IBM Personal Computer S83G-7789-16

300 Series
700 Series
IntelliStation

Hardware Maintenance Manual

June 1998

We Want Your Comments!
(Please see page 449)

This Manual Supports:

300 Series, Type
- 6272
- 6275
- 6282
- 6284
- 6285
- 6561
- 6588
- 6591
- 65XX
- 6862
- 6892

700 Series, Type
- 68XX

IntelliStation, Type
- 6888
- 6889
- 6893
- 6898
- 6899

IBM Personal Computer

S83G-7789-16

300 Series
700 Series
IntelliStation

Hardware Maintenance Manual

June 1998

We Want Your Comments!
(Please see page 449)

IBM

Note

Before using this information and the product it supports, be sure to read the general information under “Notices” on page 458.

Seventeenth Edition (June 1998)

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

This publication could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time.

It is possible that this publication may contain reference to, or information about, IBM products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that IBM intends to announce such IBM products, programming, or services in your country.

Requests for technical information about IBM products should be made to your IBM reseller or IBM marketing representative.

About This Manual

This manual contains service and reference information for IBM Personal Computer 300 Series, 700 Series, and the Professional Workstation IntelliStation products.

The manual is divided into two sections as follows:

- The service section includes procedures for isolating problems to a FRU, a Symptom-to-FRU Index, related service procedures, and an illustrated parts catalog.
- The reference section includes safety information, product descriptions, and general information about system functions, and the advanced diagnostic tests.

This manual should be used along with the advanced diagnostic tests to troubleshoot problems effectively.

Important

This manual is intended for trained servicers who are familiar with IBM Personal Computer products. Use this manual along with advanced diagnostic tests to troubleshoot problems effectively.

Before servicing an IBM product, be sure to review the “Safety Notices (Multi-lingual Translations)” on page 156 and “Safety Information” on page 160.

Related Publications

The following publications are available for IBM products. For more information, contact IBM or an IBM Authorized Dealer.

For Information About	See Publication
PS/2 Computers	IBM Personal System/2 Hardware Maintenance Manual (S52G-9971)
PS/ValuePoint Computers	IBM PS/ValuePoint Hardware Maintenance Service and Reference (S61G-1423)
Laptop, Notebook, Portable, and ThinkPad Computers (L40, CL57, N45, N51, P70/P75, ThinkPad 300, 350, 500, 510, 710T, Expansion Unit, Dock I, Dock II)	IBM Mobile Systems Hardware Maintenance Manual Volume 1 (S82G-1501)
ThinkPad Computers (ThinkPad 340, 355, 360, 370, 700, 701, 720, 750, 755)	IBM Mobile Systems Hardware Maintenance Manual Volume 2 (S82G-1502)
ThinkPad Computers (ThinkPad 365, 560, 760, SelectaDock)	IBM Mobile Systems Hardware Maintenance Manual Volume 3 (S82G-1503)
Monitors (Displays) (February 1993)	IBM PS/2 Display HMM Volume 1 (SA38-0053)
Monitors (December 1993)	IBM Color Monitor HMM Volume 2 (S71G-4197)
IBM Monitors (P/G Series) (June 1996)	IBM Monitor HMM Volume 3 (S52H-3679)
IBM 2248 Monitor (February 1996)	IBM Monitor HMM Volume 4 (S52H-3739)
Disk Array technology overview and using the IBM RAID Configuration Program	Configuring Your Disk Array booklet (S82G-1506)
Installation Planning for Personal System/2 computers	Personal System/2 Installation Planning and Beyond (G41G-2927)
Installation Planning for Advanced Personal System/2 Servers	Advanced PS/2 Servers Planning and Selection Guide (GG24-3927)

Contents

Service Information

This section contains the general checkout procedures, related service procedures, Symptom-to-FRU indexes, and parts listings for IBM Personal Computer 300/700 Series (Type 62XX, 65XX, and 68XX) and the IntelliStation (Type 6888, 6889, 6893, 6898, and 6899) computers.

Note

This manual and the diagnostic tests are intended to test ***only*** IBM products. Non-IBM products of any kind including adapter cards, accelerator boards, options, or non-IBM devices, can give false errors and invalid computer responses. If you remove a non-IBM device and the symptom goes away, the problem is with the device you removed.

General Checkout (Type 62XX, 65XX, 68XX)

This general checkout procedure is for Type 62XX, 65XX, and 68XX computers.

If you are servicing a Type 6272 Model 88X, 89X, 90X, 91X, computer, see "General Checkout (Type 6272 Models 88X, 89X, 90X, 91X)" on page 5.

If you are servicing a Type 6275, 6285, 6561, 6591, 6862, 6889, 6892, or 6893 computer, see General Checkout on page 14

If you are servicing a Type 6876 or Type 6886 Micro Channel computer, see "General Checkout (Type 6876, 6886)" on page 17.

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 "Return Codes" on page 214.

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

1. Before replacing any FRUs, ensure 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. For more information on how to determine and obtain the latest level BIOS, see "BIOS Levels" on page 200.
2. If multiple error codes are displayed, diagnose the first error code displayed.
3. If the computer hangs with a POST error, go to "Symptom-to-FRU Index" on page 32.
4. If the computer hangs and no error is displayed, go to "Undetermined Problem" on page 81.
5. If an installed device is not recognized by the diagnostics program, that device might be defective.

001

– Power-off the computer and all external devices.
– Check all cables and power cords.
– Set all display controls to the middle position.
– Insert the Diagnostics diskette into drive A.
– Power-on all external devices.
– Power-on the computer.
– Check for the following response:

1. Readable instructions or the Main Menu.

DID YOU RECEIVE THE CORRECT RESPONSE?

Yes **No**

002

If Rapid Resume is displayed, do the following:

1. Disable Rapid Resume, see "Running Rapid Resume Manager" on page 228.
2. Run the diagnostics tests.
3. Enable Rapid Resume after service is complete.

– or –

If the computer hangs during Rapid Resume, do the following:

1. Power-off; then, power-on the computer.
2. When the hard-disk drive activity light comes on, press **Ctrl+Alt+Del** to exit Rapid Resume and restart the computer. (Rapid Resume is now turned off.)

– or –

Go to the "Symptom-to-FRU Index" on page 32.

003

ARE ALL INSTALLED DEVICES IN THE COMPUTER HIGHLIGHTED ON THE MODULE TEST MENU OR HARDWARE CONFIGURATION REPORT?

Yes **No**

004

Go to "Module Test Menu and Hardware Configuration Report" on page 26.

005

Run the Advanced Diagnostics test. If necessary, refer to "Diagnostics and Test Information" on page 203.

- If you receive an error, go to "Symptom-to-FRU Index" on page 32.
- If the test stops and you cannot continue, replace the last device tested.

(Step **005** continues)

005 (continued)

- If the computer has incorrect keyboard responses, go to “Keyboard” on page 27.
- If the printer has incorrect responses, go to “Printer” on page 27.
- If the display has problems such as jittering, rolling, shifting, or being out of focus, go to “Display” on page 31.

General Checkout (Type 6272 Models 88X, 89X, 90X, 91X)

This general checkout and diagnostic procedure is for the Type 6272, Models 88X, 89X, 90X, 91X only. These models come without a diskette drive (disketteless) and without a CD-ROM.

Depending on the operating system and network configuration, the method of running diagnostics varies.

It is the customer's responsibility to make the IBM PC Enhanced Diagnostics accessible from either:

- The local hard disk
  -- or --
- The server

If the computer you are servicing is set up to start remotely, this general checkout procedure assumes that the server providing services to the computer and the network are functioning correctly.

Note

Run the IBM PC Enhanced Diagnostics under the DOS operating system. Windows 95 and Windows NT diagnostics should be run only if the DOS version is not available.

For more information about the IBM PC Enhanced Diagnostics, see “Diagnostics Test Programs” on page 205.

001

– Power-off the computer and all external devices.
– Check all cables and power cords.
– Make sure the computer is connected to a functioning network.
– Set all display controls to the middle position.
– Power-on all external devices.
– Power-on the computer.
– Check for the following response:

1. One beep
2. Operating system or diagnostics loaded

Note

If the operating system loader screen appears, select an operating system.

DID YOU RECEIVE THE CORRECT RESPONSE?

Yes **No**

002

Check the following for the response you received and perform the action:

(Step **002** continues)

002 (continued)

- No beep - See "Beep Symptoms" on page 33.
- One beep; Operating system did not load - Go to Step 006.
- Two or more beeps - Go to the "Symptom-to-FRU Index" on page 32.

003

OBSERVE THE GREEN LED ON THE TOKEN-RING ADAPTER OR THE LNK LED ON THE ETHERNET ADAPTER FOR 30 SECONDS. IS THE LED ON SOLID FOR THE ENTIRE 30 SECONDS?

Yes **No**

004

The computer might not be connected to an active network or there might be a problem with the network adapter card. See "Network Adapter LED Status" on page 11.

005

Start the PC Enhanced Diagnostics tests. If necessary, refer to "Starting IBM PC Enhanced Diagnostics" on page 9 and "Diagnostics and Test Information" on page 203.

If diagnostic programs are not installed on the computer you are servicing, contact the system administrator and ask if the diagnostic programs can be made available over the LAN. If the diagnostics can not be made available over the LAN, use the "Symptom-to-FRU Index" on page 32.

006

IS THERE A READABLE SCREEN WITH NO FLASHING, JITTERING, OR OTHER DISPLAY PROBLEMS?

Yes **No**

007

Go to "Display" on page 31.

008

OBSERVE THE GREEN LED ON THE TOKEN-RING ADAPTER OR THE LNK LED ON THE ETHERNET ADAPTER FOR 30 SECONDS. IS THE LED ON SOLID FOR THE ENTIRE 30 SECONDS?

Yes **No**

009

(Step **009** continues)

009 (continued)
The computer might not be connected to an active network or there might be a problem with the network adapter card. See "Network Adapter LED Status" on page 11.

010

IS THE COMPUTER STOPPED AT THE RPL SCREEN?
Yes No

011

– The RPL (Remote Program Load) screen displays a title line at the top of screen such as "IBM PCI Token-Ring Adapter RPL."
– Go to Step 026 on page 8.

012

CONTACT THE SYSTEM ADMINISTRATOR AND PROVIDE THE MAC ADDRESS OF THE COMPUTER YOU ARE SERVICING. ASK THE SYSTEM ADMINISTRATOR: SHOULD THE COMPUTER BE ENABLED FOR RPL?
Yes No

013

Change Startup sequence to remove network as startup device. (See "Setup Utility Program" on page 220). Go to Step 001 on page 5.

014

ASK THE SYSTEM ADMINISTRATOR: IS AN RPL IMAGE ASSIGNED TO THE COMPUTER?
Yes No

015

– If a Token-Ring adapter is installed in the computer, make note of the current startup sequence, then change startup sequence to temporarily remove network as a startup device and make the hard disk the first startup device. Restart the computer. Go to Step 017.
– If an Ethernet adapter is installed in the computer, go to Step 020 on page 8.

016

Provide the new MAC address to the system administrator.

017

(Step **017** continues)

017 (continued)
DID THE OPERATING SYSTEM LOAD?
Yes **No**

018

– Restore the startup sequence.
– Go to Step 023.

019

Go to Step 005 on page 6 to run diagnostics, then restore startup sequence after determining the problem.

020

PRESS THE HOME KEY. DID THE OPERATING SYSTEM LOAD?
Yes **No**

021

Go to Step 023.

022

Go to Step 005 on page 6 to run diagnostics.

023

CONTACT THE SYSTEM ADMINISTRATOR AND ASK: CAN DIAGNOSTICS BE ASSIGNED FROM THE SERVER?
Yes **No**

024

– If you were provided with or have observed any obvious symptoms, Go to "Symptom-to-FRU Index" on page 32.
– Notify system administrator that you have no symptoms diagnosed and diagnostics can not be run on the computer you are servicing.

025

Restart the computer and run diagnostics. See "Starting IBM PC Enhanced Diagnostics" on page 9.

026

AFTER CHECKING THE STARTUP SEQUENCE, IS NETWORK THE FIRST DEVICE LISTED IN THE STARTUP SEQUENCE?
Yes **No**

027

(Step **027** continues)

027 (continued)
– Go to Step 029.

028

– Replace the network adapter card.
– Contact the system administrator and provide the new MAC address.

029

IS THE HARD DISK DRIVE THE FIRST DEVICE LISTED IN THE STARTUP SEQUENCE?

Yes **No**

030

– If a device other than the hard disk is listed as the first device, change the startup sequence so the hard disk is the first device, then return to Step 001 on page 5. (See "Setup Utility Program" on page 220).

031

SHOULD THE COMPUTER BE ENABLED FOR RPL?

Yes **No**

032

– Ask the system administrator to reinstall the operating system, then return to Step 001 on page 5. If the operating system cannot be installed, replace the hard disk drive.

033

– Change the startup sequence so the network is the first startup device and the hard disk drive is the second startup device.
– Return to Step 001 on page 5.

Starting IBM PC Enhanced Diagnostics

These steps show how to start the DOS based IBM PC Enhanced Diagnostics from Windows 95, Windows NT, and Windows 3.X.

1. Shut down Windows 95 or Windows NT and re-start in DOS mode. If Windows 3.X is running, close Windows.
2. At the command prompt type: **CD IBMDIAG**, then press the **Enter** key.

> **Note**
>
> If an invalid directory message appears, IBM PC Enhanced Diagnostics are not installed. Restart the computer and go to Step 001 on page 5.

3. Type: **PCDR**, then press the **Enter** key.
4. Follow the instructions on the screen to run the diagnostics.

> **Note**
>
> Do not start the diagnostics in the DOS session of Windows 95 or from a command prompt under Windows NT. The system must be shut down and restarted in DOS.

Starting diagnostics under Windows 95 and Window NT: Use the Windows diagnostics version only if you cannot run the IBM PC Enhanced Diagnostics under DOS.

1. Select **Start**
2. Select **Programs**
3. Select **PC-Doctor**
4. Select **PC-Doctor for Windows**

Diagnostics on the RTC CD

The IBM PC Enhanced Diagnostics are shipped on the RTC (Ready To Configure) CD. For Type 6272 Disketteless models, the customer has the responsibility to make the diagnostics available either locally on the PC hard disk or remotely through a server.

Remote Diagnostics

Some computers might not have diagnostics loaded onto the local hard drive. If the computer you are servicing is connected to a server and the server has the diagnostic image, remote diagnostics can be run. (To use the diagnostics from the RTC CD, a diskette must be made from the diskette factory, then the diskette files are loaded on the server). See the customer's System Administrator for more information about remote diagnostics.

Remote diagnostics require:

- Access to the network
- System Administrator to download the diagnostics or to execute remote diagnostics to the client computer.

Network Adapter LED Status

Use the tables below to determine the status of the Ethernet and Token-Ring adapter cards for diagnosing network problems.

Ethernet Card LED Status:

LED Name - Status	Explanation
LNK - On LNK - Off	Successfully linked to the network. No link established. Check for: Good network condition. Good cable between computer and network receptacle. Replace: Ethernet adapter Riser card System board
ACT - On ACT - Off	Activity present (Transmit and Receive data to and from the network) No activity.
100 TX - On 100 TX - Off	Network speed equals up to 100 Mbps. Network speed equals up to 10 Mbps.

Token-Ring Card LED Status:

Note

See “Token-Ring Table Terms and Definitions” on page 13 for definition of terms in this table.

Amber	Green	Explanation
Blinking	Blinking	The adapter is waiting for initialization (during POST).
Off	Off	The adapter initialization is in progress (during POST), or the computer is powered off.
Off	Blinking	The adapter did not detect any problems during its self-diagnostic tests and is waiting to open. If this LED state occurs after the adapter has been opened, this state indicates that the adapter has been closed under software control.
Off	On	The adapter is open and operating correctly.
On	Off	The adapter self-diagnostic tests failed or there is a problem with the adapter. Replace: Adapter Riser card System board
Blinking	Off	The adapter is closed due to an undetected error. One of the following exists: • The adapter open failed. • The adapter detected a wire fault. • The adapter failed the auto-removal test.
Blinking	On	The adapter has detected beaconing or hard error. If network is known good, check cable between computer and network receptacle. Replace: Adapter Riser card System board
On	On	The adapter has failed before running the self-diagnostic tests. Replace: Adapter Riser card System board

Token-Ring Table Terms and Definitions

Auto-removal The state in which a token-ring adapter port removes itself from the network to perform self-tests to verify that it is not the cause of a hard error. If the tests are successful, the port will reattach itself to the network.

Beaconing The state that a token-ring adapter port enters after it has detected a hard error. The error condition is reported to the other devices on the network. Beaconing can result in the port removing itself from the network (auto-removal) to determine whether it is the cause of the hard error.

Hard error An error condition on a network that requires removing the source of the error or reconfiguring the network before the network can resume reliable operation.

Initialization The first step taken to prepare the port for use after the computer has been booted. During initialization, the port runs a series of internal self-diagnostic tests.

Open The state in which the port has established connection with other devices on the ring.

Wire fault An error condition caused by a break or short circuit in the cable segment that connects the port to its access unit, such as an IBM 8230 Token-Ring Network Controller Access Unit.

General Checkout (Type 6275, 6285, 6561, 6591, 6862, 6889, 6892, 6893)

This general checkout procedure is for Type 6275, 6285, 6561, 6591, 6862, 6889, 6892, 6893 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 "Return Codes" on page 214.

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

1. Before replacing any FRUs, ensure 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. For more information on how to determine and obtain the latest level BIOS, see "BIOS Levels" on page 200.
2. If multiple error codes are displayed, diagnose the first error code displayed.
3. If the computer hangs with a POST error, go to "Symptom-to-FRU Index" on page 32.
4. If the computer hangs and no error is displayed, go to "Undetermined Problem" on page 81.
5. If an installed device is not recognized by the diagnostics program, that device might be defective.

The power-on default is quick bring-up. To enable Enhanced bring-up, select the **Start Options** in the Configuration/Setup Utility program (see "Setup Utility Program" on page 220) then, enable **Power On Status**.

001

– Power-off the computer and all external devices.
– Check all cables and power cords.
– Make sure the system board is seated properly.

(Step **001** continues)

001 (continued)

- For 6275, see page 263.
- For 6285, see page 269.
- For 6561 or 6591, see “System Board Removal (Type 6561)” on page 276 or “System Board Removal (Type 6591)” on page 291.
- For 6862, see page 301.
- For 6892, see page 310.

– Make sure the processor speed setting matches the processor installed in the computer.

- For 6275, 6285, see page 326.
- For 6561, 6591, see page 330.
- For 6862, 6892, see page 363.
- For 6889, see page 376.
- For 6893, see page 379.

– Set all display controls to the middle position.
– Insert the IBM PC Enhanced Diagnostics diskette into drive A.
– Power-on all external devices.
– Power-on the computer.
– Check for the following response:

1. Readable instructions or the Main Menu.

Note

Type 6275, 6285, 6561, 6591, 6862, 6889, 6892, 6893 computers are 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:

1. Enable **Power on Status** in setup. See “Setup Utility Program” on page 220.

DID YOU RECEIVE THE CORRECT RESPONSE?

Yes **No**

002

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

1. Start the Configuration/Setup Utility program (see “Setup Utility Program” on page 220)
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**.

– or –
Go to the “Symptom-to-FRU Index” on page 32.

003

Run the IBM PC Enhanced Diagnostics test. If necessary, refer to “Diagnostics and Test Information” on page 203.

- If you receive an error, replace the part that the diagnostic program calls out or go to “Symptom-to-FRU Index” on page 32.
- If the test stops and you cannot continue, replace the last device tested.
- If the computer has incorrect keyboard responses, go to “Keyboard” on page 27.
- If the printer has incorrect responses, go to “Printer” on page 27.
- If the display has problems such as jittering, rolling, shifting, or being out of focus, go to “Display” on page 31.

General Checkout (Type 6876, 6886)

This general checkout procedure is for Type 6876 and 6886 computers.

On Type 6876 and 6886 Micro Channel computers, you can start the advanced diagnostics programs in one of three ways:

1. From the 700 Series 6876/6886 Reference Diskette
2. From the 700 Series 6876/6886 Diagnostics Diskette
3. From the System Partition.

From the Reference Diskette (Type 6876/6886)

The Reference Diskette is bootable. Starting the diagnostic programs from the Reference Diskette allows you to test the options installed in the computer or test the base system.

To Test Options (Type 6876/6886)

Notes

1. Ensure that Rapid Resume is disabled before starting this procedure.
2. If Rapid Resume is displayed during this procedure, see "Running Rapid Resume Manager" on page 228.
3. Re-run the diagnostics tests.

To test the options installed in the computer, do the following.

1. Power-off the computer and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Insert the Reference Diskette into drive A.
5. Power-on all external devices.
6. Power-on the computer.
7. Check for the following responses:
   a. One beep
   b. IBM Logo
   c. Readable instructions or the Main Menu
8. If you received the correct responses, press **Ctrl+A** (Test the Computer screen appears). Select **Options diagnostics** and follow the instructions on the screen.
9. If you **did not** receive the correct responses, go to "Symptom-to-FRU Index" on page 32.

To Test the Base System (Type 6876/6886)

Notes

1. Ensure that Rapid Resume is disabled before starting this procedure.
2. If Rapid Resume is displayed during this procedure, see "Running Rapid Resume Manager" on page 228.
3. Re-run the diagnostics tests.

To test the base system, do the following:

1. Power-off the computer and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Insert the Reference Diskette into drive A.
5. Power-on all external devices.
6. Power-on the computer.
7. Check for the following responses:
   a. One beep
   b. IBM Logo
   c. Readable instructions or the Main Menu
8. If you received the correct responses, do the following.
   a. Press **Ctrl+A**
      (Test the Computer screen appears).
   b. Select **System board diagnostics** and follow the instructions on the screen.
   c. When the QAPlus/PRO Main Menu appears, press **Ctrl+A**.
   d. Select **Diagnostics**.
   e. Select **Module Test**.
      - If the Module Test Menu is correct, run diagnostics.
      - If the Module Test Menu is not correct, go to "Module Test Menu and Hardware Configuration Report" on page 26.
9. If you **did not** receive the correct responses, go to "Symptom-to-FRU Index" on page 32.

From the Diagnostics Diskette (Type 6876/6886)

Important

If the diagnostic program is started from the diagnostics diskette, you **will not** have the option to test the Micro Channel options installed in the computer.

The Diagnostics Diskette is bootable. The procedure for starting the Diagnostics Diskette when servicing Type 6876 and 6886 computers is the same as the Type 62XX, 65XX, and 68XX computer. See "General Checkout (Type 62XX, 65XX, 68XX)" on page 2.

From the System Partition (Type 6876/6886)

Starting the diagnostic programs from the System Partition gives you the option of testing the options installed in the computer or testing the base system.

To Test Options (Type 6876/6886)

Notes

1. Ensure that Rapid Resume is disabled before starting this procedure.
2. If Rapid Resume is displayed during this procedure, see “Running Rapid Resume Manager” on page 228.
3. Re-run the diagnostics tests.

To test the options installed in the computer, do the following.

1. Power-off the computer and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Remove all media from the drives.
5. Power-on all external devices.
6. Power-on the computer.
7. Check for the following responses:
   a. One Beep
   b. IBM Logo
8. When the F1 prompt appears in the lower left-hand corner of the screen, press **F1** (the IBM logo appears, then the System Programs Main Menu).
9. Press **Ctrl+A**
   (Test the Computer screen appears).
10. If you received the correct responses, select **Options** and follow the instructions on the screen.
11. If you **did not** receive the correct responses, reinstall the System Partition on the hard disk drive from the Reference Diskette.

To Test the Base System (Type 6876/6886)

Notes

1. Ensure that Rapid Resume is disabled before starting this procedure.
2. If Rapid Resume is displayed during this procedure, see “Running Rapid Resume Manager” on page 228.
3. Re-run the diagnostics tests.

To test the base system, do the following.

1. Power-off the computer and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.

4. Remove all media from the drives.
5. Power-on all external devices.
6. Power-on the computer.
7. Check for the following responses:
   a. One Beep
   b. IBM Logo
8. When the F1 prompt appears in the lower left-hand corner of the screen, press **F1** (a second IBM logo appears followed by the System Programs Main Menu).
9. If you received the correct responses, do the following:
   a. Press **Ctrl+A**
      (Test the Computer screen appears).
   b. Select **System board diagnostics** and follow the instructions on the screen.
   c. When the QAPlus/PRO Main Menu appears, press **Ctrl+A**
   d. Select **Diagnostics**.
   e. Select **Module Test**.
   f. If the Module Test Menu is correct, run diagnostics.
   g. If the Module Test Menu is not correct, go to "Module Test Menu and Hardware Configuration Report" on page 26.
10. If you **did not** receive the correct responses, reinstall the System Partition on the hard disk drive from the Reference Diskette.

System Programs (Type 6876/6886)

The system programs are utility programs for Micro Channel computers that allow you to:

- Change the system configuration
- Set passwords
- Change the date and time
- Set power management features
- Test the computer

The programs are installed in a special protected area of the hard disk drive called the System Partition.

The System Partition appears on the FDISK and FDISKPM screens for DOS and OS/2, so that the partition can be deleted and the disk space (about 6 MB) can be used for other programs. Before you delete the System Partition, you must first use the **Back up/Restore system programs** option on the system programs Main Menu to make current copies of the Reference, Diagnostic, and QAPlus/PRO diskettes. Without the System Partition, you must use these diskettes to configure and diagnose the computer.

If the computer was manufactured without a hard disk drive, the system programs were provided on three diskettes:

- Reference Diskette
- Diagnostics Diskette
- QAPlus/PRO for IBM Diskette

Starting the System Programs (Type 6876/6886)

You can start the system programs from the hard disk drive or from the Reference Diskette.

If an error occurs during startup, the computer automatically starts the system programs to help you isolate and correct the problem. If you **do not** want the system programs to automatically start when an error occurs, change the **Bypass System Programs on error** setting in the system programs.

From the Hard Disk Drive (Type 6876/6886)

To start the system programs from the hard disk drive, do the following:

1. Remove all media from all the drives.
2. Power-off the computer; then, power it back on. (The IBM logo appears on the screen.)
3. When the F1 prompt appears, press **F1**. (A second IBM logo appears, followed by the system programs main menu.

From the Reference Diskette (Type 6876/6886)

To start the system programs from the Reference Diskette, do the following:

1. Power-off the computer.
2. Remove all media from the drives.
3. Insert the Reference Diskette into the primary diskette drive.
4. Power-on the computer.

After a few seconds, the IBM logo appears on the screen; then a second IBM logo screen appears, followed by the system programs main menu.

Power-on Password

To service Type 62XX, 65XX, and 68XX computers with an active and unknown power-on password, power-off the computer and do the following:

Note

On some models, this procedure will also remove the administrator password. See "Passwords" on page 190 for more information.

1. Unplug the power cord and remove the top cover.
2. Refer to "System Board Layouts" on page 322 and locate the system board type you are servicing. Depending on the system board, the password is reset by a jumper or switch setting.
3. Move the password jumper to connect the center pin and the pin on the opposite end of the connector; or, short then open the password jumper; or, change the switch setting as appropriate. See "System Board Layouts" on page 322.
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 and to reset the switch setting.
5. Remind the user to enter a new password when service is complete.

System Programs Main Menu (Type 6876/6886)

The following tables contain a listing of the System Programs Main Menu items followed by a description of the item.

Item	Description
Start operating system	Exits from the system programs and loads the operating system.
Back up/Restore system programs: • **Back up the system diskettes**	Makes a backup copy of the Reference, Diagnostic, and QAPlus/PRO diskettes.
• **Back up the System Partition**	Copies the system programs from the System Partition to the backup diskettes. Also creates backup Reference, Diagnostic, and QAPlus/PRO diskettes. You need at least three 2 MB diskettes for the backup procedure.
• **Restore the System Partition**	Reinstalls the system programs from backup diskettes to the System Partition. Use this program to rebuild the System Partition in case of accidental loss or damage.
Update System Programs	Copies a new version of the system programs to the System Partition from an updated set of system diskettes.
Set Configuration	Views, changes, backs up, or restores the configuration information stored in the battery-backed memory. The configuration information consist of: • The amount of memory installed • The built-in features and their assignments • The installed options with their location and assignments
• **View configuration**	Shows the present configuration information for Micro Channel adapters and built-in features.
• **Change configuration**	Allows you to change the configuration of the Micro Channel adapters. You can also change the **Bypass System Programs** setting from this menu.
• **Back up configuration**	Copies the configuration information from the battery-backed memory to the hard disk drive.

Item	Description
• **Restore Configuration**	Retrieves the Micro Channel configuration copied by the Back up Configuration program and restores that information to the battery-backed memory.
• **Run Automatic Configuration**	Verifies and updates the configuration information for the Micro Channel adapters and built-in features.
• **Display memory map**	Displays the memory address assigned to the adapters.
• **Set and View Micro Channel SCSI devices**	Shows the existing Micro Channel device settings and allows you to make limited modification to some devices. Only the information enclosed in brackets ([...]) can be changed.
• **View PCI configuration**	Shows the current configuration of Peripheral Component Interconnect devices and adapters. Because PCI components are automatically configured each time the computer starts up, you cannot change these settings.
Set Features • **Set date and time**	Changes the date and time in battery-backed memory.
• **Set password and security features**	Helps prevent the use of the computer by unauthorized persons. Two types of passwords are available from this program: a power-on password and a privileged-access password.
• **Set keyboard speed**	Changes the speed at which a character repeats when a key is held down.
• **Set console**	Select this choice if the computer is going to be used as a server, without a keyboard.
• **Set startup sequence**	Allows you to specify the sequence of the drives that the computer will attempt to start from when you power it on.

Item	Description
• **Set power management features** **Note:** If similar power management features are set in the operating system, they will override these settings.	Allows you to change the settings for the following: • Rapid Resume • Standby Timeout • Wake Up on Ring • Wake Up on Alarm
Copy an option diskette	Copies configuration and diagnostic files from a diskette that comes with an optional device.
Test the Computer	Allows you to test the base computer by selecting **System board diagnostics**, or test the Micro Channel options by selecting **Option diagnostics.**
More Utilities • **Display revision levels**	Displays updates and changes.
• **Display system error log**	Shows entries in the error log. Any memory and privileged-access password errors are recorded in this log.
• **Stand alone utility information**	Describes how to use the UINSTALL program to get information about additional utility programs available on the Diagnostics Diskette. Some of these programs can be used only with specific operating systems. Make sure you read all of the information before installing any of these utility programs.
• **Set and view system identification**	Records the computer serial number and displays the identification numbers for the system unit, processor board, and system board. This information is also know as the vital product data (VPD).
• **Set video display information**	Allows you to choose the display type and set a horizontal frequency and refresh rate.

Module Test Menu and Hardware Configuration Report

Depending on the diagnostics version level you are using, the installed devices in the computer are verified in one of two ways:

1. At the start of the diagnostic tests, the Module Test Menu is displayed. Normally, all installed devices in the computer are highlighted on the menu.
2. At the start of the diagnostic tests, the main menu appears. From this menu, select **System Info** then select **Hardware Configuration** from the next menu. Normally, all installed devices in the computer are highlighted on this report.

If an installed device is not recognized by the diagnostics program:

- The diagnostic code for the device is not on the diagnostic diskette. Run the diagnostics provided with that device.
- The missing device is defective or it requires an additional diskette or service manual.
- An unrecognizable device is installed.
- A defective device is causing another device not to be recognized.
- The SCSI controller failed (on the system board or SCSI adapter).
- Use the procedure in “Undetermined Problem” on page 81 to find the problem.

If a device is missing from the list, replace it. If this does not correct the problem, use the procedure in “Undetermined Problem” on page 81.

Keyboard

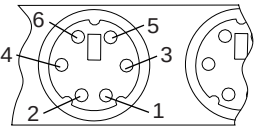
Note

If a mouse or other pointing device is attached, remove it to see if the error symptom goes away. If the symptom goes away, the mouse or pointing device is defective.

001

– Power-off the computer.
– Disconnect the keyboard cable from the system unit.
– Power-on the computer and check the keyboard cable connector on the system unit for the voltages shown. All voltages are ± 5%.

Pin	Voltage (Vdc)
1	+5.0
2	Not Used
3	Ground
4	+5.0
5	+5.0
6	Not Used



ARE THE VOLTAGES CORRECT?

Yes **No**

002

Replace the system board.

003

On keyboards with a detachable cable, replace the cable. If the problem remains or if the cable is permanently attached to the keyboard, replace the keyboard. If the problem remains, replace the system board.

Printer

1. Make sure the printer is properly connected and powered on.
2. Run the printer self-test.

If the printer self-test does not run correctly, the problem is in the printer. Refer to the printer service manual.

If the printer self-test runs correctly, install a wrap plug in the parallel port and run the diagnostic tests to determine which FRU failed.

If the diagnostic tests (with the wrap plug installed) do not detect a failure, replace the printer cable. If that does not correct the problem, replace the system board or adapter connected to the printer cable.

Power Supply

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

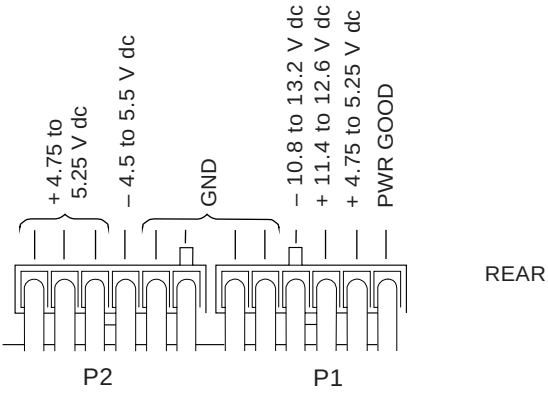
Check/Verify	FRU/Action
1. Verify that the voltage-selector switch is set for the correct voltage.	**Correct the voltage-selector switch setting.**
2. Check the following for proper installation. • Power Cord • On/Off Switch connector • On/Off Switch Power Supply connector • System Board Power Supply connectors • microprocessor(s) connection	**Reseat**
3. Check the power cord for proper continuity.	**Power Cord**
4. Check the power-on switch for continuity.	**Power-on Switch**

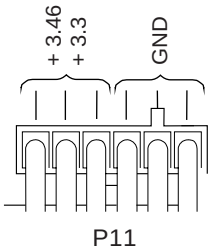
If the above are correct, check the following voltages.

PC 300/700 Series System Board Power-Supply Connections

If the computer you are servicing has a 20-pin power connector on the riser card or system board, see "20-Pin Main Power Supply Connection" on page 30.

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



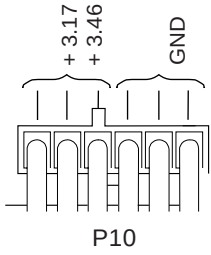


If the voltages are not correct, and the power cord is good, replace the power supply.

If the voltages are correct, and the computer you are servicing has a power supply connector on the riser card, check the following riser card voltages.

Riser Card Connections

Note: These voltages must be checked with the power supply cable connected to the riser card.



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

20-Pin Main Power Supply Connection

The 20-pin main power supply connector is located on the riser card for PC-300, Types:

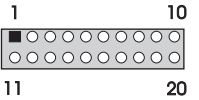
- 6275, 6285
- 6561, 6591
- 6562, 6592
- 6862, 6892

For PC360-S150 and all IntelliStation models, the 20-pin main power supply connector is located on the system board.

