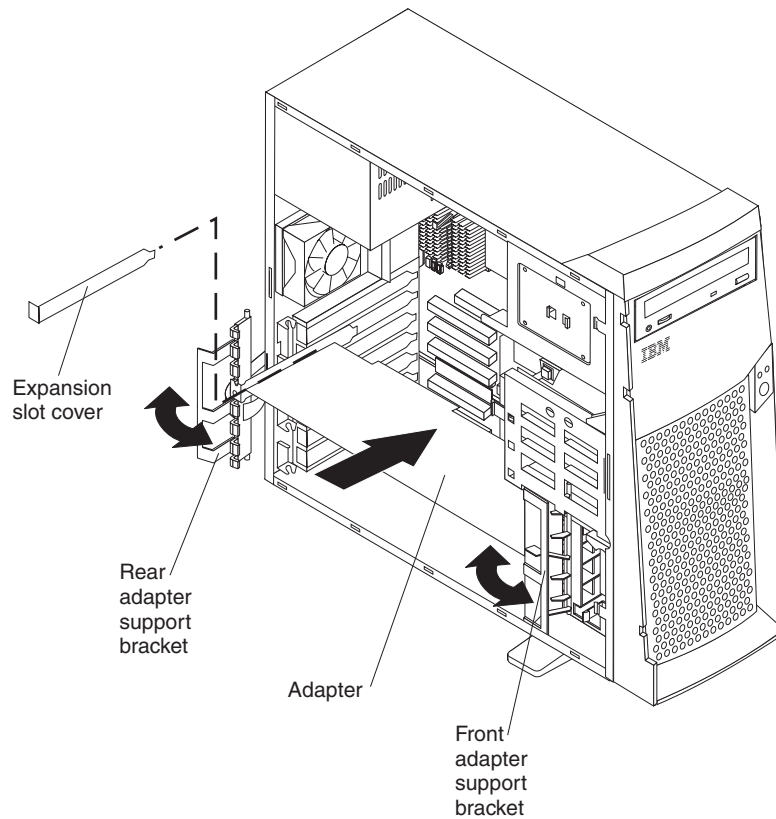
5. For full-length adapters, rotate the rear adapter support bracket to the open (unlocked) position and remove it from the computer. Rotate the front adapter support bracket to the open position. If you are installing a smaller adapter, remove only the rear support bracket.
6. Remove the expansion-slot cover. From the rear of the computer, press on the slot cover. Grasp it and pull it out of the expansion slot. 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 standards of the computer and ensures proper ventilation of computer components.

7. Set any jumpers or switches on the adapter or system board as described by the adapter manufacturer.
8. When you are ready, remove the adapter from the static-protective package. It is best to move the adapter directly from the static-protective package to the adapter slot. If this is not possible, set the adapter down on a non-conductive surface. Avoid touching the components and gold-edge connectors on the adapter.

9. To install the adapter, carefully grasp the adapter by the top edge or upper corners, and align it with the expansion slot guides; then, press the adapter *firmly* into the expansion slot.



Attention

Be certain that the adapter is correctly seated in the expansion slot before you turn on the computer. Incomplete installation of an adapter might damage the system board or the adapter.

10. Connect required cables to the adapter. Route cables so that they do not block the flow of air from the fans.
11. If you have another adapter to install, repeat steps 1 - 10. If you have another option to install, do so at this time. Otherwise, complete the rest of the steps in this section.
12. If you have installed a full-length adapter, rotate the front adapter support bracket to the closed (locked) position.
13. Reinstall the rear adapter support bracket; then, rotate the bracket to the closed (locked) position.

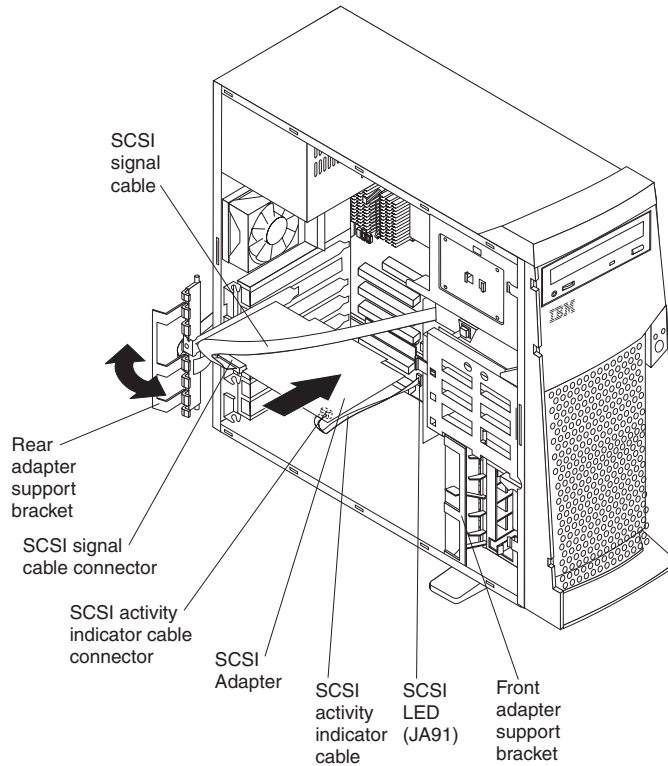
Note: The rear retaining bracket sits against the computer cover. You might find it easier to lay the computer on its side to replace the cover.

14. Replace the support bracket.
15. Replace the side cover, see "Replacing the cover" on page 41 for details.
16. Reconnect the external cables and power cords; then, turn on the attached devices and the computer.

Installing an optional SCSI adapter

Some models come without SCSI adapters. Do the following to install an optional SCSI adapter:

1. If you do not have a preinstalled SCSI adapter, complete steps 1 through 10 of “Installing an adapter” on page 31. Continue with step 2 of this procedure.
2. Connect the SCSI signal cable to the adapter; then, connect one or more of the signal cable connectors to the rear of the SCSI devices.
3. Connect the SCSI activity indicator cable to the adapter and to the SCSI LED connector (JA91) on the system board. See “System board” on page 24 for the location of the SCSI LED connector.



4. If you have other adapters or options to install or remove, do so now.
5. Rotate the front adapter support bracket to the closed (locked) position.
6. Reinstall the rear adapter support bracket; then, rotate it to the closed (locked) position.
7. Replace the support bracket.
8. Replace the cover. See “Replacing the cover” on page 41 for details.
9. Reconnect the external cables and power cords; then, turn on the attached devices and the computer.

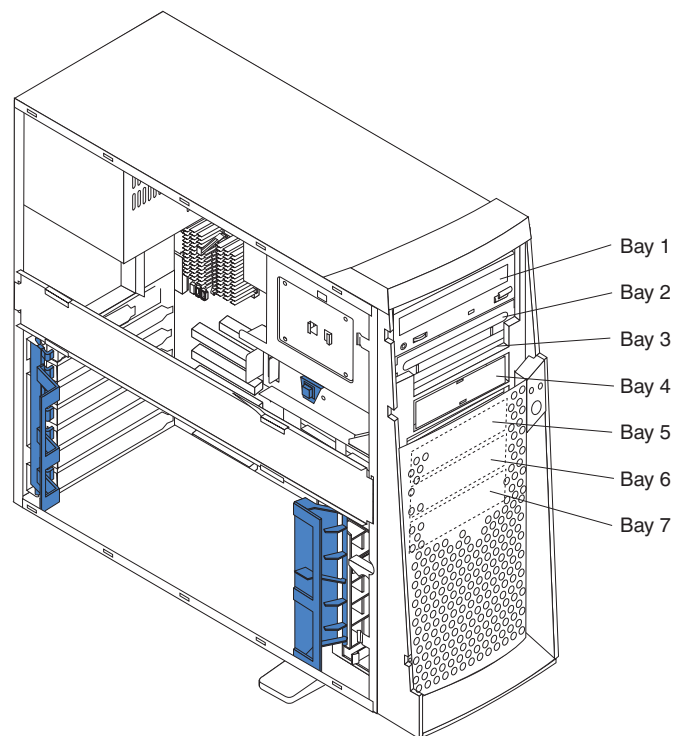
Installing internal drives

Depending on the computer model, you might have one or more of the following drives installed.

- Diskette
- Hard disk
- CD- or DVD-ROM
- Jaz or Zip
- Tape

Internal drive bays

The IntelliStation M Pro computer comes with an IDE CD-ROM or DVD-ROM drive in bay 1, a 3.5-in., 1.44 MB diskette drive in bay 3, and a hard disk drive installed in bay 5.



Notes:

1. Diskette drives, tape drives, and CD-ROM and DVD-ROM drives are examples of removable media drives. You can install removable-media drives in bays 1, 2, 3, and 4 only.
2. You can install a 3.5-in, slim-high, or a 5.25-in., half-high, removable-media drive, such as a tape backup drive, in bay 2.
3. You can only install a 3.5-in., slim-high, removable-media drive in bay 4.
4. The IntelliStation M Pro computer supports only one diskette drive, which uses 1.44 MB diskettes.
5. To install a 3.5-in. drive in a 5.25-in. bay, you must use a 5.25-in. conversion kit, supplied with the option.

6. The electromagnetic interference (EMI) integrity and cooling of the computer are protected by having all bays and PCI slots covered or occupied. When you install a drive or PCI adapter, save the EMC shield and filler panel from the bay or the PCI adapter slot cover in the event you later remove the option.
7. For a complete list of supported options for the computer, refer to <http://www.ibm.com/pc/support> on the World Wide Web.

Preinstallation steps (all bays)

Before you install a drive in the computer, verify that you have all the cables and other equipment specified in the documentation that comes with the drive. You might also need to perform certain preinstallation activities. Some of the steps are required only during the initial installation of an option.

1. Read “Safety information” on page 101, “Handling static sensitive devices” on page 104 and the documentation that comes with the drive.
2. Choose the bay in which you want to install the drive.
3. Check the instructions that come with the drive to see if you need to set any switches or jumpers on the drive. If you are installing a SCSI device, be sure to set the SCSI ID for that device.

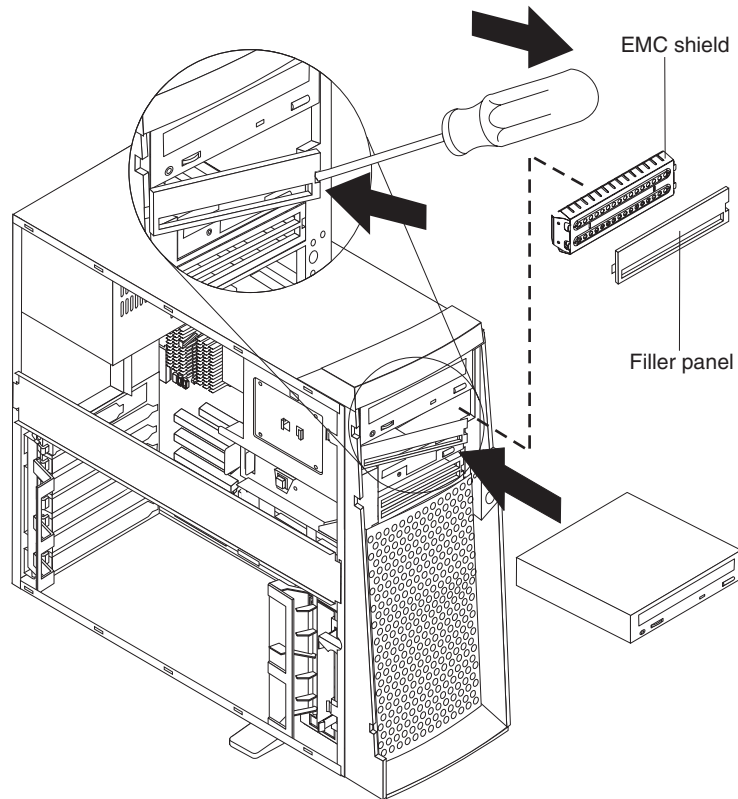
Installing a drive in bay 2 or 4

Do the following to install a drive in bay 2 or 4:

Attention

When handling static-sensitive devices, take precautions to avoid damage from static electricity.

1. Read the information in “Preinstallation steps (all bays)” on page 35.
2. Turn off the computer and attached devices and disconnect the external cables and power cords.
3. Remove the side cover. See “Removing the side cover” on page 28 for details.
4. Remove the support bracket (see “Removing the support bracket” on page 29).



5. Use a screwdriver to pry the filler panel and EMC shield away from the computer.

Note: If you are installing a drive that contains a laser, 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.



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.

6. Touch the static-protective package containing the drive to any unpainted metal surface on the computer; then, remove the drive from the bag and place it on a static-protective surface.
7. Set any jumpers or switches on the drive according to the documentation that comes with the drive.
8. You might find it easier to install the new drive into the appropriate opening on the machine front, then attach the cables.
9. If you are installing a 5.25-in. drive in bay 2, push the drive into the bay; then, use the two screws to attach the drive to the drive cage.
10. If you are installing a 3.5-in. drive in bay 2, you must attach the 5.25-in conversion kit, supplied with the option, to the 3.5-in. drive.

Note: You can install only a 3.5-in. device in bay 4.

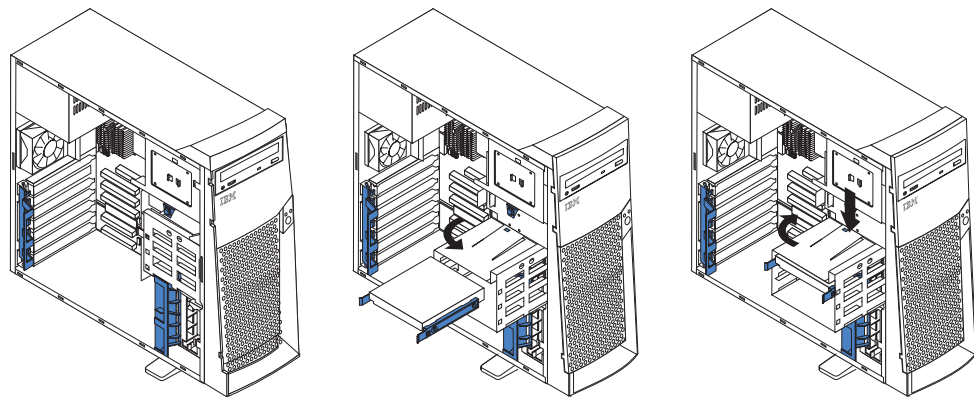
11. If the drive is an IDE device, connect one end of the IDE signal cable into the back of the drive and the other end of the cable into the IDE connector on the system board. For the location of the IDE connectors, see “Internal cable connectors” on page 25. If the drive is a SCSI device, connect one end of the SCSI signal cable into the back of the drive and the other end of the cable into the SCSI adapter.

Note: Make sure to route the SCSI signal cable so that it does not block the air flow to the rear of the drives or over the microprocessor.

12. Connect a power cable to the back of the drive. The connectors are keyed and can be inserted only one way.
13. If you have other options to install or remove, do so now.
14. Replace the support bracket.
15. Replace the side cover. See “Replacing the cover” on page 41 for details.
16. Reconnect the external cables and power cords; then, turn on the attached devices and the computer.