See “Riser Card Layouts” on page 388 and “System Board Layouts” on page 322 for connector location.

Attention

These voltages must be checked with the power supply cables connected to the system board or riser card.



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	-5 V	-5 V dc
19	5 V	+5 V dc
20	5 V	+5 V dc

Display

If the screen is rolling, replace the display assembly. If that does not correct the problem, replace the video adapter (if installed) or replace the system board.

If the screen is not rolling, do the following to run the display self-test:

1. Power-off the computer and display.
2. Disconnect the display signal cable.
3. Power-on the display.
4. Turn the brightness and contrast controls clockwise to their maximum setting.
5. Check for the following conditions:
   - You should be able to vary the screen intensity by adjusting the contrast and brightness controls.
   - The screen should be white or light gray, with a black margin (test margin) on the screen.

   Note

   The location of the test margin varies with the type of display. The test margin might be on the top, bottom, or one or both sides.

   If you do not see any test margin on the screen, replace the display. If there is a test margin on the screen, replace the video adapter (if installed) or replace the system board.

   Note

   During the first two or three seconds after the display is powered on, the following might occur while the display synchronizes with the computer.

   - Unusual patterns or characters
   - Static, crackling, or clicking sounds
   - A “power-on hum” on larger displays

   A noticeable odor might occur on new displays or displays recently removed from storage.

   These sounds, display patterns, and odors are normal; do not replace any parts.

   If you are unable to correct the problem, go to “Undetermined Problem” on page 81.

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 "General Checkout (Type 62XX, 65XX, 68XX)" on page 2. 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 Problem" on page 81.

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 your 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 28.)
- Check the hard disk drive jumper settings before you replace a hard disk drive. (See "Hard Disk Drive Jumper Settings" on page 195.)

Important

1. Some errors are indicated with a series of beep codes. (See "Beep Symptoms" on page 33.)
2. Type 6275, 6285, 6561, 6591, 6862, 6889, 6892, 6893 computers are 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:
   a. Enable **Power on Status** in setup. See "Setup Utility Program" on page 220.
3. The processor is a separate FRU from the system board; the processor is not included with the system board FRU. (See "Replacing a System Board" on page 83.)

Beep Symptoms

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

Beeps	Description
1-2-X	• One beep • A pause (or break) • Two beeps • A pause (or break) • Any number of beeps
4	Four continuous beeps

Beep Symptom	FRU/Action
1-1-3 CMOS read/write error	1. **Run Setup** 2. System Board
1-1-4 ROM BIOS check error	1. **System Board**
1-2-X DMA error	1. **System Board**
1-3-X	1. **Memory Module** 2. System Board
1-4-4	1. **Keyboard** 2. System Board
1-4-X Error detected in first 64 KB of RAM.	1. **Memory Module** 2. System Board
2-1-1, 2-1-2	1. **Run Setup** 2. System Board
2-1-X First 64 KB of RAM failed.	1. **Memory Module** 2. System Board
2-2-2	1. **Video Adapter** (if installed) 2. System Board
2-2-X First 64 KB of RAM failed.	1. **Memory Module** 2. System Board
2-3-X	1. **Memory Module** 2. System Board
2-4-X	1. **Run Setup** 2. Memory Module 3. System Board
3-1-X DMA register failed.	1. **System Board**
3-2-4 Keyboard controller failed.	1. **System Board** 2. Keyboard
3-3-4 Screen initialization failed.	1. **Video Adapter** (if installed) 2. System Board 3. Display

Beep Symptom	FRU/Action
3-4-1 Screen retrace test detected an error.	1. **Video Adapter** (if installed) 2. System Board 3. Display
3-4-2 POST is searching for video ROM.	1. **Video Adapter** (if installed) 2. System Board
4	1. **Video Adapter** (if installed) 2. System Board
All other beep code sequences.	1. **System Board**
One long and one short beep during POST. Base 640 KB memory error or shadow RAM error.	1. **Memory Module** 2. System Board
One long beep and two or three short beeps during POST. (Video error)	1. **Video Adapter** (if installed) 2. System Board
Three short beeps during POST.	1. **See "System Board Memory" on page 248.** 2. System Board
Continuous beep.	1. **System Board**
Repeating short beeps.	1. **Keyboard stuck key?** 2. Keyboard Cable 3. System Board

No Beep Symptoms

Symptom/Error	FRU/Action
No beep during POST but computer works correctly.	1. **System Board**
No beep during POST.	1. **See "Undetermined Problem" on page 81.** 2. System Board 3. Memory Module 4. Any Adapter or Device 5. Riser Card 6. Power Cord 7. Power Supply

POST Error Codes

In the following index, “X” can represent any number.

POST Error Code	FRU/Action
000 SCSI Adapter not enabled.	1. **Verify adapter device and Bus Master fields are enabled in PCI configuration program. See documentation shipped with computer.**
02X	1. **SCSI Adapter**
08X Check SCSI terminator installation.	1. **SCSI Cable** 2. SCSI Terminator 3. SCSI Device 4. SCSI Adapter
101 System board interrupt failure.	1. **System Board**
102 System board timer error.	1. **System Board**
106	1. **System Board**
110 System board memory parity error.	1. **Memory Module** 2. System Board
111 I/O channel parity error.	1. **Reseat adapters** 2. Any Adapter 3. System Board
114 Adapter ROM error.	1. **Adapter Memory** 2. System Board
129 Internal cache test error.	1. **Processor** 2. L2 Cache Memory 3. System Board
151 Real-time clock failure.	1. **System Board**
161 Bad CMOS battery.	1. **Run Setup** 2. CMOS Backup Battery (See page 158.) 3. System Board
162 Configuration mismatch. Type 6562, 6592 6862, 6889, 6892	1. **Run Setup and verify Configuration** 2. Had a device been added, removed, changed location? If not, suspect that device. 3. Power-on external devices first, then power-on computer. 4. CMOS Backup Battery (See page 158.) 5. System Board

POST Error Code	FRU/Action
162 And unable to run diagnostics.	1. **Diskette Drive** 2. System Board 3. Diskette Drive Cable
163 Clock not updating or invalid time set.	1. **Time and Date Set?** 2. CMOS Backup Battery (See page 158.) 3. System Board
164 POST detected a base memory or extended memory size mismatch error.	1. **Run Setup. Check System Summary menu for memory size change. (See "Setup Utility Program" on page 220.)** 2. Run the Extended Memory Diagnostic tests.
166 Boot Block Check Sum Error	1. **Run Flash Recovery using Boot Block. See "Flash Recovery Boot Block Jumper" on page 201** 2. System Board
167 Microprocessor installed that is not supported by the current POST/BIOS.	1. **Run Setup. Check Stepping level for the BIOS level needed, then perform the flash update.** 2. Processor
168 Alert on LAN error	1. **Run Setup. Check to see that Ethernet and Alert on LAN are enabled.** 2. System Board 3. Riser Card, if installed.
17X, 18X	1. **C2 Security**
175	1. **Run Configuration (See "Setup Utility Program" on page 220.)** 2. Riser Card, if installed 3. System Board
176	1. **Covers were removed from the computer.**
177 Corrupted Administrator Password.	1. **Riser Card** 2. System Board
178	1. **Riser Card** 2. System Board
183	1. **Enter the administrator password**

POST Error Code	FRU/Action
184 Password removed due to check-sum error. (See next 184 for Type 6862, 6889, 6892)	1. **Enter new password**
184 Type 6862, 6889, 6892 No RFID Antenna	1. **Make sure Asset Care and Asset ID are enabled in Configuration/Setup.** 2. RFID Antenna 3. System Board
185 Corrupted boot sequence.	1. **Set configuration and reinstall the boot sequence.**
186 Type 6562, 6592, 6862, 6889, 6892	1. **Riser Card, if installed** 2. System Board
187	1. **Clear Administration password** 2. System Board
189	1. **More than three password attempts were made to access the computer.**
190 Chassis intrusion detector was cleared. This is information only, no action required. If this code does not clear:	1. **System Board** 2. Riser Card, if installed
1XX Not listed above.	1. **System Board**
201, 20X Memory data error.	1. **Run Enhanced Diag. Memory Test** 2. Memory Module 3. System Board
225	1. **Unsupported Memory**
229 External cache test error.	1. **L2 Cache Memory** 2. System Board
262 POST detected a base memory or extended memory type error.	1. **Run Setup. Check System Summary menu for memory type change. (See "Setup Utility Program" on page 220.)** 2. Run the Extended Memory Diagnostic tests.
301	1. **Keyboard** 2. Keyboard Cable 3. System Board

POST Error Code	FRU/Action
303 With an 8603 error.	1. **Mouse** 2. Keyboard 3. Keyboard Cable 4. System Board
303 With no 8603 error.	1. **Keyboard** 2. Keyboard Cable 3. System Board
3XX Not listed above.	1. **Keyboard** 2. Keyboard Cable 3. System Board
5XX	1. **Video Adapter** (if installed) 2. System Board
601	1. **Diskette Drive A** 2. Diskette Drive Cable 3. System Board
601 Type 6562, 6592, 6862 6889, 6892	1. **Diskette Drive A** 2. Diskette Drive Cable 3. Riser Card, if installed 4. System Board
602	1. **Bad Diskette ?** 2. Verify Diskette and retry.
604 And able to run diagnostics.	1. **Run Setup and verify diskette configuration settings** 2. Diskette Drive A/B 3. Diskette Drive Cable 4. Riser Card if drive cable connected 5. System Board
605 POST cannot unlock the diskette drive.	1. **Diskette Drive** 2. Diskette Drive Cable 3. System Board
662	1. **Diskette drive configuration error or wrong diskette drive type, run Setup Configuration.**
6XX Not listed above.	1. **Diskette Drive** 2. System Board 3. External Drive Adapter 4. Diskette Drive Cable 5. Power Supply
762 Math coprocessor configuration error.	1. **Run Setup** 2. Processor 3. System Board
7XX Not listed above.	1. **Processor** 2. System Board
962 Parallel port configuration error.	1. **Run Configuration** 2. Parallel Adapter (if installed) 3. System Board

POST Error Code	FRU/Action
9XX	1. **Printer** 2. System Board
1047	1. **16-Bit AT Fast SCSI Adapter**
107X Check SCSI terminator installation.	1. **Check SCSI terminator installation**. 2. SCSI Cable 3. SCSI Terminator 4. SCSI Device 5. SCSI Adapter
1101 Serial connector error, possible system board failure.	1. **Run Advanced Diagnostics**
1101, **1102**, **1106**, **1108**, **1109**	1. **System Board** 2. Any Serial Device
1107	1. **Communications Cable** 2. System Board
1102 Card selected feedback error.	1. **Run Advanced Diagnostics**
1103 Port fails register check.	1. **Run Advanced Diagnostics** 2. System Board
1106 Serial option cannot be turned off.	1. **Run Advanced Diagnostics** 2. System Board
1107	1. **Serial Device Cable** 2. System Board
1110 Register test failed.	1. **Run Advanced Diagnostics** 2. System Board
1116 Interrupt error.	1. **Run Advanced Diagnostics**
1117 Failed baud rate test.	1. **Run Advanced Diagnostics**
1162 Serial port configuration error.	1. **Run Configuration** 2. Serial Adapter (if installed) 3. System Board
11XX Not listed above.	1. **System Board**
1201	1. **System Board** 2. Any Serial Device
1202, **1206**, **1208**, **1209**, **12XX**	1. **Dual Async Adapter/A** 2. System Board 3. Any Serial Device

POST Error Code	FRU/Action
1207	1. **Communications Cable** 2. Dual Async Adapter/A
13XX	1. **Game Adapter**
1402 Printer not ready.	Information only
1403 No paper error, or interrupt failure.	Information only
1404 System board timeout failure.	1. **Run Advanced Diagnostics**
1405 Parallel adapter error.	1. **Run Advanced Diagnostics**
1406 Presence test error.	1. **Run Advanced Diagnostics**
14XX Not listed above. Check printer before replacing system board.	1. **Printer** 2. System Board
15XX	1. **SDLC Adapter**
1692 Boot sequence error.	1. **Run FDISK to ensure at least one active partition is set active.**
16XX	1. **36/38 Workstation Adapter**
1762 Hard disk drive configuration error.	1. **Run Configuration (See "Setup Utility Program" on page 220.)**
1780 (Disk Drive 0) **1781** (Disk Drive 1) **1782** (Disk Drive 2) **1783** (Disk Drive 3)	1. **See "Power Supply" on page 28.** 2. Hard Disk Drive 3. Riser Card, if hard disk cable connected 4. System Board 5. Hard Disk Cable 6. Power Supply
180X, 188X PCI configuration or resource error.	1. **Run Setup and verify PCI/ISA configuration settings.** 2. If necessary, set ISA adapters to "Not available" to allow PCI adapters to properly configure. 3. Remove any suspect ISA adapters. 4. Rerun diagnostics. 5. PCI Adapter 6. PCI Riser Card

POST Error Code	FRU/Action
1962 Boot sequence error.	1. **Possible hard disk drive problem, see "Hard Disk Drive Boot Error" on page 221.**
209X	1. **Diskette Drive** 2. Diskette Cable 3. 16-bit AT Fast SCSI Adapter
20XX Not listed above	1. **BSC Adapter** 2. Riser Card
21XX	1. **SCSI Device** 2. 16-bit AT Fast SCSI Adapter 3. Alternate BSC Adapter 4. Riser Card
2401, 2402 If screen colors change.	1. **Display**
2401, 2402 If screen colors are OK.	1. **System Board** 2. Display
2409	1. **Display**
2410	1. **System Board** 2. Display
2462 Video memory configuration error.	1. **Check cable connections**. 2. Run Setup and verify video configuration settings. 3. Video Memory Modules 4. Video Adapter (if installed) 5. System Board
3015, 3040 Check for missing wrap or terminator plug on the adapter.	1. **Network Attached?** 2. LF Translator 3. Cable Problem 4. PC Network Adapter 5. Riser Card
30XX	1. **PC Network Adapter** 2. LF Translator 3. Cable Problem? 4. Riser Card
3115, 3140	1. **Network Attached?** 2. LF Translator 3. Alternate PC Network-Adapter 4. Cable Problem 5. Riser Card
31XX	1. **Alternate PC Network Adapter** 2. LF Translator 3. Cable Problem? 4. Riser Card

POST Error Code	FRU/Action
36XX	1. **GPIB Adapter** 2. Riser Card
38XX	1. **DAC Adapter** 2. Riser Card
4611, **4630**	1. **Multiport/2 Interface Board** 2. Multiport/2 Adapter
4612, **4613 4640**, **4641**	1. **Memory Module Package** 2. Multiport/2 Adapter
4650	1. **Multiport Interface Cable**
46XX Not listed above.	1. **Multiport/2 Adapter** 2. Multiport/2 Interface Board 3. Memory Module
5600	1. **Financial System Controller Adapter**
5962 An IDE device (other than hard drive) configuration error.	1. **Run Configuration** 2. CD-ROM Drive 3. CD-ROM Adapter 4. ZIP or other ATAPI device 5. System Board
62XX	1. **1st Store Loop Adapter** 2. Adapter Cable
63XX	1. **2nd Store Loop Adapter** 2. Adapter Cable
64XX	1. **Network Adapter**
71XX	1. **Voice Adapter**
74XX	1. **Video Adapter** (if installed) 2. Riser Card
76XX	1. **Page Printer Adapter**
78XX	1. **High Speed Adapter**
79XX	1. **3117 Adapter**
80XX	1. **PCMCIA Adapter**
84XX	1. **Speech Adapter** 2. Speech Control Assy. 3. Riser Card
8601, **8602**	1. **Pointing Device** (Mouse) 2. System Board
8603, **8604**	1. **System Board** 2. Pointing Device (Mouse)
86XX Not listed above	1. **Mouse** 2. System Board

POST Error Code	FRU/Action
89XX	1. **PC Music Adapter** 2. MIDI Adapter Unit 3. Riser Card
91XX	1. **Optical Drive** 2. Adapter
96XX	1. **SCSI Adapter** 2. Any SCSI Device 3. System Board
10101, **10102**, **10104** **10105**, **10106**, **10107** **10108**, **10109**, **10111** **10112**, **10113**, **10114** **10115**, **10116**	1. **Have customer verify correct operating system device drivers are installed and operational.** 2. Modem
10103, **10110**, **101171**	1. **System Board** 2. Data/Fax Modem
10117 Not listed above.	1. **Check system speaker** 2. Check PSTN cable 3. External DAA (if installed) 4. Modem
10118	1. **Run Diagnostics and verify the correct operation of the modem slot** 2. Modem
10119	1. **Diagnostics detected a non-IBM modem** 2. Modem
10120	1. **Check PSTN Cable** 2. External DAA (if installed) 3. Modem
10132, **10133**, **10134** **10135**, **10136**, **10137** **10138**, **10139**, **10140** **10141**, **10142**, **10143** **10144**, **10145**, **10146** **10147**, **10148**, **10149** **10150**, **10151**, **10152**	1. **Modem**
10153	1. **Data/Fax Modem** 2. System Board
101XX Not listed above.	1. **Modem Adapter/A** 2. Data/Fax Modem 3. System Board
10450, **10451**, **10490** **10491**, **10492**, **10499** Read/write error.	1. **Run Advanced Diagnostics** 2. Riser Card 3. Hard Disk Drive 4. System Board
10452 Seek test error.	1. **Run Advanced Diagnostics**

POST Error Code	FRU/Action
10453 Wrong drive type?	Information only
10454 Sector buffer test error.	1. **Run Advanced Diagnostics**
10455, **10456** Controller error.	1. **Run Advanced Diagnostics**
10459 Drive diagnostic command error.	Information only
10461 Drive format error	1. **Run Advanced Diagnostics**
10462 Controller seek error.	1. **Run Advanced Diagnostics**
10464 Hard Drive read error.	1. **Run Advanced Diagnostics**
10467 Drive non fatal seek error.	1. **Run Advanced Diagnostics**
10468 Drive fatal seek error.	1. **Run Advanced Diagnostics**
10469 Drive soft error count exceeded.	1. **Run Advanced Diagnostics**
10470, **10471**, **10472** Controller wrap error.	1. **Run Advanced Diagnostics**
10473 Corrupt data. Low level format might be required.	Information only
10480	1. **Hard Disk Drive** (ESDI) 2. Drive Cable 3. System Board
10481 ESDI drive D seek error.	1. **Run Advanced Diagnostics**
10482 Drive select acknowledgement bad.	1. **Run Advanced Diagnostics**
106X1	1. **Check Configuration** 2. Ethernet Adapter
10635	1. **Power-off computer, wait ten seconds; then power-on the computer.** 2. Ethernet Adapter
10651, 10660	1. **Check Cables** 2. Ethernet Adapter
106XX Not listed above.	1. **Ethernet Adapter**

POST Error Code	FRU/Action
107XX	1. **5.25-inch External Diskette Drive** 2. 5.25-inch Diskette Drive Adapter/A
109XX Check the adapter cables.	1. **ActionMedia Adapter/A** 2. System Board
112XX This adapter does not have cache.	1. **SCSI Adapter** 2. Any SCSI Device 3. System Board
119XX	1. **3119 Adapter**
121XX	1. **Modem Adapter** 2. Any Serial Device 3. System Board
136XX	1. **ISDN Primary Rate Adapter** 2. System Board
137XX	1. **System Board**
141XX	1. **Realtime Interface Coprocessor Portmaster Adapter/A**
143XX	1. **Japanese Display Adapter** 2. System Board
14710, **14711**	1. **System Board Video Adapter** 2. Adapter Video Memory
148XX	1. **Video Adapter**
14901, **14902** **1491X**, **14922**	1. **Video Adapter** (if installed) 2. System Board 3. Display (any type)
14932	1. **External Display** 2. Video Adapter
16101	1. **Riser Card Battery** **(See page 158.)**
161XX	1. **FaxConcentrator Adapter**
164XX	1. **120 MB Internal Tape Drive** 2. Diskette Cable 3. System Board
16500	1. **6157 Tape Attachment Adapter**
16520, **16540**	1. **6157 Streaming Tape Drive** 2. 6157 Tape Attachment Adapter
166XX, 167XX	1. **Token Ring Adapter** 2. System Board 3. Riser Card

POST Error Code	FRU/Action
18001 to **18029**	1. **Wizard Adapter** 2. Wizard Adapter Memory
18031 to **18039**	1. **Wizard Adapter Cable**
185XXXX	1. **DBCS Japanese Display Adapter/A** 2. System Board
20001 to **20003**	1. **Image Adapter/A** **Image-I Adapter/A** 2. Memory Module DRAM, VRAM
20004	1. **Memory Module DRAM, VRAM** 2. Image Adapter/A Image-I Adapter/A
20005 to **20010**	1. **Image Adapter/A** **Image-I Adapter/A** 2. Memory Module DRAM, VRAM
200XX Not listed above.	1. **Image Adapter/A** **Image-I Adapter/A** 2. Memory Module DRAM, VRAM 3. System Board
20101 to **20103**	1. **Printer/Scanner Option** 2. Image Adapter/A 3. Memory Module DRAM, VRAM
20104	1. **Memory Module DRAM, VRAM** 2. Printer/Scanner Option 3. Image Adapter/A
20105 to **20110**	1. **Printer/Scanner Option** 2. Image Adapter/A 3. Memory Module DRAM, VRAM
Image Adapter/A Memory Test failure indicated by graphic of adapter.	1. **Replace memory module (shown in graphic.)**
206XX	1. **SCSI-2 Adapter** 2. Any SCSI Device 3. System Board
208XX Verify there are no duplicate SCSI ID settings on the same bus.	1. **Any SCSI Device**

POST Error Code	FRU/Action
210XXXX Internal bus, size unknown. **210XX**X**1** External bus, size unknown.	1. **SCSI Hard Disk Drive** 2. SCSI Adapter or System Board 3. SCSI Cable 4. SCSI ID Switch (on some models)
Tape Drive amber LED remains on.	1. **Tape Drive** 2. SCSI Cable (internal) 3. SCSI Adapter or System Board
Tape Drive green "in use" LED fails to come on.	1. **Tape Drive** 2. SCSI Adapter or System Board 3. SCSI Cable (internal) SCSI Cable (external)
Tape automatically ejected from drive.	1. **Tape Cassette** 2. Drive
SCSI ID on rotary switch does not match SCSI ID set in configuration. Verify drive switches inside cover are set to zero.	1. **Rotary Switch Circuit Board** 2. Circuit Board Cable 3. Tape Drive
Tape sticks/breaks in drive. Verify that the tapes used meet ANSI standard X3B5.	1. **Tape Cassette**
212XX	1. **SCSI Printer** 2. Printer Cable
213XX	1. **SCSI Processor**
214XX	1. **WORM Drive**
215XXXC **215XX**XD **215XX**XE **215XX**XU If an external device, and power-on LED is off, check external voltages.	1. **CD-ROM Drive I** **CD-ROM Drive II** **Enhanced CD-ROM Drive II** **Any CD-ROM Drive** 2. SCSI Cable 3. SCSI Adapter or System Board
216XX	1. **Scanner**
217XX If an external device, and power-on LED is off, check external voltages.	1. **Rewritable Optical Drive** 2. SCSI Adapter or System Board 3. SCSI Cable
218XX Check for multi CD tray, or juke box.	1. **Changer**
219XX	1. **SCSI Communications Device**

POST Error Code	FRU/Action
24201Y0, **24210**Y0 Be sure wrap plug is attached.	1. **ISDN/2 Adapter** 2. ISDN/2 Wrap Plug 3. ISDN/2 Communications Cable
273XX	1. **1 Mbps Micro Channel Infrared LAN Adapter**
27501, **27503** **27506**, **27507**	1. **ServerGuard Adapter** 2. System Board
27502, **27504**, **27510** **27511**, **27533**, **27534** **27536**, **27537**	1. **ServerGuard Adapter**
27509	1. **Remove redundant adapters, run Auto Configuration program, then retest.**
27512	1. **WMSELF.DGS diagnostics file missing.** 2. WMSELF.DGS diagnostics file incorrect.
27535	1. **3V Lithium Backup Battery** 2. ServerGuard Adapter
27554	1. **Internal Temperature out of range** 2. ServerGuard Adapter
27555, **27556**	1. **ServerGuard Adapter** 2. Power Supply
27557	1. **7.2V NiCad Main Battery Pack** 2. ServerGuard Adapter
27558, **27559** **27560**, **27561**	1. **PCMCIA Type II Modem** 2. ServerGuard Adapter
27562	1. **External Power Control not connected** 2. External Power Control 3. ServerGuard Adapter
27563, **27564**	1. **External Power Control** 2. ServerGuard Adapter
275XX	1. **Update Diagnostic Software**
27801 to **27879**	1. **Personal Dictation System Adapter** 2. System Board
27880 to **27889**	1. **External FRU** (Speaker, Microphone)

POST Error Code	FRU/Action
I**99903**0X Hard disk reset failure.	**Possible hard disk drive problem, see “Hard Disk Drive Boot Error” on page 221.**

Error Messages

Error Message/Symptom	FRU/Action
Address Exceeds the Size of Your Memory An invalid memory address was entered. Diagnostics Tests display this message during the Locate Bad Chips option.	1. **Enter the correct address.** 2. Memory Module 3. System Board
Arithmetic Functions Failed An error was detected during the CPU Test.	1. **Microprocessor** 2. System Board
Base Memory Test Failed An error was detected in base memory.	1. **Memory Module** 2. System Board
Boot Sector Unreadable A boot sector read error was detected on the hard disk drive.	1. **Hard Disk Drive** 2. Hard Disk Drive Cable 3. Hard Disk Drive Adapter (if installed) 4. System Board
Bus Noise Test Failed RAM Test detected an error in the memory bus.	1. **Memory Module** 2. System Board
Butterfly Cylinder Access Test Failed Hard Disk Drive Test detected mismatch between the data read and the data stored on the drive.	1. **Hard Disk Drive** 2. Hard Disk Drive Cable 3. Hard Disk Drive Adapter (if installed) 4. System Board
Clock Stopped Real-time clock has stopped working.	1. **Real-Time Clock Assembly** 2. System Board
CMOS Clock Test Failed Time and Date Settings for CMOS and DOS **do not** Match.	1. **Real-Time Clock Assembly** 2. System Board
Controller Diagnostic Test Failed An error was detected while testing the Hard Disk Controller (Adapter).	1. **Hard Disk Drive Adapter** (if installed) 2. Hard Disk Drive 3. System Board
Cylinder 0 errors Test detected an error reading the first cylinder of the hard disk drive.	1. **Hard Disk Drive** 2. Hard Disk Drive Adapter (if installed) 3. System Board
Device is Not Ready **Ready the Device...** **or** **Press Any Key**	1. **Ensure the device is powered-on.** 2. Replace failing device 3. Device Adapter (if installed) 4. System Board

Error Message/Symptom	FRU/Action
Disk Error Encountered Opening Output File Press Any Key To Continue.	1. **Hard Disk Drive** 2. Hard Disk Drive Adapter (if installed) 3. System Board
DMA #X Failed Main Components Test detected an error while testing the DMA controller.	1. **System Board**
DMA Page Register Failed DMA page register error	1. **System Board**
Drive (x) Media (y) Mismatch FAT ID mismatch with installed drive.	1. **Check diskette and diskette drive capacity.** 2. Diskette Drive 3. System Board
Error in video buffer. Bad bits. Video memory test error.	1. **Video Adapter** (if installed) 2. System Board 3. Display
Exception Interrupt In Protected Mode Diags Cannot Continue Server error, remove one adapter at a time until the symptom goes away.	1. **Any Adapter** 2. System Board 3. Processor
Extended Memory Test Failed Extended memory error.	1. **Memory Module** 2. System Board
Floppy Drive Failed Diskette drive(s) failed.	1. **Diskette Drive** 2. System Board 3. Diskette Drive Cable
General Function Failed Remove one adapter at a time until the symptom goes away.	1. **Any Adapter** 2. System Board 3. Processor
Hard Drives Failed Hard Disk Drive test error.	1. **Hard Disk Drive** 2. Hard Disk Drive Adapter (if installed) 3. System Board
Incorrect DOS version	1. **Ensure you are using DOS version 3.0 or higher.**
INT Mask Register Failed INT Mask Register error.	1. **Microprocessor** 2. System Board
Invalid Date Clock/DOS date mismatch.	1. **Real-Time Clock Assembly** 2. System Board

Error Message/Symptom	FRU/Action
Invalid Time Clock/DOS time mismatch. Back-up clock and DOS time of day settings do not match.	1. **Real-Time Clock Assembly** 2. System Board
Linear Cylinder Access Test Failed Hard disk drive error.	1. **Hard Disk Drive** 2. Hard Disk Drive Cable 3. Hard Disk Drive Adapter (if installed) 4. System Board
Logic Function Failed CPU Logic test error.	1. **Microprocessor** 2. System Board
Loopback Error COM Port Test or Parallel Port error. A wrap plug must be installed to successfully complete these tests.	1. **System Board** 2. Wrap Plug
Main Components Failed System board error.	1. **System Board** 2. Processor
Memory test cannot run at this location in memory Not enough free memory available to start the memory test.	1. **Memory Module** 2. System Board
Missing QAPlus/PRO Files(s) One or more diagnostic support files are missing.	1. **Diagnostic Diskette**
NO LOOP-BACK PLUG. Skipping External loopback test No wrap plug installed.	1. **Install wrap plug on the serial port, rerun test.** 2. System Board
Not ready Printer not on-line or not ready.	1. **Ready Printer** 2. Printer 3. Printer Cable 4. System Board
No 'type-amatic' repeat At least one repeat key must be tested during this test or an error will occur. Type-amatic test error.	1. **Keyboard** 2. System Board
Not used by any standard device IRQ is not currently being used by a non-standard device.	1. **System Board**
Numeric Proc Failed NPU test error.	1. **Microprocessor** 2. System Board

Error Message/Symptom	FRU/Action
Parallel Ports Failed Test Report Summary message.	1. **System Board**
Pass (N): ** Errors ** Drive (X) Failed Diskette drive read/write test error.	1. **Diskette Drive** 2. System Board 3. Diskette Drive Cable
Pass (N) Drive Not Ready Diskette drive door is open or defective.	1. **Ensure diskette drive is ready.** 2. Diskette Drive 3. System Board 4. Diskette Drive Cable
Pass (N): Drive (X) Write Protected or Unformatted	1. **Insert a non-write protected, formatted diskette into the diskette drive; then rerun the test.** 2. Diskette Drive 3. System Board 4. Diskette Drive Cable
Pass (N): Unknown Media Drive (X) Diskette Drive Test error.	1. **Diskette** 2. Diskette Drive 3. System Board 4. Diskette Drive Cable
Place Hi-density Media in Drive Media/drive mismatch.	1. **Diskette** 2. Diskette Drive 3. System Board 4. Diskette Drive Cable
Printer Failed Printer powered-on and ready?	1. **Printer** 2. Printer Cable 3. System Board
Printer Fault Printer powered-on and ready?	1. **Printer** 2. Printer Cable 3. System Board
Printer Not Selected Ensure the printer is powered-on and ready.	1. **Printer** 2. Printer Cable 3. System Board
Program or File Not Found Press Any Key Diagnostics cannot find the USER(N).COM file.	1. **Diagnostic Diskette** 2. Diskette Drive 3. System Board
Program Too Big To Fit In Memory Too many Terminate and Stay Resident programs in memory.	1. **Reboot the system from the Diagnostic Diskette.**

Error Message/Symptom	FRU/Action
QAPlus/PRO Cannot Be Re-run Because Of Error In Relocating Program Diagnostics failed to relocate the Diagnostics Test programs so the memory space it resides in was not tested.	1. **Diagnostic Diskette** 2. Memory Module 3. System Board
RAM Memory Error in Block n. Bad bits n Memory error.	1. **Memory Module** 2. System Board
RAM Test Failed Memory error.	1. **Memory Module** 2. System Board
Read error on cylinder n Hard disk drive format error.	1. **Hard Disk Drive** 2. Hard Disk Drive Adapter (if installed) 3. System Board
Read Errors Diskette drive read error.	1. **Diskette** 2. Diskette Drive 3. System Board 4. Diskette Drive Cable
Receive Error Serial Port loopback test error.	1. **Serial Port Cable** 2. System Board
Refresh Failure Diagnostics Test detected an error while testing the DMA controller's RAM refresh cycle.	1. **Memory Module** 2. System Board
RTC Interrupt Failure Diagnostics Test cannot detect the Real-Time clock interrupt.	1. **Real-Time Clock Assembly** 2. System Board
Serial Chip Error COM Port error, general.	1. **Serial Port Cable** 2. System Board
Serial Compare Error COM Port error, information transmitted is not the same as information received.	1. **Serial Port Cable** 2. System Board
Serial Time-out Error COM Port error, time interval is too long between transmitted and received data.	1. **Serial Port Cable** 2. System Board
Serious Memory Error — Diags Cannot Continue Memory Test error.	1. **Memory Module** 2. System Board
Sorry You Need A Mouse Mouse or mouse driver was not detected.	1. **Mouse** 2. System Board

Error Message/Symptom	FRU/Action
System Hangs Go to “Undetermined Problem” on page 81.	1. **Any device** 2. Any adapter 3. System Board
The Address Exceeds The Size Of Your Memory An invalid memory address was entered. The Diagnostics Tests display this message during the Locate Bad Chips option under the interact menu if an invalid memory address was entered at the "Enter Memory Address Of Bad Chip" prompt.	1. **Enter correct address** 2. Memory Module 3. System Board
That Number is Out Of Range An invalid bit number was entered. Diagnostics Tests display this message during the Locate Bad Chips option.	1. **Enter the correct number.** 2. Memory Module 3. System Board
Too Many Errors — Test Aborted Too many errors, the Diagnostics Test cannot continue.	1. **Microprocessor** 2. System Board
Transmit Error Internal or external serial port loopback test failure.	1. **Serial Port Cable** 2. System Board
Video Adapter Failed Test Result Summary, displayed if "Fail" was at the Quit/Fail/Pass menu of any video test.	1. **Video Adapter** (if installed) 2. System Board 3. Display
Write error on cylinder n Hard disk drive write error.	1. **Hard Disk Drive** 2. Hard Disk Drive Adapter (if installed)
Write Errors Diskette drive write error.	1. **Diskette** 2. Diskette Drive 3. System Board 4. Diskette Drive Cable
Write Protected or Unformatted Diskette is Write Protected or not formatted.	1. **Insert a non-write protected, formatted diskette into the diskette drive; then rerun the test.** 2. Diskette Drive 3. System Board 4. Diskette Drive Cable

Error Message/Symptom	FRU/Action
You Cannot Delete the Motherboard "Remove Board" option was selected. The Diagnostics Tests display this message during the Locate Bad Chips option.	1. **Make the correct selection.** 2. Memory Module 3. System Board 4. Processor

Diagnostic Error Codes

Refer to the following Diagnostic Error Codes when using the IBM PC Enhanced Diagnostics test. See “Diagnostics Test Programs” on page 205 for information about the IBM PC Enhanced Diagnostics program.

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 need to
000-196-XXX BIOS test halt, error threshold exceeded	1. **Depress F3 to review the log file. See “Viewing the Test Log” on page 209.** 2. Re-start the test to reset the log file.