Installing a hard disk drive in bay 5, 6, or 7

You might find it useful to work with the computer laying on its side. Bays 5, 6, and 7 are in the drive cage. The drive cage is located just above the front adapter support bracket. Refer to the following illustration as you work with the drive cage.



1. Read the information in “Preinstallation steps (all bays)” on page 35.
2. Turn off the computer and all attached devices. Disconnect all external cables and power cords; then, remove the cover. See “Removing the side cover” on page 28 for details.

3. Remove the support bracket.
4. Access the drive cage.
 - a. If the computer has hard disk drives preinstalled in the drive cage, disconnect the power and signal cables from the rear of the drives.
 - b. Grasp the drive cage and rotate the cage out (middle view above) of the computer until it locks into place with the drive cage retention tab. The open ends of the drive slots and installed drives will face you.

Note: Ensure that the drive cage locks into place over the drive cage retention tab by pressing the drive cage all the way up.

5. Attach the guide rails to the side of the drive using the screws provided. If you obtained the optional drive from IBM, the guide rails are blue plastic.
6. Slide the drive into the drive cage until the plastic tabs on the drive guide rails lock into place in the drive cage.
7. Lift the drive cage up, and press in on the drive cage release tab; then, rotate the cage back into the computer (right view above).

Note: Clear any cables that might impede the replacement of the drive cage.

8. Connect the power and signal cables to the rear of each drive and to the system board if necessary.

Note: Route the signal cable so that it does not block the air flow to the rear of the drives or over the microprocessor.

9. If you have other options to install or remove, do so now.
10. Replace the support bracket.
11. Replace the side cover, see “Replacing the cover” on page 41 for details.
12. Reconnect the external cables and power cords; then, turn on the attached devices and the computer.

Installing memory modules

Adding memory to the computer is an easy way to make programs run faster. You can increase the amount of memory in the computer by installing memory modules. The IntelliStation M Pro computer uses industry-standard, RAMBUS in-line memory modules (RIMMs).

Notes:

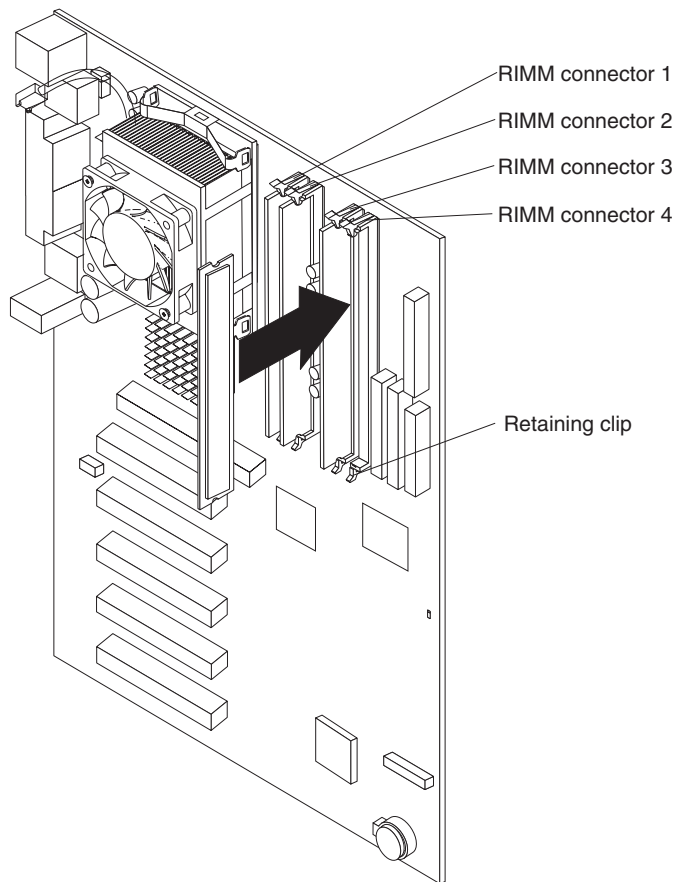
1. Any connector that does not have a RIMM installed must have a continuity RIMM (C-RIMM), a module that looks like a RIMM but has no memory on it. A C-RIMM is used to continue the connection on a RIMM connector that does not have memory installed.
2. Install only ECC RIMMs to enable ECC. If you use ECC and non-ECC memory together, it will function as non-ECC memory.
3. RIMM connectors do not support dual inline memory modules (DIMMs).
4. Use only PC600 or PC800 RIMMs.

Note: If you use PC600 and PC800 RIMMs together, all memory will function at the speed of the slowest RIMM.

5. The IntelliStation M Pro computer supports 128 MB, 256 MB, and 512 MB RIMMs. The computer supports a minimum of 128 MB and a maximum of 2.0 GB of system memory. Go to <http://www.ibm.com/pc/support> for a list of memory modules to use with the computer.

- RIMMs must be installed in matched pairs (same type and capacity). RIMM 1 and 2 are a pair; RIMM 3 and 4 are a pair.

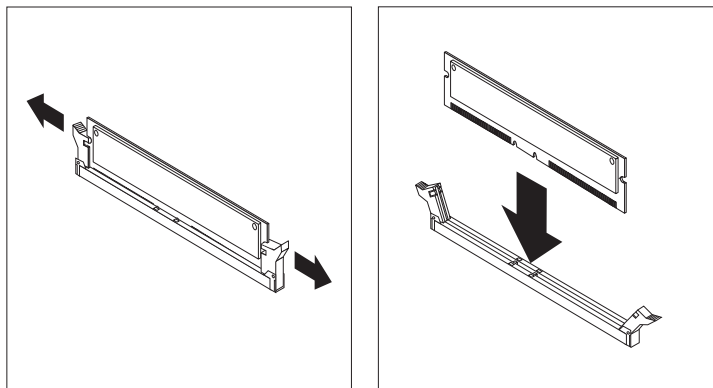
Note: The illustrations in this document might differ slightly from your hardware.



Do the following to install a RIMM or C-RIMM:

Attention: When handling static-sensitive devices, take precautions to avoid damage from static electricity. For details on handling these devices, see “Handling static sensitive devices” on page 104.

- Review the safety precautions listed in the “Safety information” on page 101.
- Turn off the computer and all attached devices. Disconnect all external cables and power cords; then, remove the cover. See “Removing the side cover” on page 28 for details.
- Remove the support bracket.
- Touch the static-protective package containing the RIMM to any unpainted metal surface on the computer. Then, remove the new RIMM from the package.
- Open the retaining clips and, if necessary, remove any existing RIMM or C-RIMM.
- Gently open the retaining clip on each end of the RIMM slot. Turn the RIMM so that the pins align correctly with the connector.



7. Insert the RIMM into the connector by aligning the RIMM edges with the slots at each end of the RIMM connector. Firmly press the RIMM straight down into the connector by applying pressure on both ends of the RIMM simultaneously. The retaining clips snap into the locked position when the RIMM is firmly seated in the connector.
8. If a gap exists between the RIMM and the retaining clips, the RIMM has not been correctly installed. Open the retaining clips, remove the RIMM, then reinsert it.
9. If you have other options to install or remove, do so now. Otherwise, finish the installation with the steps below.
10. Replace the support bracket.
11. Replace the side cover. See “Replacing the cover” on page 41.
12. Reconnect the external cables and power cords. Turn on the attached devices, then the computer.

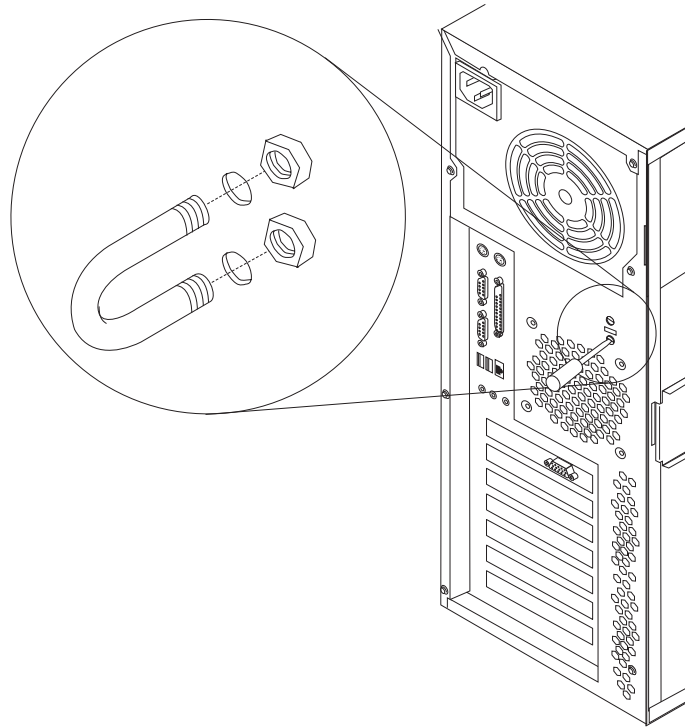
Installing a security U-bolt

To help prevent theft, you can add a security U-bolt and cable to the computer. This section discusses how to install a security U-bolt.

Do the following to install the U-bolt:

1. Review the safety precautions listed in “Safety information” on page 101.
2. Turn off the computer and all attached devices. Disconnect all external cables and power cords; then, remove the cover. See “Removing the side cover” on page 28 for details.
3. Use a screwdriver to remove the two metal knockouts.
4. Insert the U-bolt through the rear panel; then, attach and tighten the nuts.

Note: Your computer might look different slightly different than the one shown.



5. Thread the cable through the U-bolt and around an object that is not part of or permanently secured to the building structure or foundation, and from which the cable cannot be removed. Fasten the cable ends together with a lock. After you add the security cable, be certain it does not interfere with other cables connected to the computer.
6. Reconnect the external cables and power cords, and turn on the attached devices and the computer.

Replacing the cover

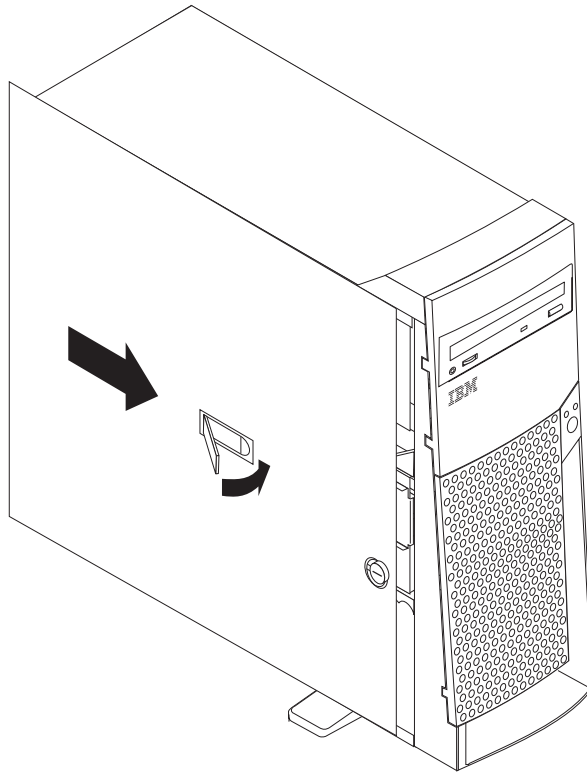
The following information describes replacing the cover.

Notes:

1. Because of the placement of the adapter support brackets, you might find it easier to lay the computer on its side with the cover lock facing you.
2. If you removed the support bracket, reinstall it before you replace the cover. See “Removing the support bracket” on page 29 for details.

Do the following to replace the computer cover:

1. Clear any cables that might impede the replacement of the cover.
2. Install the side cover by placing it into position on the computer. Be certain the notches on the underside of the cover match up to the holes along the sides of the computer. Press down on the cover release latch button as you close the cover release latch to lock the cover.



3. If you have not done so already, make sure that the two front stabilizing feet are rotated outward so that they properly support the computer. Rotate each individual foot outward 90 degrees.
4. Reconnect the external cables and power cords to the computer; then, connect the power cords to electrical outlets.
5. Turn on the attached devices; then, turn on the computer.

Connecting external devices

You can attach several external devices to the computer. To attach an external device:

1. Be sure the computer and all attached devices are turned off.
2. Read “Before you begin” on page 23 and the documentation that comes with the options.
3. Follow the instructions that come with the option to prepare it for installation and to connect it to the computer.

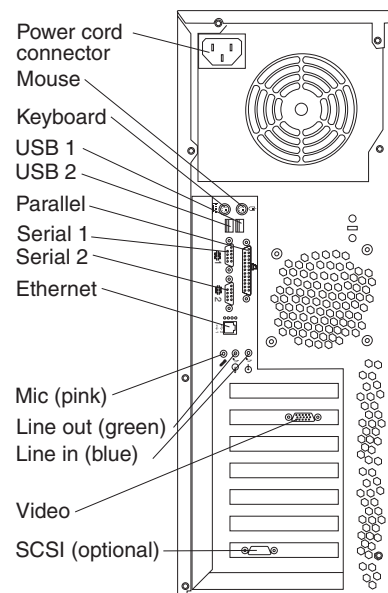
Input/Output connector descriptions

This section provides pin and other information about the I/O connectors on the rear of the computer. Refer to “Input/Output connector locations.” These connectors include the following:

- One mouse
- One keyboard
- One parallel
- Two serial
- One Ethernet
- Two USB
- Line in
- Line out
- Microphone
- One video (Optional multiple connectors on some models)
- One Ultra 3/160 SCSI (some models)

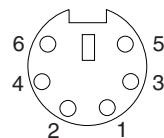
Input/Output connector locations

The following illustration shows the input/output connectors and the expansion slots on the rear of the computer. For pin assignments and more details about these connectors, see the individual descriptions that follow.



Mouse connector

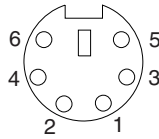
The computer has one mouse connector that supports a mouse or other pointing device. The mouse connector is located on the rear of the computer. See “Input/Output connector locations.”



Keyboard connector

The computer has one keyboard connector. See “Input/Output connector locations” on page 43 for its location.

Note: If you attach a standard (non-USB) keyboard to the keyboard connector, the USB ports and devices are disabled during the power-on self-test (POST).



Parallel connector

The computer has one parallel connector. This connector supports three standard Institute of Electrical and Electronics Engineers (IEEE) 1284 modes of operation: standard parallel port (SPP), enhanced parallel port (EPP), and extended capability port (ECP).

Viewing or changing the connector assignments

Use the BIOS Setup Utility program to configure the parallel connector as bi-directional. With this configuration, data can be read from and written to a device. In bidirectional mode, the computer supports the ECP and EPP modes.

Do the following to view or change the parallel-connector assignment:

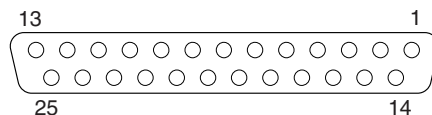
1. Restart the computer.
2. Press and hold the F2 key to launch the BIOS Setup Utility.
3. On the BIOS Setup Utility menu, use the cursor keys on the keyboard to select **Advanced”Peripheral Configuration”Parallel Port**.

Note: When you configure the parallel connector as bi-directional, use an IEEE 1284-compliant cable. The cable must not exceed 3 meters (9.8 ft.).

4. Follow the instructions on the screen to save the changes and exit from the BIOS Setup Utility menu.

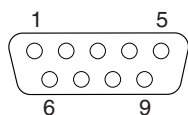
Parallel connector

There is a 25-pin, female D-shell parallel connector on the rear of the computer. See “Input/Output connector locations” on page 43 for the location of this connector.



Serial connectors

The computer has two standard 9-pin D-shell serial connectors: Serial connector 1 and Serial connector 2. See “Input/Output connector locations” on page 43 for their location.



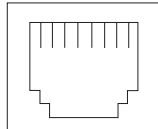
Ethernet connector

The computer comes with an integrated Ethernet controller. This controller provides an interface for connecting to 10-Mbps or 100-Mbps networks and provides full-duplex capability, which enables simultaneous transmission and reception of data on an Ethernet LAN.

To access the Ethernet connector, attach a Category 3, 4, or 5 unshielded twisted-pair (UTP) cable to the RJ-45 connector on the rear of the computer. See “Input/Output connector locations” on page 43.

Important

To operate the computer within FCC Class A or Class B limits, use a category 5 Ethernet cable.



Universal Serial Bus connectors

The computer has two Universal Serial Bus (USB) connectors, which configure automatically when you use any USB device. USB is a serial interface standard for telephony and multimedia devices. It uses Plug and Play technology to determine the type of device attached to the connector.

Notes:

1. If you attach a standard (non-USB) keyboard to the keyboard connector, the USB connectors and devices will be disabled during the power-on self-test.
2. If you install a USB keyboard that has a mouse connector, the USB keyboard emulates a mouse, and you will not be able to disable the mouse settings in the BIOS Setup Utility program.

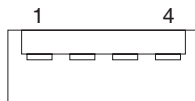
USB cables

Use a 4-pin USB cable to connect external devices to USB connectors.

USB technology transfers data at up to 12 megabits-per-second (Mbps) with a maximum of 127 external devices and a maximum signal distance of five meters (16 ft) per segment.

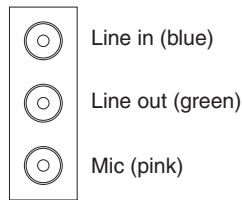
USB connectors

See “Input/Output connector locations” on page 43 for the location of the USB connectors.



Audio connectors

The audio connectors are used to connect external audio equipment to the computer. See “Input/Output connector locations” on page 43 for the location of these connectors.



Line out

This connector is used to send audio signals from the computer to external devices, such as powered speakers with built-in amplifiers, headphones, multimedia keyboards, or the audio Line in connector on a stereo system.

Note: The internal speaker in your computer is disabled when any device is attached to this connector.

Line in

This connector is used to accept audio signals from external devices, such as line output from a stereo, television, or musical instrument into the computer sound system.

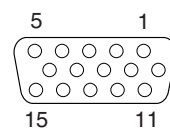
Microphone

This connector is used to connect a microphone to your computer when you want to record voice or other sounds on the hard-disk drive. It can also be used by speech recognition software.

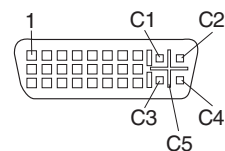
Video connector

The computer uses an AGP adapter located in the AGP slot on the system board. The video connector is on the adapter and is located on the rear of the computer. See “Input/Output connector locations” on page 43 for the location of this connector.

Analog video connector:



Digital (DVI-I) video connector:



Models with the Fire GL4 video adapter come with a digital-to-analog converter for each DVI-I connector.

Some models come with an AGP adapter that has dual video connectors.

Attention: On the Fire GL4 video adapter, the first or only monitor must be connected to the bottom connector (connector number 1).

Ultra 3/160 SCSI connector

Some computer models come with a SCSI adapter, which supports an Ultra 3/160/MB SCSI internal channel in a full-featured PCI 2.1-/2.2-compliant bus master package. This configuration supports zero wait state, 32-bit memory transfers at 160 Mbytes/second, when low voltage differential (LVD) SCSI peripherals are attached. This channel supports up to 15 SCSI devices. In addition, this adapter uses:

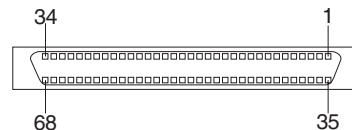
- Double-transition clocking to achieve high transfer rates
- Domain name validation to negotiate compatible data transfer speeds with each device
- Cyclic-redundancy checking, instead of the usual parity checking, to significantly improve data reliability

SCSI cabling requirements

You can install five internal SCSI devices using the SCSI signal cable that comes with your computer. If you plan to attach external SCSI devices, you must order an additional SCSI cable. To select and order the correct cables for use with external devices, contact your IBM reseller or IBM marketing representative. To receive an indication of SCSI hard-disk drive activity, you must also connect the SCSI adapter to the SCSI LED (JA91) connector on the system board. See “System board” on page 24 for the location of the SCSI connector.

Setting SCSI IDs

Each SCSI device connected to a SCSI controller must have a unique SCSI ID. This ID enables the SCSI controller to identify the device and ensure that different devices on the same SCSI channel do not attempt to transfer data simultaneously. SCSI devices that are connected to different SCSI channels can have duplicate SCSI IDs. Refer to the information that is provided with the device for instructions to set its SCSI ID. With a SCSI adapter installed in your computer, you can use its 68-pin SCSI connector to connect different types of SCSI devices.



To install external SCSI devices, you must have an optional SCSI PCI adapter installed. Refer to the information that is provided with the device for instructions to set its SCSI ID.

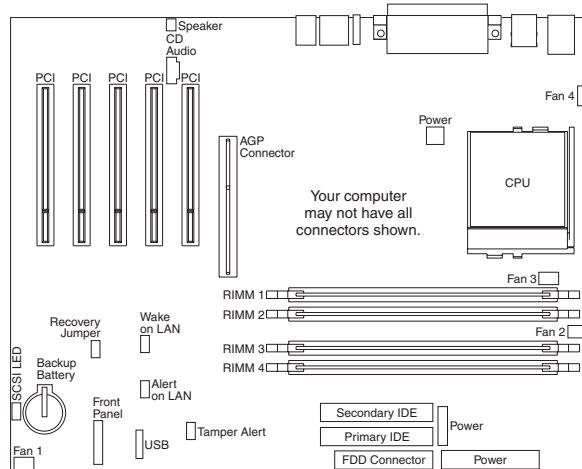
Chapter 6. FRU information (service only)

This section covers the service removals for Type 6849 and 6231 computers.

Note: This section is for trained servicers

Type 6849 and 6231 removals

System board layout



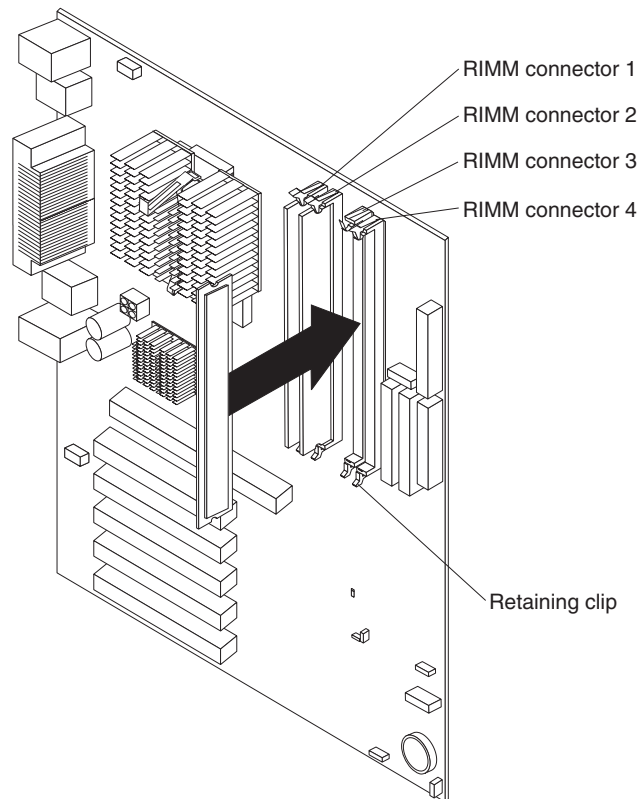
System board jumper settings

The following table contains the jumper setting information. (D) indicates the default setting.

Configuration/Flash Boot Block Recovery: Use the recovery jumper setting to configure CMOS or to Flash Boot Block Recover.

Jumper	Setting	Description
CMOS Reset	Remove	Flash recovery
	1-2 (D)	Normal Mode

System board memory



Rambus inline memory modules (RIMMs)

The IBM-installed RIMMs are ECC (error checking and correction) RDRAM (Rambus dynamic random access memory) modules.

When installing or replacing RIMMs, take the following information into consideration:

- RIMM connectors do not support dual inline memory modules (DIMMs)
- Use only PC600 or PC800 RIMMs.
- RIMMs must be installed in pairs. The RIMMs installed in a RIMM connector pair must be of the same speed, and size.
- Any connector that does not have a RIMM installed must have a continuity RIMM (C-RIMM).
- Install only ECC RIMMs to enable ECC. If ECC and non-ECC memory are used together, the memory will function as non-ECC memory.

Note: If PC600 and PC800 RIMMs are used together, all memory will function at the speed of the slowest RIMM.

Memory placement for 4-RIMM Memory Card				
Number of RIMMs	Pair 1		Pair 2	
	1	2	3	4
2 RIMMs	RIMM	RIMM	C-RIMM	C-RIMM
4 RIMMs	RIMM	RIMM	RIMM	RIMM
Note: Memory must be installed in matched pairs.				

The following matrix cross-references the name of the computer (printed on the logo) and the size, speed, and type of memory modules supported in the computer.

Note: RAMBUS inline memory module (RIMM) is used in the type 6849 and 6231 computers. RIMM modules are not compatible with SIMM or DIMM memory modules. Refer to the information below regarding RIMM memory for type 6849 and 6231.

Computer Name	RIMM Memory Module			
	Size		Memory	Type
IntelliStation Type 6849 and 6231	64 MB	128MB	PC600	RDRAM
	256 MB	512 MB;	PC800	ECC/Non-ECC
	2 GB Maximum			

Supported RIMM memory configuration

Type 6849 and 6231 has two memory channels with two memory sockets for each channel making a total of four RIMM memory sockets. RIMM sockets must have a RIMM memory module or a C-RIMM (RIMM Continuity module) installed. There can be no empty RIMM sockets. RIMM sockets must contain either a RIMM or a CRIMM. At least one socket, from each memory channel, must have a RIMM memory module installed.

Note: Both memory channels must be populated the same.

- RIMM sockets 1 and 3 are on memory channel A.
- RIMM sockets 2 and 4 are on memory channel B.

Each RIMM socket supports a maximum of 512 MB of memory.

- If new memory is to be added in a memory channel, remove a C-RIMM and install the new RIMM. (You must also do the same with the other memory Channel).
- If memory is to be removed from a memory channel, remove the RIMM and install a C-RIMM. (You must also do the same with the other memory Channel).

RIMM sizes of 64 MB, 128 MB, 256 MB, and 512 MB are acceptable. RIMM sockets, within each memory channel, can be filled in any order. However, both memory channels must be populated the same. ECC or non-ECC, RAMBUS dynamic random access memory (RDRAM) are supported. If ECC and non-ECC are installed together, all memory will function as non-ECC.

Note: Mixed RIMM speeds will run at the lower speed.

Procedures to determine memory errors:

1. If a memory error occurs, and the system is operational, run memory diagnostics.
2. If a memory error occurs, and the system is not operational:
 - a. Replace one RIMM module at a time until the system comes up.

Note: All unused RIMM sockets must have a C-RIMM installed.

- b. Run memory diagnostics.
- c. Install the other RIMM and run diagnostics again to identify the failing RIMM.

RIMM diagnostic approach

Identify any Beep or POST codes. See Chapter 7, "Symptom-to-FRU index," on page 61.

Use the IBM PC Enhanced Diagnostics program to run memory tests. See "IBM Enhanced Diagnostics" on page 6.

Procedures to determine memory errors

1. If a memory error occurs, and the system is operational, run memory diagnostics.
2. If a memory error occurs, and the system is not operational:
 - a. Replace one RIMM module at a time until the system comes up.

Note: All unused RIMM sockets must have a C-RIMM installed. Both memory channels must be populated the same.

- b. Run memory diagnostics.
- c. Replace the other RIMMs and run diagnostics again to identify the failing RIMM.

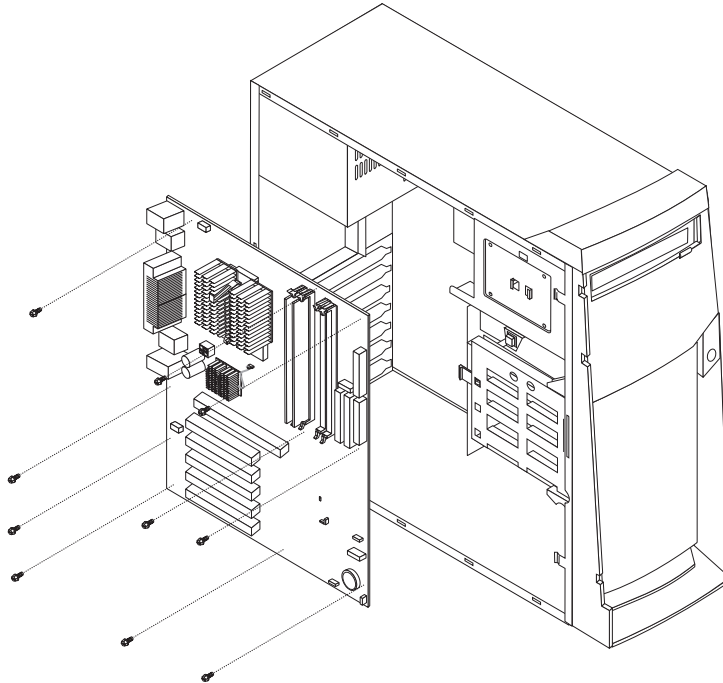
Replacing a system board

Notes:

1. The BIOS and Vital Product Data (VPD) for the computer you are servicing must be installed on the new system board (FRU) after it is installed in the computer. To do this, **you must run the Flash Update program using the Flash Update diskette.** See "BIOS levels" on page 89, "Vital product data" on page 87, and "Flash (BIOS/VPD) update procedure" on page 89.
2. Always ensure the latest level of BIOS is installed on the computer. A down level BIOS may cause false errors and unnecessary replacement of the system board.
3. The processor is a separate FRU from the system board and is not included with the system board FRU.
4. If the new system board does not correct the problem, reinstall the options on the old system board, reinstall the old system board, then replace the processor.

To replace the system board, do the following:

1. Remove any components and dsisconnect any cables that impede access to the system board and processor/heatsink (see the section for each component for more information).
2. Remove the heatsink, processor and mounting brackets from the old system board and install them on the new system board (see “Replacing a processor” on page 54).
3. Remove the 10 screws that attach the system board to the chassis.
4. Remove the board from the chassis.