Diagnostic Error Code	FRU/Action
000-197-XXX BIOS test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
000-198-XXX BIOS test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to “Undetermined Problem” on page 81
000-199-XXX BIOS test failed, cause unknown	1. **Go to “Undetermined Problem” on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
000-250-XXX BIOS APM failure	1. **Flash the system** 2. System board
000-270-XXX BIOS ACPI failure	1. **Flash the system** 2. System board
001-000-XXX System Test Passed	1. **No action**
001-00X-XXX System Error	1. **System board**
001-01X-XXX System Error	1. **System board**
001-024-XXX System Addressing test failure	1. **System board**
001-025-XXX System Checksum Value error	1. **Flash the system** 2. System board
001-026-XXX System FLASH data error	1. **Flash the system** 2. System board
001-027-XXX System Configuration/Setup error	1. **Run Setup** 2. Flash the system 3. System board
001-032-XXX System Device Controller failure	1. **System board**
001-034-XXX System Device Buffer Allocation failure	1. **Reboot the system** 2. Flash the system 3. Run memory test 4. System board

Diagnostic Error Code	FRU/Action
001-035-XXX System Device Reset condition detected	1. **System board**
001-036-XXX System Register error	1. **System board**
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 need to
001-196-XXX System test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
001-197-XXX System test warning	1. **Make sure component that is called out is enabled and/or connected** 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 enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
001-199-XXX System test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
001-250-XXX System ECC error	1. **System board**

Diagnostic Error Code	FRU/Action
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
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

Diagnostic Error Code	FRU/Action
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**
001-301-XXX System RTC Century byte error	1. **Flash the system** 2. System board
005-000-XXX Video Test Passed	1. **No action**
005-00X-XXX Video error	1. **Video card, if installed** 2. System board
005-010-XXX **005-011-XXX** **005-012-XXX** **005-013-XXX** Video Signal failure	1. **Video card, if installed** 2. System board
005-016-XXX Video Simple Pattern test failure	1. **Video Ram** 2. Video card, if installed 3. System board
005-024-XXX Video Addressing test failure	1. **Video card, if installed** 2. System board
005-025-XXX Video Checksum Value error	1. **Video card, if installed** 2. System board
005-027-XXX Video Configuration/Setup error	1. **Run Setup** 2. Video drivers update 3. Video card, if installed 4. System board
005-031-XXX Video Device Cable failure	1. **Video cable** 2. Monitor 3. Video card, if installed 4. System board
005-032-XXX Video Device Controller failure	1. **Video card, if installed** 2. System board
005-036-XXX Video Register error	1. **Video card, if installed** 2. System board
005-038-XXX System BIOS extension failure	1. **Video card, if installed** 2. System board
005-040-XXX Video IRQ failure	1. **Video card, if installed** 2. System board

Diagnostic Error Code	FRU/Action
005-195-XXX Video Test aborted by user	1. **Information** 2. Re-start the test, if need to
005-196-XXX Video test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
005-197-XXX Video test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
005-198-XXX Video test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
005-199-XXX Video test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
005-2XX-XXX **005-3XX-XXX** Video subsystem error	1. **Video card, if installed** 2. System board
006-000-XXX Diskette interface Test Passed	1. **No action**
006-0XX-XXX Diskette interface error	1. **Diskette drive Cable** 2. Diskette drive 3. System board
006-195-XXX Diskette interface Test aborted by user	1. **Information** 2. Re-start the test, if need to
006-196-XXX Diskette interface test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.

Diagnostic Error Code	FRU/Action
006-197-XXX Diskette interface test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
006-198-XXX Diskette interface test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
006-199-XXX Diskette interface test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
006-25X-XXX Diskette interface Error	1. **Diskette drive Cable** 2. Diskette drive 3. System board
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**

Diagnostic Error Code	FRU/Action
011-195-XXX Serial port Test aborted by user	1. **Information** 2. Re-start the test, if need to
011-196-XXX Serial port test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
011-197-XXX Serial port test warning	1. **Make sure component that is called out is enabled and/or connected** 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 enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
011-199-XXX Serial port test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 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**
014-001-XXX Parallel port Presence	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	1. **System board**
014-013-XXX **014-014-XXX** Parallel port Control Signal/Loopback test failure	1. **System board**
014-015-XXX Parallel port External Loopback failure	1. **Wrap plug** 2. System board

Diagnostic Error Code	FRU/Action
014-027-XXX Parallel port Configuration/Setup error	1. **Run Setup, enable port** 2. Flash the system 3. System board
014-03X-XXX **014-04X-XXX** Parallel port failure	1. **System board**
014-195-XXX Parallel port Test aborted by user	1. **Information** 2. Re-start the test, if need to
014-196-XXX Parallel port test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
014-197-XXX Parallel port test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
014-198-XXX Parallel port test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
014-199-XXX Parallel port test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
014-2XX-XXX **014-3XX-XXX** Parallel port failure	1. **External parallel device** 2. System board
015-000-XXX USB port Interface Test Passed	1. **No action**
015-001-XXX USB port Presence	1. **Remove USB Device(s) and re-test** 2. System board
015-002-XXX USB port Timeout	1. **Remove USB Device(s) and re-test** 2. System board

Diagnostic Error Code	FRU/Action
015-015-XXX USB port External Loopback failure	1. **Remove USB Device(s) and re-test** 2. System board
015-027-XXX USB port Configuration/Setup error	1. **Flash the system** 2. System board
015-032-XXX USB port Device Controller failure	1. **System board**
015-034-XXX USB port buffer allocation failure	1. **Reboot the system** 2. Flash the system 3. Run memory test 4. System board
015-035-XXX USB port Reset condition detected	1. **Remove USB Device(s) and re-test** 2. System board
015-036-XXX USB port Register error	1. **System board**
015-040-XXX USB port IRQ failure	1. **Run setup and check for conflicts** 2. Flash the system 3. System board
015-195-XXX USB port Test aborted by user	1. **Information** 2. Re-start the test, if need to
015-196-XXX USB port test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
015-197-XXX USB port test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
015-198-XXX USB port test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81

Diagnostic Error Code	FRU/Action
015-199-XXX USB port test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
018-000-XXX PCI Card Test Passed	1. **No action**
018-0XX-XXX PCI Card Failure	1. **PCI card** 2. Riser card, if installed 3. System board
018-195-XXX PCI Card Test aborted by user	1. **Information** 2. Re-start the test, if need to
018-196-XXX PCI Card test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
018-197-XXX PCI Card test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
018-198-XXX PCI Card test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
018-199-XXX PCI Card test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
018-250-XXX PCI Card Services error	1. **PCI card** 2. Riser card, if installed 3. System board
020-000-XXX PCI Interface Test Passed	1. **No action**
020-0XX-XXX PCI Interface error	1. **PCI card** 2. Riser card, if installed 3. System board

Diagnostic Error Code	FRU/Action
020-195-XXX PCI Test aborted by user	1. **Information** 2. Re-start the test, if need to
020-196-XXX PCI test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
020-197-XXX PCI test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
020-198-XXX PCI test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
020-199-XXX PCI test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
020-262-XXX PCI system error	1. **PCI card** 2. Riser card, if installed 3. System board
025-000-XXX IDE interface Test Passed	1. **No action**
025-00X-XXX **025-01X-XXX** IDE interface failure	1. **IDE signal cable** 2. Check power supply 3. IDE device 4. System board
025-027-XXX IDE interface Configuration/Setup error	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	1. **IDE signal cable** 2. Check power supply 3. IDE device 4. System board
025-195-XXX IDE interface Test aborted by user	1. **Information** 2. Re-start the test, if need to

Diagnostic Error Code	FRU/Action
025-196-XXX IDE interface test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
025-197-XXX IDE interface test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
025-198-XXX IDE interface test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
025-199-XXX IDE interface test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
030-000-XXX SCSI interface Test Passed	1. **No action**
030-00X-XXX **030-01X-XXX** SCSI interface failure	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	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	1. **SCSI signal cable** 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-195-XXX SCSI interface Test aborted by user	1. **Information** 2. Re-start the test, if need to

Diagnostic Error Code	FRU/Action
030-196-XXX SCSI interface test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
030-197-XXX SCSI interface test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
030-198-XXX SCSI interface test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
030-199-XXX SCSI interface test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
035-000-XXX RAID interface Test Passed	1. **No action**
035-0XX-XXX RAID interface Failure	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	1. **Information** 2. Re-start the test, if need to
035-196-XXX RAID interface test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
035-197-XXX RAID interface test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test

Diagnostic Error Code	FRU/Action
035-198-XXX RAID interface test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
035-199-XXX RAID interface test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
071-000-XXX Audio port Interface Test Passed	1. **No action**
071-00X-XXX **071-01X-XXX** **071-02X-XXX** **Audio port error**	1. **Run Setup** 2. Flash the system 3. System board
071-03X-XXX Audio port failure	1. **Speakers** 2. Microphone 3. Audio card, if installed 4. System board
071-04X-XXX Audio port failure	1. **Run Setup** 2. Audio card, if installed 3. System board
071-195-XXX Audio port Test aborted by user	1. **Information** 2. Re-start the test, if need to
071-196-XXX Audio port test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
071-197-XXX Audio port test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
071-198-XXX Audio port test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81

Diagnostic Error Code	FRU/Action
071-199-XXX Audio port test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
071-25X-XXX Audio port failure	1. **Speakers** 2. Audio card, if installed 3. System board
080-000-XXX Game Port interface Test Passed	1. **No action**
080-XXX-XXX Game Port interface Error	1. **Remove the game port device and re-test the system**
080-195-XXX Game Port interface Test aborted by user	1. **Information** 2. Re-start the test, if need to
080-196-XXX Game Port interface test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
080-197-XXX Game Port interface test warning	1. **Make sure component that is called out is enabled and/or connected** 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	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
080-199-XXX Game Port interface test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
086-000-XXX Mouse Port interface Test Passed	1. **No action**

Diagnostic Error Code	FRU/Action
086-001-XXX Mouse Port interface Presence	1. **Mouse** 2. System board
086-032-XXX Mouse Port interface Device controller failure	1. **Mouse** 2. System board
086-035-XXX Mouse Port interface Reset	1. **Mouse** 2. System board
086-040-XXX Mouse Port interface IRQ failure	1. **Run Setup** 2. Mouse 3. System board
086-195-XXX Mouse Port interface Test aborted by user	1. **Information** 2. Re-start the test, if need to
086-196-XXX Mouse Port interface test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
086-197-XXX Mouse Port interface test warning	1. **Make sure component that is called out is enabled and/or connected** 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	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
086-199-XXX Mouse Port interface test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
089-000-XXX Microprocessor Test Passed	1. **No action**
089-XXX-XXX Microprocessor failure	1. **Microprocessor(s)** 2. System board
089-195-XXX Microprocessor Test aborted by user	1. **Information** 2. Re-start the test, if need to

Diagnostic Error Code	FRU/Action
089-196-XXX Microprocessor test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
089-197-XXX Microprocessor test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
089-198-XXX Microprocessor test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
089-199-XXX Microprocessor test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
170-000-XXX Voltage Sensor(s) Test Passed	1. **No action**
170-0XX-XXX Voltage Sensor(s) failure	1. **Flash system** 2. System board
170-195-XXX Voltage Sensor(s) Test aborted by user	1. **Information** 2. Re-start the test, if need to
170-196-XXX Voltage Sensor(s) test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
170-197-XXX Voltage Sensor(s) test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test

Diagnostic Error Code	FRU/Action
170-198-XXX Voltage Sensor(s) test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81
170-199-XXX Voltage Sensor(s) test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
170-250-XXX **170-251-XXX** Voltage Sensor(s) Voltage limit error	1. **Power supply** 2. System board
170-254-XXX Voltage Sensor(s) Voltage Regulator Module error	1. **Voltage Regulator Module (VRM)** 2. Microprocessor 3. System board
175-000-XXX Thermal Sensor(s) Test Passed	1. **No action**
175-0XX-XXX Thermal Sensor(s) failure	1. **Flash system** 2. System board
175-195-XXX Thermal Sensor(s) Test aborted by user	1. **Information** 2. Re-start the test, if need to
175-196-XXX Thermal Sensor(s) test halt, error threshold exceeded	1. **Depress F3 to review the log file. See "Viewing the Test Log" on page 209.** 2. Re-start the test to reset the log file.
175-197-XXX Thermal Sensor(s) test warning	1. **Make sure component that is called out is enabled and/or connected** 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
175-198-XXX Thermal Sensor(s) test aborted	1. **If a component is called out, make sure it is enabled and/or connected** 2. Flash the system and re-test 3. Go to "Undetermined Problem" on page 81

Diagnostic Error Code	FRU/Action
175-199-XXX Thermal Sensor(s) test failed, cause unknown	1. **Go to "Undetermined Problem" on page 81.** 2. Flash the system and re-test 3. Replace component under function test.
175-250-XXX **175-251-XXX** Thermal Sensor(s) limit error	1. **Check fans** 2. Check Power supply 3. Microprocessor 4. System board
185-000-XXX Asset Security Test Passed	1. **No action**
185-XXX-XXX Asset Security failure	1. **Assure Asset Security Enabled** 2. Flash system 3. System board
185-278-XXX Asset Security Chassis Intrusion	1. **C2 Cover Switch** 2. System board
201-000-XXX System Memory Test Passed	1. **No action**
201-XXX-XXX System Memory error	1. **Replace the memory module called out by the test** 2. System board
202-000-XXX System Cache Test Passed	1. **No action**
202-XXX-XXX System Cache error	1. **Cache, if removable** 2. System board 3. Microprocessor
206-000-XXX Diskette Drive Test Passed	1. **No action**
206-XXX-XXX Diskette Drive error	1. **Diskette Drive Cable** 2. Check power supply voltages 3. Diskette drive 4. System board
215-000-XXX CD-ROM Drive Test Passed	1. **No action**
215-XXX-XXX CD-ROM Drive error	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	1. **No action**

Diagnostic Error Code	FRU/Action
217-25X-XXX **217-26X-XXX** Hard Disk Drive (IDE) error	1. **Hard Disk Drive Cable** 2. Check power supply voltages 3. Hard Disk drive (IDE) 4. System board
217-28X-XXX **217-29X-XXX** Hard Disk Drive (SCSI) error	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	1. **No action**
220-XXX-XXX Hi-Capacity Cartridge Drive error	1. **Remove the Hi-Capacity Cartridge Drive and re-test the system**
301-000-XXX Keyboard Test Passed	1. **No action**
301-XXX-XXX Keyboard error	1. **Keyboard** 2. Check and test Mouse 3. System board
302-000-XXX Mouse Test Passed	1. **No action**
302-XXX-XXX Mouse error	1. **Mouse** 2. Check and test Keyboard 3. System board
303-000-XXX Joystick Test Passed	1. **No action**
303-XXX-XXX Joystick error	1. **Remove the Joystick and re-test the system**
305-000-XXX Monitor DDC Test Passed	1. **No action**
305-250-XXX Monitor DDC self test failure	1. **Run Setup to enable DDC** 2. Cable 3. Monitor 4. Video card 5. System board
415-000-XXX Modem Test Passed	1. **No action**
415-XXX-XXX Modem error	1. **Remove the Modem and re-test the system**

Miscellaneous Error Messages

Message/Symptom	FRU/Action
CMOS Backup Battery inaccurate.	1. **CMOS Backup Battery See page 158.** 2. System Board
Changing colors.	1. **Display**
Computer will **not** power-off. See “Power Supply” on page 28.	1. **Power Switch** 2. System Board
Computer will **not** RPL from server	1. **Ensure Network is in startup sequence as first device or first device after diskette.** 2. Ensure Network adapter is enabled for RPL. 3. Network adapter (Advise network administrator of new MAC address)
Computer will **not** Wake On LAN	1. **Check power supply and signal cable connections to network adapter.** 2. Ensure Wake On LAN feature is enabled in Setup/Configuration. See “Setup Utility Program” on page 220. 3. Ensure network administrator is using correct MAC address. 4. Ensure no interrupt or I/O address conflicts. 5. Network adapter (Advise network administrator of new MAC address)
Dead computer. See “Power Supply” on page 28.	1. **Power Switch** 2. Power Supply 3. System Board
Diskette drive in-use light remains on or does not light when drive is active.	1. **Diskette Drive** 2. System Board 3. Diskette Drive Cable
Flashing cursor with an otherwise blank display.	1. **System Board** 2. Primary Hard Disk Drive 3. Hard Disk Drive Cable
Incorrect memory size during POST.	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.	1. **Diskette Drive** 2. System Board 3. Diskette Drive Cable 4. Network Adapter
Intensity or color varies from left to right of characters and color bars.	1. **Display** 2. System Board
No power, or fan not running.	1. **See "Power Supply" on page 28.**
Nonsystem disk or disk error-type message with a known-good diagnostic diskette.	1. **Diskette Drive** 2. System Board 3. Diskette Drive Cable
Other display symptoms not listed above (including blank or illegible display).	1. **See "Display" on page 31.** 2. System Board 3. Display
Power-on indicator or hard disk drive in-use light not on, but computer works correctly.	1. **Power Supply** 2. System Board 3. LED Cables
Printer problems.	1. **See "Printer" on page 27.**
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	1. **Run Setup** 2. Diskette Drive 3. Diskette Drive Cable 4. System Board 5. Power Supply
RPL computer cannot access programs from its own hard disk.	1. **If network admin. is using LCCM Hybrid RPL, check startup sequence: First device: network; Second device: hard disk** 2. Hard disk drive
RPL computer does not RPL from server.	1. **Check startup sequence** 2. Check the "Network Adapter LED Status" on page 11.
Serial or parallel port device failure (system board port).	1. **External Device Self-Test OK?** 2. External Device 3. Cable 4. System Board
Serial or parallel port device failure (adapter port).	1. **External Device Self-Test OK?** 2. External Device 3. Cable 4. Alternate Adapter 5. System Board 6. Riser Card

Message/Symptom	FRU/Action
Some or all keys on the keyboard do not work.	1. **Keyboard** 2. Keyboard Cable 3. System Board

Undetermined Problem

Check the power supply voltages. See “Power Supply” on page 28. If the voltages are correct, return here and continue with the following steps.

1. Power-off the computer.
2. Remove or disconnect the following, one at a time:
   a. Non-IBM devices
   b. External devices (modem, printer, or mouse)
   c. Any adapters
   d. Riser card
   e. Memory modules
      Before removing or replacing memory modules, see “System Board Memory” on page 248.
   f. Extended video memory
   g. External Cache
   h. External Cache RAM
   i. Hard disk drive
   j. 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 83.

Replacing a Processor

For Pentium® processors, install the processor with the beveled corner aligned with the beveled corner of the processor socket.

For Type 6588, 6888, and other Types that have Pentium II processors, see “Microprocessor Removal (Type 6588, 6888)” on page 284.

For Dual Pentium II processors, jumper the processor speed to the slowest speed processor.

When a second Pentium Pro or Pentium II microprocessor is installed for Dual processor operation, the processor revision must be one under, the same, or one above from each other. To find the processor revision level, go to the configuration Setup (see “Setup Utility Program” on page 220) and select:

1. Advanced Setup
2. Processor Control
3. Processor ID

The processor ID has four numbers, such as 0650.

- The first two numbers, 06, designates the Pentium processor.
- The second two numbers, 50, designates the processor revision level.

In this case, revision levels of 49, 50, or 51 are acceptable.

Important

If the processor is not installed correctly, the system board and the processor can be damaged.

Replacing a Video Cache Module

Use an appropriate video cache extracting tool to remove a video cache module from the system board. If a module is removed without properly using an extracting tool, the module socket can be damaged. See “Special Tools” on page 146 for the IBM P/N of the video cache extracting tool.

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 200 "Vital Product Data" on page 192, and "Flash (BIOS/VPD) Update Procedure" on page 201.
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. If you are instructed to replace the system board, do the following.
4. Remove the processor from the old system board and install it on the new system board. For Type 6588, 6888, see "Microprocessor Removal (Type 6588, 6888)" on page 284.
5. Remove any of the following installed options on the old system board, and install them on the new system board.
   - External cache memory and cache tag RAM
   - Memory modules
   - Extended video memory
6. Ensure that the new system board jumper settings match the old system board jumper settings.
7. 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.

System Board Replacement (Type 6588, 6888)

To remove the system board, remove:

- System board mounting screws
- Four screws holding the microprocessor retention bracket
- Two front screws

Lift the system board out of the system unit. Leave the system board plate (that was located under the system board) in the system unit.

To install a system board:

- Position the new system board over the system board plate and install:
  - Retention bracket and four screws

- Two front screws
- System board mounting screws

The system board can also be removed by removing the system board mounting screws, sliding the system board to the back (toward the fan), and lifting the system board out of the system unit. See note below.

See “Microprocessor Bracket and Plate Removal/Installation (Type 6588, 6888)” on page 287.

Note

The retention bracket, system board plate, and screws and washers must be removed from the old system board and installed on the new system board.

Important

Make sure the plastic washers are attached to the six mounting tabs of the system board plate, and that the washers are under the two front screw heads that secure the system board plate.

If any of the washers are not installed, the system board can be damaged.

System Board Replacement (Type 6898)

This notice is for the system board and EMC shield of the IntelliStation M Pro, Type 6898 computers.

Note

To avoid damage to the vertical fingers on the EMC shield over the USB, Mouse/Keyboard, and Ethernet connectors, use caution when installing the system board.

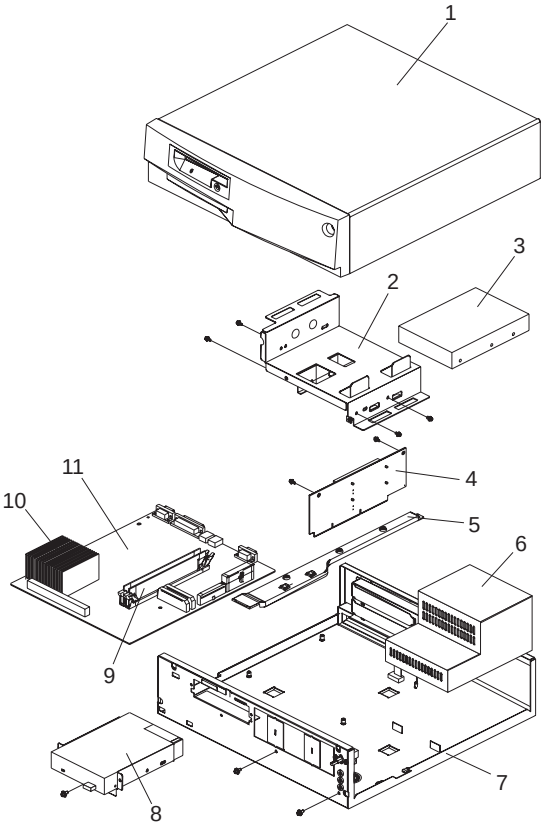
For removal or installation of the system board, angle the system board under the EMC shield fingers to prevent bending or damaging the fingers.

System Board Replacement (Type 6561, 6591)

For system board replacement, see “System Board Removal (Type 6561)” on page 276 and “System Board Removal (Type 6591)” on page 291.

Notes:

Type 6272 Parts



Parts Listing

Index	System (Type 6272)	FRU No.
1	Cover Assembly	76H4459
1	Cover Assembly (Models 88X, 89X, 90X, 91X)	02K2740
2	3.5-Inch Drive Bracket	76H4465
	5.25-Inch Drive Bracket	76H4466
3	1.2 GB[1] IDE Hard Disk Drive	07H1120
3	2.5 GB IDE Hard Disk Drive	75H8978
3	4.2 GB IDE Hard Disk Drive (Model 77X)	02K1146
	16X Max CD-ROM Drive	02K1152
	IDE Cable	76H4491
4	Riser Card	61H0193
	PCI Etherjet EPROM Card Models (88X, 89X, 90X, 91X)	01K2082
5	Riser Card Bracket	76H4464
6	Power Supply (85W)	76H4860
6	Power Supply - Japan	76H4858
7	Base Frame Assembly (with labels)	76H4460
7	Base Frame Assembly (with labels) (Models 88X, 89X, 90X, 91X)	02K2782
	Bezel Covers Kit	76H4461
	3.5-In. Blank Drive Bezel (Models 88X, 89X, 90X, 91X)	02K2741
	Torx Screw (Models 88X, 89X, 90X, 91X)	02K2742
	Model Plate	76H4462
	Power button	76H4469
	Power Switch and Cable	76H4485
	Dual LED Cable Assembly, Hard Disk/Power	76H4463
	LED Cable Assembly, LAN Activity	12J5542
	Cable - Switch to Planar, Security	60G2258
	Serial Port B Connector and Cable Assembly	76H7122
	60 mm Fan Assembly (Models 89X, 90X, 91X)	76H6613
	Pedestal Assembly	12J3146
	Wall Mount	12J3147
	EMC Clip	01K1619
	Mounting Screw Kit	93F0041
	Foot (4)	07H1440
8	3.5-Inch 1.44 MB Diskette Drive	75H9550
	Diskette Drive Cable	76H4228
9	Memory - 8 MB DIMM, Non-Parity	42H2807
9	Memory - 16 MB DIMM, Non-Parity	42H2808
9	Memory - 32 MB DIMM, Non-Parity	42H2809
10	Processor, Pentium®-133 MHz[2]	76H7116
10	Processor, Pentium-166 MHz	76H7117

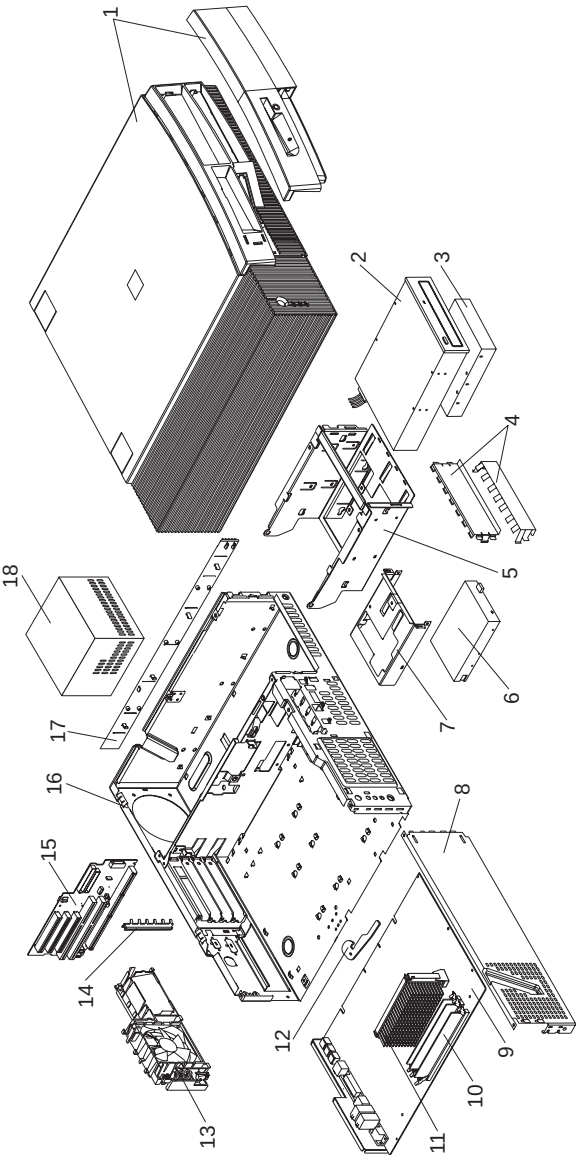
---

1 When referring to hard-disk-drive capacity, GB means 1 000 000 000 bytes; total user-accessible capacity may vary depending on operating environment.

2 MHz measures internal clock speed of the microprocessor only; not application performance. Many factors affect application performance.

Index	System (Type 6272)	FRU No.
10	Processor, Pentium MMX™-166 MHz	76H7119
10	Processor, Pentium MMX-200 MHz	01K1699
10	Processor, Pentium MMX-233 MHz	02K2768
11	System Board (no processor, memory) with Ethernet	61H0507
11	System Board (no processor, memory) without Ethernet (Models 88X, 89X, 90X, 91X)	61H0151
	L2 Cache, 256 KB	01K4400
	COAST Cache, 512 KB (EMEA Only)	61H1048
	Video RAM 1 MB	42H2828
	Lithium Battery	33F8354
	Jumper Kit	93F0067

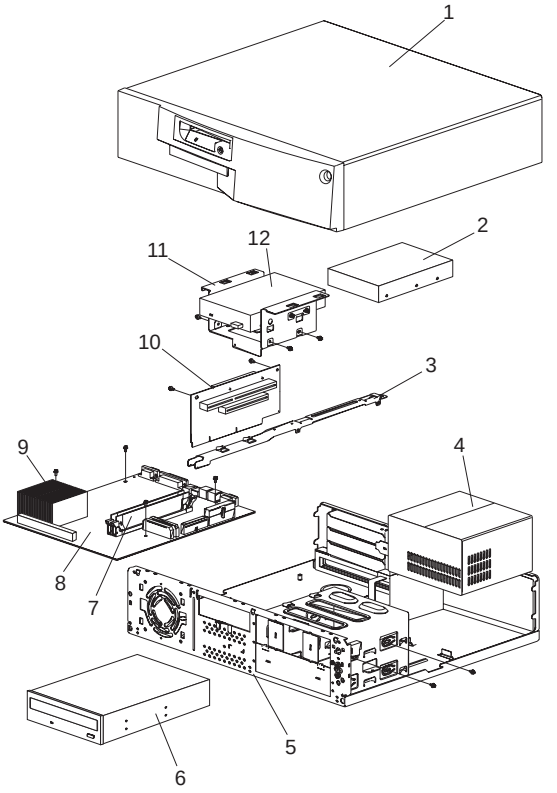
Type 6275 Parts



Parts Listing

Index	System (Type 6275)	FRU No.
1	Cover Assembly	01K1607
	Name Plate	03K9645
2	CD-ROM Drive (32X Max)	02K1115
	IDE Cable, CD-ROM (1-drop)	03K9724
3	3.2 GB EIDE Hard Disk Drive	10L6006
3	6.4 GB EIDE Hard Disk Drive	10L6012
	Hard Disk Cable, EIDE	12J4518
4	EMC Shields	76H7338
5	Hard Disk/CD-ROM Cage	03K9641
6	1.44 MB 3.5-Inch Diskette Drive	75H9550
6	1.44 MB 3.5-Inch Diskette Drive-Japan	75H9552
	Diskette Drive Cable	76H7340
7	3.5-Inch Diskette Bracket	76H7330
8	Side Bracket	76H7329
9	System Board (no processor, memory, rails)	61H1037
	System Board Guide Rails, center and front	03K9626
10	Memory - 32 MB DIMM, Non-Parity	01K1146
10	Memory - 64 MB DIMM, Non-Parity	01K1147
11	Processor Pentium II 300 MHz	01K4291
	Air Duct for 300 MHz. Processor only	03K9648
11	Processor Pentium II 333 MHz ECC	01K4327
11	Processor Pentium II 350 MHz	02K2776
11	Processor Pentium II 400 MHz	03K9672
12	Latch and Screw	01K1612
13	Fan/Power Switch Assembly	03K9647
14	I/O Bracket	03K9622
15	Riser Card	20L0970
	Riser Clips, front and rear	02K2766
16	Chassis Assembly	03K9646
17	Side Panel	76H7333
18	145 Watt Power Supply	01K9846
18	145 Watt Power Supply - Japan	01K9848
	Bezel Kit	76H7339
	Cable, Wake On Ring	76H7345
	Foot (4)	93F2386
	Jumper Kit	93F0067
	Keylock Assembly	76H7336
	Lithium Battery	33F8354
	Misc. Screw Kit	93F0041

Type 6282, 6284 Parts

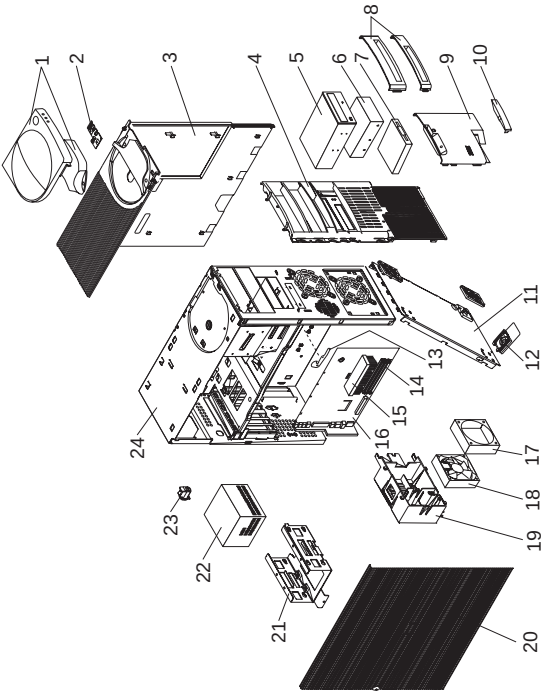


Parts Listing

Index	System (Type 6282, 6284)	FRU No.
1	Cover Assembly	76H4230
2	1.2 GB IDE Hard Disk Drive	07H1120
2	2.1 GB IDE Hard Disk Drive (Models G4X, G5X)	12J3141
2	2.5 GB IDE Hard Disk Drive	75H8978
2	3.2 GB IDE Hard Disk Drive	10L6006
2	4.2 GB IDE Hard Disk Drive (Models 80X, 81X, 85X)	02K1146
	IDE Cable	76H6064
3	Riser Card Bracket	76H1788
4	Power Supply (145W)	76H4856
4	Power Supply - Japan	76H4858
5	Base Frame Assembly (with labels)	76H4231
	Bezel Covers Kit	76H4232
	Model Plate	76H4233
	Power button	76H4234
	Power Switch and Cable	76H4485
	Keylock Assembly	12J6076
	Dual LED Cable Assembly, Hard Disk/Power	76H4463
	LED Cable Assembly, LAN Activity	12J5542
	Cable - Switch to Planar, Security	60G2258
	Serial Port B Connector and Cable Assembly	76H7122
	80 mm Fan Assembly	06H1796
	Pedestal Assembly	12J3146
	EMC Clips Kit	12J4462
	Mounting Screw Kit	93F0041
	Foot (4)	07H1440
6	16X Max CD-ROM Drive	02K1152
	Audio Card	12J4437
	ESS Audio Card (Model 78X)	02K3457
	Audio Cable	10H2924
7	Memory - 8 MB DIMM, Non-Parity	42H2807
7	Memory - 16 MB DIMM, Non-Parity	42H2808
7	Memory - 32 MB DIMM, Non-Parity	42H2809
8	System Board (no processor, memory) with Ethernet (Models 24X, 28X, 36X, 48X, 52X, 64X, 67X, 68X, 70X, 71X, 81X)	61H0507
8	System Board (no processor, memory) without Ethernet	61H0382
8	System Board (no processor, memory) without Ethernet (Models 85X, 86X, 87X)	61H0151
	L2 Cache, 256 KB	01K4400
	COAST Cache, 512 KB (EMEA Only)	61H1048
	Video RAM 1 MB	42H2828
	Lithium Battery	33F8354
	Jumper Kit	93F0067
9	Processor, Pentium-133 MHz	76H7116
9	Processor, Pentium-166 MHz	76H7117
9	Processor, Pentium-200 MHz	76H7118
9	Processor, Pentium MMX-166 MHz	76H7119
9	Processor, Pentium MMX-200 MHz	01K1699
9	Processor, Pentium MMX-233 MHz (Models 85X, 86X, 87X)	02K2768
10	Riser Card	61H0188