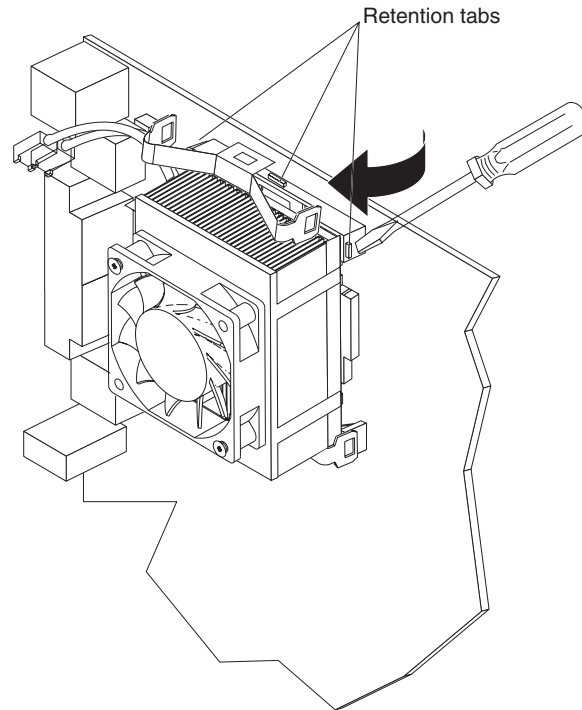


5. Remove any of the following installed options on the old system board, and install them on the new system board.
 - Memory modules
6. Ensure that the new system board jumper settings match the old system board jumper settings.

Replacing a processor

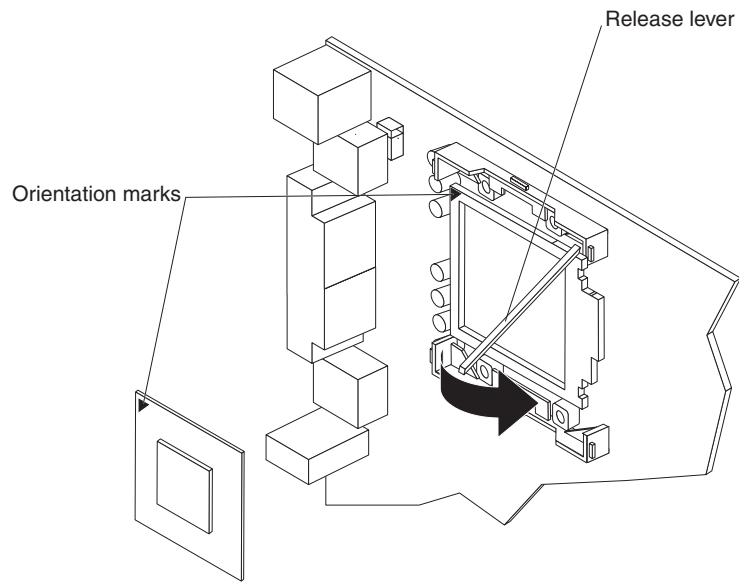
To replace the processor, do the following:

1. Remove any components and dsisconnect any cables that impede access to the fansink/heatsink and processor (see the section for each component for more information).
2. Remove the fansink/heatsink from the processor.
 - a. Unplug the fansink cable.



- b. Remove one retention clip by using a small flat-blade screwdriver to carefully pry one end of the clip off of the retention tab; then, slide the clip off of the remaining two tabs and lift it out of the machine.
- c. Use the same procedure to remove the second retention clip.
- d. Lift the fansink up and out of the machine.

3. Rotate the processor socket release lever upward to the maximum vertical position.



Important: Note the location of the orientation marks (triangles) on the processor and socket to ensure proper orientation of the processor during installation.

4. Lift the processor up and out of the machine.
5. To install the processor and fansink, reverse the previous steps.

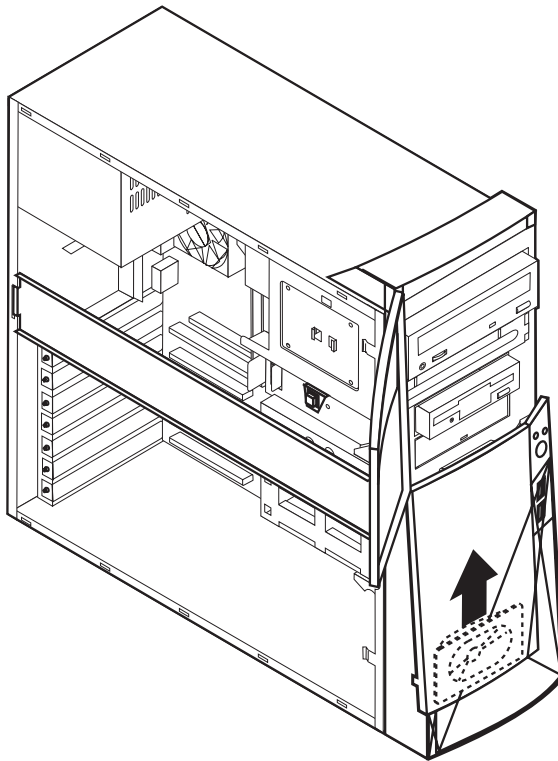
Note: During installation, make sure that the processor is fully seated in its socket and that the goal post latches are engaged.

Important:

1. Make sure the fansink and air baffle (if any) are installed to prevent processor overheating.
2. If the processor is not installed correctly, the system board and the processor can be damaged.

Speaker removal

1. Remove the cover (see “Removing the side cover” on page 28).
2. The speaker is secured by one tab on either side and two at the bottom. Firmly push the speaker up from the bottom until it comes out from the tabs.



Power supply

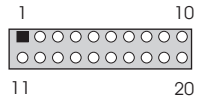
If the power-on indicator is not on, the power supply fan is not running, or the computer will not power-off, use the following procedures.

Check/Verify	FRU/Action
Check the following for proper installation. <ul style="list-style-type: none">• Power Cord• On/Off Switch connector• On/Off Switch Power Supply connector• System Board Power Supply connectors• Microprocessor(s) connection	Reseat
Check the power-on switch for continuity.	Power Cord
Check the power-on switch for continuity.	Power-on Switch

20-pin main power supply connection

See “System board layout” on page 49 for connector locations.

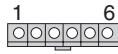
Attention: These voltages must be checked with the power supply cables connected to the system board.



Pin	Signal	Function
1	3.3 V	+3.3 V dc
2	3.3 V	+3.3 V dc
3	COM	Ground
4	5 V	+5 V dc
5	COM	Ground
6	5 V	+5 V dc
7	COM	Ground
8	POK	Power Good
9	5VSB	Standby Voltage
10	12 V	+12 V dc
11	3.3 V	+3.3 V dc
12	-12 V	-12 V dc
13	COM	Ground
14	PS-ON	DC Remote Enable
15	COM	Ground
16	COM	Ground
17	COM	Ground
18	No Voltage	Not Used
19	5 V	+5 Vdc
20	5 V	+5 Vdc

If the voltages are not correct, and the power cord is good, replace the power supply.

6-pin power supply connection



Pin	Signal	Function
1	COM	Ground
2	COM	Ground
3	COM	Ground
4	3.3 V	+3.3 V DC
5	3.3 V	+3.3 V DC
6	5 V	+5 V DC

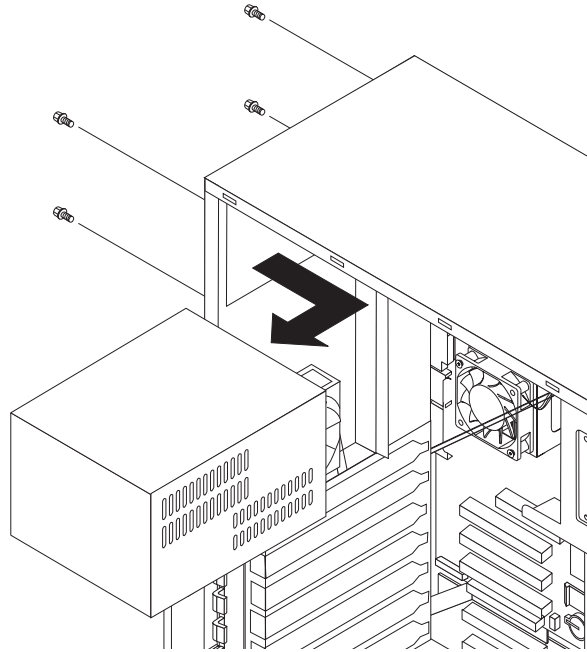
4-pin power supply connection



Pin	Signal	Function
1	COM	Ground
2	COM	Ground
3	12 V	+12 V DC
4	12 V	+12 V DC

Power supply removal

1. Remove the power cable.
2. Remove the cover (see “Removing the side cover” on page 28).
3. Remove the four screws that secure the power supply to the back of the chassis.
4. Remove the power supply.



Chapter 7. Symptom-to-FRU index

The Symptom-to-FRU index lists error symptoms and possible causes. The most likely cause is listed first. Always begin with Chapter 1, “General checkout,” on page 1. This index can also be used to help you decide which FRUs to have available when servicing a computer. If you are unable to correct the problem using this index, go to “Undetermined problems” on page 86.

Notes:

- If you have both an error message and an incorrect audio response, diagnose the error message first.
- If you cannot run the diagnostic tests or you get a diagnostic error code when running a test, but did receive a POST error message, diagnose the POST error message first.
- If you did not receive any error message, look for a description of the error symptoms in the first part of this index.
- Check all power supply voltages before you replace the system board (see “Power supply” on page 56

Important:

Some errors are indicated with a series of beep codes (see “Beep symptoms” on page 62).

Type 6849 and 6231 computers default to come up quiet (no beep and no memory count and checkpoint code display) when no errors are detected by POST. To enable beep and memory count and checkpoint code display when a successful POST occurs, do the following:

1. Select **Start Options** in the BIOS Setup Utility program (see “Using the BIOS Setup Utility program” on page 19).
2. Set **Power-On Self-Test** to **Enhanced**.

The processor is a separate FRU from the system board; the processor is not included with the system board FRU.

In the following indexes, X can represent any number.

RIMM memory errors

The following RIMM error messages are issued by the diagnostic programs.

Error	FRU/Action
Corrupt BIOS	Reflash the BIOS.
Information in BIOS is not as expected.	Perform boot block recovery.
Not able to find expected DMI information from BIOS.	Replace the system board.
Memory controller chipset vendor ID does not match expected value.	
Test aborted by user	Restart test.

Hard disk drive boot error

A hard disk drive boot error can have the following causes.

Error	FRU/Action
The start-up drive is not in the boot sequence in configuration.	Check the configuration and ensure the start-up drive is in the boot sequence.
No operating system installed on the boot drive.	Install an operating system on the boot drive.
The boot sector on the start-up drive is corrupted.	The drive must be formatted, do the following: <ol style="list-style-type: none">1. Attempt to access and recover (back-up) the failing hard disk drive.2. Using the operating systems programs, format the hard disk drive.3. Install operating system, and restore files.
The drive is defective.	Replace the hard disk drive.

Beep symptoms

Beep symptoms are short tones or a series of short tones separated by pauses (intervals without sound).

Note: One beep after successfully completing POST indicates the system is functioning properly.

Use the following table to diagnose beep symptoms.

Beeps	FRU/Action
1 Refresh failure.	<ol style="list-style-type: none">1. Verify all RIMM slots are occupied correctly. See “Installing memory modules” on page 382. Reseat memory.3. Test with known good memory. Replace memory if bad.4. Replace system board.
2 Parity cannot be reset	<ol style="list-style-type: none">1. Verify all RIMM slots are occupied correctly. See “Installing memory modules” on page 382. Reseat memory.3. Test with known good memory. Replace memory if bad.4. Replace system board.
3 First 64 KB memory failure.	<ol style="list-style-type: none">1. Verify all RIMM slots are occupied correctly. See “Installing memory modules” on page 382. Reseat memory.3. Test with known good memory. Replace memory if bad.4. Replace system board.
4 Timer not operational.	Change system board.
5 Not used.	Not used.
6 8042 GateA20 cannot be toggled.	Change system board.

Beeps	FRU/Action
7 Exception interrupt error.	Change system board.
8 Display memory R/W error.	<ol style="list-style-type: none"> 1. Verify all RIMM slots are occupied correctly. See “Installing memory modules” on page 38 2. Reseat memory. 3. Test with known good memory. Replace memory if bad. 4. Replace system board.
9 Not used.	Not used.
10 CMOS shutdown register test error.	Change system board.
11 Invalid BIOS (e.g. POST module not found, etc.).	Reflash BIOS.

Diagnostic error codes

Refer to the following diagnostic error codes when using the diagnostic tests. See Chapter 3, "Diagnostics," on page 5 for the specific type for information about the diagnostic programs.

In the following index, *X* can represent any number.

Diagnostic Error Code	FRU/Action
000-000-XXX BIOS Test Passed	1. No action
000-002-XXX BIOS Timeout	1. Flash the system 2. System board
000-024-XXX BIOS Addressing test failure	1. Flash the system 2. System board
000-025-XXX BIOS Checksum Value error	1. Flash the system 2. Boot block 3. System board
000-026-XXX FLASH data error	1. Flash the system 2. Boot block 3. System board
000-027-XXX BIOS Configuration/Setup error	1. Run Setup 2. Flash the system 3. Boot block 4. System board
000-034-XXX BIOS Buffer Allocation failure	1. Reboot the system 2. Flash the system 3. Run memory test 4. System board
000-035-XXX BIOS Reset Condition detected	1. Flash the system 2. System board
000-036-XXX BIOS Register error	1. Flash the system 2. Boot block 3. System board
000-038-XXX BIOS Extension failure	1. Flash the system 2. Adapter card 3. System board
000-039-XXX BIOS DMI data error	1. Flash the system 2. System board
000-195-XXX BIOS Test aborted by user	1. Information 2. Re-start the test, if necessary
000-196-XXX BIOS test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
000-197-XXX BIOS test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
000-198-XXX BIOS test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
000-199-XXX BIOS test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
000-250-XXX BIOS APM failure	<ol style="list-style-type: none"> 1. Flash the system 2. System board
000-270-XXX BIOS ACPI failure	<ol style="list-style-type: none"> 1. Flash the system 2. System board
001-000-XXX System Test Passed	<ol style="list-style-type: none"> 1. No action
001-00X-XXX System Error	<ol style="list-style-type: none"> 1. System board
001-01X-XXX System Error	<ol style="list-style-type: none"> 1. System board
001-024-XXX System Addressing test failure	<ol style="list-style-type: none"> 1. System board
001-025-XXX System Checksum Value error	<ol style="list-style-type: none"> 1. Flash the system 2. System board
001-026-XXX System FLASH data error	<ol style="list-style-type: none"> 1. Flash the system 2. System board
001-027-XXX System Configuration/Setup error	<ol style="list-style-type: none"> 1. Run Setup 2. Flash the system 3. System board
001-032-XXX System Device Controller failure	<ol style="list-style-type: none"> 1. System board
001-034-XXX System Device Buffer Allocation failure	<ol style="list-style-type: none"> 1. Reboot the system 2. Flash the system 3. Run memory test 4. System board
001-035-XXX System Device Reset condition detected	<ol style="list-style-type: none"> 1. System board
001-036-XXX System Register error	<ol style="list-style-type: none"> 1. System board