Index	System (Type 6282, 6284)	FRU No.
11	3.5-Inch Drive Bracket	76H1789
12	3.5-Inch 1.44 MB Diskette Drive	75H9550
	Diskette Drive Cable	76H4489

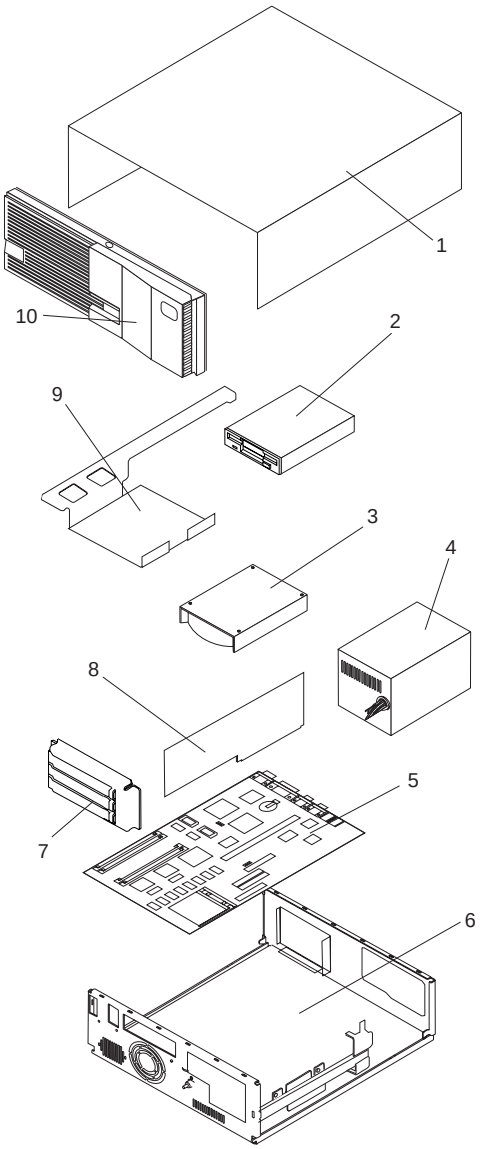
Type 6285 Parts



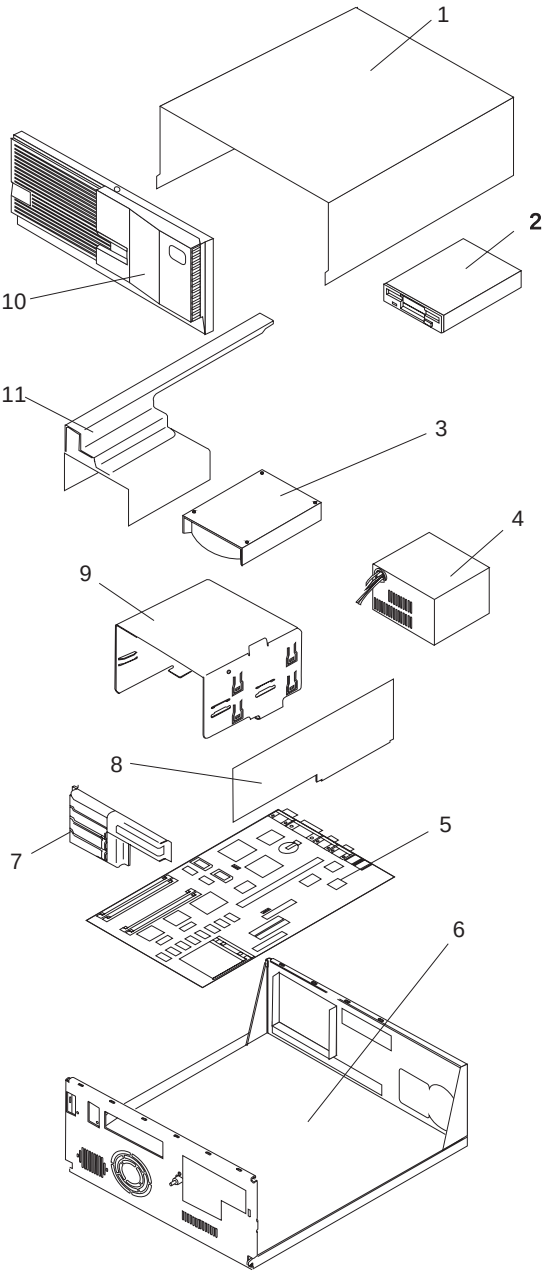
Parts Listing

Index	System (Type 6285)	FRU No.
1	Cover and Handle	12J4494
2	Power Switch/LED Cable Assembly	12J4510
3	Top Cover Assembly	12J4509
4	Front Bezel	12J4495
5	CD-ROM (32X Max)	02K1115
	CD-ROM Audio Cable	75H9219
6	3.2 GB EIDE Hard Disk Drive	10L6006
6	6.4 GB EIDE Hard Disk Drive	10L6012
	Hard Disk Cable, EIDE	12J4518
7	1.44 MB, 3.5-Inch Diskette Drive	75H9550
7	1.44 MB, 3.5-Inch Diskette Drive-Japan	75H9552
	Diskette Drive Cable	76H7340
8	Louver Blank Bezels	12J4497
	Miscellaneous Optional Bezels	12J4498
9	3.5-inch Front Panel	01K1854
10	Model Plate	02K2832
11	Bottom cover	03K9602
12	Foot (4)	12J6294
13	System Board Latch and Screw	01K1612
14	Memory - 32 MB DIMM, Non-Parity	01K1146
14	Memory - 64 MB DIMM, Non-Parity	01K1147
15	Processor Pentium II 300 MHz	01K4291
15	Processor Pentium II 333 MHz ECC	01K4327
15	Processor Pentium II 350 MHz	02K2776
15	Processor Pentium II 400 MHz	03K9672
16	System Board (no proc., memory, rails)	61H1037
	System Board Rail Set	03K9626
17	Fan Bracket	03K9606
18	92 mm Fan with rubber mounts	02K2861
19	Card Guide	03K9605
20	Access Cover Assembly	12J4493
21	Hard Disk Drive Bracket	03K9608
22	Power Supply (200W)	75H8991
22	Power Supply (200W) - Japan	76H4873
23	Keylock Assembly	12J5102
24	Base Frame Assembly	03K9611
	Cable - Wake On Ring	76H7345
	Lithium Battery	33F8354
	Miscellaneous Hardware Kit	03K9603
	Miscellaneous Screw Kit	93F0041
	Riser Card	20L0926
	Riser Supports (front and rear)	02K2766

Type 6X7X Parts



Type 6X8X Parts



Parts Listing

Index	System (Type 6X7X, 6X8X)	FRU No.
1	**Cover**	
	Top Cover 3x3 with Labels (6571, 6573, 6575, 6576, 6577, 6875, 6876, 6877)	06H5722
	Top Cover 5x5 with Labels (6581, 6583, 6585, 6586, 6587)	75H7986
	Top Cover 5x5 with Labels (6587, 6589, 6885, 6886, 6887)	75H7986
	Logo Kit	06H5723
2	**Diskette Drive and Cable**	
	3.5-Inch 1.44 MB Diskette Drive	93F2361
	3.5-Inch 1.44 MB Diskette Drive (Japan Only - Short Button)	41H7675
	3.5-Inch 1.44 MB Diskette Drive (Japan Only - Long Button)	41H7676
	3.5-Inch 2.88 MB Diskette Drive	82G1887
	3.5-Inch Auto-Eject Diskette Drive (Non-EMEA) (6875, 6876, 6885, 6886)	71G0660
	Diskette Drive Cable	06H6344
	Diskette Drive Cable (6577, 6587)	06H6325
	5.25-Inch 1.2 MB Diskette Drive	82G1824
	5.25-Inch Diskette Drive Bracket (6587, 6589, 6887)	06H9408
3	**Hard Disk Drive and Cable**	
	170 MB[3] IDE Hard Disk Drive	71G4958
	270 MB IDE Hard Disk Drive (6571, 6573, 6581, 6583)	06H4152
	270 MB IDE Hard Disk Drive (6575, 6585, 6875, 6876, 6885, 6886)	82G5926
	364 MB IDE Hard Disk Drive	82G5927
	540 MB IDE Hard Disk Drive	82G5928
	540 MB SCSI Hard Disk Drive	82G5932
	635 MB IDE Hard Disk Drive	06H9063
	728 MB IDE Hard Disk Drive	82G5929
	850 MB IDE Hard Disk Drive	06H8419
	1 GB IDE Hard Disk Drive	06H6111
	1 GB SCSI Hard Disk Drive	06H9079
	1.2 GB IDE Hard Disk Drive	07H0383
	1.2 GB SCSI Hard Disk Drive	07H0390
	1.6 GB IDE Hard Disk (6577, 6587, 6589)	75H7497
	1.6 GB IDE Hard Disk Drive (6877, 6887)	06H9064
	2.0 GB SCSI Hard Disk Drive (6877, 6887)	07H1118
	2.2 GB SCSI Hard Disk Drive (6589)	76H0958
	2.5 GB IDE Hard Disk Drive (6577, 6587)	76H5822
	2.5 GB IDE Hard Disk Drive (6589)	07H1123
	4.2 GB IDE Hard Disk Drive (6577, 6587, 6589)	76H5820
	SCSI Adapter PCI (6589)	60H7823

3 When referring to hard-disk-drive capacity, MB means 1 000 000 bytes; total user-accessible capacity may vary depending on operating environment.

Index	System (Type 6X7X, 6X8X)	FRU No.
	Adaptec SCSI Adapter (6877, 6887)	07H0132
	IDE Cable	06H6326
	Hard Disk Drive LED and Cable	93F2388
	SCSI Hard Disk Drive LED and Cable	75H9217
	Hard Disk Drive Bracket	06H9409
	SCSI Cable PCI 3x3 (6575, 6875, 6876, 6877)	71G2556
	SCSI Cable PCI 5x5 (6585, 6885, 6886, 6887)	06H6062
	SCSI Cable PCI 5x5 (6589)	06H9674
4	**Power Supply, Cable, Switch**	
	145 Watt Power Supply 3x3 (6571, 6573)	06H2972
	145 Watt Power Supply 3x3 (6575)	06H3861
	145 Watt Power Supply 3x3 (3.3 Volt) (6576, 6875, 6876)	06H3862
	145 Watt Power Supply 3x3 (3.3 Volt) (6577, 6877)	06H8824
	210 Watt Power Supply 5x5 (6581, 6583, 6585)	06H2967
	210 Watt Power Supply 5x5 (3.3 Volt) (6586, 6885, 6886)	06H2968
	200 Watt Power Supply 5x5 (3.3 Volt) (6587, 6887)	06H8825
	200 Watt Power Supply 5x5 (3.3 Volt) (6587 - Japan Only)	55H6636
	200 Watt Power Supply 5x5 (3.3 Volt) (6589)	12J5109
	200 Watt Power Supply 5x5 (3.3 Volt) (6589 - Japan Only)	12J5111
	Power Switch and Cable (6576, 6586 Only)	06H3863
	Power Switch and Cable (All Others)	60G2258
	Power Button 3x3 (6571, 6573, 6575, 6576, 6875, 6876)	06H5724
	Power Button 3x3 (6577, 6877)	06H9414
	Power Button 5x5 (6581, 6583, 6585, 6586, 6885, 6886)	06H1777
	Power Button 5x5 (6587, 6887)	06H9403
	LED and Power Cable	93F2389
5	**System Board** (Without processor, memory, or cache)	
	6571, 6573, 6581, 6583	65G4152
	6571, 6573, 6581, 6583	96G1819
	6575, 6585	88G4282
	6576, 6586 (Model 3XX, 4XX Only)	11H9623
	6576, 6586 (Model 5XX Only)	96G3576
	6576, 6586 (Models 6XX, 7XX, 8XX, 9XX)	96G3573
	For P54C (6577, 6587)	93H5966
	For P55C (6577, 6587)	93H4690
	6589	40H6044
	6875, 6885 (Model PxH,PxM,RxH,TxH Only)	40H4744
	6875, 6885 (All Other Models)	88G4270
	6876, 6886 (Model PxH,PxM,RxH,TxH Only)	40H4743
	6876, 6886 (All Other Models)	11H5545
	6877, 6887	60H9453

System (Type 6X7X, 6X8X)	FRU No.
Processor	
6571, 6573, 6581, 6583	
486SX-25	71G0790
486SX-33	71G0791
486SX2-25/50	71G0792
486DX-33	71G0793
486DX2-25/50	71G0794
486DX2-33/66	71G0795
486DX4-100 with regulator	82G5056
6575, 6585	
P60-60	06H6055
6576, 6586	
P54C-75	06H7589
P54C-9O	06H7590
P54C-100	06H7591
P54C-133	06H9492
P54C-166	07H0270
6577, 6587	
P54C-100	07H0838
P54C-120	76H5392
P54C-133	07H0843
P54C-166	07H0971
P54C-200	75H9575
P55C-166	12J2758
P55C-200	12J2759
Voltage Regulator Card	76H3658
Shunt Block-Supports Pentium processor on a Pentium MMX system board	01K5755
6589	
P6-180	75H9215
P6-200	75H9212
Pentium Pro™-200 Optional Second Processor	75H9831
Voltage Regulator Card	07H1097
6875, 6876, 6885, 6886	
P54C-75	06H5210
P54C-90	06H5251
P54C-100	06H6063
P54C-120	06H8212
P54C-133	06H8228
6877, 6887	
P54C-100	07H0311
P54C-133	06H9891
P54C-150	06H9892
P54C-166	07H0971
72-Pin Memory SIMM (Non-parity)	
4 MB Non-parity (6571, 6573, 6575, 6581, 6583, 6585)	92G7540
4 MB Non-parity (6576, 6586)	60G2900

Index	System (Type 6X7X, 6X8X)	FRU No.
	4 MB EDO Non-parity-60 ns (6577, 6587, 6877, 6887)	92G7319
	8 MB Non-parity (6571, 6573, 6575, 6581, 6583, 6585)	92G7542
	8 MB Non-parity (6576, 6586)	92G7245
	8 MB EDO Non-parity-60 ns (6577, 6587, 6877, 6887)	92G7321
	16 MB Non-parity (6571, 6573, 6575, 6581, 6583, 6585)	92G7544
	16 MB Non-parity (6576, 6586)	92G7247
	16 MB EDO Non-parity-60 ns (6577, 6587, 6877, 6887)	92G7323
	32 MB Non-parity (6571, 6573, 6575, 6581, 6583, 6585)	92G7546
	32 MB Non-parity (6576, 6586)	92G7249
	32 MB EDO Non-parity-60 ns (6577, 6587, 6877, 6887)	92G7325
	72-Pin Memory SIMM (Parity)	
	4 MB Parity (6875, 6876, 6885, 6886)	73G3233
	4 MB Parity (6877, 6887)	42H2785
	8 MB Parity (6875, 6876, 6885, 6886)	92G7521
	8 MB Parity (6877, 6887)	42H2786
	16 MB Parity (6875, 6876, 6885, 6886)	60G2950
	16 MB Parity (6877, 6887)	92G7294
	32 MB Parity (6875, 6876, 6885, 6886)	73G3135
	32 MB Parity (6877, 6887)	92G7295
	168-Pin Memory DIMM	
	16 MB Non-Parity EDO (6577, 6587, 6877, 6887)	42H2779
	32 MB Non-Parity EDO (6577, 6587, 6877, 6887)	42H2780
	16 MB Non-Parity EDO (6589)	42H2795
	32 MB Non-Parity EDO (6589)	42H2797
	32 MB EDO ECC (6589)	42H2801
	16 MB Parity (6877, 6887)	42H2783
	32 MB Parity (6877, 6887)	42H2784
	L2 Cache	
	128 KB (6571, 6573, 6581, 6583)	06H4759
	256 KB (6571, 6573, 6581, 6583)	06H4760
	256 KB (6875, 6876, 6885, 6886)	06H6052
	256 KB (6576, 6586)	06H7586
	256 KB (6577, 6587, 6877, 6887)	07H1150
	512 KB (6577, 6587, 6877, 6887)	42H2781
	1 MB (6875, 6876, 6885, 6886)	92G7552
	Video Memory	
	Video DRAM 1 MB (6575, 6576, 6585, 6586, 6875, 6876, 6885, 6886)	92G7432
	Video DRAM 1 MB (6577, 6587)	42H2770
6	**Base Frame Assembly**	
	Base Assembly 3x3 (6571, 6573)	06H5728
	Base Assembly 3x3 (6575, 6576, 6875, 6876)	06H5727
	Base Assembly 3x3 (6577, 6877)	07H1092

Index	System (Type 6X7X, 6X8X)	FRU No.
	Base Assembly 5x5 (6581, 6583, 6585, 6586, 6885, 6886)	06H9405
	Base Assembly 5x5 (6587, 6589, 6887)	06H9405
	Foot (Qty 4) 3x3 (6571, 6573, 6575, 6576, 6577, 6875, 6876, 6877)	10H3080
	Foot (Qty 4) 5x5 (6581, 6583, 6585, 6586, 6587, 6589, 6885, 6886, 6887)	06H1773
	Blank Bezel with and without Audio 3x3 (6571, 6573, 6575, 6576, 6875, 6876)	06H6992
	Blank Bezel with/without Audio 3x3 (6577, 6877)	06H9421
	Blank Bezel with and without Audio 5x5 (6581, 6583, 6585, 6586, 6885, 6886)	06H1774
	Blank Bezel with Audio 5x5 (6587, 6589, 6887)	06H9411
	Bottom Cover 5x5 (6587, 6589, 6885, 6886, 6887)	06H1791
	Floor Stand Assembly	06H1792
	C-2 Switch Assembly 3x3 (6875, 6876)	06H5748
	C-2 Switch Assembly 3x3 (6877)	06H9971
	C-2 Switch Assembly 5x5 (6885, 6886)	06H1788
	C-2 Switch Assembly 5x5 (6887)	06H9972
	PCMCIA Card Assembly ISA (6571, 6573, 6575, 6875, 6581, 6583, 6585, 6885)	81G4632
	PCMCIA Card Assembly Micro Channel (6876, 6886)	81G4261
	PCMCIA Bay Assembly (6571, 6573, 6575, 6875, 6581, 6583, 6585, 6885)	81G4633
	PCMCIA Cable (6876, 6886)	81G4634
	PCMCIA Bracket 3x3 (6571, 6573, 6575, 6576, 6875, 6876)	82G4982
	PCMCIA Bracket 3x3 (6877)	75H7491
	PCMCIA Bracket 5x5 (6581, 6583, 6585, 6586, 6885, 6886, 6887)	06H1790
	Audio Front Panel Assembly 3x3 (6875, 6876)	06H5749
	Audio Front Panel Assembly 3x3 (6877)	06H9422
	Audio Front Panel Assembly 5x5 (6887)	06H9412
	Audio Front Panel Assembly Bracket 5x5 (6887)	06H9413
	Front Panel Card (All Types)	06H9150
	Front Panel Bracket (6877)	06H9423
	Rear Decorative Panel 3x3 (6571, 6573)	10H2925
	Rear Decorative Panel 3x3 (6575, 6576, 6875, 6876)	06H5742
	Rear Decorative Panel 3x3 (6577, 6877)	06H9420
	Rear Decorative Panel 5x5 (6581, 6583, 6585, 6586, 6885, 6886)	06H1785
	Rear Decorative Panel 5x5 (6587, 6589, 6887)	06H9407
	80 mm Fan Assembly	06H1796
	80 mm Fan Guard 3x3	06H5733

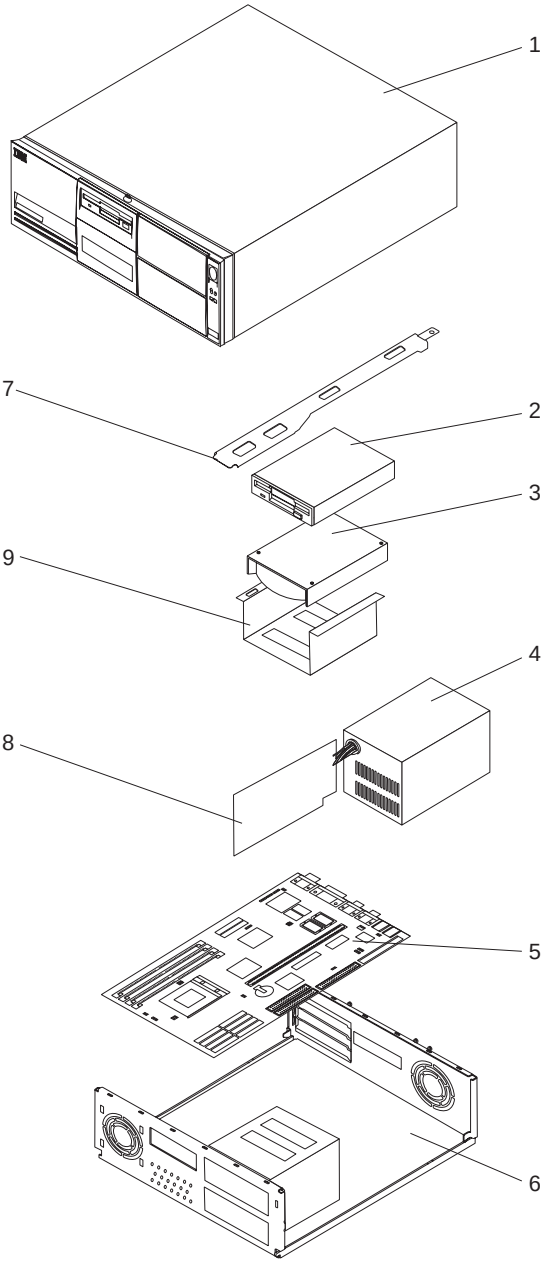
Index	System (Type 6X7X, 6X8X)	FRU No.
	Air Duct (Processor) (6576, 6577, 6586, 6587)	72H2545
7	**I/O Panel Assembly**	
	Rear I/O Panel Assembly ISA 3x3 (6571, 6573, 6575, 6576, 6577, 6875, 6877)	06H5744
	Rear I/O Panel Assembly MCA 3x3 (6876)	06H5745
	Rear I/O Panel Assembly ISA 5x5 (6581, 6583, 6585, 6586, 6885)	06H1786
	Rear I/O Panel Assembly MCA 5x5 (6886)	06H1787
	Rear I/O Panel Assembly ISA 5x5 (6587, 6589, 6887)	06H9410
8	**Riser Card**	
	ISA/VESA 3x3 (6571)	88G4250
	ISA/PCI 3x3 (6573)	88G4255
	ISA/PCI 3x3 (6575)	06H4714
	ISA/PCI 3x3 (6576)	11H9624
	ISA/PCI 3x3 (6875)	06H4003
	MCA/PCI 3x3 (6876)	06H4018
	ISA/PCI 3x3 (6577, 6877)	01K2028
	ISA/VESA 5x5 (6581)	88G4260
	ISA/PCI 5x5 (6583)	88G4265
	ISA/PCI 5x5 (6585)	06H4715
	ISA/PCI 5x5 (6586)	11H9625
	ISA/PCI 5x5 (6587, 6589, 6887) (3 Shared / 2 ISA)	01K2094
	ISA/PCI 5x5 (6589) (3 Shared / 2 PCI)	93H7830
	ISA/PCI 5x5 (6885)	06H4008
	MCA/PCI 5x5 (6886)	06H4023
	Card Guide	
	Card Guide 3x3 MCA/PCI (6876)	06H5729
	Card Guide 5x5 MCA/PCI (6886)	06H1778
	Card Guide PCMCIA 3x3 (6571, 6573, 6575, 6576, 6875, 6876)	06H5731
	Card Guide ISA 3x3 (6571, 6573, 6575, 6576, 6875)	06H5730
	Card Guide ISA/PCI 3x3 (6577, 6877)	06H9416
	Card Guide ISA 5x5 (6581, 6583, 6585, 6586, 6589, 6885)	06H1779
	Card Guide ISA/PCI 5x5 (6587, 6887)	07H1091
9	DASD Mounting Tray 3x3 (6571, 6573, 6575, 6576, 6577, 6875, 6876, 6877)	06H5743
9	Removable DASD Tray 5x5 (6581, 6583, 6585, 6586, 6885, 6886)	06H9408
10	Front Bezel w/ Labels and keylock 3x3 (6571, 6573, 6575, 6576, 6875, 6876)	06H6994
10	Front Bezel w/ Labels 3x3 (6577)	07H0350
10	Front Bezel w/ Labels 3x3 (6877)	06H9415
10	Front Bezel w/ Labels 5x5 (6581, 6583, 6585, 6586, 6885, 6886)	06H1775
10	Front Bezel w/ Labels 5x5 (6587)	07H0349
10	Front Bezel w/ Labels 5x5 (6589)	75H9214
10	Front Bezel w/ Labels 5x5 (6877)	06H9404

Index	System (Type 6X7X, 6X8X)	FRU No.
11	Non-removal DASD Tray 5x5 (6581, 6583, 6585, 6586, 6885, 6886)	06H9409
11	Non-removal DASD SCSI Tray 5x5 (6589)	01K1911
	EMC Shield (4 each) 3x3 (6571, 6573, 6575, 6576, 6577, 6875, 6876)	06H5747
	EMC Shield 3x3 (6877)	75H7928
	EMC Shield 5.25-Inch (4 each) 5x5 (6581, 6583, 6585, 6586, 6587, 6589, 6885, 6886, 6887)	06H1782
	Speaker (6575, 6585)	92F0421
	Speaker (6877)	06H9417
	Speaker Enhanced (6875, 6876, 6885, 6886, 6887)	06H5735
	Cover Latch 3x3 (6571, 6573, 6575, 6576, 6577, 6875, 6876, 6877)	06H5736
	Cover Latch 5x5 (6581, 6583, 6585, 6586, 6589, 6885, 6886, 6887)	06H1783
	Cover Latch 5x5 (6587)	07H0844
	Blank Bezel Holder 3x3 (6571, 6573, 6575, 6576, 6875, 6876)	06H5740
	Blank Bezel PCMCIA 3x3 (6571, 6573, 6575, 6576, 6875, 6876)	06H5741
	Blank Bezel PCMCIA 3x3 (6877)	06H9419
	Blank Bezel PCMCIA 5x5 (6581, 6583, 6585, 6586, 6589, 6885, 6886, 6887)	06H1784
	Backup Battery - CMOS (Lithium) (See page 158)	33F8354
	Cover Lock Assembly 3x3 with Pawl (6577, 6877)	06H9418
	Cover Lock Assembly 5x5 (6581, 6583, 6585, 6586, 6589, 6885, 6886)	06H1776
	Cover Lock Assembly 5x5 (6587, 6887)	06H9406
	Blank Drive Bezel 3.5-Inch 3x3 (6571, 6573, 6575, 6576, 6589, 6875, 6876, 6877, 6887)	06H5739
	Blank Drive Bezel 3.5-Inch 5x5 (6587)	76H5856
	Blank Drive Bezel 5.25-Inch	06H5738
	Mounting Screw Kit	93F0041
	Jumper Kit	93F0067
	EMC Clips (6 each)	06H5734
	Multimedia / Options (Type 6X7X and 6X8X)	
	Audio Card, 16-bit (6571, 6573, 6575, 6581, 6583, 6585)	10H3157
	Cable - Audio Card (6571, 6573, 6575, 6581, 6583, 6585)	10H2924
	Audio System Board/Card Cable (6575, 6585, 6885, 6886)	06H6068
	Audio Cable to CD-ROM (6877, 6887)	55H8623
	Audio Card - DSP (6877, 6887) Australia	75H7457
	Audio Card - DSP (6877, 6887) Austria	75H0448
	Audio Card - DSP (6877, 6887) Denmark	75H0455
	Audio Card - DSP (6877, 6887) EMEA	07H0015
	Audio Card - DSP (6877, 6887) Finland	75H0449

Index	System (Type 6X7X, 6X8X)	FRU No.
	Audio Card - DSP (6877, 6887) France	07H0016
	Audio Card - DSP (6877, 6887) Germany	07H0018
	Audio Card - DSP (6877, 6887) Italy	75H7453
	Audio Card - DSP (6877, 6887) Japan	75H7451
	Audio Card - DSP (6877, 6887) Netherlands	75H0458
	Audio Card - DSP (6877, 6887) Norway	75H7460
	Audio Card - DSP (6877, 6887) Portugal	75H7450
	Audio Card - DSP (6877, 6887) Spain	75H0459
	Audio Card - DSP (6877, 6887) Sweden	75H0454
	Audio Card - DSP (6877, 6887) Switzerland	75H0456
	Audio Card - DSP (6877, 6887) U.S.	07H0017
	DSP Cable for DSP Audio Card (6877, 6887)	76H2654
	Cable-Front panel to audio card (6877, 6887)	01K1465
	Matrox Video Adapter (6598, 6877, 6887)	06H9074
	S3 Trio Video Adapter (6589)	75H9213
	Auxiliary Video Extension Cable MCA (6876, 6886)	06H6728
	Video Adapter Matrox-PCI (6589)	75H9227
	Video Card Assembly PCI (6875, 6876, 6885, 6886)	06H5249
	SCSI Card Assembly PCI (6575, 6576, 6585, 6586, 6875, 6876, 6885, 6886)	06H9610
	Infrared Dongle Card (6877, 6887)	07H0020
	CD-ROM Drive IDE, Dual-Speed (2X)	06H5906
	CD-ROM Drive IDE, Quad-Speed (4X)	06H7654
	CD-ROM Drive IDE, Six-Speed (6X)	75H9601
	CD-ROM Drive IDE, Six-Speed (6X)	06H9429
	CD-ROM Drive IDE, Six-Speed (6X) (6598)	06H9431
	PDCD-ROM Drive IDE, Six-Speed (6X) (6589)	76H0481
	CD-ROM Drive IDE, Eight-Speed (8X) (6589)	75H9748
	CD-ROM Drive IDE, Eight-Speed (8X) (6589)	76H0472
	CD-ROM Drive IDE, (16X Max) (6587 - Japan Models)	76H6103
	CD-ROM Drive IDE, (16X Max) (6589)	76H6101
	Audio Cable (for CD-ROM Drive)	07H0019
	Transformer (6581, 6583 - U.S./Canada)	06H3615
	Transformer (6581, 6583 - World Trade)	06H3618
	Microphone (6581, 6583)	06H3616
	Microphone (6885, 6886)	66G1246
	Microphone with Headset	30H2312
	Speaker (6581, 6583)	06H3614
	Communications (Type 6X7X and 6X8X)	

Index	System (Type 6X7X, 6X8X)	FRU No.
	Token Ring Card Assembly PCI	04H8098
	Token Ring Card Assembly ISA	55H6810
	Ethernet Card Assembly PCI	25H4383
	Ethernet Card Assembly ISA	25H6151
	Ethernet Card, Intel 10/100 (6587 - Japan)	12J3123
	Wake-On-LAN Cable PCI (6877, 6887)	07H0447
	FAX/Modem Assembly ISA	04H5788
	FAX/Modem Cable ISA	06H6053

Type 6560 Parts

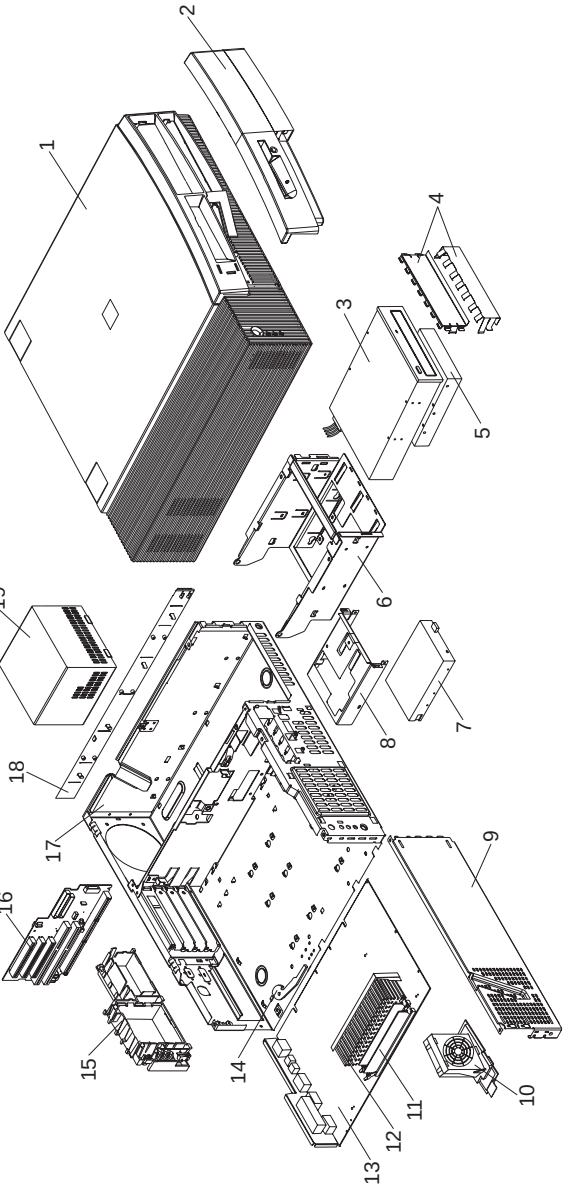


Parts Listing

Index	System (Type 6560)	FRU No.
1	**Top Cover and Logo**	
	Top Cover, including front bezel 4x4	75H7956
	Label Plate - Personal Computer 340 (6560)	75H7959
	Bezel Covers Kit	75H7958
2	**Diskette Drive and Cable**	
	3.5" 1.44 MB Diskette Drive	93F2361
	3.5-Inch 1.44 MB Diskette Drive (Japan Only - Short Button)	41H7675
	3.5-Inch 1.44 MB Diskette Drive (Japan Only - Long Button)	41H7676
	Diskette Drive Cable	06H6325
3	**Hard Disk/CD Drives and Cables** (Order either one of the same capacity drive)	
	850 MB Hard Disk Drive IDE	06H8419
	850 MB Hard Disk Drive IDE	42H1825
	1.2 GB Hard Disk Drive IDE	07H0383
	1.2 GB Hard Disk Drive IDE	07H1120
	2.5 GB Hard Disk Drive IDE	07H1123
	CD-ROM Drive 6X IDE	75H9601
	CD-ROM Drive 6X IDE	06H9429
	Toroid Kit for 6X CD-ROM Drive	11H6128
	IDE Cable	06H6326
	LED and Cable Power/Hard Disk Drive	07H1444
4	**Power Supply** (Order one of the following power supplies for Type 6560)	
	145 Watt Power Supply	75H8473
	145 Watt Power Supply (without switch bracket)	75H8474
	145 Watt Power Supply	07H1441
	200 Watt Power Supply (Japan)	06H2968
	Switch Cable Assembly (Japan)	06H3863
5	**System Board** (Without processor, memory, or cache)	
	System Board	93H4641
	System Board (with cache)	93H4603
	L2 Cache	
	256 KB	42H2804
	Processors	
	Pentium-100	07H1446
	Pentium-120	07H1451
	Pentium-133	75H8235
	Pentium-166	75H8261
	72-Pin Memory SIMM	
	4 MB Non-parity EDO	92G7319
	8 MB Non-parity EDO	92G7321
	16 MB Non-parity EDO	92G7323
6	**Base Assembly**	
	Base Assembly 4x4 (6560)	75H7957
	Fan Assembly 80 mm	75H8258
	Foot 4 each	07H1440
	LED and Cable Power/Hard Disk Drive	07H1444
	Lithium Battery (See page 158)	33F8354
	Power Button	75H7979
	Jumper Kit	93F0067
	Mounting Screws	93F0041

Index	System (Type 6560)	FRU No.
7	**Card Guide**	
	Riser Card Support Bracket	76H1788
8	**Riser Card**	
	4x4 PCI/ISA	12H0897
	Serial Port Adapter Card	01K1604
9	**Removable DASD Tray**	76H1789

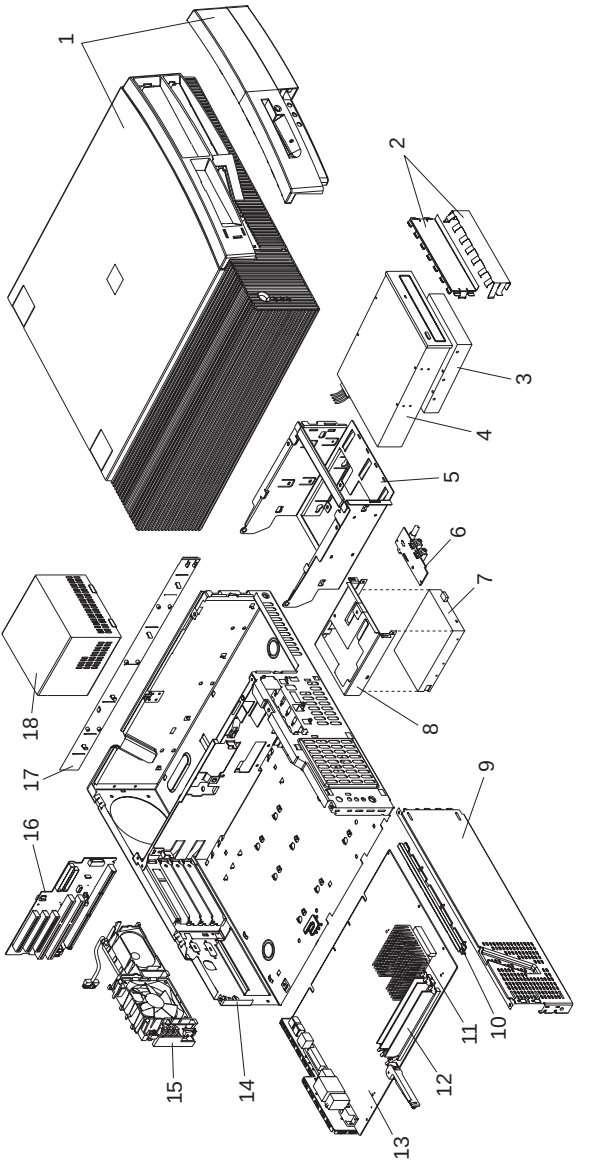
Type 6561 Parts



Parts Listing

Index	System (Type 6561)	FRU No.
1	Cover Assembly	01K1607
2	Bezel Kit	76H7339
	Name Plate	01K1611
3	CD-ROM Drive/32X	02K3412
3	CD-ROM Drive/32X (Models 29J, 42X, 46J, 47J)	02K1115
	Audio Cable, CD-ROM	75H9219
	IDE Cable, CD-ROM (1-drop)	03K9724
	IDE Cable, CD-ROM (2-drop)	12J3432
4	EMC Shield Kit	76H7338
5	2.1 GB EIDE Hard Disk Drive	12J3141
5	2.5 GB EIDE Hard Disk Drive	75H8978
5	4.2 GB EIDE Hard Disk Drive	12J3143
	IDE Cable	76H7341
6	Hard Disk/CD-ROM Cage	76H7331
7	3.5-Inch 1.44 MB Diskette Drive	75H9550
7	3.5-Inch 1.44 MB Diskette Drive-Japan	75H9552
	Diskette Drive Cable	76H7340
8	3.5-Inch Diskette Bracket	76H7330
9	Side Bracket	76H7329
10	Fan Assembly 80 mm	10L5501
10	Fan Assembly 80 mm (233, 266 MHz. Proc. only)	03K9541
11	Memory - 16 MB DIMM, Non-Parity	01K1104
11	Memory - 32 MB DIMM, Non-Parity	01K1105
11	Memory - 32 MB DIMM, ECC	01K1125
12	Processor Pentium II 233 MHz.	01K2165
12	Processor Pentium II 266 MHz.	01K2166
12	Intel Celeron™ Processor 266 MHz., no cache	01K4295
12	Processor Pentium II 233 MHz. ECC	01K2168
12	Processor Pentium II 266 MHz. ECC	01K2169
12	Processor Pentium II 300 MHz. ECC	01K4291
	Goal Posts - Processor support	02K2856
13	System Board (no processor, memory -- with guide rails and shield)	01K2145
	Guide Rail - system board	01K1610
	Lithium Battery	33F8354
	Jumper Kit	93F0067
14	Latch and Screw - system board	01K1612
15	Power Switch/LED Assembly Cage	03K9542
16	Riser Card	61H0499
	Front Riser Support Guide	02K2766
17	Chassis Assembly	01K1608
	Keylock Assembly	76H7336
	Foot (4)	93F2386
18	Side Panel	76H7333
19	145 Watt Power Supply	01K9846
19	145 Watt Power Supply - Japan	01K9848
	Audio Adapter	01K2154
	Ethernet Adapter	08L2566
	Cable, Wake On Ring	08L2559
	Misc. Screw Kit	93F0041

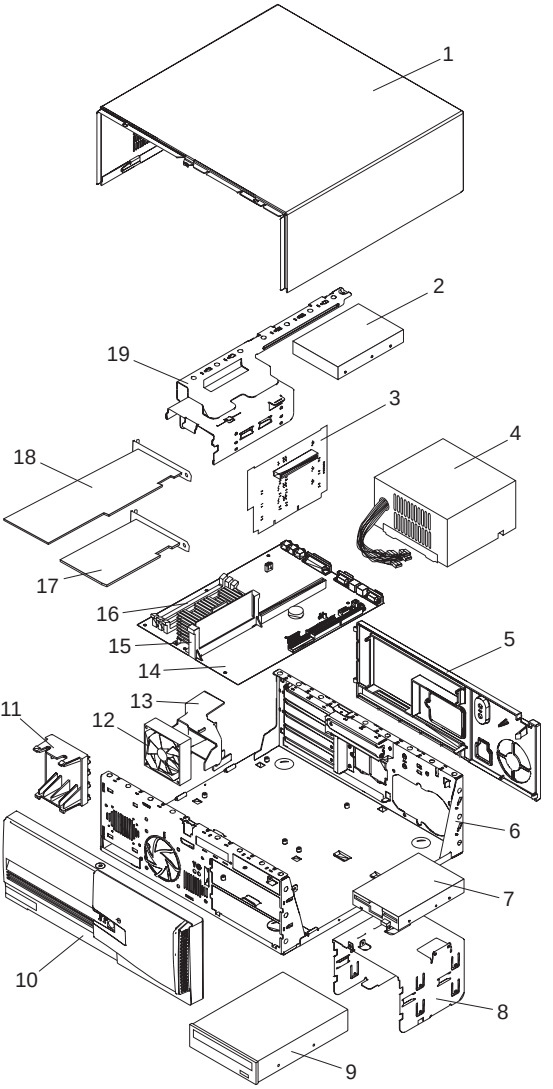
Type 6562 Parts



Parts Listing

Index	System (Type 6562)	FRU No.
1	Cover Assembly	76H7327
	Power Button	03K9729
2	EMC Shields	76H7338
3	2.5 GB EIDE Hard Disk Drive	76H5822
3	4.2 GB EIDE Hard Disk Drive	12J4574
	IDE Cable	76H7341
3	2.1 GB SCSI Hard Disk Drive	00K7913
3	4.3 GB SCSI Hard Disk Drive	00K7909
	SCSI Adapter Card - Adaptec	12J3094
	SCSI Data Cable	76H7343
	SCSI LED Cable	76H7344
4	CD-ROM Drive (24X Max)	12J3521
	IDE Cable, CD-ROM (1-drop)	12J3432
5	Hard Disk/CD-ROM Cage	76H7331
6	Audio Panel Assembly	76H7171
	Audio Cable	01K5680
7	3.5-Inch 1.44 MB Diskette Drive	75H9550
7	3.5-Inch 1.44 MB Diskette Drive-Japan	75H9552
	Diskette Drive Cable	76H7340
	Diskette Drive Power Cable	12J3431
8	3.5-Inch Diskette Bracket	76H7330
9	Side Bracket with Bumpers	76H7329
	Bumper Kit for Side Bracket	03K9732
10	System Board Guide Rail	76H7335
	Cable, Wake On Ring	76H7345
11	Processor Pentium MMX 166 MHz	76H7119
11	Processor Pentium MMX 200 MHz	76H5509
11	Processor Pentium MMX 233 MHz	02K2768
12	Memory - 16 MB DIMM, Non-Parity	01K1116
12	Memory - 32 MB DIMM, Non-Parity	01K1117
12	Memory - 16 MB DIMM, EDO ECC	01K1120
12	Memory - 32 MB DIMM, EDO ECC	01K1121
13	System Board (no processor, memory)	07L7353
	Lithium Battery	33F8354
	Jumper Kit	93F0067
14	Chassis Assembly	76H7328
	Keylock Assembly	76H7336
	Foot (4)	93F2386
	Bezel Kit	76H7339
	Bumper Kit	03K9732
	Misc. Screw Kit	93F0041
15	Fan/Speaker/Power Switch Assembly	76H7332
16	Riser Card	93H2831
	Riser Card Support	76H7334
17	Side Panel	76H7333
18	145 Watt Power Supply	12J5991
18	145 Watt Power Supply - Japan	12J5993

Type 6588, 6888 Parts

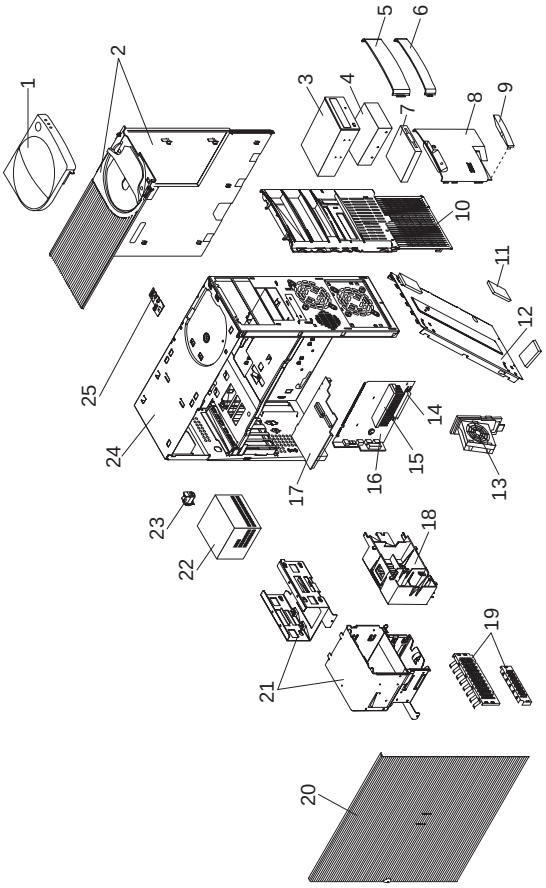


Parts Listing

Index	System (Type 6588, 6888)	FRU No.
1	Top Cover	
	(6588)	75H7986
	(6888)	12J6023
	Cover Latch (6588)	06H1783
	Cover Latch (6888)	12J6029
2	2.5 GB EIDE Hard Disk Drive (6588)	07H1123
2	4.2 GB EIDE Hard Disk Drive (6588)	76H5820
2	4.3 GB SCSI Hard Disk Drive (6588, 6888)	76H4616
	SCSI Cable (6588, 6888)	01K1459
	EIDE Cable (6588, 6888)	06H6326
3	Riser Card (6588, 6888)	12J3018
4	Power Supply-200W (6588, 6888)	12J5109
4	Power Supply-200W (Japan)	12J5111
5	Rear Fascia	
	(6588)	01K1689
	(6888)	12J6028
	Rear Panel I/O (6588, 6888)	06H9410
6	Base Frame Assembly (with labels) (6588, 6888)	12J3040
	Rear Panel D Shell (6588, 6888)	12J3023
	Serial Cable 9-pin (6588, 6888)	75H9218
	Power Switch and Cable (6588, 6888)	60G2258
	LED Cable Assembly, Dual - Power/Hard Disk (6588, 6888)	76H4463
	LED Cable Assembly, Hard Disk (6588, 6888)	93F2388
	LED Cable Assembly, Power (6588, 6888)	93F2389
	SCSI LED Cable (6588, 6888)	75H9217
	IR/Serial Cable (6588, 6888)	12J3025
	Security Switch and Cable Assembly (6588, 6888)	06H1788
	Keylock and Key (6588)	06H1776
	Keylock and Key (6888)	12J6027
	Bottom Cover (6888)	01K1652
	Pedestal (6888)	12J3038
7	Diskette Drive, 3.5-Inch, 1.44 MB	
	(6588)	93F2361
	(6888)	76H4091
	Diskette Drive Cable (6588, 6888)	06H6344
8	Bracket, 5.25-inch (6588, 6888)	06H9408
9	CD-ROM (16X Max)	
	(6588)	76H6101
	(6588, Models 53U, 53O, 72J, 73J only)	02K1152
	(6888)	02K1125
10	Front Bezel Assembly	
	(6588)	12J3021
	(6888)	12J3039
	Blank Drive Bezel 5.25-inch (6588)	06H5738
	Blank Drive Bezel 5.25-inch (6888)	12J6025
	Blank Drive Bezel 3.5-inch (6588)	06H5739
	Blank Drive Bezel (6588)	06H9411
	Blank Drive Bezel (6888)	01K1653
	Bezel, PCMCIA (6588)	06H1784
	Bezel, PCMCIA (6888)	12J6024
11	Card Guide (6588, 6888)	06H1779

Index	System (Type 6588, 6888)	FRU No.
12	Fan Assembly 80 mm (6588, 6888)	12J3020
13	Fan Duct (6588, 6888)	12J3022
13	Fan Duct (300 MHz Processor)	01K1894
14	System Board (no processor, memory) (6588, 6888). See page83 .	93H9700
14	System Board (no processor, memory) (6588, Model 11X). See page83 .	07L7120
	Cable, Audio-System Board to CD-ROM (6588, 6888)	75H9219
	Lithium Battery (6588, 6888)	33F8354
15	Processor, 233 MHz - 512 KB Cache (6588)	12J3019
15	Processor, 266 MHz - 512 KB Cache (6588, 6888)	12J3024
15	Processor with Fan Sink, 300 MHz - 512 KB Cache (6588, 6888)	01K1895
	Processor Retention Kit (6588, 6888) Kit includes: Retainer Bracket, System Board Plate, 6-Screws, Washers.	12J6030
16	Memory	
	32 MB DIMM, NP EDO (6588)	42H2797
	32 MB DIMM, ECC (6888)	42H2801
	64 MB DIMM, ECC (6888)	42H2829
17	SCSI Adapter (6588, 6888)	12J3094
	4 MB Video Adapter - Matrox (6588, 6888)	75H9227
18	Intergraph 3D Graphics Adapter (6888)	75H9225
19	Bracket, Hard File (6588, 6888)	06H9409
	EMC Shield (6588, 6888)	06H1782
	Foot (6588, 6888)	06H1773
	Misc. Screw Kit (6588, 6888)	93F0041
	Jumper Kit (6588, 6888)	93F0067

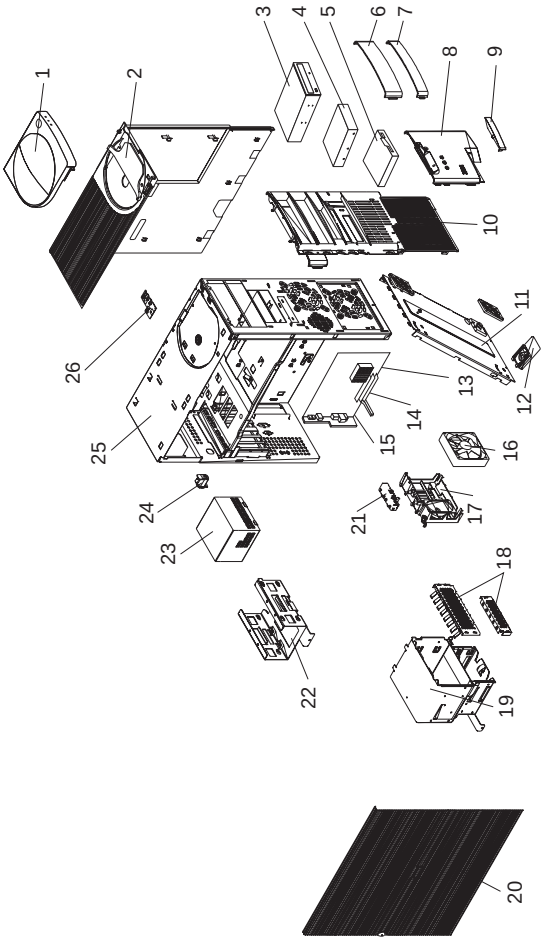
Type 6591 Parts



Parts Listing

Index	System (Type 6591)	FRU No.
1	Handle and Cap Assembly	12J4494
2	Top Cover Assembly	12J4509
3	CD-ROM Drive/32X	02K3412
3	CD-ROM Drive/32X (Models 74J, 75J, 76X)	02K1115
	Audio Cable, CD-ROM	75H9219
	IDE Cable, CD-ROM (1-drop)	03K9724
4	2.1 GB EIDE Hard Disk Drive	12J3141
4	4.2 GB EIDE Hard Disk Drive	12J3143
4	6.4 GB EIDE Hard Disk Drive	75H9921
	Hard Disk Cable, EIDE	12J4518
5	Miscellaneous Blank Bezel	12J4497
6	Miscellaneous Optional Bezel	12J4498
7	3.5-Inch 1.44 MB Diskette Drive	75H9550
7	3.5-Inch 1.44 MB Diskette Drive-Japan	75H9552
	Diskette Drive Cable	76H7340
8	Front Panel, 3.5-inch	01K1854
9	Model Plate	02K2832
10	Front Bezel	12J4495
11	Foot (4)	12J6294
12	Bottom panel	03K9602
13	Fan Assembly 80 mm	10L5501
13	80 mm Fan Assembly (233, 266 MHz. Proc. only)	03K9541
14	Memory - 32 MB DIMM, Non-Parity	01K1105
14	Memory - 64 MB DIMM, Non-Parity	01K1106
14	Memory - 64 MB DIMM, ECC	01K1126
15	Processor 233 MHz Pentium II	01K2165
15	Processor 266 MHz Pentium II	01K2166
15	Intel Celeron™ Processor 266 MHz., no cache	01K4295
15	Processor 300 MHz Pentium II ECC	01K4291
15	Processor 333 MHz Pentium II ECC	01K2167
16	System Board (no processor, memory -- with guide rails and shield)	01K2145
	Processor Support Posts	02K2856
	System Board Guide Rail	01K1610
	Lithium Battery	33F8354
17	Riser Card	61H0498
	Riser Support Clips, Front/Rear	02K2766
	Cable - Wake On Ring	08L2559
18	Card Guide	03K9605
19	EMC Kit	12J4508
20	Access Cover Assembly	12J4493
21	DASD Bracket 3.5-inch/5.25-inch and 3.5-inch Drive Bracket	03K9608
22	Power Supply (200W)	75H8991
22	Power Supply (200W) - Japan	76H4873
23	Keylock Assembly	12J5102
24	Base Frame Assembly	03K9610
	Latch and Screw, system board	01K1612
25	Power Switch/LED Cable Assembly	12J4510
	Audio Adapter	01K2154
	Wake On Ring LAN Cable	76H7345
	Miscellaneous Hardware Kit	03K9603
	Miscellaneous Screw Kit	93F0041
	Jumper Kit	93F0067

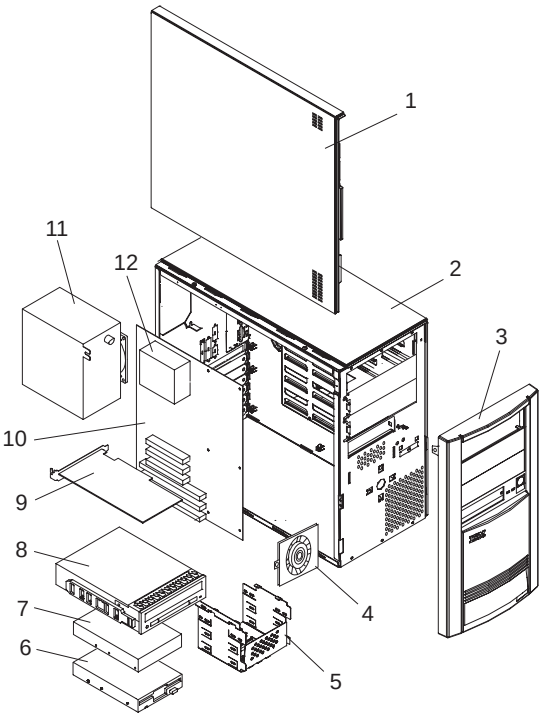
Type 6592 Parts



Parts Listing

Index	System (Type 6592)	FRU No.
1	Handle Cover	12J4494
2	Top Cover Assembly	12J4509
3	CD-ROM (24X Max)	12J3521
	CD-ROM Audio Cable	75H9219
4	2.5 GB EIDE Hard Disk Drive	76H5822
4	4.2 GB EIDE Hard Disk Drive	12J4574
	Hard Disk Cable, EIDE	12J4518
4	2.1 GB SCSI Hard Disk Drive	00K7913
4	4.3 GB SCSI Hard Disk Drive	00K7909
	SCSI Adapter Card - Adaptec	12J3094
	SCSI Data Cable	12J4513
	SCSI LED Cable	76H7344
5	3.5-Inch 1.44 MB Diskette Drive	75H9550
5	3.5-Inch 1.44 MB Diskette Drive-Japan	75H9552
	Diskette Drive Cable	76H7340
6	Miscellaneous Blank Bezel	12J4497
7	Miscellaneous Optional Bezel	12J4498
8	3.5-inch Bezel Assembly	12J4496
9	Model Plate	12J4499
10	Front Bezel	12J4495
11	Bottom panel	12J4504
12	Foot (4)	12J4506
13	Processor Pentium MMX 166 MHz	76H7119
13	Processor Pentium MMX 200 MHz	76H5509
13	Processor Pentium MMX 233 MHz	02K2768
14	Memory - 16 MB DIMM, Non-Parity	01K1116
14	Memory - 32 MB DIMM, Non-Parity	01K1117
14	Memory - 16 MB DIMM, EDO ECC	01K1120
14	Memory - 32 MB DIMM, EDO ECC	01K1121
15	System Board (no processor, memory)	07L7353
	Lithium Battery	33F8354
	Riser Card	93H7192
	Riser Card Support	76H7334
	Cable - Wake On Ring	76H7345
16	92 mm Fan Assembly	12J5536
17	Speaker, C2, Card Guide Assembly	12J4507
18	EMC Kit	12J4508
19	DASD Bracket 3.5-inch/5.25-inch	12J4501
20	Access Cover Assembly	12J4493
21	Audio, front Panel	12J4514
22	3.5-inch Drive Bracket	12J4502
23	Power Supply (200W)	75H8991
23	Power Supply (200W) - Japan	76H4873
24	Keylock Assembly	12J5102
25	Base Frame Assembly	12J4500
	Planar Side Guide Rail	76H7335
	Miscellaneous Hardware Kit	12J4503
	Miscellaneous Screw Kit	93F0041
	Jumper Kit	93F0067
26	Power Switch/LED Cable Assembly	12J4510

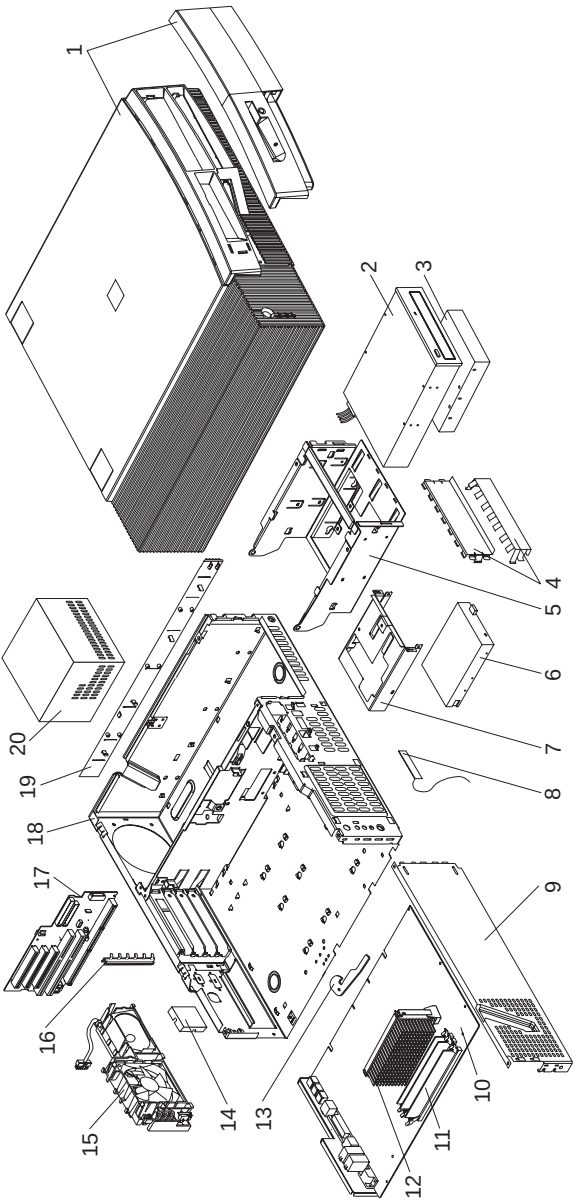
Type 6598 Parts



Parts Listing

Index	System (Type 6598)	FRU No.
1	Side Cover Access Panel	06H9673
2	Base Frame Assembly (with labels)	07H0164
	Rear Frame I/O Icon Label	07H0174
	System Board Label - Inside Cover	07H0173
	EMC Shield	07H0166
3	Front Bezel Assembly	06H9659
4	80 mm Fan Assembly	06H1796
5	DASD Mounting Tray	07H0165
	5.25-Inch Blank Bezel	07H0167
	Hard Disk Drive LED and Cable	06H9670
6	3.5-Inch 1.44 MB Diskette Drive	93F2361
	Diskette Drive Cable	06H6344
7	1.2GB IDE Hard Disk Drive	07H0383
	IDE Cable	06H6326
7	2.2GB SCSI Hard Disk Drive	06H8561
	U-SCSI PCI Cables	06H9674
8	CD-ROM (6X)	06H9431
	CD-ROM EMC Shields (2)	07H0171
	Software Recovery CD	07H1277
9	Matrox Graphics Adapter - PCI	06H9074
	Ultra-SCSI Adapter - PCI (Adaptec)	07H0141
	LED Cable (for Ultra-SCSI Adapter)	07H1278
10	System Board (no processor, memory)	06H9658
	Memory - 8 MB (72-Pin 60 ns Non-parity)	42H2776
	Memory - 16 MB (72-Pin 60 ns Non-parity)	42H2777
	Memory - 16 MB (72-Pin 60 ns Parity)	92G7294
	Lithium Battery	33F8354
11	Power Supply (200W)	06H9660
	Power Switch and Cable	06H9671
12	150 MHz Processor (without heat sink)	07H0163
12	200 MHz Processor (without heat sink)	07H1290
	Accessory Kit (4 Rails)	06H9672
	Miscellaneous Parts Kit	07H0170
	Jumper Kit	93F0067

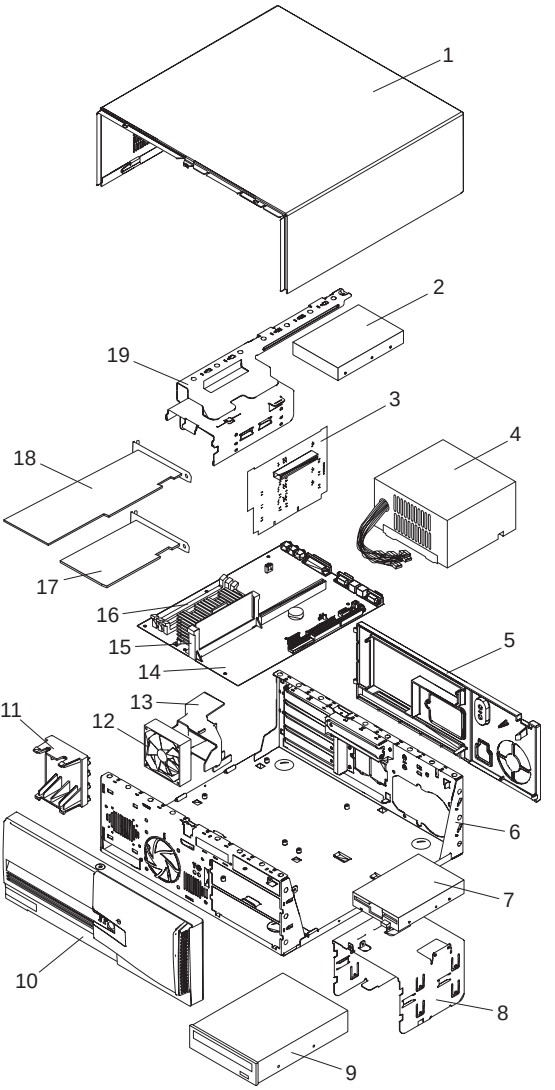
Type 6862 Parts



Parts Listing

Index	System (Type 6862)	FRU No.
1	Cover Assembly	01K1607
	Name Plate	03K9625
	(Order either of the below 32X Max CD-ROM drives)	
2	CD-ROM Drive (32X Max)	02K1115
2	CD-ROM Drive (32X Max)	02K3412
	IDE Cable, CD-ROM (1-drop)	03K9724
3	4.2 GB EIDE Hard Disk Drive	10L6011
3	6.4 GB EIDE Hard Disk Drive	10L6012
	IDE Cable	76H7341
3	4.5 GB SCSI Hard Disk Drive	10L6084
	SCSI Adapter Card - Adaptec	10L7095
	SCSI Data Cable	76H7343
	SCSI LED Cable	76H7344
4	EMC Shields	76H7338
5	Hard Disk/CD-ROM Cage	03K9641
6	1.44 MB 3.5-Inch Diskette Drive	75H9550
6	1.44 MB 3.5-Inch Diskette Drive-Japan	75H9552
	Diskette Drive Cable	76H7340
7	3.5-Inch Diskette Bracket	76H7330
8	RFID Antenna	03K9769
9	Side Bracket	76H7329
10	System Board (no processor, memory, rails)	20L0944
	System Board Guide Rails, center and front	03K9626
11	Memory - 32 MB DIMM, EDO ECC	01K1143
11	Memory - 32 MB DIMM, Non-Parity	01K1146
11	Memory - 64 MB DIMM, EDO ECC	01K1140
11	Memory - 64 MB DIMM, Non-Parity	01K1147
12	Processor Pentium II 266 MHz	02K2775
12	Processor Pentium II 300 MHz	01K4291
	Air Duct for 300 MHz. Processor only	03K9648
12	Processor Pentium II 333 MHz ECC	01K4327
12	Processor Pentium II 350 MHz	02K2776
12	Processor Pentium II 400 MHz	03K9672
13	Latch and Screw	01K1612
14	Card Blank Bracket (AGP Cover)	03K9623
15	Fan/Speaker/Power Switch Assembly	76H7332
16	I/O Bracket	03K9622
17	Riser Card	20L0970
	Riser Clips, front and rear	02K2766
18	Chassis Assembly	03K9621
19	Side Panel	76H7333
20	145 Watt Power Supply	01K9846
20	145 Watt Power Supply - Japan	01K9848
	Bezel Kit	76H7339
	Cable, Wake On Ring	76H7345
	Foot (4)	93F2386
	Jumper Kit	93F0067
	Keylock Assembly	03K9624
	Lithium Battery	33F8354
	Misc. Screw Kit	93F0041

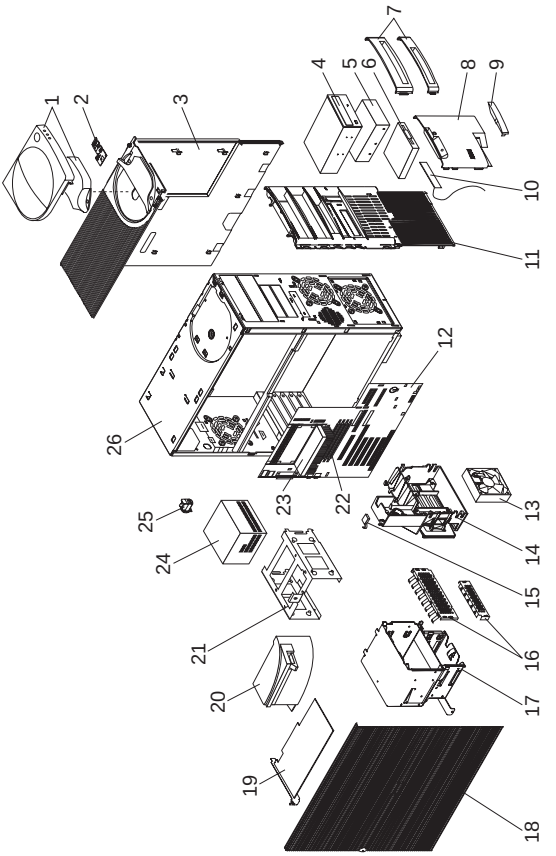
Type 6888 Parts



Note

See “Type 6588, 6888 Parts” on page 114 for Type 6888 parts listing.