Diagnostic Error Code	FRU/Action
001-038-XXX System Extension failure	1. Adapter card 2. System board
001-039-XXX System DMI data structure error	1. Flash the system 2. System board
001-040-XXX System IRQ failure	1. Power-off/on system and re-test 2. System board
001-041-XXX System DMA failure	1. Power-off/on system and re-test 2. System board
001-195-XXX System Test aborted by user	1. Information 2. Re-start the test, if necessary
001-196-XXX System test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
001-197-XXX System test warning	1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
001-198-XXX System test aborted	1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
001-199-XXX System test failed, cause unknown	1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
001-250-XXX System ECC error	1. System board
001-254-XXX 001-255-XXX 001-256-XXX 001-257-XXX System DMA error	1. System board
001-260-XXX 001-264-XXX System IRQ error	1. System board
001-268-XXX System IRQ1 failure	1. Device on IRQ1 2. System board
001-269-XXX System IRQ2 failure	1. Device on IRQ2 2. System board
001-270-XXX System IRQ3 failure	1. Device on IRQ3 2. System board

Diagnostic Error Code	FRU/Action
001-271-XXX System IRQ4 failure	1. Device on IRQ4 2. System board
001-272-XXX System IRQ5 failure	1. Device on IRQ5 2. System board
001-273-XXX System IRQ6 (diskette drive) failure	1. Diskette Cable 2. Diskette drive 3. System board
001-274-XXX System IRQ7 failure	1. Device on IRQ7 2. System board
001-275-XXX System IRQ8 failure	1. Device on IRQ8 2. System board
001-276-XXX System IRQ9 failure	1. Device on IRQ9 2. System board
001-277-XXX System IRQ10 failure	1. Device on IRQ10 2. System board
001-278-XXX System IRQ11 failure	1. Device on IRQ11 2. System board
001-279-XXX System IRQ12 failure	1. Device on IRQ12 2. System board
001-280-XXX System IRQ13 failure	1. Device on IRQ13 2. System board
001-281-XXX System IRQ14 (hard disk drive) failure	1. Hard disk drive cable 2. Hard disk drive 3. System board
001-282-XXX System IRQ15 failure	1. Device on IRQ15 2. System board
001-286-XXX 001-287-XXX 001-288-XXX System Timer failure	1. System board
001-292-XXX System CMOS RAM error	1. Run Setup and re-test 2. System board
001-293-XXX System CMOS Battery	1. Battery 2. System board
001-298-XXX System RTC date/time update failure	1. Flash the system 2. System board
001-299-XXX System RTC periodic interrupt failure	1. System board
001-300-XXX System RTC Alarm failure	1. System board

Diagnostic Error Code	FRU/Action
001-301-XXX System RTC Century byte error	<ol style="list-style-type: none"> 1. Flash the system 2. System board
005-000-XXX Video Test Passed	<ol style="list-style-type: none"> 1. No action
005-00X-XXX Video error	<ol style="list-style-type: none"> 1. Video card, if installed 2. System board
005-010-XXX 005-011-XXX 005-012-XXX 005-013-XXX Video Signal failure	<ol style="list-style-type: none"> 1. Video card, if installed 2. System board
005-016-XXX Video Simple Pattern test failure	<ol style="list-style-type: none"> 1. Video Ram 2. Video card, if installed 3. System board
005-024-XXX Video Addressing test failure	<ol style="list-style-type: none"> 1. Video card, if installed 2. System board
005-025-XXX Video Checksum Value error	<ol style="list-style-type: none"> 1. Video card, if installed 2. System board
005-027-XXX Video Configuration/Setup error	<ol style="list-style-type: none"> 1. Run Setup 2. Video drivers update 3. Video card, if installed 4. System board
005-031-XXX Video Device Cable failure	<ol style="list-style-type: none"> 1. Video cable 2. Monitor 3. Video card, if installed 4. System board
005-032-XXX Video Device Controller failure	<ol style="list-style-type: none"> 1. Video card, if installed 2. System board
005-036-XXX Video Register error	<ol style="list-style-type: none"> 1. Video card, if installed 2. System board
005-038-XXX System BIOS extension failure	<ol style="list-style-type: none"> 1. Video card, if installed 2. System board
005-040-XXX Video IRQ failure	<ol style="list-style-type: none"> 1. Video card, if installed 2. System board
005-195-XXX Video Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary
005-196-XXX Video test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
005-197-XXX Video test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
005-198-XXX Video test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
005-199-XXX Video test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
005-2XX-XXX 005-3XX-XXX Video subsystem error	<ol style="list-style-type: none"> 1. Video card, if installed 2. System board
006-000-XXX Diskette interface Test Passed	<ol style="list-style-type: none"> 1. No action
006-0XX-XXX Diskette interface error	<ol style="list-style-type: none"> 1. Diskette drive Cable 2. Diskette drive 3. System board
006-195-XXX Diskette interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary
006-196-XXX Diskette interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
006-197-XXX Diskette interface test warning	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
006-198-XXX Diskette interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
006-199-XXX Diskette interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
006-25X-XXX Diskette interface Error	<ol style="list-style-type: none"> 1. Diskette drive cable 2. Diskette drive 3. System board

Diagnostic Error Code	FRU/Action
011-000-XXX Serial port Interface Test Passed	1. No action
011-001-XXX Serial port Presence	1. Remove external serial device, if present 2. Run setup, enable port 3. System board
011-002-XXX 011-003-XXX Serial port Timeout/Parity error	1. System board
011-013-XXX 011-014-XXX Serial port Control Signal/Loopback test failure	1. System board
011-015-XXX Serial port External Loopback failure	1. Wrap plug 2. System board
011-027-XXX Serial port Configuration/Setup error	1. Run Setup, enable port 2. Flash the system 3. System board
011-03X-XXX 011-04X-XXX Serial port failure	1. System board
011-195-XXX Serial port Test aborted by user	1. Information 2. Re-start the test, if necessary
011-196-XXX Serial port test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
011-197-XXX Serial port test warning	1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
011-198-XXX Serial port test aborted	1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
011-199-XXX Serial port test failed, cause unknown	1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
011-2XX-XXX Serial port signal failure	1. External serial device 2. System board
014-000-XXX Parallel port Interface Test Passed	1. No action

Diagnostic Error Code	FRU/Action
014-001-XXX Parallel port Presence	<ol style="list-style-type: none"> 1. Remove external parallel device, if present 2. Run setup, enable port 3. System board
014-002-XXX 014-003-XXX Parallel port Timeout/Parity error	<ol style="list-style-type: none"> 1. System board
014-013-XXX 014-014-XXX Parallel port Control Signal/Loopback test failure	<ol style="list-style-type: none"> 1. System board
014-015-XXX Parallel port External Loopback failure	<ol style="list-style-type: none"> 1. Wrap plug 2. System board
014-027-XXX Parallel port Configuration/Setup error	<ol style="list-style-type: none"> 1. Run Setup, enable port 2. Flash the system 3. System board
014-03X-XXX 014-04X-XXX Parallel port failure	<ol style="list-style-type: none"> 1. System board
014-195-XXX Parallel port Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary
014-196-XXX Parallel port test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
014-197-XXX Parallel port test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
014-198-XXX Parallel port test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
014-199-XXX Parallel port test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
014-2XX-XXX 014-3XX-XXX Parallel port failure	<ol style="list-style-type: none"> 1. External parallel device 2. System board
015-000-XXX USB port Interface Test Passed	<ol style="list-style-type: none"> 1. No action
015-001-XXX USB port Presence	<ol style="list-style-type: none"> 1. Remove USB device(s) and re-test 2. System board

Diagnostic Error Code	FRU/Action
015-002-XXX USB port Timeout	<ol style="list-style-type: none"> 1. Remove USB device(s) and re-test 2. System board
015-015-XXX USB port External Loopback failure	<ol style="list-style-type: none"> 1. Remove USB device(s) and re-test 2. System board
015-027-XXX USB port Configuration/Setup error	<ol style="list-style-type: none"> 1. Flash the system 2. System board
015-032-XXX USB port Device Controller failure	<ol style="list-style-type: none"> 1. System board
015-034-XXX USB port buffer allocation failure	<ol style="list-style-type: none"> 1. Reboot the system 2. Flash the system 3. Run memory test 4. System board
015-035-XXX USB port Reset condition detected	<ol style="list-style-type: none"> 1. Remove USB device(s) and re-test 2. System board
015-036-XXX USB port Register error	<ol style="list-style-type: none"> 1. System board
015-040-XXX USB port IRQ failure	<ol style="list-style-type: none"> 1. Run setup and check for conflicts 2. Flash the system 3. System board
015-195-XXX USB port Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary
015-196-XXX USB port test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
015-197-XXX USB port test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
015-198-XXX USB port test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
015-199-XXX USB port test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
018-000-XXX PCI Card Test Passed	<ol style="list-style-type: none"> 1. No action
018-0XX-XXX PCI Card Failure	<ol style="list-style-type: none"> 1. Riser card, if installed 2. System board

Diagnostic Error Code	FRU/Action
018-195-XXX PCI Card Test aborted by user	<ol style="list-style-type: none"> 1. PCI card 2. Information 3. Re-start the test, if necessary
018-196-XXX PCI Card test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
018-197-XXX PCI Card test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
018-198-XXX PCI Card test aborted	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
018-199-XXX PCI Card test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
018-250-XXX PCI Card Services error	<ol style="list-style-type: none"> 1. PCI card 2. Riser card, if installed 3. System board
020-000-XXX PCI Interface Test Passed	<ol style="list-style-type: none"> 1. No action
020-0XX-XXX PCI Interface error	<ol style="list-style-type: none"> 1. PCI card 2. Riser card, if installed 3. System board
020-195-XXX PCI Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary
020-196-XXX PCI test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
020-197-XXX PCI test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
020-198-XXX PCI test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section

Diagnostic Error Code	FRU/Action
020-199-XXX PCI test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
020-262-XXX PCI system error	<ol style="list-style-type: none"> 1. PCI card 2. Riser card, if installed 3. System board
025-000-XXX IDE interface Test Passed	<ol style="list-style-type: none"> 1. No action
025-00X-XXX 025-01X-XXX IDE interface failure	<ol style="list-style-type: none"> 1. IDE signal cable 2. Check power supply 3. IDE device 4. System board
025-027-XXX IDE interface Configuration/Setup error	<ol style="list-style-type: none"> 1. IDE signal cable 2. Flash the system 3. IDE device 4. System board
025-02X-XXX 025-03X-XXX 025-04X-XXX IDE Interface failure	<ol style="list-style-type: none"> 1. IDE signal cable 2. Check power supply 3. IDE device 4. System board
025-195-XXX IDE interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary
025-196-XXX IDE interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
025-197-XXX IDE interface test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
025-198-XXX IDE interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
025-199-XXX IDE interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
030-000-XXX SCSI interface Test Passed	<ol style="list-style-type: none"> 1. No action

Diagnostic Error Code	FRU/Action
030-00X-XXX 030-01X-XXX SCSI interface failure	<ol style="list-style-type: none"> 1. SCSI signal cable 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-027-XXX SCSI interface Configuration/Setup error	<ol style="list-style-type: none"> 1. SCSI signal cable 2. Flash the system 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-03X-XXX 030-04X-XXX SCSI interface error	<ol style="list-style-type: none"> 1. SCSI signal cable 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. installed System board
030-195-XXX SCSI interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary
030-196-XXX SCSI interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
030-197-XXX SCSI interface test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
030-198-XXX SCSI interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
030-199-XXX SCSI interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
035-000-XXX RAID interface Test Passed	<ol style="list-style-type: none"> 1. No action
035-0XX-XXX RAID interface Failure	<ol style="list-style-type: none"> 1. RAID signal cable 2. RAID device 3. RAID adapter card, if installed 4. System board
035-195-XXX RAID interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
035-196-XXX RAID interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
035-197-XXX RAID interface test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
035-198-XXX RAID interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
035-199-XXX RAID interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
071-000-XXX Audio port Interface Test Passed	<ol style="list-style-type: none"> 1. No action
071-00X-XXX 071-01X-XXX 071-02X-XXX Audio port error	<ol style="list-style-type: none"> 1. Run Setup 2. Flash the system 3. System board
071-03X-XXX Audio port failure	<ol style="list-style-type: none"> 1. Speakers 2. Microphone 3. Audio card, if installed 4. System board
071-04X-XXX Audio port failure	<ol style="list-style-type: none"> 1. Run Setup 2. Audio card, if installed 3. System board
071-195-XXX Audio port Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary
071-196-XXX Audio port test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
071-197-XXX Audio port test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
071-198-XXX Audio port test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section

Diagnostic Error Code	FRU/Action
071-199-XXX Audio port test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
071-25X-XXX Audio port failure	<ol style="list-style-type: none"> 1. Speakers 2. Audio card, if installed 3. System board
080-000-XXX Game Port interface Test Passed	<ol style="list-style-type: none"> 1. No action
080-XXX-XXX Game Port interface Error	<ol style="list-style-type: none"> 1. Remove the game port device and re-test the system
080-195-XXX Game Port interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary
080-196-XXX Game Port interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
080-197-XXX Game Port interface test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
080-198-XXX Game Port interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
080-199-XXX Game Port interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
086-000-XXX Mouse Port interface Test Passed	<ol style="list-style-type: none"> 1. No action
086-001-XXX Mouse Port interface Presence	<ol style="list-style-type: none"> 1. Mouse 2. System board
086-032-XXX Mouse Port interface Device controller failure	<ol style="list-style-type: none"> 1. Mouse 2. System board
086-035-XXX Mouse Port interface Reset	<ol style="list-style-type: none"> 1. Mouse 2. System board
086-040-XXX Mouse Port interface IRQ failure	<ol style="list-style-type: none"> 1. Run Setup 2. Mouse 3. System board
086-195-XXX Mouse Port interface Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
086-196-XXX Mouse Port interface test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
086-197-XXX Mouse Port interface test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
086-198-XXX Mouse Port interface test aborted	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test 3. Go to the "Undetermined problems" section
086-199-XXX Mouse Port interface test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
089-000-XXX Microprocessor Test Passed	<ol style="list-style-type: none"> 1. No action
089-XXX-XXX Microprocessor failure	<ol style="list-style-type: none"> 1. Microprocessor(s) 2. System board
089-195-XXX Microprocessor Test aborted by user	<ol style="list-style-type: none"> 1. Information 2. Re-start the test, if necessary
089-196-XXX Microprocessor test halt, error threshold exceeded	<ol style="list-style-type: none"> 1. Press F3 to review the log file 2. Re-start the test to reset the log file
089-197-XXX Microprocessor test warning	<ol style="list-style-type: none"> 1. Make sure the component that is called out is connected and/or enabled 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
089-198-XXX Microprocessor test aborted	<ol style="list-style-type: none"> 1. Flash the system and re-test 2. Go to the "Undetermined problems" section
089-199-XXX Microprocessor test failed, cause unknown	<ol style="list-style-type: none"> 1. If a component is called out, make sure it is connected and/or enabled 2. Go to the "Undetermined problems" section 3. Flash the system and re-test 4. Replace component under function test
170-000-XXX Voltage Sensor(s) Test Passed	<ol style="list-style-type: none"> 1. No action
170-0XX-XXX Voltage Sensor(s) failure	<ol style="list-style-type: none"> 1. Flash system 2. System board