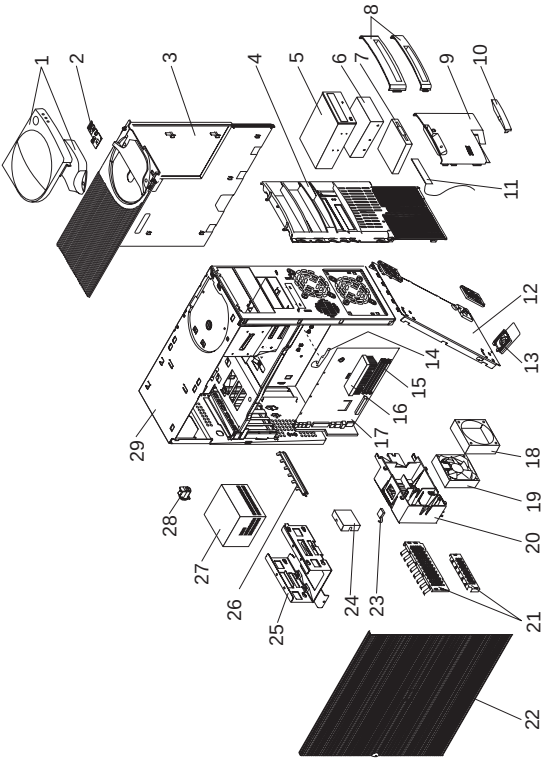
Type 6889 Parts



Parts Listing

Index	System (Type 6889)	FRU No.
1	Handle/Cap Assembly	12J5547
2	Power switch/LED Cable Assembly	12J4510
3	Top/Side Cover Assembly	01K1637
4	CD-ROM Drive 32X Max	02K1119
5	6.4 GB IDE Hard Disk Drive, 7200 RPM	10L6078
5	9.1 GB IDE Hard Disk Drive, 7200 RPM	10L6079
5	9.1 GB SCSI Hard Disk Drive, 7200 RPM	10L6085
6	3.5-In. 1.44 MB Diskette Drive	75H9550
6	3.5-In. 1.44 MB Diskette Drive - Japan	75H9552
7	Blank Louver Bezels (3.5-In. and 5.25-In.)	01K1888
	Miscellaneous Optional Bezels	12J5551
8	3.5-In. Bezel Assembly	12J5549
9	Model Plate	12J5552
10	RFID Antenna	03K9769
11	Front Bezel	12J5548
12	System Board-without processor or memory	93H9345
13	Fan Assembly 92 mm	02K2861
14	Card Guide	10L5607
15	C2 Switch Assembly	01K1495
16	EMC Kit	12J4508
17	3.5/5.25-In. Hard Disk Bracket	12J4501
18	Access Cover Assembly	12J5546
19	Video Adapter - Matrox Millenium	01K4340
19	Video Adapter - 3D PRO 3400/GA	01K4337
19	Video Adapter - 3D PRO 3400/T	01K4336
19	Video Adapter - Permedia 2V	01K4342
20	Air Baffle	02K2864
21	3.5-In. Hard Disk Bracket	12J4516
22	64 MB ECC DIMM Memory	01K4353
22	128 MB ECC DIMM Memory	01K4354
23	350 MHz Pentium II microprocessor	01K4333
23	400 MHz Pentium II microprocessor	01K4334
	Terminator Card, Processor	01K7349
	Processor Retainer Support Bracket Assembly	02K2903
24	Power Supply 330 W.	01K9866
25	Keylock Assembly	12J5102
26	Chassis Assembly	12J4515
	Cable - Audio CD-ROM	75H9219
	Cable - CD-ROM IDE	01K1483
	Cable - Diskette Drive	01K1541
	Cable - Hard Disk IDE	01K1553
	Cable - Intergraph	01K2035
	Cable - SCSI 2 Drop	01K1485
	Cable - SCSI 4 Drop	01K1481
	Foot (Qty 4)	12J4506
	Microphone	01K4910
	Miscellaneous Hardware Kit	12J4503
	Miscellaneous Screw Kit	93F0041
	Speaker	06H9417
	System Board EMC Shield	01K1855

Type 6892 Parts

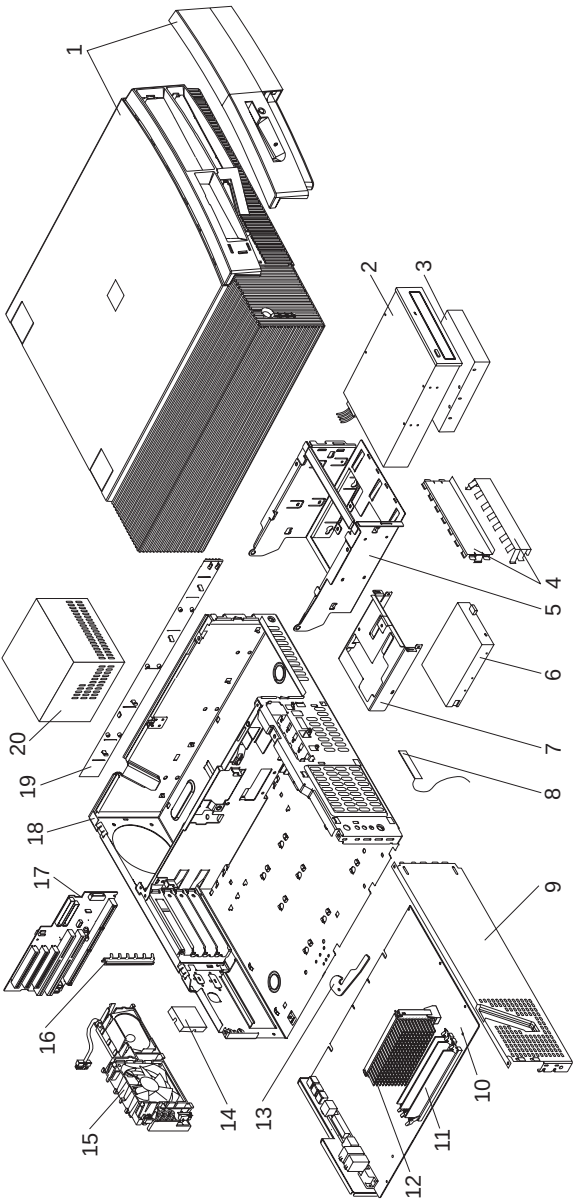


Parts Listing

Index	System (Type 6892)	FRU No.
1	Cover and Handle	12J4494
2	Power Switch/LED Cable Assembly	12J4510
3	Top Cover Assembly	12J4509
4	Front Bezel	12J4495
	(Order either 32X Max CD-ROM drives)	
5	CD-ROM (32X Max)	02K1115
5	CD-ROM (32X Max)	02K3412
	CD-ROM Audio Cable	75H9219
6	4.2 GB EIDE Hard Disk Drive	10L6011
6	6.4 GB EIDE Hard Disk Drive	10L6012
	Hard Disk Cable, EIDE	12J4518
6	4.5 GB SCSI Hard Disk Drive	10L6084
	SCSI Adapter Card - Adaptec	10L7095
	SCSI Data Cable	01K1467
	SCSI LED Cable	76H7344
7	1.44 MB, 3.5-Inch Diskette Drive	75H9550
7	1.44 MB, 3.5-Inch Diskette Drive-Japan	75H9552
	Diskette Drive Cable	76H7340
8	Louver Blank Bezel	01K1889
	Miscellaneous Optional Bezel	12J4498
9	3.5-inch Front Panel	01K1854
10	Model Plate	12J4499
11	RFID Antenna	03K9769
12	Bottom cover	03K9602
13	Foot (4)	12J4506
14	System Board Latch and Screw	01K1612
15	Memory - 32 MB DIMM, EDO ECC	01K1143
15	Memory - 32 MB DIMM, Non-Parity	01K1146
15	Memory - 64 MB DIMM, EDO ECC	01K1140
15	Memory - 64 MB DIMM, Non-Parity	01K1147
16	Processor Pentium II 266 MHz	02K2775
16	Processor Pentium II 300 MHz	01K4291
16	Processor Pentium II 333 MHz ECC	01K4327
16	Processor Pentium II 350 MHz	02K2776
16	Processor Pentium II 400 MHz	03K9672
17	System Board (no proc., memory, rails)	20L0944
	System Board Rail Set	03K9626
18	Fan Bracket	03K9606
19	60 mm Fan with rubber mounts (Open Bay, AAP models only)	10L5513
19	92 mm Fan with rubber mounts	02K2861
20	Speaker/Card Guide Assembly	03K9605
21	EMC Kit	12J4508
22	Access Cover Assembly	12J4493
23	C2 Switch Cable Assembly	01K1495
24	AGP Cover	03K9623
25	Hard Disk Drive Bracket	03K9608
26	I/O Clamp	03K9604
27	Power Supply (200W)	75H8991
27	Power Supply (200W) - Japan	76H4873
28	Keylock Assembly	12J5102
29	Base Frame Assembly	03K9609
	Cable - Wake On Ring	76H7345
	Lithium Battery	33F8354
	Miscellaneous Hardware Kit	03K9603
	Miscellaneous Screw Kit	93F0041
	Riser Card	20L0926

Index	System (Type 6892)	FRU No.
	Riser Supports (front and rear)	02K2766
	Speaker Assembly	03K9607

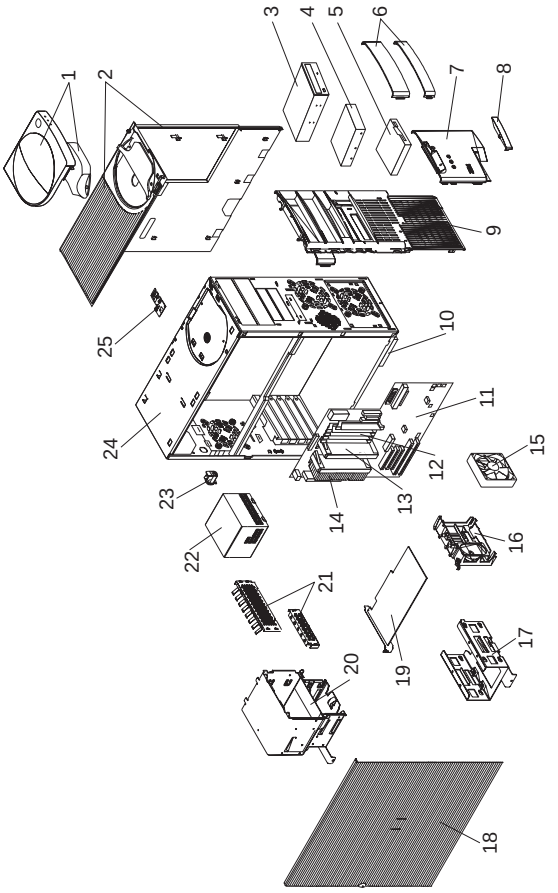
Type 6893 Parts



Parts Listing

Index	System (Type 6893)	FRU No.
1	Cover Assembly	02K2731
	Name Plate and Bezels Kit	03K9817
2	CD-ROM Drive (32X Max)	02K1119
	IDE Cable, CD-ROM (1-drop)	03K9724
3	6.4 GB EIDE 7200rpm Hard Disk Drive	10L6078
	IDE Cable	76H7341
3	4.5 GB SCSI 7200rpm Hard Disk Drive	10L6084
	SCSI Adapter Card - Adaptec	10L7095
	SCSI Data Cable	76H7343
	SCSI LED Cable	76H7344
4	EMC Shields 5.25-inch	76H7338
5	Hard Disk/CD-ROM Cage	03K9641
6	1.44 MB 3.5-Inch Diskette Drive	75H9550
6	1.44 MB 3.5-Inch Diskette Drive-Japan	75H9552
	Diskette Drive Cable	76H7340
7	3.5-Inch Diskette Bracket	76H7330
8	RFID Antenna	03K9769
9	Side Bracket	76H7329
10	System Board (no processor, memory, rails)	20L0944
	System Board Guide Rails, center and front	03K9626
11	Memory - 64 MB DIMM, EDO ECC	01K1140
11	Memory - 128 MB DIMM, EDO ECC	01K1141
12	Processor Pentium II 350 MHz	02K2776
12	Processor Pentium II 400 MHz	03K9672
13	Latch and Screw	01K1612
14	Card Blank Bracket (AGP Cover)	03K9623
15	Fan/Speaker/Power Switch Assembly	76H7332
16	I/O Bracket	03K9622
17	Riser Card	20L0970
	Riser Clips, front and rear	02K2766
18	Chassis Assembly	03K9818
19	Side Panel	02K2728
20	145 Watt Power Supply	01K9846
20	145 Watt Power Supply - Japan	01K9848
	Cable, Wake On Ring	76H7345
	Foot (4)	93F2386
	Jumper Kit	93F0067
	Keylock Assembly	03K9624
	Lithium Battery	33F8354
	Matrox Millenium Video Card	01K4326
	Misc. Screw Kit	93F0041
	Permedia 2V Video Card	01K4331

Type 6898 Parts

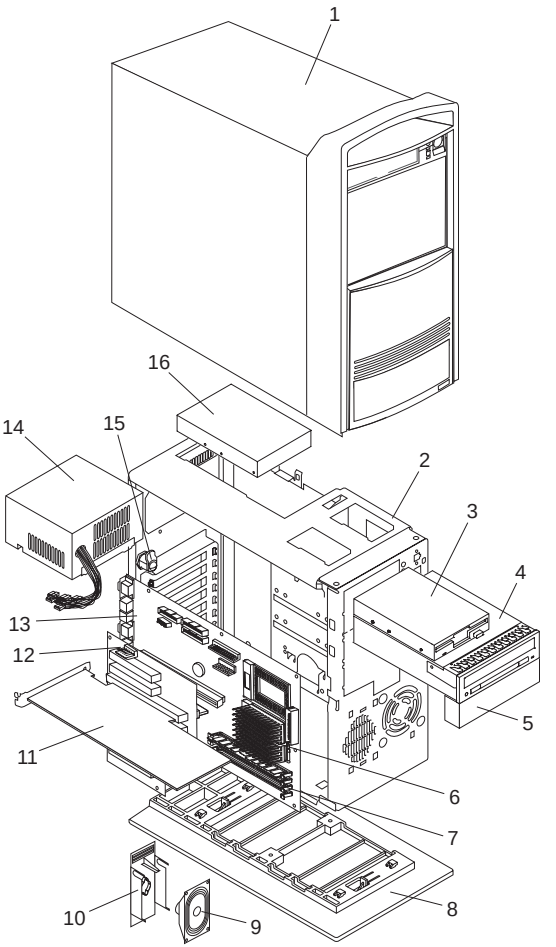


Parts Listing

Index	System (Type 6898)	FRU No.
1	Handle/Cap Assembly	12J5547
2	Top/Side Cover Assembly	01K1637
	(Order either of the below 24X Max CD-ROM drives that match the FRU number of the drive being replaced)	
3	CD-ROM Drive 24X Max	12J3525
3	CD-ROM Drive 24X Max	12J3527
4	4.2 GB Hard Disk Drive EIDE	02K1146
4	4.5 GB Hard Disk Drive SCSI	00K7929
4	6.4 GB IDE Hard Disk Drive	75H9921
4	6.4 GB EIDE Hard Disk Drive	10L6078
4	9.1 GB Hard Disk Drive SCSI	02K1141
5	3.5-In. 1.44 MB Diskette Drive	75H9550
5	3.5-In. 1.44 MB Diskette Drive - Japan	75H9552
6	Blank Louver Bezels (3.5-In. and 5.25-In.)	01K1888
7	3.5-In. Bezel Assembly	12J5549
8	Name Plate	12J5552
9	Front Bezel	12J5548
10	Foot (Qty 4)	12J4506
11	System Board with SCSI onboard adapter-without processor or memory	93H7269
11	System Board (for 333 MHz Models)	08L0046
	Processor Retainer Support Kit	03K9570
12	32 MB ECC DIMM Memory	01K1125
12	64 MB ECC DIMM Memory	01K1126
12	128 MB ECC DIMM Memory	01K1127
13	Terminator Card, Processor	12J2701
14	233 MHz Processor	12J2700
14	266 MHz Processor	12J2703
14	300 MHz Processor	01K2109
14	333 MHz Processor	01K2167
15	Fan Assembly 92 mm	02K2861
16	Card Guide	10L5607
	Speaker	06H9417
17	3.5-In. Hard Disk Bracket	12J4516
18	Access Cover Assembly	12J5546
19	Video Adapter - Permedia II	01K2069
19	Video Adapter - 3D PRO 2200/T	01K2014
19	Video Adapter - Matrox Millenium	01K4340
20	3.5/5.25-In. Hard Disk Bracket	12J4501
21	EMC Kit	12J4508
22	Power Supply 330 W.	01K9858
23	Keylock Assembly	12J5102
24	Chassis Assembly	12J4515
25	Power/LED Panel Cable Assembly	12J4510
	Air Baffle	02K2864
	C2 Switch Assembly	01K1495
	Cable - Audio CD-ROM	75H9219
	Cable - CD-ROM IDE	01K1475
	Cable - Diskette Drive	76H4228
	Cable - Hard Disk IDE	12J4518
	Cable - SCSI 2 Drop	01K1499
	Cable - SCSI 4 Drop	01K1497
	Cable - SCSI LED	76H7344
	Cable - Wake On Ring	76H7345
	Miscellaneous Blank Bezels	12J5550

Index	System (Type 6898)	FRU No.
	Miscellaneous Hardware Kit including card guide	12J4503
	Miscellaneous Optional Bezels	12J5551
	System Board EMC Shield	01K1855

Type 6899 Parts

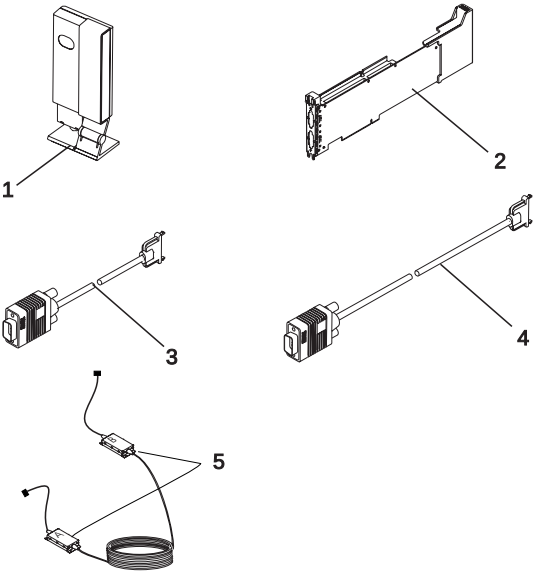


Parts Listing

Index	System (Type 6899)	FRU No.
1	Cover	12J3028
	Front Bezel Assembly	12J3027
2	Base Frame Assembly (with labels)	12J3029
	Power Switch and Cable	60G2258
	Dual LED Cable Assembly, Hard Disk/Power	93F2389
	Serial Port B Connector and Cable Assembly	75H9218
	92 mm Fan Assembly	12J3035
3	3.5-Inch 1.44 MB Diskette Drive	76F4091
	Diskette Drive Cable	06H6344
	(Order either of the below 16X Max CD-ROM drives)	
4	CD-ROM (16X Max)	02K1125
4	CD-ROM (16X Max)	76H6107
5	5.25-Inch Blank Bezel	12J3030
	3.5-Inch Blank Bezel	12J3031
6	Processor, Pentium Pro-200 MHz - 256 KB Cache	75H9212
6	Processor, Pentium Pro-200 MHz - 512 KB Cache (Model 17X)	12J3036
	Voltage Regulator Card	07H1097
7	Memory - 32 MB DIMM, EDO ECC	42H2801
7	Memory - 64 MB DIMM, EDO ECC	42H2829
8	Pedestal	76H1735
9	Speaker and Cable	01K1479
10	Card Guide	75H9222
11	Intergraph 3D Graphics Adapter	75H9225
	4 MB Video Adapter - Matrox	75H9227
	Ethernet Adapter, Intel 10/100	12J3123
	Ultra-SCSI Adapter - PCI (Adaptec)	12J3094
	LED Cable (for Ultra-SCSI Adapter)	75H9217
12	Riser Card	60H9503
13	System Board (no processor, memory)	93H3593
	Cable, Auxiliary Power Extension	76H6766
	Cable, Wake-Up on LAN	07H0447
	Cable, Audio - System Board to CD-ROM	75H9219
	Lithium Battery	33F8354
14	Power Supply (200W)	12J5109
14	Power Supply (200W) - Japan	12J5111
15	Keylock and Key	61G2177
16	2.1 GB SCSI Hard Disk Drive	07H1119
16	4.5 GB SCSI Hard Disk Drive	76H2697
	SCSI Cable	06H9674
	IDE Cable	06H6326
	SCSI LED Cable	75H9217
	EMC Clips DASD/FDD	12J3033
	Miscellaneous Hardware Kit	12J3032
	Mounting Screw Kit	93F0041
	Jumper Kit	93F0067

Common Parts

Wireless LAN Adapter (ISA, Micro Channel Bus)



Index	*Wireless LAN (ISA, Micro Channel Bus)*	
1	Radio Module, Australia	80G2708
1	Radio Module, EMEA (Non-Europe)	80G2714
1	Radio Module, ETSI Countries	80G2702
1	Radio Module, Finland	25H0988
1	Radio Module, France	80G2706
1	Radio Module, Japan	80G2703
1	Radio Module, Korea	80G2715
1	Radio Module, Mexico	80G2705
1	Radio Module, New Zealand	80G2704
1	Radio Module, Singapore	80G2709
1	Radio Module US/Canada/Non-EMEA	80G2701
2	IBM Wireless LAN Controller Card	80G2700
2	IBM Wireless LAN Controller Card, No-Cipher	80G2711
3	1.5 m cable	80G2713
4	4 m cable	54G2016
5	Custom Cable Kit	80G4320

Computer Power Cords

Arabic Countries	14F0033
Australia	93F2365
Belgium	1339520
Bulgaria	1339520
Canada	93F2364
Czechoslovakia	1339520
Denmark	13F9997
Finland	1339520
France	1339520
Germany	1339520
Hungary	1339520
Israel	14F0087
Italy	14F0069
Latin-America	93F2366
Netherlands	1339520
New Zealand	93F2365
Norway	1339520
Poland	1339520
Portugal	1339520
Serbia	1339520
Slovakia	1339520
South Africa	14F0015
Spain	1339520
Switzerland	1339520
Switzerland (French, German)	14F0051
U.S.	93F2364
UK, Ireland	14F0033
Yugoslavia	1339520

Display Power Cord	38F3908

Display and Monitor Information

Display and monitor information is separately available and is listed under “Related Publications” on page iv.

Mouse

Mouse (6272, 6275, 6282, 6285, 6561, 6562, 6588, 6591, 6592)	76H5080
Mouse Ball and Lid (6272, 6275, 6282, 6285, 6561, 6562, 6588, 6591, 6592)	07H0664
Mouse	06H4595
Mouse Ball and Clip (Twist-off)	06H4585
Mouse (6862, 6892)	12J4546
Mouse Ball and Clip (6862, 6892)	12J4547
Mouse, 3 button (6888, 6889, 6893, 6898, 6899)	76H6620
Mouse Ball/Roller (6888, 6889, 6893, 6898, 6899)	76H6619

Keyboards (TrackPoint II)

US English	82G3282
Pointing Stick Caps	66G6444
Canadian/French	82G3286
Latin/Spanish	82G3284

Keyboards (IBM Basic II)

Arabic	06H5256
Belgian-French	06H5257
Belgian-UK/Dutch	06H5258
Brazil/Portugal	06H5692
Bulgarian	06H5259
Chinese/US	06H5291
Czech	06H5260
Danish	06H5261
Dutch	06H5262
French	06H5264
French/Canadian	06H5691
German 129	06H5265
German 453	06H5689
Greek	06H5266
Hebrew	06H5267
Hungarian	06H5268
Icelandic	06H5269
Italian	06H5270
Korea	06H5286
Latin/Spanish	06H5690
Norwegian	06H5272
Polish	06H5273
Portuguese	06H5274
Romanian	06H5275
Russian/Cyrillic	06H5276
Serbian/Cyrillic	06H5277
Slovak	06H5278
Spanish	06H5279
Swiss/Finnish	06H5263
Swiss (French/German)	06H5280
Taiwan	06H5288
Thailand	06H5287
Turkish 179	06H5281
Turkish 440	06H5282
UK English	06H5283
US English	06H5305
Yugoslavia/Lithuania	06H5285

Keyboards (IBM Basic, 101-Key Rubberdome)

Arabic	71G4617
Belgian-French	71G4618
Belgian-UK/Dutch	71G4639
Bulgarian	71G4619
Czech	71G4620
Danish	71G4621
Dutch	71G4622
Swiss/Finnish	71G4623
French	71G4624
French/Canadian	06H2963
German	71G4625
Greek	71G4626
Hebrew	71G4627
Hungarian	71G4628
Icelandic	71G4629
Italian	71G4630
Latin/Spanish	82G3291
Norwegian	71G4631
Polish	71G4632
Portuguese	71G4633
Romanian	71G4634
Russian/Cyrillic	71G4635
Serbian/Cyrillic	71G4636
Slovak	71G4637
Spanish	71G4638
Swiss French/German	71G4640
Turkish 179	71G4642
Turkish 440	82G3255
UK English	71G4643
US English	71G4646
Yugoslavia/Lithuania	71G4647

Keyboards (IBM Enhanced, 101-Key Buckling Spring)

Arabic	1391490
Belgian	1391414
Bulgarian	1399583
Czech	1399570
Danish	1391407
Dutch	1391511
Farsi	52G9811
Finnish	1391411
French	1391402
French/Canadian	82G3280
German	1391403
Greek	1399046
Hebrew	1391408
Hungarian	1399581
Icelandic (with Cap Set 1391495)	1391407
Italian	1393395
Latin/Spanish	82G3294
Norwegian	1391409
Polish	1399580
Portuguese	1391410
Romanian	1399582
Russian/Cyrillic	1399579
Serbian/Cyrillic	1399578
Slovak	1399571
South African	1396790
Spanish	1391405
Swedish	1391411
Swiss - French/German	1391412
Turkish 179	1393286
Turkish 440	8125409
UK English	1391406
US English	82G3278
US English - EMEA	1396790
Yugoslavia/Lithuania	1393669

Keyboards (IBM Enhanced, 101-Key Buckling Spring) (Type 6877, 6887)

Brazil/Portugal (104-Key)	42H1297
French/Canadian (102-Key)	42H1299
Latin/Spanish (102-Key)	42H1298
US English (101-Key)	42H1296

Keyboards (104-Key)

Arabic	07H0673
Belgian-French	07H0674
Belgian-UK/Dutch	07H0675
Brazil/Portugal	07H0672
Bulgarian	07H0676
Chinese	07H0705
Czech	07H0677
Danish	07H0678
Dutch	07H0679
French	07H0680
French/Canadian	07H0668
German	07H0681
German (2137 Standard)	07H0682
Greek	07H0683
Hebrew	07H0684
Hungarian	07H0685
Icelandic	07H0686
Italian	07H0687
Korea	07H0706
Japan	07H0704
Latin/Spanish	07H0670
Norwegian	07H0688
Polish	07H0689
Portuguese	07H0690
Romania	07H0691
Russian	07H0693
Russian/Cyrillic	07H0692
Serbian/Cyrillic	07H0694
Slovak	07H0695
Spanish	07H0696
Swiss/Finnish	07H0697
Swiss French/German	07H0698
Thailand	07H0707
Turkish (ID 179)	07H0699
Turkish (ID 440)	07H0700
UK English	07H0701
US English	07H0666
US English (ISO 9995 Compliant)	07H0703
Yugoslavia/Lithuania	07H0702

Keyboards PC NEXT Pearl White (Type 6275, 6285, 6561, 6591, 6862, 6892)

Arabic	02K0815
Belgian-French	02K0816
Belgian-UK/Dutch	02K0817
Brazil/Portugal	02K0814
Bulgarian	02K0818
Chinese	02K0845
Czech	02K0819
Danish	02K0820
Dutch	02K0821
French	02K0822
French/Canadian-ID 058	02K0808
French/Canadian-ID 445	02K0810
German	02K0823
Greek	02K0824
Hebrew	02K0825
Hungarian	02K0826
Icelandic	02K0827
Italian	02K0828
Japan	02K0844
Latin/Spanish	02K0812
Norwegian	02K0829
Polish	02K0830
Portuguese	02K0831
Romania	02K0832
Russian	02K0833
Serbian/Cyrillic	02K0834
Slovak	02K0835
Spanish	02K0836
Swed/Finn	02K0837
Swiss French/German	02K0838
Thailand	02K0847
Turkish (ID 179)	02K0839
Turkish (ID 440)	02K0840
UK English	02K0841
US English	02K0806
UK English (ISO Compliant)	02K0843
Yugoslavia	02K0842

Keyboards (IntelliStation Type 6888, 6899)

Arabic	76H0903
Belgian-French	76H0904
Belgian-UK/Dutch	76H0905
Brazil/Portugal	76H0902
Bulgarian	76H0906
Chinese	76H0934
Czech	76H0907
Danish	76H0908
Dutch	76H0909
EMEA Blank - 104 key	76H0937
EMEA Blank - 105 key	76H0938
French	76H0910
French/Canadian	76H0898
German	76H0939
Greek	76H0912
Hebrew	76H0913
Hungarian	76H0914
Icelandic	76H0915
Italian	76H0916
Korea	76H0935
Japan	76H0933
Latin/Spanish	76H0900
Norwegian	76H0917
Polish	76H0918
Portuguese	76H0919
Romania	76H0920
Russian	76H0922
Russian/Cyrillic	76H0921
Serbian/Cyrillic	76H0923
Slovak	76H0924
Spanish	76H0925
Swedish	76H0926
Swiss French/German	76H0927
Thailand	76H0936
Turkish (ID 179)	76H0928
Turkish (ID 440)	76H0929
UK English	76H0930
US English	76H0896
US English (ISO 9995 Compliant)	76H0932
Yugoslavia/Lithuania	76H0931

Keyboards PC NEXT Gray (Type 6889, 6893, 6898)

Arabic	02K0870
Belgian-French	02K0871
Belgian-UK/Dutch	02K0872
Brazil/Portugal	02K0869
Bulgarian	02K0873
Chinese/US	02K0900
Czech	02K0874
Danish	02K0875
Dutch	02K0876
French	02K0877
French/Canadian-ID 058	02K0863
French/Canadian-ID 445	02K0865
German	02K0878
Greek	02K0879
Hebrew	02K0880
Hungarian	02K0881
Icelandic	02K0882
Italian	02K0883
Korea	02K0901
Japan	02K0899
Latin/Spanish	02K0867
Norwegian	02K0884
Polish	02K0885
Portuguese	02K0886
Romania	02K0887
Russian	02K0888
Serbian/Cyrillic	02K0889
Slovak	02K0890
Spanish	02K0891
Swed/Finn	02K0892
Swiss French/German	02K0893
Thailand	02K0902
Turkish (ID 179)	02K0894
Turkish (ID 440)	02K0895
UK English	02K0896
US English	02K0861
UK English (ISO Compliant)	02K0898
Yugoslavia/Lithuania	02K0897

Special Tools

The following tools are required to service these computers:

- A volt-ohm meter, IBM P/N 73G5404
- Wrap Plug, IBM P/N 72X8546
- Video cache extracting tool, IBM P/N 73G5523
- T15 Torx bit from Torx bit set, IBM P/N 93F2830

Reference Information

Safety Notices (Multi-lingual Translations)

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

- English
- Brazilian/Portuguese
- Chinese
- French
- German
- Hungarian
- Italian
- Russian
- Slovakian
- Spanish

Caution Notice 1

Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, then disconnect any interconnecting cables.

Antes de remover qualquer unidade substituível no local (Field Replaceable Unit - FRU), desligue o computador, retire todos os cabos de alimentação das respectivas tomadas eléctricas, remremova a pilha (se instalada) e, em seguida, desconecte todos os cabos de interligação.

在拆除任何 FRU 之前，关闭计算机电源，从电源插座拔去所有电线，拆除电池（假如有安装），然后才拆接任何互连电缆。

Avant de retirer une unité remplaçable en clientèle, mettez le système hors tension, débranchez tous les cordons d'alimentation des socles de prise de courant, retirez la batterie et déconnectez tous les cordons d'interface.

Die Stromzufuhr muß abgeschaltet, alle Stromkabel aus der Steckdose gezogen, der Akku entfernt und alle Verbindungskabel abgenommen sein, bevor eine FRU entfernt wird.

A helyszínen cserélhetõ egységek eltávolítása elõtt kapcsolja ki a számítógépet, húzza ki a konnektorból a hálózati csatlakozót, majd távolítsa el az összekötõ kábeleket is.

Prima di rimuovere qualsiasi FRU, spegnere il sistema, scollegare dalle prese elettriche tutti i cavi di alimentazione, rimuovere la batteria e poi scollegare i cavi di interconnessione.

Перед тем, как снимать FRU, выключите питание компьютера, отсоедините все кабели питания от электрических розеток, снимите блок батарей, затем отсоедините все кабели.

Pred vybratím FRU, vypnite počítač, odpojte všetky najpájacie káble z elektrických zásuviek, vyberte batérie /v prípade,že sú nainštalované/ potom rozpojte prepojovacie káble.

Antes de quitar una FRU, apague el sistema, desenchufe todos los cables de las tomas de corriente eléctrica, quite la batería y, a continuación, desconecte cualquier cable de conexión entre dispositivos.

Caution Notice 2

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

A pilha de lítio representa risco de incêndio, explosão ou queimaduras graves. Não recarregue, desmonte ou exponha a pilha a temperaturas superiores a 100°C (212°F), não a incinere ou ponha o conteúdo da respectiva célula em contacto com a água nem remova o respectivo conector polarizado. Destrua a pilha de acordo com as normas ou regulamentações locais. Utilize apenas a pilha com o "part-number" indicado nas listas apropriadas. A utilização de uma pilha incorrecta pode resultar na ignição ou explosão da mesma.

锂电池可以引起火警、爆炸、或严重烧伤。请不要把它再充电，拆除两极分化的连接物，拆散、加热超过 100°C (212°F)，焚化、或把电池内含物暴露于水中。根据本地的条例或规则把电池处理。电池只可以使用于名单适当的部件。不正确的使用电池可以导致电池燃烧或爆炸。

Elle présente des risques d'incendie, d'explosion ou de brûlures graves. Ne la rechargez pas, ne retirez pas son connecteur polarisé et ne la démontez pas. Ne l'exposez pas à une temperature supérieure à 100°C, ne la faites pas brûler et n'en exposez pas le contenu à l'eau. Mettez la pile au rebut conformément à la réglementation en vigueur. Une pile inappropriée risque de prendre feu ou d'exploser.

Die Systembatterie ist eine Lithiumbatterie. Sie kann sich entzünden, explodieren oder schwere Verbrennungen hervorrufen. Batterien dieses Typs dürfen nicht aufgeladen, zerlegt, über 100 C erhitzt oder verbrannt werden. Auch darf ihr Inhalt nicht mit Wasser in Verbindung gebracht oder der zur richtigen Polung angebrachte Verbindungsstecker entfernt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

Caution Notice 2 Continued

A lítiumelemek meggyulladhatnak, tûz- és robbanásveszélyesek. Ezért ne próbálkozzon az elemek újratöltésével, a csatlakozók eltávolításával, ne kísérletezzen a széjjelszedésükkel ! Óvja õket a 100°C (212°F) fölötti hõmérséklettõl, ne dobja õket tûzbe, és vigyázzon, hogy az elemek cellái ne érintkezhessenek vízzel ! A használt elemeket a helyi hatósági rendelkezéseknek megfelelõen kezelje.

La batteria di supporto e una batteria al litio e puo incendiarsi, esplodere o procurare gravi ustioni. Evitare di ricaricarla, smontarne il connettore polarizzato, smontarla, riscaldarla ad una temperatura superiore ai 100 gradi centigradi, incendiarla o gettarla in acqua. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Литиевая батарея может вызвать пожар, взрыв или серьезный ожог. Не перезаряжайте ее, не снимайте полюсный разъем, не разбирайте ее, не нагревайте выше 100 градусов Цельсия, не поджигайте и не мочите.
Использованный блок батарей можно помещать в отходы только в соответствии с национальным законодательством или нормативами. При замене блока батарей разрешается использовать только батареи, указанные в списке комплектующих. Использование несоответствующей батареи может привести к ее взрыву или загоранию.

Litiové batérie môžu spôsobiť požiar, explóziu alebo vzplanutie. Nenabíjať, neodstraňovať polarizované konektory, nerozoberať, neohrievať nad 100 C, nespaľovať, alebo vystavovať obsah článkov vode.

La bateria de repuesto es una bateria de litio y puede provocar incendios, explosiones o quemaduras graves. No la recargue, ni quite el conector polarizado, ni la desmonte, ni caliente por encima de los 100°C (212°F), ni la incinere ni exponga el contenido de sus celdas al agua. Deséchela tal como dispone la normativa local.