Diagnostic Error Code	FRU/Action
170-195-XXX Voltage Sensor(s) Test aborted by user	<ol style="list-style-type: none"> Information Re-start the test, if necessary
170-196-XXX Voltage Sensor(s) test halt, error threshold exceeded	<ol style="list-style-type: none"> Press F3 to review the log file Re-start the test to reset the log file
170-197-XXX Voltage Sensor(s) test warning	<ol style="list-style-type: none"> Make sure the component that is called out is connected and/or enabled Re-run test Component that is called out in warning statement Component under test
170-198-XXX Voltage Sensor(s) test aborted	<ol style="list-style-type: none"> If a component is called out, make sure it is connected and/or enabled Flash the system and re-test Go to the "Undetermined problems" section
170-199-XXX Voltage Sensor(s) test failed, cause unknown	<ol style="list-style-type: none"> Go to the "Undetermined problems" section Flash the system and re-test Replace component under function test
170-250-XXX 170-251-XXX Voltage Sensor(s) Voltage limit error	<ol style="list-style-type: none"> Power supply System board
170-254-XXX Voltage Sensor(s) Voltage Regulator Module error	<ol style="list-style-type: none"> Voltage Regulator Module (VRM) Microprocessor System board
175-000-XXX Thermal Sensor(s) Test Passed	<ol style="list-style-type: none"> No action
175-0XX-XXX Thermal Sensor(s) failure	<ol style="list-style-type: none"> Flash system System board
175-195-XXX Thermal Sensor(s) Test aborted by user	<ol style="list-style-type: none"> Information Re-start the test, if necessary
175-196-XXX Thermal Sensor(s) test halt, error threshold exceeded	<ol style="list-style-type: none"> Press F3 to review the log file Re-start the test to reset the log file
175-197-XXX Thermal Sensor(s) test warning	<ol style="list-style-type: none"> Make sure the component that is called out is connected and/or enabled Re-run test Component that is called out in warning statement Component under test
175-198-XXX Thermal Sensor(s) test aborted	<ol style="list-style-type: none"> If a component is called out, make sure it is connected and/or enabled Flash the system and re-test Go to "Undetermined problems" section

Diagnostic Error Code	FRU/Action
175-199-XXX Thermal Sensor(s) test failed, cause unknown	<ol style="list-style-type: none"> 1. Go to the "Undetermined problems" section 2. Flash the system and re-test 3. Replace component under function test
175-250-XXX 175-251-XXX Thermal Sensor(s) limit error	<ol style="list-style-type: none"> 1. Check fans 2. Check Power supply 3. Microprocessor 4. System board
185-000-XXX Asset Security Test Passed	<ol style="list-style-type: none"> 1. No action
185-XXX-XXX Asset Security failure	<ol style="list-style-type: none"> 1. Flash system 2. System board
185-278-XXX Asset Security Chassis Intrusion	<ol style="list-style-type: none"> 1. Assure Asset Security Enabled 2. C2 Cover Switch 3. System board
201-000-XXX System Memory Test Passed	<ol style="list-style-type: none"> 1. No action
201-XXX-XXX System Memory error	<ol style="list-style-type: none"> 1. Replace the memory module called out by the test 2. System board
202-000-XXX System Cache Test Passed	<ol style="list-style-type: none"> 1. No action
202-XXX-XXX System Cache error	<ol style="list-style-type: none"> 1. Cache, if removable 2. System board 3. Microprocessor
206-000-XXX Diskette Drive Test Passed	<ol style="list-style-type: none"> 1. No action
206-XXX-XXX Diskette Drive error	<ol style="list-style-type: none"> 1. Diskette Drive Cable 2. Check power supply voltages 3. Diskette drive 4. System board
215-000-XXX CD-ROM Drive Test Passed	<ol style="list-style-type: none"> 1. No action
215-XXX-XXX CD-ROM Drive error	<ol style="list-style-type: none"> 1. CD-ROM Drive Cable 2. Check power supply voltages 3. CD-ROM drive 4. System board
217-000-XXX Hard Disk Drive Test Passed	<ol style="list-style-type: none"> 1. No action
217-25X-XXX 217-26X-XXX Hard Disk Drive (IDE) error	<ol style="list-style-type: none"> 1. Hard Disk Drive Cable 2. Check power supply voltages 3. Hard Disk drive (IDE) 4. System board

Diagnostic Error Code	FRU/Action
217-28X-XXX 217-29X-XXX Hard Disk Drive (SCSI) error	<ol style="list-style-type: none"> 1. Hard Disk Drive Cable 2. Check power supply voltages 3. Hard Disk drive (SCSI) 4. SCSI adapter card 5. System board
220-000-XXX Hi-Capacity Cartridge Drive Test Passed	<ol style="list-style-type: none"> 1. No action
220-XXX-XXX Hi-Capacity Cartridge Drive error	<ol style="list-style-type: none"> 1. Remove the Hi-Capacity Cartridge Drive and re-test the system
301-XXX-XXX Keyboard error	<ol style="list-style-type: none"> 1. Keyboard 2. Check and test mouse 3. System board
301-000-XXX Keyboard Test Passed	<ol style="list-style-type: none"> 1. No action
302-000-XXX Mouse Test Passed	<ol style="list-style-type: none"> 1. No action
302-XXX-XXX Mouse error	<ol style="list-style-type: none"> 1. Mouse 2. Check and test Keyboard 3. System board
303-000-XXX Joystick Test Passed	<ol style="list-style-type: none"> 1. No action
303-XXX-XXX Joystick error	<ol style="list-style-type: none"> 1. Remove the Joystick and re-test the system
305-000-XXX Monitor DDC Test Passed	<ol style="list-style-type: none"> 1. No action
305-250-XXX Monitor DDC self test failure	<ol style="list-style-type: none"> 1. Run Setup to enable DDC 2. Cable 3. Monitor 4. Video card 5. System board
415-000-XXX Modem Test Passed	<ol style="list-style-type: none"> 1. No action
415-XXX-XXX Modem error	<ol style="list-style-type: none"> 1. Remove the Modem and re-test the system

POST error codes

Each time you power-on the system, it performs a series of tests that check the operation of the system and some options. This series of tests is called the *Power-On Self-Test*, or *POST*. POST does the following operations.

- Checks some basic system-board operations
- Checks the memory operation
- Starts the video operation
- Verifies that the diskette drive is working
- Verifies that the hard disk drive is working

If the POST finishes without detecting any problems, a single beep sounds and the first screen of the operating system or application program appears.

Note:

Type 6849 and 6231 computers default to come up quiet (no beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable beep and memory count and checkpoint code display when a successful POST occurs, do the following:

1. Select **Start Options** in the BIOS Setup Utility program (see "Using the BIOS Setup Utility program" on page 19).
2. Set **Power-On Self-Test** to **Enhanced**.

If the POST detects a problem, an error message appears on the screen. A single problem can cause several error messages to appear. When you correct the cause of the first error message, the other error messages probably will not appear on the screen the next time you turn on the system.

During the POST, the BIOS generates diagnostic progress codes (POST codes) to I/O port 80h. If the POST fails, execution stops and the last POST code generated is left at port 80h. This code is useful for determining the point where an error occurred.

Displaying the POST codes requires an add-in card, often called a POST card (PCI, not ISA). The POST card can decode the port and display the contents on a medium such as a seven-segment display.

The table below offers descriptions of the POST codes generated by the BIOS.

Error Message	FRU / Action
GA20 Error	1. Replace system board.
Pri Master HDD Error Pri Slave HDD Error Sec Master HDD Error Sec Slave HDD Error	1. Check/replace cables 2. Replace drive. 3. Replace system board.
Pri Master Drive -ATAPI Incompatible Pri Slave Drive - ATAPI Incompatible Sec Master Drive - ATAPI Incompatible Sec Slave Drive - ATAPI Incompatible	1. Run setup to make sure drive is selected correctly. 2. Replace drive.
A: Drive Error	1. Check/replace cables. 2. Replace drive. 3. Replace system board.
Cache Memory Bad	1. Replace CPU.
CMOS Battery Low	1. Replace battery. 2. Replace system board.
CMOS Display Type Wrong	1. Run setup and save. 2. Replace system board.
CMOS Checksum Bad	1. Check/change battery. 2. Run setup to reset value. 3. Replace system board.

Error Message	FRU / Action
CMOS Settings Wrong	<ol style="list-style-type: none"> 1. Check battery. 2. Run setup. 3. Replace system board.
CMOS Date/Time Not Set	<ol style="list-style-type: none"> 1. Check battery. 2. Run setup/set date and time. 3. Replace system board.
DMA Error	<ol style="list-style-type: none"> 1. Check cables. 2. Run setup. 3. Replace system board.
FDC Failure	<ol style="list-style-type: none"> 1. Check cables. 2. Run setup. 3. Replace system board.
HDC Failure	<ol style="list-style-type: none"> 1. Check cables. 2. Run setup. 3. Replace system board.
Checking NVRAM...	No action.
Update OK!	No action.
Updated Failed	<ol style="list-style-type: none"> 1. Check battery. 2. Replace system board.
Keyboard Error	<ol style="list-style-type: none"> 1. Check keyboard connection. 2. Replace keyboard. 3. Replace system board.
KB/Interface Error	<ol style="list-style-type: none"> 1. Run diagnostics. 2. Check keyboard. 3. Check mouse. 4. Replace keyboard. 5. Replace mouse. 6. Replace system board.
Memory Size Decreased/Changed	<ol style="list-style-type: none"> 1. Reseat memory. 2. Run memory diagnostics. 3. Replace bad memory.
Memory Size Increased	<ol style="list-style-type: none"> 1. Reseat memory. 2. Run memory diagnostics. 3. Replace bad memory, if any.
No Boot Device Available	<ol style="list-style-type: none"> 1. Run setup and check boot sequence. 2. Cables. 3. Boot devices.
Off Board Parity Error	<ol style="list-style-type: none"> 1. Run diagnostics. 2. Replace bad cards.
On Board Parity Error	<ol style="list-style-type: none"> 1. Run diagnostics. 2. Replace system board.

Miscellaneous error messages

Message/Symptom	FRU/Action
CMOS Backup Battery inaccurate	<ol style="list-style-type: none"> 1. CMOS Backup Battery (see “Safety information” on page 101) 2. System Board
Changing colors	<ol style="list-style-type: none"> 1. Display
Computer will <i>not</i> power-off. See “Power supply” on page 56	<ol style="list-style-type: none"> 1. Power Switch 2. System Board 3. Riser card
Computer will <i>not</i> RPL from server	<ol style="list-style-type: none"> 1. Ensure that network is in startup sequence as first device or first device after diskette 2. Ensure that network adapter is enabled for RPL 3. Network adapter (Advise network administrator of new MAC address)
Computer will <i>not</i> Wake On LAN (if applicable)	<ol style="list-style-type: none"> 1. Check power supply and signal cable connections to network adapter 2. Ensure that the operating system settings are set to enable Wake on LAN 3. Ensure Wake On LAN feature is enabled in Setup/Configuration (see “Using the BIOS Setup Utility program” on page 19) 4. Ensure network administrator is using correct MAC address 5. Ensure no interrupt or I/O address conflicts 6. Network adapter (advise network administrator of new MAC address)
Dead computer. See “Power supply” on page 56	<ol style="list-style-type: none"> 1. Power Supply 2. System Board 3. Riser card
Diskette drive in-use light remains on or does not light when drive is active.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable 4. Riser card
Flashing cursor with an otherwise blank display.	<ol style="list-style-type: none"> 1. System Board 2. Primary Hard Disk Drive 3. Hard Disk Drive Cable 4. Riser card
Incorrect memory size during POST	<ol style="list-style-type: none"> 1. Run the Memory tests 2. Memory Module 3. System Board

Message/Symptom	FRU/Action
"Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> 1. System Board 2. Diskette Drive Cable 3. Riser card 4. Network Adapter
Intensity or color varies from left to right of characters and color bars	<ol style="list-style-type: none"> 1. Display 2. System Board
No power or fan not running	1. See "Power supply" on page 56
Non-system disk or disk error-type message with a known-good diagnostic diskette.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable 4. Riser card
Other display symptoms not listed above (including blank or illegible display)	<ol style="list-style-type: none"> 1. Display 2. System Board
Power-on indicator or hard disk drive in-use light not on, but computer works correctly	<ol style="list-style-type: none"> 1. Power Supply 2. System Board 3. LED Cables
Printer problems	1. Printer
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive	<ol style="list-style-type: none"> 1. Run Setup 2. Diskette Drive 3. Diskette Drive Cable 4. System Board 5. Riser card 6. Power Supply
RPL computer cannot access programs from its own hard disk.	<ol style="list-style-type: none"> 1. If network administrator is using LCCM Hybrid RPL, check startup sequence: <ol style="list-style-type: none"> a. First device - network b. Second device - hard disk 2. Hard disk drive
RPL computer does not RPL from server	<ol style="list-style-type: none"> 1. Check startup sequence 2. Check the network adapter LED status
Serial or parallel port device failure (system board port)	<ol style="list-style-type: none"> 1. External Device Self-Test OK? 2. External Device 3. Cable 4. System Board
Serial or parallel port device failure (adapter port)	<ol style="list-style-type: none"> 1. External Device Self-Test OK? 2. External Device 3. Cable 4. Alternate Adapter 5. System Board

Message/Symptom	FRU/Action
Some or all keys on the keyboard do not work	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board

Undetermined problems

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, use the CMOS jumper to override the power-on password and clear the CMOS memory; see “Erasing a lost or forgotten password (clearing CMOS)” on page 14. If you suspect that the BIOS code is damaged, see “Recovering from a POST/BIOS update failure” on page 15.

Check the power supply voltages (see “Power supply” on page 56). If the voltages are correct, return here and continue with the following steps.

1. Power-off the computer.
2. Remove or disconnect the following components (if installed) one at a time.
 - a. Non-IBM devices
 - b. External devices (modem, printer, or mouse)
 - c. Any adapters
 - d. Memory modules. Before removing or replacing memory modules, see “Installing memory modules” on page 38.
 - e. Extended video memory
 - f. External Cache
 - g. External Cache RAM
 - h. Hard disk drive
 - i. Diskette drive
3. Power-on the computer to re-test the system.
4. Repeat steps 1 through 3 until you find the failing device or adapter.

If all devices and adapters have been removed, and the problem continues, replace the system board (see “Replacing a system board” on page 52).

Security features

Security features in this section include the following:

- Passwords
- Vital Product Data
- Management Information Format (MIF)
- Alert on LAN

Passwords

The following section provides information about computer hardware and software-related passwords.

- Power-on Password
- Administrator Password
- Operating System Password

Power-on and Administrator passwords are set in the Setup Utility program. See “Using the BIOS Setup Utility program” on page 19 for information about running the Setup Utility.

Power-on password

A power-on password denies access to the computer by an unauthorized user when the computer is powered on. When a power-on password is active, the password prompt appears on the screen each time the computer is powered on. The computer starts after the proper password is entered.

Removing a power-on password

To service a computer with an active and unknown power-on password, power-off the computer and use the following procedure.

Note: On some models, this procedure will also remove the administrator password.

1. Unplug the power cord and remove the top cover.
2. Refer to “System board layout” on page 49 to find the recovery jumper.
3. Move the recovery jumper from normal to clear.
4. Power-on the computer. The system senses the change in the position and erases the password. It is necessary to move the jumper back to the previous position.
5. Remind the user to enter a new password when service is complete.

Administrator password

The administrator password is used to restrict access to the BIOS Setup Utility program. If the administrator password is activated, and you do not enter the administrator password, the configuration can be viewed but not changed.

Note: Type 6849 and 6231 computers have Enhanced Security Mode. If Enhanced Security mode is enabled and there is no password given, the computer will act as if Enhanced Security is disabled.

If Enhanced Security is Enabled and an administrator password is given, the administrator password must be entered to use the computer. If the administrator password is lost or forgotten, the system board in the computer must be replaced in order to regain access to the BIOS Setup Utility program.

Administrator password control

The Administrator password is set in the Setup Configuration. Refer to “Using the BIOS Setup Utility program” on page 19.

Operating system password

An operating system password is very similar to a power-on password and denies access to the computer by an unauthorized user when the password is activated. The computer is unusable until the password is entered and recognized by the computer.

Vital product data

Each computer has a unique Vital Product Data (VPD) code stored in the nonvolatile memory on the system board. After you replace the system board, the VPD must be updated. To update the VPD, see “Flash (BIOS/VPD) update procedure” on page 89.

Management Information Format (MIF)

Management Information Format (MIF) is a file used to maintain a list of the system unit serial number along with all serialized components (for example, system board, riser card, memory, and processor).

At the time of computer manufacture, the EPROM will be loaded with the serial numbers of the system and all major components. The customer will have access to the MIF file via the DMI MIF Browser that is installed with the preload and is also available on the SSCD that is provided with the system.

A company called Retain-a-Group is a central data warehouse offering serial number data management. Retain-a-Group acts as a focal point to law enforcement. The customer has the option to purchase serial number information and services from Retain-a-Group. It is the customer's responsibility to maintain the MIF file and to inform Retain-a-Group of any changes to the file.

Some customers may request their servicers to assist them in maintaining the MIF file when serialized components are replaced during hardware service. This assistance is between the customer and the servicer. The servicer can use the DMI MIF Browser to update the MIF information in the EPROM. It is anticipated that some servicers might charge for this service.

To update the EPROM using the DMI MIF Browser, use the following procedure.

1. Click **Start** from the desktop, then **Programs**.
2. Select **IBM SystemView Agent**.
3. Select the **Serial Number Information** icon.
4. Click the plus sign to expand.
5. Select the component you want to view or edit.
6. Double click on the component you want to change.
7. Enter new data in the *Value* field, then click **Apply**.

Alert on LAN

Alert on LAN provides notification of changes in the computer, even when the computer power is turned off. Working with DMI and Wake on LAN« technologies, Alert on LAN helps to manage and monitor the hardware and software features of the computer. Alert on LAN generates notifications to the server of these occurrences:

- Computer disconnected from the network
- Computer unplugged from the power outlet
- All POST errors
- Operating system or POST hang condition

Alert on LAN events are configured to be Enabled or Disabled from the LAN server only, and not from the computer. See the LAN administrator for configuration status information.

BIOS levels

An incorrect level of BIOS can cause false error and unnecessary FRU replacement. Use the following information to determine the current level of BIOS installed in the computer, the latest BIOS available for the computer, and where to obtain the latest level of BIOS.

- Current Level BIOS information
 - Run the Configuration Utility to determine the level of BIOS installed.
- Sources for determining the latest level BIOS available
 1. IBM PC Company Home Page <http://www.ibm.com/pc/us/>
 2. PC PartnerInfo-Technical Database (CTSTIPS.NSF)
 3. HelpCenter®
 4. Levels 1 and 2 Support
 5. RETAIN®
- Sources for obtaining the latest level BIOS available
 1. IBM PC Company Home Page <http://www.ibm.com/pc/us/>
 2. PC PartnerInfo-Technical Database (CTSTIPS.NSF)
 3. HelpCenter
 4. Levels 1 and 2 Support

To update (flash) the BIOS, see “Flash (BIOS/VPD) update procedure.”

Flash (BIOS/VPD) update procedure

Attention: Refer to the information label located inside the system unit cover for any model-specific information.

1. Power-off the computer.
2. Insert the flash update diskette into drive A.
3. Power-on the computer.
4. When the Update Utility appears; select the country/keyboard, then press **Enter**.
5. If the computer serial number was previously recorded, the number is displayed with an option to update it. Press **Y** to update the serial number.
6. Type the 7-digit serial number of the computer you are servicing, then press **Enter**.
7. Follow the instructions on the screen to complete the flash (BIOS/VPD) update procedure.

Flash recovery boot block jumper

Attention: If an interruption occurs during a Flash/BIOS upgrade, the BIOS might be left in an unusable state. The Boot Block jumper enables you to restart the system and recover the BIOS.

To perform a Flash/BIOS recovery using the recovery jumper, use the following procedure.

1. Power-off the computer and remove the cover.
2. Move the system board recovery jumper to the **clear** position. Refer to “System board layout” on page 49 or the label inside the computer for more information.

3. Insert the upgrade diskette into the diskette drive.
4. Power-on the computer. The IBM Logo will appear.
5. When the Flash Update Utility appears, select the country/keyboard, then press **Enter**.
6. If the computer serial number was previously recorded, the number is displayed with an option to update it. Press **Y** to update the serial number.
7. Type the 7-digit serial number of the computer you are servicing, then press **Enter**.
8. Follow the instructions on the screen to complete the flash (BIOS/VPD) update procedure.
9. When you are instructed to reboot the computer, power-off the computer and move the recovery jumper to the **normal** position. Then replace the cover and power-on the computer.

Power management

Power management reduces the power consumption of certain components of the computer such as the system power supply, processor, hard disk drives, and some monitors. Advanced Power Management and Rapid Resume™ Manager are features of some personal computers.

Automatic configuration and power interface (ACPI) BIOS

Being an ACPI BIOS system, the operating system is allowed to control the power management features of the computer and the setting for Advanced Power Management (APM) BIOS mode are ignored. Not all operating systems support ACPI BIOS mode.

Advanced Power Management

Energy-saving settings can be viewed and changed by using the Advanced Power Management menu in the BIOS Setup Utility program.

Attention: If a device, such as a monitor, does not have power-management capabilities, it can be damaged when exposed to a reduced-power state. Before making energy-saving selections for the monitor, check the documentation supplied with the monitor to see if it supports Display Power Management Signaling (DPMS).

Automatic Hardware Power Management features

Automatic Hardware Power Management can reduce the power states of the computer, processor, and monitor (if the monitor supports DPMS) if they are inactive for a predetermined length of time.

There are three levels of specified time that the computer must be inactive before the power management options that are selected take effect. Select the amount of time that is offered within each level.

Level 1	Set time from 5 minutes to 4 hours.
Level 2	Set time from 10 minutes to 5 hours.
Level 3	Set time from 15 minutes to 6 hours.

At each level, you can define the amount of energy savings by specifying values for the following options.

- **System Power**

- Select **On** for the computer to remain on.
- Select **Off** for the computer to shut down.

- **Processor Speed**

Set the microprocessor to be **disabled**, or to run at **1**, **10**, **25**, or **50** percent of its internal clock speed.

- **Display**

Set display to be disabled or to be reduced at these power states:

- **Standby:** Screen is blank, but can be restored immediately when any activity is detected.
- **Suspend:** Monitor uses less power than in Standby mode. Screen image is restored after a few seconds when any activity is detected.
- **Off:** Monitor power is off. Press Monitor power button to restore power. On some monitors, you might have to depress the power button twice.

Setting Automatic Hardware Power Management features

1. Start the BIOS Setup Utility program (see “Using the BIOS Setup Utility program” on page 19).
2. Select **Advanced Power Management** from the BIOS Setup Utility program menu.
3. Select the **APM BIOS Mode** and be sure it is set to **Enabled**. If it is not, press Left Arrow (<-->) or Right Arrow (-->) to change the setting.
4. Select **Automatic Hardware Power Management**.
5. Set **Automatic Hardware Power Management** to **Enabled**.
6. Select values for the three categories of power management (system power, processor speed, and display), as necessary.
7. Set **Hard Disk** to **Enabled** or **Disabled**.

Note: This does not apply to SCSI drives.

8. Press **Esc** twice to return to the BIOS Setup Utility program menu.
9. Before you exit from the program, select **Save Settings** from the BIOS Setup Utility program menu.
10. To exit from the BIOS Setup Utility program, press **Esc** and follow the instructions on the screen.

Automatic Power-On features

The Automatic Power-On features within the Power Management menu allow you to enable and disable features that turn on the computer automatically.

- **Serial Port A Ring Detect:** With this feature set to **Enabled** and an external modem connected to serial port (COM1), the computer will turn on automatically when a ring is detected on the modem.
- **PCI Modem Ring Detect:** With this feature set to **Enabled**, the computer will turn on automatically when a ring is detected on the internal modem.
- **PCI Wake Up:** This feature allow PCI cards that support this capability to wake the system.

- **Wake Up on Alarm:** You can specify a date and time at which the computer will be turned on automatically. This can be either a single event or a daily event.
- **Wake on LAN:** If the computer has a properly configured token-ring or Ethernet LAN adapter card that is Wake on LAN-enabled and there is remote network management software, you can use the IBM-developed Wake on LAN feature. When you set Wake on LAN to Enabled, the computer will turn on when it receives a specific signal from another computer on the local area network (LAN). For further information, see “Wake on LAN” on page 93.

Network settings

This section applies only to computers that are linked to a network.

The BIOS Setup Utility program includes settings that can be enabled and disabled to configure the network interface in the computer. These settings are the following:

- Flash over LAN (Update POST/BIOS over Network)
- Wake on LAN

Flash over LAN (update POST/BIOS over network)

Note: For local Flash (BIOS/VPD) update, see “Flash (BIOS/VPD) update procedure” on page 89.

This setting is used to enable or disable the Flash over LAN feature. When the feature is enabled, the system programs, in the computer, can be updated remotely from a network server. If the administrator password is set in the computer, it does not have to be entered by the server.

To access the Flash over LAN setting, use the following procedure.

1. Start the BIOS Setup Utility program. See “Using the BIOS Setup Utility program” on page 19.
2. Select **System Security**.
3. Select **POST/BIOS Update** from the Configuration/Setup Utility program menu.
4. To enable Flash over LAN, select **Enabled**. To disable Flash over LAN, select **Disabled**.
5. Press **Esc** twice to return to the BIOS Setup Utility program menu.
6. Before you exit from the program, select **Save Settings** from the BIOS Setup Utility program menu.
7. To exit from the BIOS Setup Utility program, press **Esc** and follow the instructions on the screen.

Wake on LAN

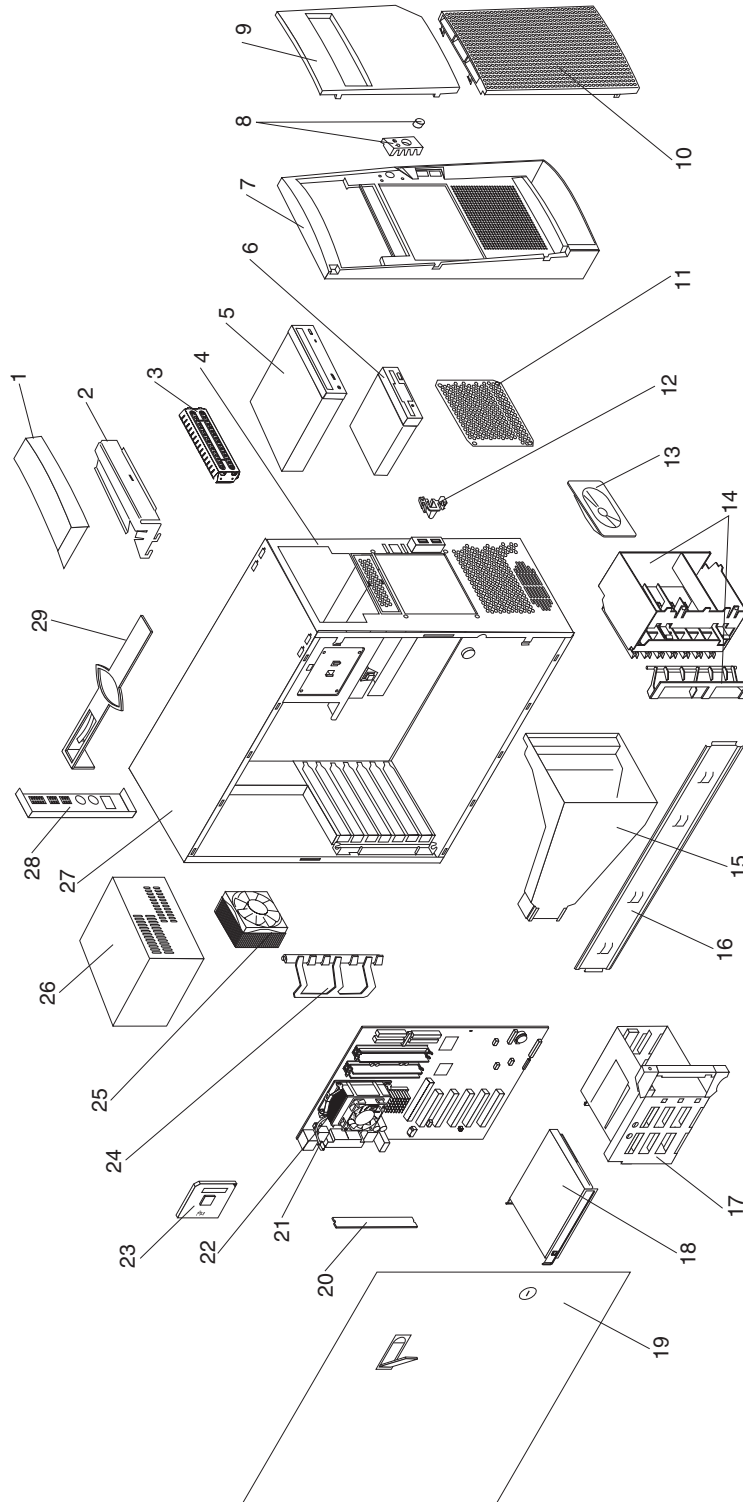
This setting is used to enable or disable the IBM-developed Wake on LAN feature. This feature makes it possible for the computer to be turned on remotely by a network server. Remote network management software must be used in conjunction with this feature.

To access the Wake on LAN setting, use the following procedure.

1. Start the BIOS Setup Utility program. See “Using the BIOS Setup Utility program” on page 19.
2. Select **Advanced Power Management**.
3. Select **Automatic Power On** from the program menu.
4. Select **Wake on LAN** from the Automatic Power On menu.
5. To enable Wake on LAN, select **Enabled**. To disable Wake on LAN, select **Disabled**.
6. Press **Esc** until you return to the BIOS Setup Utility program menu.
7. Before you exit from the program, select **Save Settings** from the BIOS Setup Utility program menu.
8. To exit from the BIOS Setup Utility program, press **Esc** and follow the instructions on the screen.

Chapter 8. Parts listing

System, Type 6849 and 6231



This parts listing supports models 10X, 12X, 13X, 15X, 16X, 20X, 22X, 23X, 25X, 26X, A0G, A2G, A3G, A5G, A6G, B0G, B2G, B3G, B5G, B6G, 1PU, 2PU.