Safety Information

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

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.**
- Asset ID allows the computer to be scanned by various radio frequency emitting devices supplied by independent companies. Asset ID is intended for use only with radio frequency equipment that meets ANSI/IEEE C95.1 1992 RF Radiation Limits.

Safety Inspection Guide

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

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

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).

- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

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

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
   a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
   b. The power cord should be the appropriate type as specified in the parts listings.
   c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling Electrostatic Discharge-Sensitive Devices

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

Notes:

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

When handling ESD-sensitive parts:

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

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

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

Grounding Requirements

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

Laser Compliance Statement

Some IBM Personal Computer models are equipped from the factory with a CD-ROM drive. CD-ROM drives are also sold separately as options. The CD-ROM drive is a laser product. The CD-ROM drive is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

When a CD-ROM drive is installed, note the following.

CAUTION:

Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

O uso de controles, ajustes ou desempenho de procedimentos diferentes daqueles aqui especificados pode resultar em perigosa exposição à radiação.

凡未在这里指明的任何控制用法、调整、行为，

都会导致严重后果。

Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites.

Werden Steuer- und Einstellelemente anders als hier festgesetzt verwendet, kann gefährliche Laserstrahlung auftreten.

Az itt előírt eljárásoktól, beállításoktól és vezérlésektől eltérni a lézersugárzás veszélye miatt kockázatos !

L'utilizzo di controlli, regolazioni o l'esecuzione di procedure diverse da quelle specificate possono provocare l'esposizione a

Использование элементов настройки и выполнение процедур иных, чем указано здесь, может привести к опасному радиационному облучению.

Použitie kontrôl, úprav alebo iných vykonaní od iných výrobcov, ako je v tomto špecifikované, mohlo by mať za následok nebezpečenstvo vystavenia sa vyžiarovaniu.

El uso de controles o ajustes o la ejecución de procedimientos distintos de los aquí especificados puede provocar la exposición a radiaciones peligrosas.

Opening the CD-ROM drive could result in exposure to hazardous laser radiation. There are no serviceable parts inside the CD-ROM drive. **Do not open.**

Some CD-ROM drives contain an embedded Class 3A or Class 3B laser diode. Note the following.

DANGER:

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

Radiação por raio laser ao abrir. Não olhe fixo no feixe de luz, não olhe diretamente por meio de instrumentos óticos e evite exposição direta com o feixe de luz.

开启时会有激光发射时，请勿盯视激光光束，请勿直接查看视觉仪器，并且避免直接接触在激光光束之中。

Rayonnement laser si carter ouvert. Évitez de fixer le faisceau, de le regarder directement avec des instruments optiques, ou de vous exposer au rayon.

Laserstrahlung bei geöffnetem Gerät. Nicht direkt oder über optische Instrumente in den Laserstrahl sehen und den Strahlungsbereich meiden.

Kinyitáskor lézersugár ! Ne nézzen bele se szabad szemmel, se optikai eszközökkel. Kerülje a sugárnyalábbal való érintkezést !

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

Открывая, берегитесь лазерного излучения. Не смотрите на луч, не разглядывайте его с помощью оптических инструментов, а также избегайте прямого воздействия лазерного луча.

Keď je laserová jednotka otvorená. Vyhnite sa priamemu pohľadu a nehľadte priamo s optickými nástrojmi do ľúča a vyhnite sa priamemu vystaveniu ľúčov.

Radiación láser al abrir. No mire fijamente ni examine con instrumental óptico el haz de luz. Evite la exposición directa al haz.

Product Description

The PC 300/700 Series and IntelliStation computers are available in either 3x2, 3x3, 4x4, 5x5, 6x6 or 6x7 models as follows:

Type 6272 Three drive bays, two I/O adapter slots

Type 6282, 6284 Four drive bays, four I/O adapter slots

Type 6275 Four drive bays, four I/O adapter slots

Type 6285 Six drive bays, six I/O adapter slots

Type 6X7X Three drive bays, three I/O adapter slots

Type 6560 Four drive bays, four I/O adapter slots

Type 6561 Four drive bays, four I/O adapter slots

Type 6562 Four drive bays, four I/O adapter slots

Type 6588 Five drive bays, five I/O adapter slots

Type 6X8X Five drive bays, five I/O adapter slots

Type 6591 Six drive bays, six I/O adapter slots

Type 6592 Six drive bays, six I/O adapter slots

Type 6598 Six drive bays, six I/O adapter slots

Type 6862 Four drive bays, four I/O adapter slots, one AGP adapter slot

Type 6888 Five drive bays, five I/O adapter slots

Type 6889 Six drive bays, six I/O adapter slots

Type 6892 Six drive bays, six I/O adapter slots, one AGP adapter slot

Type 6893 Four drive bays, four I/O adapter slots, one AGP adapter slot

Type 6898 Six drive bays, six I/O adapter slots

Type 6899 Six drive bays, seven I/O adapter slots

- **Security**
  - Administrator password
  - Cover lock (Optional for some models)
  - Power-on password
  - Operating system password
  - U-bolt and cable (Optional for some models)
  - C2 security on some models
- **CMOS backup battery (Lithium)**
- **Common parts**
  (Varies with each model, see “Type/Model Number Conversion” on page 399.)
  - Diskette drive (Except for Type 6272, Models 88X, 89X, 90X, 91X)
  - Hard disk drive
  - Keyboard
  - Power supply
  - Mouse

Specifications Information (ISO/ANSI)

The model specifications information on the following pages was determined in controlled acoustical environments according to procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779, and are reported in accordance with ISO 9296. Actual sound pressure levels in your location might differ from the average values stated because of room reflections and other nearby noise sources. The declared sound power levels indicate an upper limit, below which a large proportion of machines will operate.

Specifications Type 6272

Feature	Description
Size	Depth: 400 mm (15.8 in.) Height: 95 mm (3.7 in.) Width: 369 mm (14.5 in.)
Weight	Minimum: 6.8 kg (15.0 lb) Maximum: 8.16 kg (18.0 lb)[4]
Environment	Air temperature: - System on: 10° to 32° C (50° to 95°F) - System off: 10° to 43° C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 110 BTU (35 watts) - Maximum: 273 BTU (80 watts)[5] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 100 V ac - Maximum: 127 V ac High range input voltage: - Minimum: 200 V ac - Maximum: 240 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.30 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 38 dB idle At bystander position (1 meter): - 37 dB operating - 33 dB idle Declared (upper limit) sound power levels: - 5.1 bels operating - 4.8 bels idle

4 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

5 Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

6 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6275

Feature	Description
Size	Depth: 450 mm (17.7 in.) Height: 128 mm (5.0 in.) Width: 450 mm (17.7 in.)
Weight	Minimum: 9.9 kg (22.0 lb) Maximum: 11.3 kg (25.0 lb)[7]
Environment	Air temperature: - System on: 10° to 32° C (50° to 90°F) - System off: 10° to 43° C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 245 BTU (70 watts) - Maximum: 700 BTU (204 watts)[8]
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 37 dB operating - 34 dB idle At bystander position (1 meter): - 32 dB operating - 29 dB idle Declared (upper limit) sound power levels: - 4.9 bels operating - 4.5 bels idle

7 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

8 Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

9 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6282, 6284

Feature	Description
Size	Depth: 420 mm (16.5 in.) Height: 110 mm (4.3 in.) Width: 440 mm (17.3 in.)
Weight	Minimum: 9.07 kg (20.0 lb) Maximum: 11.30 kg (25.0 lb)[10]
Environment	Air temperature: - System on: 10° to 32° C (50° to 95°F) - System off: 10° to 43° C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 120 BTU (35 watts) - Maximum: 685 BTU (200 watts)[11] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 100 V ac - Maximum: 127 V ac High range input voltage: - Minimum: 200 V ac - Maximum: 240 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.30 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 38 dB idle At bystander position (1 meter): - 37 dB operating - 33 dB idle Declared (upper limit) sound power levels: - 5.1 bels operating - 4.8 bels idle

10 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

11 Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

12 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6285

Feature	Description
Size	Depth: 445 mm (17.5 inches) Height: 492 mm (19.4 inches) Width: 200 mm (7.9 inches)
Weight	Weight: 15 kg (33 lb) Maximum: 17.3 kg (38 lb)[13]
Environment	Air temperature: - System on: 10° to 32°C (50° to 90°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 245 BTU (70 watts) - Maximum: 969 BTU (285 watts)[14]
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.51 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 35 dB operating - 33 dB idle At bystander position (1 meter): - 32 dB operating - 29 dB idle Declared (upper limit) sound power levels: - 4.8 bels operating - 4.3 bels idle

13 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

14 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

15 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6X7X

Feature	Description
Size	Depth: 450 mm (17.7 in.) Height: 130 mm (5.1 in.) Width: 360 mm (14.2 in.)
Weight	Minimum: 8.6 kg (19.0 lb) Maximum: 10.4 kg (23.0 lb)[16]
Environment	Air temperature: - System on: 10° to 32° C (50° to 95°F) - System off: 10° to 43° C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 120 BTU (35 watts) - Maximum: 685 BTU (200 watts)[17] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 100 V ac - Maximum: 125 V ac High range input voltage: - Minimum: 200 V ac - Maximum: 240 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.30 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 43 dB idle At bystander position (1 meter): - 40 dB operating - 40 dB idle Declared (upper limit) sound power levels: - 5.0 bels operating - 4.8 bels idle

16 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

17 Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

18 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6X8X

Feature	Description
Size	Depth: 448 mm (17.6 in.) Height: 160 mm (6.3 in.) Width: 420 mm (16.5 in.)
Weight	Minimum: 12.7 kg (28.0 lb) Maximum: 14.1 kg (31.0 lb)[19]
Environment	Air temperature: - System on: 10° to 32°C (50° to 90°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 120 BTU (35 watts) - Maximum: 1060 BTU (310 watts)[20] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 110 V ac - Maximum: 125 V ac High range input voltage: - Minimum: 200 V ac - Maximum: 240 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 43 dB idle At bystander position (1 meter): - 40 dB operating - 40 dB idle Declared (upper limit) sound power levels: - 5.0 bels operating - 4.8 bels idle

19 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

20 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

21 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6560

Feature	Description
Size	Depth: 420 mm (16.53 inches) Height: 102 mm (4.0 inches) Width: 440 mm (17.32 inches)
Weight	Minimum: 8.0 kg (17.61 lb) Maximum: 10.0 kg (22.0 lb)[22]
Environment	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 120 BTU (35 watts) - Maximum: 685 BTU (200 watts)[23] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 110 V ac - Maximum: 125 V ac High range input voltage: - Minimum: 200 V ac - Maximum: 240 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 43 dB idle At bystander position (1 meter): - 40 dB operating - 40 dB idle Declared (upper limit) sound power levels: - 5.0 bels operating - 4.8 bels idle

22 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

23 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

24 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6561

Feature	Description
Size	Depth: 450 mm (17.8 in.) Height: 128 mm (5.0 in.) Width: 450 mm (17.7 in.)
Weight	Minimum: 9.9 kg (22.0 lb) Maximum: 11.3 kg (25.0 lb)[25]
Environment	Air temperature: - System on: 10° to 32° C (50° to 90°F) - System off: 10° to 43° C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 170 BTU (50 watts) - Maximum: 700 BTU (204 watts)[26]
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.11 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 38 dB operating - 34 dB idle At bystander position (1 meter): - 33 dB operating - 28 dB idle Declared (upper limit) sound power levels: - 4.9 bels operating - 4.6 bels idle

25 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

26 Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

27 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6562

Feature	Description
Size	Depth: 450 mm (17.8 in.) Height: 128 mm (5.0 in.) Width: 450 mm (17.7 in.)
Weight	Minimum: 9.9 kg (22.0 lb) Maximum: 11.3 kg (25.0 lb)[28]
Environment	Air temperature: - System on: 10° to 32° C (50° to 90°F) - System off: 10° to 43° C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 120 BTU (35 watts) - Maximum: 700 BTU (204 watts)[29]
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.51 cubic meters/minute (18 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 41 dB operating - 36 dB idle At bystander position (1 meter): - 35 dB operating - 29 dB idle Declared (upper limit) sound power levels: - 5.1 bels operating - 4.8 bels idle

28 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

29 Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

30 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6588

Feature	Description
Size	Depth: 475 mm (18.7 inches) Height: 157 mm (6.2 inches) Width: 419 mm (16.5 inches)
Weight	Weight: 14.1 kg (31.0 pounds)[31]
Environment	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 120 BTU (35 watts) - Maximum: 700 BTU (204 watts)[32] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 38 dB idle At bystander position (1 meter): - 37 dB operating - 33 dB idle Declared (upper limit) sound power levels: - 5.3 bels operating - 4.9 bels idle

31 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

32 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

33 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6589

Feature	Description
Size	Depth: 455 mm (17.9 in.) Height: 160 mm (6.3 in.) Width: 420 mm (16.5 in.)
Weight	Minimum: 12.7 kg (28.0 lb) Maximum: 14.1 kg (31.0 lb)[34]
Environment	Air temperature: - System on: 10° to 32°C (50° to 90°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 120 BTU (35 watts) - Maximum: 1060 BTU (310 watts)[35] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 38 dB operating - 43 dB idle At bystander position (1 meter): - 33 dB operating - 37 dB idle Declared (upper limit) sound power levels: - 5.3 bels operating - 4.9 bels idle

34 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

35 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

36 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6591

Feature	Description
Size	Depth: 445 mm (17.5 inches) Height: 492 mm (19.4 inches) Width: 200 mm (7.9 inches)
Weight	Weight: 15 kg (33 lb) Maximum: 17.3 kg (38 lb)[37]
Environment	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 170 BTU (50 watts) - Maximum: 969 BTU (285 watts)[38]
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.11 kVA - Maximum: 0.70 kVA
Airflow	Approximately 0.57 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 36 dB operating - 34 dB idle At bystander position (1 meter): - 32 dB operating - 29 dB idle Declared (upper limit) sound power levels: - 4.8 bels operating - 4.6 bels idle

37 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

38 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

39 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6592

Feature	Description
Size	Depth: 445 mm (17.5 inches) Height: 492 mm (19.4 inches) Width: 200 mm (7.9 inches)
Weight	Weight: 15 kg (33 lb) Maximum: 17.3 kg (38 lb)[40]
Environment	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 120 BTU (35 watts) - Maximum: 969 BTU (285 watts)[41]
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.51 kVA
Airflow	Approximately 0.57 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 38 dB operating - 35 dB idle At bystander position (1 meter): - 33 dB operating - 30 dB idle Declared (upper limit) sound power levels: - 5.1 bels operating - 4.8 bels idle

40 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

41 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

42 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6598

Feature	Description
Size	Depth: 460 mm (18.0 inches) Height: 405 mm (16.0 inches) Width: 210 mm (8.3 inches)
Weight	Weight: 13.4 kg (29.5 pounds)[43]
Environment	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 120 BTU (35 watts) - Maximum: 1060 BTU (310 watts)[44] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 110 V ac - Maximum: 125 V ac High range input voltage: - Minimum: 200 V ac - Maximum: 240 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 43 dB idle At bystander position (1 meter): - 40 dB operating - 40 dB idle Declared (upper limit) sound power levels: - 5.0 bels operating - 4.8 bels idle

43 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

44 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

45 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6862

Feature	Description
Size	Depth: 450 mm (17.7 in.) Height: 128 mm (5.0 in.) Width: 450 mm (17.7 in.)
Weight	Minimum: 9.9 kg (22.0 lb) Maximum: 11.3 kg (25.0 lb)[46]
Environment	Air temperature: - System on: 10° to 32° C (50° to 90°F) - System off: 10° to 43° C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 245 BTU (70 watts) - Maximum: 700 BTU (204 watts)[47]
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 37 dB operating - 34 dB idle At bystander position (1 meter): - 32 dB operating - 29 dB idle Declared (upper limit) sound power levels: - 4.9 bels operating - 4.5 bels idle

46 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

47 Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

48 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6888

Feature	Description
Size	Depth: 475 mm (18.7 inches) Height: 450 mm (17.7 inches) Width: 259 mm (10.2 inches) with pedestal
Weight	Weight: 14.1 kg (31.0 pounds)[49]
Environment	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 120 BTU (35 watts) - Maximum: 700 BTU (204 watts)[50] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 38 dB idle At bystander position (1 meter): - 37 dB operating - 33 dB idle Declared (upper limit) sound power levels: - 5.3 bels operating - 4.9 bels idle

49 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

50 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

51 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6889

Feature	Description
Size	Depth: 445 mm (17.5 inches) Height: 492 mm (19.4 inches) Width: 200 mm (7.9 inches)
Weight	- Maximum (as shipped): Weight: 17.3 kg (38 pounds)[52]
Environment	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Maximum (as shipped): 306 BTU (90 watts)[53]
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Maximum (as shipped): 0.75 kVA
Airflow	Approximately 0.92 cubic meters/minute (32.5 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 42 dB operating - 37 dB idle At bystander position (1 meter): - 36 dB operating - 34 dB idle Declared (upper limit) sound power levels: - 5.2 bels operating - 5.0 bels idle

52 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

53 Maximum power and heat specifications are based on the 330-watt maximum capacity of the system power supply.

54 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6892

Feature	Description
Size	Depth: 445 mm (17.5 inches) Height: 492 mm (19.4 inches) Width: 200 mm (7.9 inches)
Weight	Weight: 15 kg (33 lb) Maximum: 17.3 kg (38 lb)[55]
Environment	Air temperature: - System on: 10° to 32°C (50° to 90°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 245 BTU (70 watts) - Maximum: 969 BTU (285 watts)[56]
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.51 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 35 dB operating - 33 dB idle At bystander position (1 meter): - 32 dB operating - 29 dB idle Declared (upper limit) sound power levels: - 4.8 bels operating - 4.3 bels idle

55 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

56 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

57 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6893

Feature	Description
Size	Depth: 450 mm (17.7 in.) Height: 128 mm (5.0 in.) Width: 450 mm (17.7 in.)
Weight	Minimum: 9.9 kg (22.0 lb) Maximum: 11.3 kg (25.0 lb)[58]
Environment	Air temperature: - System on: 10° to 32° C (50° to 90°F) - System off: 10° to 43° C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 245 BTU (70 watts) - Maximum: 700 BTU (204 watts)[59]
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 37 dB operating - 34 dB idle At bystander position (1 meter): - 32 dB operating - 29 dB idle Declared (upper limit) sound power levels: - 4.9 bels operating - 4.5 bels idle

58 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

59 Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

60 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6898

Feature	Description
Size	Depth: 445 mm (17.5 inches) Height: 492 mm (19.4 inches) Width: 200 mm (7.9 inches)
Weight	Weight: 17.3 kg (38 pounds)[61]
Environment	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Maximum (as shipped): 306 BTU (90 watts)[62] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Maximum (as shipped): 0.70 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 46 dB operating - 42 dB idle At bystander position (1 meter): - 40 dB operating - 36 dB idle Declared (upper limit) sound power levels: - 5.5 bels operating - 5.1 bels idle

61 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

62 Maximum power and heat specifications are based on the 330-watt maximum capacity of the system power supply.

63 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6899

Feature	Description
Size	Depth: 427 mm (16.8 inches) Height: 429 mm (16.9 inches) Width: 241 mm (9.5 inches) with pedestal
Weight	Weight: 12.9 kg (28.5 pounds)[64]
Environment	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 43°C (50° to 110°F) Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 2134 m (7000 ft)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 137 BTU (40 watts) - Maximum: 785 BTU (230 watts)[65] - Deep sleep: 15 BTU (4 watts)
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Minimum: 0.08 kVA - Maximum: 0.52 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 46 dB operating - 42 dB idle At bystander position (1 meter): - 40 dB operating - 36 dB idle Declared (upper limit) sound power levels: - 5.5 bels operating - 5.1 bels idle

64 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.

65 Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

66 For additional information, see the *ISO Supplier's Declaration* available from IBM.

Security Features

Security features in this section include:

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

Passwords

The following 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 “Setup Utility Program” on page 220 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 do the following:

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 Layouts” on page 322 and locate the system board type you are servicing. Depending on the system board, the password is reset by a jumper or switch block.
3. Move the password jumper to connect the center pin and the pin on the opposite end of the connector; or, change the switch setting as appropriate.
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 and to reset the switch setting.
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 Configuration/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 6862, 6892, 6889, has 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 Configuration/Setup Utility program.

For PC 700 computers, the administrator password is set by jumpering an administrator password control jumper, which can be on the riser card or the system board.

Note: The administrator password control jumper **will not** remove the password.

Administrator Password Control Jumper on Riser Card: Refer to "Riser Card Layouts" on page 388 for PC 700 Series riser cards that have an administrator password control jumper. Pins shown on the riser card are jumpered in the default (D) position.

Jumper Position	Results
1-2 (D)	Administrator Password **can** be set
2-3	Administrator password **cannot** be set

Administrator Password Control Jumper/Switch on System Board: Refer to "System Board Layouts" on page 322 and locate the system board type you are servicing. Depending on the system board, the password is set by a jumper or switch block.

Important

PC 700 Series Only:
If the Administrator Password is lost or forgotten, the password cannot be changed or removed. If this occurs, the system board must be replaced and the customer charged accordingly.

PC 300 Series and IntelliStation:
The Administrator Password can be reset on PC 300 Series and IntelliStation computers.

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 201.

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. MIF is used on Type:

- 6561, 6591
- 6562, 6592,
- 6862, 6892,
- 6889

At the time of computer manufacture, the EPROM (located on the riser card) 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 RTC CD 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:

1. Click **Start** from the desktop, then **Programs**.
2. Select **IBM SystemView Agent**.
3. Select **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 is supported on these computer Types:

- 6862, 6892
- 6889, 6893

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:

- Cover removed
- Processor(s) removed
- Computer disconnected from the network
- Computer unplugged from the power outlet
- Voltage out of specifications
- Temperature out of specifications
- Fan speed out of specifications
- 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.

AssetCare

AssetCare is supported on these computer Types:

- 6862, 6892
- 6889, 6893

AssetCare is part of the security software that allows the reading and tracking of computer and user data in the EEPROM. The EEPROM is a dual port device that can be accessed through a wireless RF interface or standard system bus.

With an appropriate RF reader, the RFID data can be read even with the system still in the box.

With a DMI compliant software and the AssetCare software installed, read/write access to the EEPROM data via the keyboard is available.

The 256-byte data fields in the EEPROM are as follows:

- Serial number (read only, RF)
- Configuration data (read only, RF)
- User area (read/write)
  - Lease information
  - Asset information
  - Owner information
  - Warranty information
  - User defined fields (5)

AssetCare Enablement can be enabled or disabled under **System Security** in Setup/Configuration Utility. Disabling AssetCare will disable the RF read/write functions to the EEPROM.

Asset ID

Asset ID is supported on these computer Types:

- 6862, 6892
- 6889, 6893

Asset ID is the application of using radio frequency technology to communicate with the AssetCare EEPROM described above. Asset ID assists customers in performing electronic property pass, system deployment, and physical inventory applications using radio frequency equipment from third party vendors. The electronic property pass application can be set so that if unauthorized removal of the PC from the enterprise occurs an administrator password is required during the next boot up of the system.

Asset ID Enablement can be enabled or disabled under **System Security** in Setup/Configuration Utility.

Note

Disabling both AssetCare and Asset ID will disable the RF antenna testing during POST and will not cause a POST error 184 (No RFID Antenna).

Hard Disk Drive Jumper Settings

IDE hard disk drives for the PC 300/700 series computers use jumpers to set the drives as primary (master) or secondary (slave).

For SCSI hard disk drives, see “SCSI Hard Disk Drive Settings” on page 196.

Attention

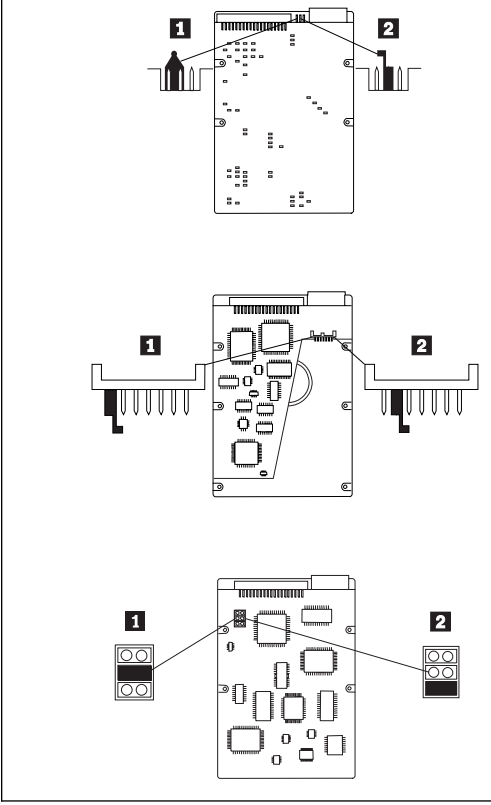
For drives not listed below, refer to the label on the hard disk drive for the hard disk drive settings.

IDE Hard Disk Drive Settings

1 Primary (Master) Hard Disk Drive

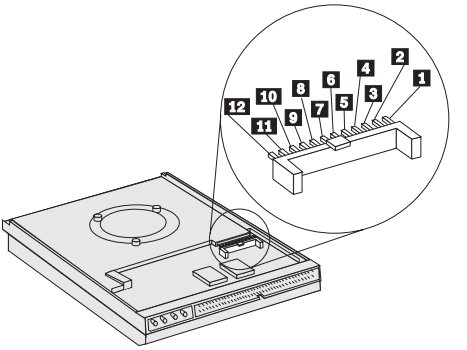
2 Secondary (Slave) Hard Disk Drive

IDE Drives



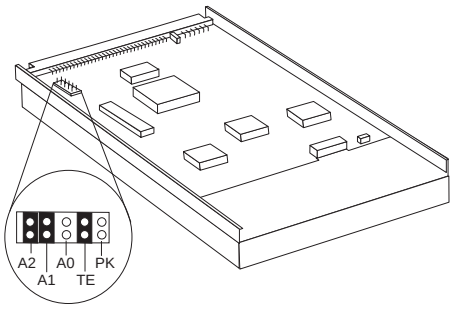
SCSI Hard Disk Drive Settings

540 MB SCSI



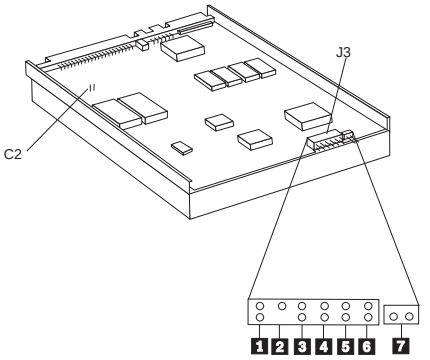
SCSI ID	Position 1 2 3	SCSI ID	Position 1 2 3
6	: ▮ ▮	2	: ▮ :
5	▮ : ▮	1	▮ : :
4	: : ▮	0	: : :
3	▮ ▮ :		

1 GB SCSI



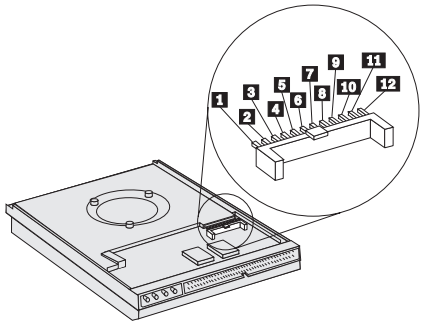
SCSI ID	Position A2 A1 A0	SCSI ID	Position A2 A1 A0
7	On On On	3	Off On On
6	On On Off	2	Off On Off
5	On Off On	1	Off Off On
4	On Off Off	0	Off Off Off

1.12 GB, 2.25 GB SCSI



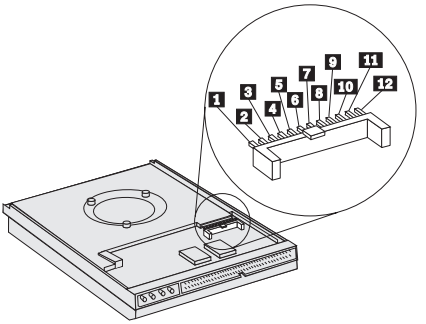
SCSI ID	Position 4 3 2 1	SCSI ID	Position 4 3 2 1
0	: : : :	8	: : : ▮
1	▮ : : :	9	▮ : : ▮
2	: ▮ : :	10	: ▮ : ▮
3	▮ ▮ : :	11	▮ ▮ : ▮
4	: : ▮ :	12	: : ▮ ▮
5	▮ : ▮ :	13	▮ : ▮ ▮
6	: ▮ ▮ :	14	: ▮ ▮ ▮
7	—Reserved—	15	▮ ▮ ▮ ▮

2 GB SCSI



SCSI ID	Position 4 3 2	SCSI ID	Position 4 3 2
6	: ▮ ▮	2	: ▮ :
5	▮ : ▮	1	▮ : :
4	: : ▮	0	: : :
3	▮ ▮ :		

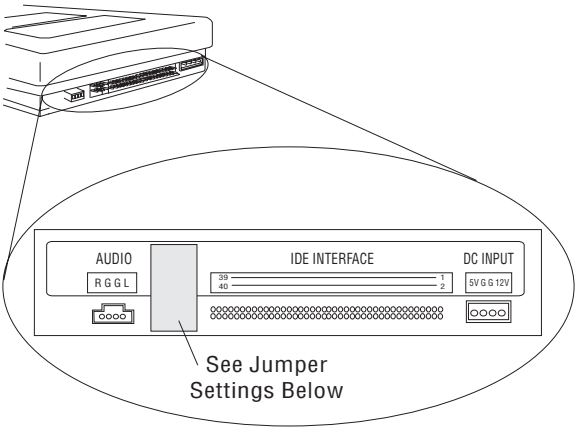
2.1 GB, 4.5 GB SCSI



SCSI ID	Position 4 3 2 1	SCSI ID	Position 4 3 2 1
0	: : : :	8	: : : ▮
1	▮ : : :	9	▮ : : ▮
2	: ▮ : :	10	: ▮ : ▮
3	▮ ▮ : :	11	▮ ▮ : ▮
4	: : ▮ :	12	: : ▮ ▮
5	▮ : ▮ :	13	▮ : ▮ ▮
6	: ▮ ▮ :	14	: ▮ ▮ ▮
7	—Reserved—	15	▮ ▮ ▮ ▮

CD-ROM, PD/CD-ROM Drive Jumper Settings

CD-ROM and PC/CD-ROM drives use jumpers or tabs to set the drives as primary (master) or secondary (slave). Refer to the drive connector labels or the figures below for the drive settings.



CD-ROM, PD/CD-ROM Type	Primary (Master)	Secondary (Slave)
2X CD-ROM FRU 06H5906	: : ▮ : :	: ▮ : : :
4X CD-ROM FRU 06H7654	: : ▮ : :	: ▮ : : :
6X CD-ROM	: : ▮	: ▮ :
8X CD-ROM	: : ▮	: ▮ :
6X PD/CD-ROM	: : ▮	: ▮ :
16X Max CD-ROM	: : ▮	: ▮ :
24X Max CD-ROM	: : ▮	: ▮ :
32X Max CD-ROM	: : ▮	: ▮ :

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.pc.ibm.com/us/**
  2. PC PartnerInfo-Technical Database (CTSTIPS.NSF)
  3. Bulletin Board System (BBS)
  4. HelpCenter
  5. Levels 1 and 2 Support
  6. RETAIN
- Sources for obtaining the latest level BIOS available.
  1. IBM PC Company Home Page **http://www.pc.ibm.com/us/**
  2. PC PartnerInfo-Technical Database (CTSTIPS.NSF)
  3. Bulletin board system (BBS)
  4. HelpCenter
  5. Levels 1 and 2 Support

To update (flash) the BIOS, see “Flash (BIOS/VPD) Update Procedure” on page 201.

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 your 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 or switch enables you to restart the system and recover the BIOS.

To perform a Flash/BIOS recovery using the Boot Block jumper:

1. Power-off the computer and remove the cover.
2. Move the system board Boot Block jumper or switch to the **recover** position. Refer to “System Board Layouts” on page 322 or the information 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 your 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 Boot Block jumper or switch to the **normal** position. Then, replace the cover and power-on the computer.

PC 360-S150 (Type 6598) Flash Recovery Jumper

Attention

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

To perform a Flash/BIOS recovery:

1. Power-off the computer and remove the cover.
2. Move the system board Flash jumper from pins 23-24 to pins 22-23. Refer to “PC 360-S150 (Type 6598) - Pentium Pro 150/200 MHz Jumper Settings” on page 356 for more information.
3. Insert the upgrade diskette into the diskette drive.
4. Power-on the computer and listen to the speaker. You should hear beeps in the following sequence.
   a. After you restart the computer, it beeps once. This beep marks the beginning of the power-on self test (POST).
   b. After a short delay (less than 10 seconds), the computer beeps again. This marks the beginning of the recovery process; the recovery code is being copied into the flash component.
   c. After about 30 seconds, the computer beeps twice, marking the end of the recovery process. Wait until the diskette drive in-use light goes out.
5. Power-off the computer and move the jumper back to the normal (default) position.
6. Leave the upgrade diskette in the diskette drive and power-on the computer.
7. Continue with the original upgrade.

Diagnostics and Test Information

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

- Power-on self-test (POST)
- POST Beep Codes
- Error Code Format
- Diagnostic Test Programs
  - IBM PC Enhanced Diagnostics (For all Types, except 6571, 6581, 6573, 6583, 6875, 6885)
  - PC 300/700 Series, IntelliStation Diagnostics (Only for Types 6571, 6581, 6573, 6583, 6875, 6885)

Power-On Self-Test (POST)

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:

- 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 your operating system or application program appears.

Note

Type 6275, 6285, 6561, 6591, 6862, 6889, 6892, 6893 computers are 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:

1. Enable **Power on Status** in setup. See “Setup Utility Program” on page 220.

If the POST detects a problem, an error message appears on your 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.

POST Beep Codes

The Power On Self-Test generates a beeping sound to indicate successful completion of POST or to indicate that the tests detect an error.

One beep and the appearance of text on the display indicates successful completion of the POST. More than one beep indicates that the POST detects an error.

Note

Type 6275, 6285, 6561, 6591, 6862, 6889, 6892, 6893 computers are 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:

1. Enable **Power on Status** in setup. See "Setup Utility Program" on page 220.

Error Code Format

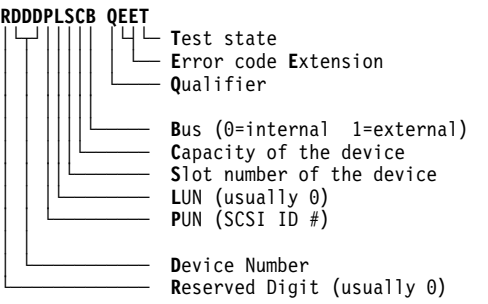
This section provides an explanation of the encoded non-SCSI and SCSI POST error codes.

Error messages are displayed on the screen as three, four, five, eight, twelve, or thirteen digits. An "X" in an error message can be any number or letter. The shorter POST errors are highlighted in the Symptom-to-FRU Index. Some digits will represent different information for SCSI errors versus non-SCSI errors.

The following figure shows which digits display the shorter POST errors. The figure also defines additional SCSI information.