Index	System (IntelliStation – Type 6849 and 6231)	FRU No.
1	Handle caps kit (All models)	19K4934
2	Support handle (All models)	19K4936
3	EMC shield for 5.25" bay (All models)	19K5548
4	Chassis assembly (All models)	25P5111
5	48x CD-ROM (Primary) (All models)	33P3211
5	48x CD-ROM (Alternate) (All models)	06P5271
5	48x CD-ROM (Alternate) (All models)	19K1531
5	48x CD-ROM (Alternate) (All models)	19K1535
5	48x CD-ROM (Alternate) (All models)	24P3605
5	48x CD-ROM (Alternate) (All models)	33P3203
5	48x CD-ROM (Alternate) (All models)	33P3207
5	48x CD-ROM (Alternate) (All models)	33P3215
6	3.5" 1.44MB floppy disk drive (Primary) (All models)	76H4091
6	3.5" 1.44MB floppy disk drive (Alternate) (All models)	06P5227
6	3.5" 1.44MB 3-mode floppy disk drive (Alternate) (All models)	06P5144
7	Front bezel assembly (All models)	25P5147
8	Power button kit (All models)	19K4940
9	Bezel door assembly (All models)	25P0543
10	Panel with icon (All models)	19K4942
11	EMC shield for 3.5" bay (All models)	19K4943
12	Control panel assembly (All models)	19K4935
13	Speaker assembly (All models)	19K4929
14	I/O card edge retainer (All models)	19K4945
15	Fan duct assembly	25P4939
16	Support/Cam bracket assembly (All models)	19K4963
17	DASD rotating cage assembly (All models)	19K4931
18	18.2GB SCSI Hard disk drive (Primary) (Models 13X, 15X, 16X, 23X, 25X, 26X, A3G, A5G, A6G, B3G, B5G, B6G)	06P5365
18	18.2GB SCSI Hard disk drive (Alternate) (Models 13X, 15X, 16X, 23X, 25X, 26X, A3G, A5G, A6G, B3G, B5G, B6G)	19K1485
18	40.0GB Hard disk drive (Models 10X, 12X, 20X, 22X, A0G, A2G, B0G, B2G)	19K1568
19	Sliding door w/lock assembly (All models)	24P1752
20	128MB ECC RIMM (Models 10X, 12X, 20X, 22X, A0G, A2G, B0G, B2G)	33L3351
20	256MB ECC RIMM (Models 13X, 15X, 16X, 23X, 25X, 26X, 1PU, 2PU, A3G, A5G, A6G, B3G, B5G, B6G)	33L3353
21	System board (All models)	33P2876
22	Processor fansink (All models)	32P4004
23	Processor 2.0 GHz with 512K-level cache (Models 10X, 12X, 13X, 15X, 16X, 1PU, A0G, A2G, A3G, A5G, A6G)	48P7205
23	Processor 2.2 GHz with 512K-level cache (Models 20X, 22X, 23X, 25X, 26X, 2PU, B0G, B2G, B3G, B5G, B6G)	48P7206
24	Card guide assembly (All models)	19K4947
25	Fan ASM 80mm ball bearing (Primary) (All models)	49P0286
25	Fan ASM 80mm ball bearing (Alternate) (All models)	22P4447
26	340 W Power supply (All models)	24P6898
27	Cover assembly, side & top (All models)	19K4957
28	EMC planar shield (All models)	49P1918
29	Bezel release bar (All models)	19K4946
	Heatsink retainer module (All models)	24P4811
	Retention clip (All models)	25P0867
	Fan duct extension (All models)	32P0674
	Service label (All models)	49P1925

Index	System (IntelliStation – Type 6849 and 6231)	FRU No.
	CD Audio cable (All models)	75H9219
	Bezel blanks kit (All models)	00N7082
	C2 switch assembly (All models)	09K9827
	DASD Hard disk drive rail kit (All models)	23P1328
	Dual USB cable (All models)	19K4964
	FDD cable (All models)	76H4228
	5-Drop SCSI cable (Models 13X, 15X, 16X, 23X, 25X, 26X, A3G, A5G, A6G, B3G, B5G, B6G)	01K1549
	DVI Dual VGA cable (Models 10X, 20X, 1PU, 2PU, A0G, B0G)	48P7583
	VGA Pigtail cable (Models 12X, 13X, 22X, 23X, A2G, A3G, B2G, B3G)	48P7586
	LED-Hard disk drive cable (Models 13X, 15X, 16X, 23X, 25X, 26X, A3G, A5G, A6G, B3G, B5G, B6G)	76H7344
	Foot kit (All models)	12J4506
	Foot, snap-in (All models)	01N2196
	Hardfile - ATA (2 drop) cable (Models 10X, 12X, 20X, 22X, A0G, A2G, B0G, B2G)	37L5098
	3V Lithium battery (All models)	33F8354
	Lock assembly (All models)	24P1751
	Memory continuity card (All models)	00N5223
	Misc. hardware kit (includes: 7 M3.5 screws, 1 EMC gasket, 1 I/O blank bracket, 1 power support bracket, 4 isolator brackets, 1 key holder bracket, 1 thumbcrew, 4 M3.5 slotted screws, 1 RFID clip, 4 planar spacers, 1 SCSI cable clamp, 6 M3.5 slotted screws) (All models)	09N5764
	Mouse, 3-button (All models)	76H6620
	Power Cord (All models)	93F2364
	Side panel with nameplate (All models)	19K4954
	Dongle (Models 15X, 16X, 25X, 26X, A5G, A6G, B3G, B5G, B6G)	09N3435
	Ultra 160 SCSI adapter (Models 13X, 15X, 16X, 23X, 25X, 26X, A3G, A5G, A6G, B3G, B5G, B6G)	06P2215
	Video adapter, ATI Fire GL8800 (Models 15X, 25X, A5G, B5G)	25P6680
	Video adapter, 3Dlabs Wildcat III 6110 (Models 16X, 26X, A6G, B6G)	25P6591
	Video adapter, NVIDIAQuadro4 200NVS (Models 12X, 13X, 22X, 23X, A2G, A3G, B2G, B3G)	25P6684
	Video adapter, Matrox Millenium G450 (Models 10X, 20X, 1PU, 2PU, A0G, B0G)	25P6691
	Win 2000/NT Recovery CDs	FRU No.
	US English (All "U" models)	32P0536
	UK English (All "G" models)	32P0537
	AP English (All "A" models)	32P0538
	French Canadian (All "F" models)	32P0539
	French (All "G" models)	32P0540
	German (All "G" models)	32P0541
	Italian (All "G" models)	32P0542
	Spanish (All "G" models)	32P0543
	Dutch (All "G" models)	32P0544
	Danish (All "G" models)	32P0545
	Swedish (All "G" models)	32P0546
	Norwegian (All "G" models)	32P0547
	Finnish (All "G" models)	32P0548
	Japan (All "A" models)	59P2812
	China (All "A" models)	59P2813
	Hong Kong (All "A" models)	59P2814
	Taiwan (All "A" models)	59P2815

Keyboards

Keyboard	FRU No.
Arabic	37L2555
Belgium/French	37L2556
Belgium/UK	37L2557
Bulgarian	37L2558
Czech	37L2559
Chinese/US	37L2585
Danish	37L2560
Dutch	37L2561
French	37L2562
French Canadian	37L0913
French Canadian	37L2552
German	37L2563
Greek	37L2564
Hebrew	37L2565
Hungarian	37L2566
Korean	02K0901
LA Spanish	37L2553
Iceland	37L2567
Italy	37L2568
Norwegian	37L2569
Polish	37L2570
Portuguese	37L2571
Romanian	37L2572
Russian	37L2573
Serbian/Cyrillic	37L2574
Slavic	37L2575
Spanish	37L2576
Swedish/Finn	37L2577
Swiss, F/G	37L2578
Thailand	37L2587
Turkish	37L2579
Turkish	37L2580
UK English	37L2581
US English	37L2551
US English-EMEA	37L2583
Yugosl/Lat	37L2582

Power cords

Power cord	FRU No.
China (PRC)	01K9851
Japan	01K9853
Thailand	12J5120
Israel	12J5122
Bangladesh, Burma, India, Pakistan, South Africa, Sri Lanka	12J5124
Chile, Ethiopia, Italy, Libya, Somalia	12J5126
Argentina, Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa	12J5128
Antigua, Bahrain, Brunei, Channel Islands, Cyprus, Dubai, Fiji, Ghana, Hong Kong, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia	12J5987

Power cord

Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Macau, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe

Denmark, Switzerland, Liechtenstein

Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), Venezuela

United States of America

FRU No.

55H6643

55H6646

76H4865

6952301 (110) 1838574 (220)
36L8886 (220V/15A)

Chapter 9. Related service information

Note: The service procedures are designed to help you isolate problems. They are written with the assumption that you have model-specific training on all computers, or that are familiar with the computers, functions, terminology, and service information provided in this manual.

Safety information

The following section contains the safety information that you need to be familiar with before servicing an IBM computer.

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 computer 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 and 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 static 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.

Safety notices (multi-lingual translations)

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

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

Important: All caution and danger statements in this section begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in this section.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in this section under statement 1.

Be sure to read all caution and danger statements 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	To Disconnect
<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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.

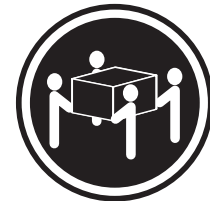
- Statement 4



≥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 lbs.) on top of rack-mounted devices.



Importante:

Todas as instruções de cuidado e perigo da *Netfinity Server 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"> 1. DESLIGUE Tudo. 2. Primeiramente, conecte todos os cabos aos dispositivos. 3. Conecte os cabos de sinal aos conectores. 4. Conecte os cabos de alimentação às tomadas. 5. LIGUE os dispositivos. 	<ol style="list-style-type: none"> 1. DESLIGUE Tudo. 2. Primeiramente, remova os cabos de alimentação das tomadas. 3. Remova os cabos de sinal dos conectores. 4. Remova todos os cabos dos dispositivos.

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:

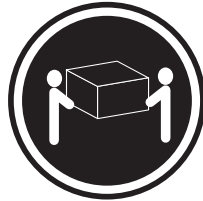
- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Nenhuma peça localizada no interior do dispositivo pode ser consertada.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui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

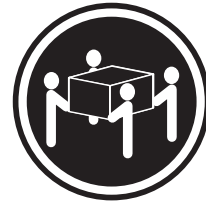
Instrução 4



≥18 kg (37 lbs)



≥32 kg (70,5 lbs)



≥55 kg (121,2 lbs)

CUIDADO:

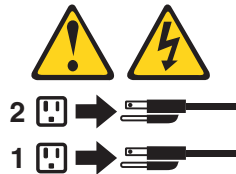
Ao levantar a máquina, faça-o com segurança.

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:

Netfinity Server Library 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。
将应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:	断开连接时:
1. 关闭所有设备。	1. 关闭所有设备。
2. 首先将所有电缆连接至设备。	2. 首先从插座中拔出电源线。
3. 将信号电缆连接至接口。	3. 从接口上拔下信号电缆。
4. 将电源线连接至插座。	

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一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导致激光辐射的危险。



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)

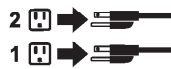
警告：
抬起时请采用安全操作方法。

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拔下热插拔风扇电缆。

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。



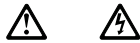
重要資訊：

Netfinity Server Library 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)

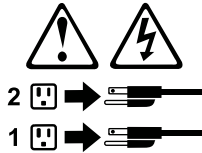
注意：

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 *Netfinity Server* 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.

Notice n° 1



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



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.

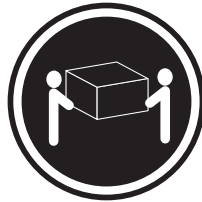


DANGER

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.

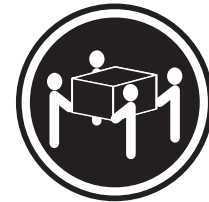
Notice n° 4



≥18 kg



≥32 kg



≥55 kg

ATTENTION:

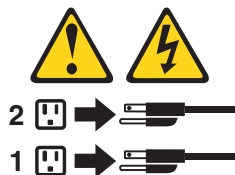
Faites-vous aider pour soulever ce produit.

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

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.

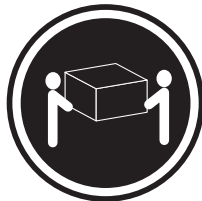


VORSICHT

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.

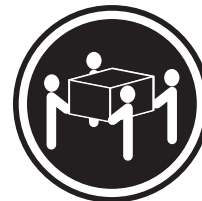
Hinweis 4



≥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 Servers und dem Betriebsspannungsschalter am Netzteil wird die Stromversorgung für den Server nicht unterbrochen. Der Server könnte auch mehr als ein Netzkabel aufweisen. Um die gesamte Stromversorgung des Servers 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 *Netfinity Server 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"> 1. SPEGNERE tutti i dispositivi. 2. Collegare prima tutti i cavi alle unità. 3. Collegare i cavi di segnale ai connettori. 4. Collegare i cavi di alimentazione alle prese elettriche. 5. ACCENDERE le unità. 	<ol style="list-style-type: none"> 1. SPEGNERE tutti i dispositivi. 2. Rimuovere prima i cavi di alimentazione dalle prese elettriche. 3. Rimuovere i cavi di segnale dai connettori. 4. Rimuovere tutti i cavi dalle unità.

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.

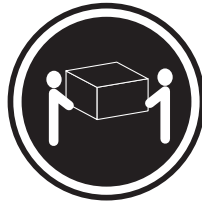


PERICOLO

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.





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

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.

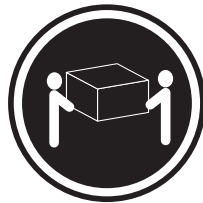


PELIGRO

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.

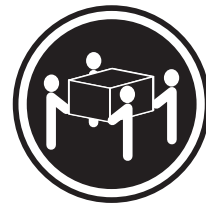
Declaración 4



≥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.

Send us your comments!

We want to know your opinion about this manual (part number 22p3034). Your input will help us to improve our publications.

Please photocopy this survey, complete it, and then fax it to **IBM HMM Survey** at **919-543-8167 (USA)**.

Name: _____

Phone number: _____

1. Do you like this manual?

Yes No

2. What would you like to see added, changed, or deleted in this manual?

3. What is your service experience level?

Less than five years

More than five years

4. Which Servers do you service most?

Thank you for your response!

Problem determination tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Processor or hard disk upgrades
- Failure symptom
 - Do diagnostics fail?
 - What, when, where, single, or multiple systems?
 - Is the failure repeatable?
 - Has this configuration ever worked?
 - If it has been working, what changes were made prior to it failing?
 - Is this the original reported failure?
- Reference/Diagnostics version
 - Type and version level
- Hardware configuration
 - Print (print screen) configuration currently in use
 - BIOS level
- Operating system software
 - Type and version level

Note: To eliminate confusion, identical systems are considered identical only if they:

1. Are the exact machine type and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same Reference/Diagnostics Diskette (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operation system control files

Comparing the configuration and software set-up between "working and non-working" systems will often lead to problem resolution.

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