Notes

- Non-IBM device error codes and documentation supersede this list.
- Duplicate SCSI ID settings will cause misleading error symptoms or messages.



Diagnostics Test Programs

There are now two diagnostics programs that you can use to service the IBM PC 300/700 Series, IntelliStation computers.

- IBM PC Enhanced Diagnostics, developed by Watergate Software with IBM Advanced Memory Diagnostics.
- PC300/700 Series, IntelliStation Diagnostics, developed by Diagsoft for IBM.

> **Note**
>
> See “General Checkout (Type 6272 Models 88X, 89X, 90X, 91X)” on page 5 for diagnostic options and procedures for these Type 6272 (disketteless) models.

IBM PC Enhanced Diagnostics: The IBM PC Enhanced Diagnostics programs use a full range of diagnostic utilities to determine the operating condition of the computers hardware components. The user interface is WaterGate's PC-Doctor which serves as the control program for running the IBM Advanced Memory Diagnostics and the suite of diagnostic tests provided by PC-Doctor.

The IBM PC Enhanced Diagnostics diskette, P/N 10L9171, and the supplemental diskette, P/N 10L9176, come with an information sheet and online help.

Updates for the IBM PC Enhanced Diagnostics are available on-line at: **http://www.pc.ibm.com/us/**

This diagnostic diskette includes:

- A new user interface (WaterGate Software's PC-Doctor)
  - This interface serves as the control program for running both the IBM Advanced Memory Diagnostics and the suite of diagnostic tests provided by PC-Doctor.
- IBM Advanced Memory Diagnostics
  - The memory diagnostic tests determine which memory module (SIMM or DIMM) is defective and report the socket where the failing module is located. The Memory diagnostics can run a quick and full test of the system. Diagnostics can also be run on a single SIMM or DIMM.

> **Note**
>
> See “Symptom-to-FRU Index” on page 32 for the IBM PC Enhanced Diagnostics error codes.

Supported Systems

The IBM PC Enhanced Diagnostics will run on all of the IBM PC 300/700, and IntelliStation computer systems, except for Type 6571, 6581, 6573, 6583, 6875, 6885.

Starting the IBM PC Enhanced Diagnostics Program

To start the program:

1. Shut down and power-off the system.
2. Wait 10 seconds.
3. Insert the IBM Enhanced Diagnostics Diskette into diskette drive A.
4. Power-on the system.

The initial diagnostics menu will be displayed.

Navigating Through the Diagnostic Programs

Use either the mouse or the keyboard to navigate through the Enhanced Diagnostics program.

- Use the cursor movement keys to navigate within the menus.
- The **Enter** key is used to select a menu item.
- The **Esc** key is used to back up to the previous menu.
- For online help select F1.

Running diagnostic tests

There are four ways to run the diagnostic tests:

1. Using the cursor movement keys, highlight **Run Normal Test** or **Run Quick Test** from the Diagnostics Menu and then press **Enter**.

   This will automatically run a pre-defined group of tests from each test category. **Run Normal Test** runs a more extensive set of tests than does **Run Quick Test** and takes longer to execute.
2. Press **F5** to automatically run all selected tests in all categories. See “Test Selection” on page 207.
3. From within a test category, press **Ctrl-Enter** to automatically run only the selected tests in that category. See “Test Selection” on page 207.
4. Using the cursor movement keys, highlight a single test within a test category and then press **Enter**. This will run only that test.

Press **Esc** at any time to stop the testing process.

Test results, (N/A, PASSED, FAILED, ABORTED), are displayed in the field beside the test description and in the test log. See “Viewing the Test Log” on page 209.

Test Selection

To select one or more tests:

1. Open the corresponding test category.
2. Using the cursor movement keys, highlight the desired test.
3. Press **Space bar**.

   A selected test is marked with a chevron, **>>**. Pressing the space bar again de-selects a test and removes the chevron.
4. Repeat steps 2 and 3 above to select all desired tests.

IBM Advanced Memory Diagnostics

The IBM Advanced Memory Diagnostics provide the capability to identify a particular memory module (SIMM/DIMM) which fails during testing. Use the System Board Layouts section in the latest PC 300/700, IntelliStation Hardware Maintenance Manual (HMM) to reference the memory sockets, or select **F1 twice** to load the Online Manual and select Chapter 11 'SIMM/DIMM Locator'.

Follow the steps below to locate the IBM Advanced Memory Diagnostics test options.

1. Select the DIAGNOSTICS option on the toolbar and press **Enter**.
2. Highlight either the 'Memory Test-Full' or 'Memory Test-Quick option and press **Enter**.

- Memory Test-Full

  The full memory test will take about 80 seconds per MB of memory and will detect marginal, intermittent, and solid (stuck) memory failures.

- Memory Test-Quick

  The quick memory test will take about 20 seconds per MB of memory and will detect solid (stuck) memory failures only.

Notes

Either level of memory testing can be performed on all memory or a single SIMM/DIMM socket.

Only sockets containing a SIMM or DIMM can be selected for testing. Unpopulated sockets are noted by **.....** besides the test description.

Test Results

IBM PC Enhanced Diagnostic test results will produce this error code format:

Function Code	Failure Type	DeviceID	Date	ChkDigits	Text

Function Code: Represents the feature or function within the PC.

Failure Type: Represents the type of error encountered.

DeviceID: Contains the component's unit-id which corresponds to either a fixed disk drive, removable media drive, serial or parallel port, processor, specific DIMM, or a device on the PCI bus.

Date: Contains the date on which the diagnostic test was run. Date is retrieved from CMOS and displayed using the YYYYMMDD format.

ChkDigits: Contains a 2-digit check-digit value to ensure that:

- Diagnostics were run on the specified date
- Diagnostics were run on the specified IBM computer
- The diagnostic error code is recorded correctly

Text: Description of the error.

Note

See “Symptom-to-FRU Index” on page 32 for the IBM PC Enhanced Diagnostics error codes.

Quick and Full Erase - Hard Drive

The IBM PC Enhanced Diagnostics Program offers two hard drive format utilities:

- Quick Erase Hard Drive
- Full Erase Hard Drive

The Quick Erase Hard Drive provides a DOS utility that performs the following:

- Destroys the Master Boot Record (MBR) on the hard drive.
- Destroys all copy of the FAT Table on all partitions (both the master and backup).
- Destroys the partition table.
- Provides messages that warn the user that this is a non-recoverable process.

The Full Erase Hard Drive provides a DOS utility that performs the following:

- Performs all the steps in Quick Erase.
- Provides a DOS utility that writes random data to all sectors of the hard drive.
- Provide an estimate of time to completion along with a visual representation of completion status.
- Provides messages that warn the user that this is a non-recoverable process.

Important

Make sure customer backs up all data before using the Quick or Full Erase function.

To select the Quick Erase or Full Erase Hard Drive utility:

1. Select the UTILITY option on the toolbar and press enter.
2. Select either the QUICK ERASE or FULL ERASE HARD DISK option and then, follow the instructions.

Viewing the Test Log

Errors reported by the diagnostic test will be displayed by the program as a failed test.

To view details of a failure or to view a list of test results, do the following from any test category screen:

- Press **F3** to activate the log File
- Press **F3** again to save the file to diskette or F2 to print the file.

SIMM/DIMM Memory Errors: SIMM/DIMM error messages issued by the IBM PC Enhanced Diagnostics:

Message	Failure Found	Recommended Actions
2xx-1y	A memory error was detected in SIMM socket Y	Replace the SIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board.

Message	Failure Found	Recommended Actions
2xx-2y	A memory error was detected in DIMM socket Y	Replace the DIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board or where memory is on the processor card, replace the processor card.
Corrupt BIOS	Information in BIOS is not as expected. Not able to find expected DMI information from BIOS. Memory controller chipset vendor ID does not match expected value.	Reflash the BIOS. Replace the system board.
Test aborted by user	User stopped test.	Restart test.
Note: "Y" is the SIMM/DIMM socket number. Use the System Board Layouts section in the latest PC 300/700, IntelliStation Hardware Maintenance Manual, HMM, to reference the memory sockets.		

PC 300/700 Series, IntelliStation

Diagnostics: Always use the latest PC 300/700 Series, IntelliStation Diagnostics Diskette. As of this HMM printing, the current release is Version 5.50.

The Diagnostics test programs, developed by DiagSoft for IBM, is used to test the IBM components of the system and some external devices. The amount of time required to test all components depends on the number of components.

QAPlus/WIN: QAPlus/WIN, a Windows program, is included in the preinstalled software on certain IBM computers. QAPlus/WIN provides an effective tool for isolating software-related problems, because it encompasses the entire operating system. QAPlus/WIN gathers Windows-related information and also does some hardware device testing.

QAPlus/PRO: QAPlus/PRO is a DOS diagnostic program that is available either in preinstalled software or on a diskette. If the computer has DOS or DOS with Windows preinstalled, you can access QAPlus/PRO by typing QAPRO and the C:\ prompt. You must first exit from Windows to use QAPRO.

QAPlus/PRO provides similar diagnostic capacity to QAPlus/WIN, but is more balanced between software and hardware problem determination. The Windows-related information that is available in QAPlus/WIN is not available in QAPlus/PRO. However, QAPlus/PRO does gather a wealth of information about the DOS environment, including device drivers. It more effectively isolates hardware problems than QAPlus/WIN, because it is not limited by the operating system environment.

When OS/2 is preinstalled, QAPlus/PRO is not available from the hard disk. However, you can use the Diskette Factory available on the computer to build the QAPlus/PRO diskette.

Typically, if software was not preinstalled on the computer, QAPlus/PRO is provided on a diskette supplied with the computer. To access QAPlus/PRO, boot the computer with the QAPlus/PRO diskette in the primary diskette drive.

CoSession for Windows: If the CoSession for Windows program is preinstalled in the computer, IBM HelpCenter personnel can use that program to diagnose the system from a remote location. To use CoSession for Windows, you must have a modem attached to your computer. Contact the IBM HelpCenter for instructions before attempting to use CoSession for Windows.

The test programs include the following features.

Feature	Description
Advanced Diagnostic Tests	Identifies most problems associated with the following major components: • System board • Hard disk drives • Diskette drives • CD-ROM drives • RAM • Serial and parallel ports • Video adapter • Printer • Keyboard • Mouse
Flexible Test Control	Allows you to: • Run groups of tests in batch • Specify parameters to use for each test (for example, video modes, disk cylinders, and port addresses) • Specify the number of passes you want to run (one to continuous) • Log the test results to a text dBase (DBF) format file • Save all test settings for future use • View System Information • View the server's configuration information. (For example, you can view the IRQ/DMA assignments, memory usage, and device drivers) • Select System Utilities • Run a low-level format also contains system utilities. • Format a diskette

Error Messages

Messages generated by the software—the operating system or application programs—generally are text messages, but they also can be numeric. Basically, there are five types of error messages.

- POST error messages
- POST beep codes
- Diagnostic error messages
- Software generated messages
- Multiple messages

Error Message	Description
POST Error Messages	Displayed when POST finds problems with the hardware or detects a change in the hardware configuration.
POST Beep Codes	Sounds emitted from the speaker if POST finds a problem. One beep indicates POST completed successfully. Multiple beeps indicate a problem was found by the POST.
Diagnostic Error Messages	Displayed when a test program finds a problem with a hardware option.
Software Generated Error Messages	Displayed 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.
Multiple Messages	The first error that occurs can cause additional errors. Follow the suggested action of the first error displayed. In this case, the system displays more than one error message. Always follow the suggested action instructions for the *first* error message displayed.

Return Codes

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. To register the test properly in the test log, the test programs must generate one of the following return codes:

Return Code	Description
0	Indicates the device passed its test.
1	Indicated the device failed its test.
2 or greater	Indicates the test stopped or was aborted.

Using the Test Programs

The test programs provide advanced functions and utilities for users and service or support professionals to troubleshoot even the most difficult problems.

Program Navigation

You can maneuver within the test programs by typing the first letter of a menu choice, using the function keys, or using command-line options.

Using the First Letter of a Menu Choice

Throughout the test programs, pressing the first letter of an option on a menu is the same as moving to that item with the cursor and pressing Enter; however, this function is not enabled on Test Group Screens.

Using the Function Keys

Use the following keys to maneuver throughout the test programs:

Keys	Action
Enter	Select an item, run the test module, or run the test
Down Arrow (↓)	Moves the cursor down
Up Arrow (↑)	Moves the cursor up
F1	Calls up the appropriate Help information. Use the up arrow key (↑) or the down arrow key (↓) to scroll through the information. Pressing F1 from within a Help screen provides a help index from which you can select different categories. One of the important help categories is function key usage. Pressing Esc exits Help and returns to where you left off.
Esc	Go back to the previous menu

Additional functions are available in the Test Module Selection screen and the Test Group screen using the following keys:

Keys	Action
Tab	Move to test group (or move to parameters)
Spacebar	Toggle modules on/off (or toggle tests on/off)
F2	View test results log
F10	Local menu
+	Next logical unit number (for example, LUN 1, LUN 2, and so on)
–	Previous logical unit number

Command Line Options

The following Command Line Options are available when initially starting the diagnostic program from within its directory.

Type **QAPLPRO/XXX** (where **/XXX** represents one of the following from the list below) then press Enter.

Command	Action
/B&W	The **/B&W** command line option forces the program to load in Black and White (Monochrome) mode, which is often more readable on laptop computers.
/LOG=file	The **/LOG=file** command line option directs the test programs to start using a specified Error Log file.
/INT10	The **/INT10** command line option forces the test programs to use the BIOS for screen writes.
/OXXX	The **/OXXX** command line option, where XXX=test group (for example, MBD/MEM/VID/HDU/ FDU/KBD/COM/LPT, and so on), omits the designated test group from testing.
/USRCONFIG =file	The **/USERCONFIG=file** command line option tells the test programs to look for a user diagnostic configuration file other than the default USERDIAG.CFG.
/SCRIPT =file[,R]	The **/SCRIPT=file[,R]** command line option with the ",R" runs the selected script. Please see "Scripting" on page 217 for a description of scripting. **Note:** You can use a "–" instead of a "/" as the command line switch.

Viewing the Test Groups

As you move the cursor bar up or down in the Test Module Selection window, the right hand screen changes to show the attributes, parameters, and the selected tests of the corresponding Test Group. The ♦ indicates a module selected for testing.

The indicated attributes are characteristics of the selected test module that are used by the test programs to determine which tests to run or how to run selected tests. Attributes are also used to limit the allowable range of parameters (for example, – ending cylinder).

Parameters are values you select to establish the scope of tests. For example, you can select Extended Memory testing parameters and limit the testing to a specific range of test blocks by specifying the starting and ending memory block. This might be appropriate if prior experience indicates that problems are likely to exist in a

specific area of memory. By selecting these limiting parameters, you reduce memory testing time.

Scripting

Scripting allows you to select specific groups of tests, testing parameters, and options. Your selection is saved for later use as a test *Script*. To set up a test script, first select all the appropriate test groups and specific tests you want to run from the Module Testing section under Diagnostics. You should also select appropriate testing parameters and options. See "Program Navigation" on page 215, for instructions to save a test script.

Changing Logical Unit Numbers

In some instances, you can have more than one logical unit number (LUN) for a particular module. LUNs represent individual devices within a test group or module. For example, you might have two diskette drives or two hard disk drives; or, you might have base, extended, shadow, and cache memory installed in the computer. This configuration might result in as many as four or five different LUNs in the Memory Test Group. Or you might have base, extended, shadow, and cache memory installed in the system which might result in as many as four or five different LUNs in the Memory Test Group.

From either the Module Test Menu or the Test Group window, you can change to a different LUN (where applicable) by pressing the plus (+) key (next LUN), or the minus (–) key (previous LUN).

Test Group Specifications

In the upper-right-hand portion of the testing screen (or just the upper portion if you switched to an individual test group screen) are the specifications for the related test group.

Note: In the Hard Disk Test Group specification area, if a software program was to compress your drive, the indicated size is the compressed size of the logical drive.

Starting the Diagnostics Diskette

1. Insert the Diagnostics diskette into drive A.
2. Power-on the computer.
3. When the Diagnostics **Main Menu** is displayed, press **Ctrl+A**. (The screen will not change.)
4. Select Diagnostics; then, press **Enter**.
5. Follow the instructions that appear on your screen. If an error is displayed, go to "Symptom-to-FRU Index" on page 32.

Module Testing Mode

If the test programs do not find a problem, or you want to perform in-depth testing, the Module Testing mode provides a method to run individual tests on a single module. For example, you can run an individual test for the diskette drive, or you can run groups of tests for several modules.

In the Module Testing mode, you can define how many times each test should run and how the test program should log the errors.

To start the Module Testing mode:

1. Start the Diagnostics diskette.
2. Select **Diagnostic Menu** from the Main Menu.
3. Select **Quick Checks** from the next menu.
4. Use the up and down arrow keys (↑ and ↓) to move the highlight bar from one selection to the next.
5. Follow the instructions on the screen.

Note: As you scroll down the selection menu, the Test Group window to the right changes to correspond to the highlighted Module.

Running Selected Module Tests

To run all selected tests for a test group:

1. Use the up and down arrow keys (↑ and ↓) to move the cursor to your selection.
2. Press **Enter**.

Note: A ♦ appears next to your selection.

Running All Selected Modules

To run all selected test modules:

1. Use the down arrow key (↓) to move the cursor to the last choice, **Run All Selected Modules**.
2. Press **Enter**.

Note: A ♦ appears next to your selection.

Changing Selected Tests in Test Groups

To change selected tests in a Test Group:

1. In the Module Tests Menu, use the up and down arrow keys (↑ and ↓) to move the cursor to your selection.
2. Press **Tab** to move into the expanded Test Group window.
3. Scroll to the test you want to select or deselect.

   Warning: Items indicated by a directly adjacent "*" (**red** text on color screens) are destructive tests.
4. Press the spacebar at the highlighted test to toggle between select (indicated by a ♦) and deselect.

Note: Pressing the first letter of a test does not activate the test, unlike menu operation.

5. Press **Enter**.

Running an Individual Test

To run an individual test:

1. Use the up and down arrow keys (↑ and ↓) to move to the highlighted bar to the test you want to run.
2. Press **Enter** to run the test.

   Note: The results of the test appear in the lower-right-hand Test Log window. Also, if you enabled Test Logging, the results are recorded in the Test Log.

3. When the test completes, press Esc to return to the Test Group Menu.

Stopping the Tests

To stop running a specific test or stop testing after you have started a test, press Esc while the test is running. The test pauses at the first possible opportunity, and the Skip/Abort Test Menu appears with the following options:

Option	Action
Continue	The test program begins testing where it left off.
Skip to next test	The test program skips the current test, but remaining tests for the selected Test Module continue.
Skip to next group	The test program skips the remaining tests in the current test group.
Abort all tests	The test program stops and returns to the previous menu.

Setup Utility Program

Attention

A customized setup configuration (other than default settings) might exist on the computer you are servicing. Running the Setup Utility program might alter those settings. Note the current configuration settings and verify that the settings are in place when service is complete. To start the Setup Utility program, see "Setup Utility Program."

The Setup Utility (configuration) program is stored in the permanent memory of the computer. This program includes settings for the following:

- Devices and I/O Ports
- Date and Time
- Security
- Start Options
- Advanced Setup
- ISA Legacy Resources
- Rapid Resume Manager

To run the Setup Utility program, do the following:

1. Power-off the computer and wait for a few seconds until all in-use lights go off.
2. Power-on the computer.
3. When the Setup Utility prompt appears on the screen during start-up, press **F1**. The Setup Utility menu appears.
4. Follow the instructions on the screen.
5. When finished, select System Summary to verify that any configuration changes have been accepted.

Adapter Configuration

To add adapters to past generations of ISA computers, a variety of switches are provided on the adapters. These switches control the assignment of computer resources such as interrupt request (IRQ) lines, direct memory access (DMA) channels, and memory address ranges. Determining how to set switches for (or *configuring*) these resources can be complex. Plug and Play adapters and devices make this task easier.

Plug and Play Adapters

Plug and Play adapters are easier to install and set up because they are auto-configuring (no jumpers or switches) to set. A Plug and Play adapter comes with built-in identification and configuration specifications set in the adapter memory. This information is sensed by the I/O bus and interpreted by the computer BIOS. The BIOS routines then automatically configure the adapter around the resources already in use by other devices.

PCI adapters are generally Plug and Play devices. Many ISA adapters are not Plug and Play devices. If the adapter you are installing is not a Plug and Play adapter (a *legacy* device), you must configure it manually.

Legacy Adapters

ISA adapters that are not Plug and Play devices are referred to as *legacy* devices. The Configuration/Setup Utility program can help you manually configure legacy adapters.

The Configuration/Setup Utility program screens show the legacy resources typically required by adapters:

I/O port address
Memory address
Interrupt request (IRQ) line
Direct memory access (DMA) channel

Resources not currently being used by adapters already installed in your computer are highlighted. From these screens you can select available resources for the adapter you are installing. Set the resources used by installed legacy adapters to *not available*. This enables the Plug and Play code to configure around legacy adapters. Then you can make the appropriate jumper or switch settings on the adapter. Using this procedure helps prevent conflicts with other adapters. Refer to the adapter documentation for information about required resources. If your computer comes with preinstalled software, you can also select these resources using the Plug and Play icon.

Note

The Plug and Play feature uses memory addresses ED00h to EFFFh. If you install an ISA legacy adapter or use a memory manager program, do not use the addresses within this range.

Formatting Diskettes

To format a diskette within the Diagnostic programs, select one of the following options:

Format A: high density — 1.44 MB

Format A: low density — 720 KB

Format B: high density — 1.44 MB

Format B: low density — 720 KB

After selecting a diskette format option, follow the instructions that appear on the screen.

Hard Disk Drive Boot Error

A hard disk drive boot error (error codes 1962 and I999030X) can be caused by the following:

Cause	Actions
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: 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. Go to “Preparing the Hard Disk Drive for Use” on page 222.
The drive is defective.	Replace the hard disk drive.

When To Use the Low-Level Format Program

Notes

1. The low-level format is not available on all diagnostic diskettes.
2. Before formatting the hard disk drive, make a back-up copy of the files on the drive to be formatted.

Use the Low-Level Format program:

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

Preparing the Hard Disk Drive for Use

When the Low-Level Format program is finished, restore to the hard disk all the files that you previously backed up.

1. Partition the remainder of the hard disk for your operating system. (The commands vary with the operating system. Refer to your operating-system manual for instructions.)
2. Format the hard disk using your operating system. (The commands vary with the operating system. Refer to your operating-system manual for instructions.)
3. Install the operating system.

You are now ready to restore the files.

File Editor

The File Editor is an ASCII text editor that uses simple function key commands.

To access the File Editor:

1. Select **File Editor** from the ***Utility Menu***; then press **Enter**.
2. Insert a diskette into Drive A or Drive B before selecting the file you want to edit, then select the file you want to edit from the Files selection box.
3. Make your changes. The arrow keys move the cursor, and the function keys perform search and block editing functions. (See "File Edit Function Keys.")
4. When you are done, press **F10** to update the file with the changes you made, or press **Esc** to quit the editing process without saving the changes.

File Edit Function Keys

The following information describes the function of the function keys and keyboard keys when you are using the File Editor.

Key	Description
Arrows	Move the cursor to the place in the text where you want to make changes.
Home	Press **Home** once, to move the cursor to the start of the current line. Press **Home** twice, to move to the beginning of the file. Press **Home** three times, to move to the beginning of the file.
End	Press **End** once, to move the cursor to the end of the current line. Press **End** twice, to move the cursor to the end of the current screen. Press **End** three times, to move the end of the file.
F2	Press **F2** to be in search mode, You are prompted to enter the search word or words on a reverse highlighted line at the bottom of the File Edit Screen. After typing in the search word, press **Enter.**
F3	Press **F3** to find the next occurrence of a search word.
F4	Press **F4** to mark the start of a block of text (if you have not previously marked it). If you previously marked the block of text, pressing this key unmarks the text block.

Key	Description
F5	Press **F5** to complete the block marking (started with F4). If you did not previously press **F4** to start marking a block of text, **F5** is ignored.
F6	Press **F6** while the cursor is within the active block to move an active (marked) block of text. Move the cursor to the new location where the active block is to be moved, then press **F6** again. If there is no active block of text, **F6** is ignored.
F7	To copy an active (marked) block of text to a new location, move the cursor to the new location and then press **F7**. If there is no active block of text **F7** is ignored.
F8	To delete an active (marked) block of text, move the cursor within the active block and press **F8.** If there is no active block of text, **F8** is ignored.
F10	Press **F10**, to save all changes and exit the file.

Notes:

1. Always make a backup copy on a self-starting diskette of the AUTOEXEC.BAT and CONFIG.SYS files *before* making any changes.
2. The default text editing mode of the File Editor is the insert mode. To toggle between overtype and insert modes, press Insert.

Diagnostics Control Keys

The following is a list of the Diagnostics Control Keys, when used and a description of the Diagnostics response.

Control Keys	When Used	Diagnostics Response
Ctrl+A	Main Menu	Allows you to select test from the sub menus that are highlighted with red letters. **Attention**: If selected, these test will erase the information stored on the diskette or hard disk drive.

Control Keys	When Used	Diagnostics Response
Up and Down Arrow Keys	Main Menu Module Test Menu Test Group Menu	Highlights an item you want to select.
Space Bar	Module Test Menu Test Group Menu	Adds a diamond to the left of the highlighted test. The test will run when **Run All Selected** is highlighted and the Enter key is pressed. Also removes the diamond to the left of the item. The test will not run when **Run All Selected** is highlighted and the Enter key is pressed.
Tab Key	Main Menu Module Test Menu	Selects the additional test for the menu you are in.
+/– Keys	Test Group Menu	Selects additional test. The LUN displayed on the top right Test Group Menu shows which test is selected and how and remain (example LUN 1 of 2).

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 Mode

When ACPI BIOS mode is enabled, 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. ACPI BIOS mode can be enabled or disabled in Setup under Power Management.

Advanced Power Management

Energy-saving settings can be viewed and changed by using the Advanced Power Management menu in the Configuration/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 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 Configuration/Setup Utility program (see "Setup Utility Program" on page 220).
2. Select **Advanced Power Management** from the Configuration/Setup Utility program menu.
3. Be sure **APM BIOS Mode** 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 levels 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 Configuration/Setup Utility program menu.
9. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
10. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

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

- **Serial Port Ring Detect:** With this feature set to **Enabled** and an *external* modem connected to the serial port, the computer will turn on automatically when a ring is detected on the modem.

- **Modem Ring Detect:** With this feature set to **Enabled**, the computer will turn on automatically when a ring is detected on the internal modem.
- **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 230.

Rapid Resume Manager

Personal computers come with built-in energy-saving capabilities. Rapid Resume Manager reduces the power consumption of the computer. The following are features of Rapid Resume Manager:

- Rapid Resume
- Standby
- Scheduler
- Wake Up on Ring

Rapid Resume: With Rapid Resume activated, the computer saves its current state when you power it off with the power switch. Rapid Resume retains all current settings, remembers which programs were active, and saves the position and size of windows and other objects on the screen. When the computer is restarted (with the power-on switch, the Scheduler, or Wake-Up on Ring), it quickly returns to full-power operation in exactly the same state. The programs that were being used will reappear in the state they were in when you suspended operation of the computer.

Running Rapid Resume Manager: To select and activate, deactivate, or change Rapid Resume Manager, do the following.

1. From Program Manager, select **IBM Management Plus**.
2. Select **Rapid Resume Manager**.
3. View or change settings.
4. Follow the instructions on the screen.

Standby: When the Standby feature is enabled, it initiates reduced power modes for the display, microprocessor, and hard disk drive after a specified period of inactivity. The default setting for automatically initiating standby is 20 minutes. The display is blanked

and the hard disk drive "spins down' (enters a reduced-power state). Any use of the keyboard, mouse, or hard disk drive causes the computer to exit standby and return to full-power operation. For example, if 40 minutes is selected as the specified period, the computer goes into standby state if the mouse, keyboard, or microprocessor is not active for more than 40 minutes.

To select and activate, deactivate, or change the Standby feature, see “Running Rapid Resume Manager” on page 228.

Scheduler: Use the Scheduler to set a time for the computer to do the following:

- Start a program
- Display a message
- Power-off the computer

If the computer will not already be powered-on when it is time to start a program or display a message, a setting can be selected to power-on the computer at the appropriate time.

To select and activate, deactivate, or change the Scheduler feature, see “Running Rapid Resume Manager” on page 228.

Wake Up on Ring: You can select settings so that, if the modem receives a call and the computer is in the suspend state, the computer "wakes up" on the first ring; that is, it returns to full-power.

To select the Wake Up on Ring settings, feature, see “Running Rapid Resume Manager” on page 228.

Network Settings

This section applies only to computers linked to a network.

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

- 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 201.

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:

1. Start the Configuration/Setup Utility program. See “Setup Utility Program” on page 220.
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 Configuration/Setup Utility program menu.
6. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
7. To exit from the Configuration/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:

1. Start the Configuration/Setup Utility program. See “Setup Utility Program” on page 220.
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 Configuration/Setup Utility program menu.
7. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
8. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

Recovering from Software Problems (Type 68X7)

Note

The following software-related information is also included in the *About Your Software* booklet supplied with certain model IBM PC Computers. It is included here for reference only.

This section provides information and procedures to help a customer recover from problems that prevent either OS/2 Warp or DOS from starting. To follow many of these procedures, you will need the following diskettes that were created when the computer was initially installed.

- OS/2 Warp Utility Diskettes
- PC DOS 7 Diskettes

Notes:

1. If these diskettes are not available and a problem with the computer prevents you from making them now, you can make them from another IBM Personal Computer that has the same version of PC DOS and OS/2 Warp installed.
2. PC DOS 7.0 *Disk 1* is a multipurpose diskette. It not only is the starting point for installing DOS 7, it is also a general-purpose utility diskette.

Utility Diskettes

Utility diskettes help you correct problems when you cannot start your computer from the hard disk.

The utility diskettes contain programs that allow you to start an editor program, check your hard disk for errors or problems, view and define hard disk partition information, and format a diskette or hard disk. The OS/2 Warp utility diskettes also contain programs that allow you to back up and restore OS/2 Warp. The preinstalled software includes programs to create utility diskettes for both DOS and OS/2 Warp. Make these utility diskettes at the earliest opportunity.

Creating Utility Diskettes

To create the utility diskette for DOS:

1. Start the Diskette Factory in either OS/2 Warp or Windows.
2. Select **IBM PC DOS 7.0** and follow the instructions on the screen.

To create utility diskettes for OS/2 Warp:

1. On the Desktop, double-click on **OS/2 System**.
2. Double-click on **System Setup**.

3. Double-click on **Create Utility Diskettes**, and follow the instructions on the screen.
4. Label the diskettes:
   - OS/2 Warp Utility Diskette 1
   - OS/2 Warp Utility Diskette 2
   - OS/2 Warp Utility Diskette 3

OS/2 Warp Recovery Choices Program

The Recovery Choices Program built into OS/2 Warp provides a means to recover from some problems that prevent OS/2 Warp from loading successfully, such as:

- A video mode not supported by your hardware
- An incorrect statement in the OS/2 Warp CONFIG.SYS file
- A damaged .INI file
- A hard disk error

If you get an unreadable screen or a message that OS/2 Warp cannot start correctly, you can try to resolve the problem using the Recovery Choices Program.

To start the Recovery Choices Program:

1. Power-on the computer. If the computer is already on, restart it using the **Ctrl**+**Alt**+**Del** key sequence.
2. When a small white box appears in the upper left-hand corner of the screen, press **Alt**+**F1**.
3. When the Recovery Choices screen appears, select from the following:
   - **Esc**: Quits the Recovery Choices program and continues the OS/2 Warp boot (startup) sequence.
   - **C**: Gives you access to an OS/2 command prompt.
   - **V**: Resets the video mode to a base VGA mode and restarts the computer. After the computer restarts, you can select another video mode, if necessary.
   - **X**: Restores OS/2 Warp to its original state (as it was originally installed).
   - **1, 2, or 3**: Starts OS/2 Warp using a set of configuration files used during one of the last three times OS/2 Warp was started. The date when these files were archived appears next to each selection. These selections do not appear on the Recovery Choices screen unless you previously opened the Desktop Settings notebook and selected **Create archive at each system restart** from the Archive page.

   For more information about the Recovery Choices program, refer to the *Master Help Index* located in the Information folder on the OS/2 Desktop.

Editing the CONFIG.SYS File

A CONFIG.SYS file contains lines of instructions that control how the computer starts up and how the computer works with the devices attached to it. The active CONFIG.SYS file for DOS and OS/2 Warp is stored in the root directory. OS/2 Warp maintains other CONFIG.SYS files in other subdirectories for error recovery and other purposes.

Important: If you need to edit the CONFIG.SYS file to remedy a problem, edit the one in your root directory.

For information about statements that can appear in the CONFIG.SYS file, refer to the *Command Reference* located in the Information folder on the OS/2 Desktop.

Using OS/2 Warp to Edit the CONFIG.SYS File

To edit the CONFIG.SYS file while OS/2 Warp is active:

1. On the Desktop, double-click on **OS/2 System**.
2. Double-click on **Command Prompts**.
3. Double-click on **OS/2 Window** or **OS/2 Full Screen**.
4. Type `COPY CONFIG.SYS CONFIG.OLD` and press **Enter**. This copies the current CONFIG.SYS file as CONFIG.OLD in case you need it for future reference.
5. Type `E C:\CONFIG.SYS` where
   - E is the command to start the System Editor.
   - C is the drive where OS/2 Warp is installed.
   - \ is the symbol for the root directory.

   Then press **Enter**.
6. When you are done working on the file, select **File**, and then select **Save**.
7. Select **Type** in the Save Notification window.
8. Select **Plain text**, and then select **Set**.
9. Press **Alt+F4** to exit from the System Editor.
10. Shut down your computer. (You must restart your computer in order for the changes to take effect.)

Using OS/2 Warp Utility Diskettes to Edit the CONFIG.SYS File

To edit the CONFIG.SYS file using the OS/2 Warp Utility Diskettes:

1. Insert *Utility Diskette 1* in your diskette drive.
2. Power-on the computer. If the computer is already on, restart the computer using the **Ctrl**+**Alt**+**Del** key sequence.
3. Follow the instructions on the screen until you get to a command prompt.
4. Insert *Utility Diskette 3*.
5. Type `COPY C:\CONFIG.SYS CONFIG.OLD` and press **Enter**. This copies your current CONFIG.SYS file as CONFIG.OLD in case you need it for future reference.

6. Type `TEDIT C:\CONFIG.SYS` and press **Enter**.
7. Press **Esc** to move the cursor from the command line to the editing area.
8. When you are done working on the file, press **F4** (File) to save the file and exit from the editor.
9. Shut down your computer. (You must restart your computer in order for the changes to take effect.)

Using the DOS Utility Diskette to Edit the CONFIG.SYS File

To edit the CONFIG.SYS file from the DOS Utility Diskette:

1. Insert PC DOS *Disk 1* in your diskette drive.
2. Power-on the computer. If the computer is already on, restart the computer using the **Ctrl**+**Alt**+**Del** key sequence.
3. When the following prompt appears:

   Do you want to install PC DOS 7 (Y,N)?

   type `N`. The command prompt appears.
4. Type `COPY C:\CONFIG.SYS CONFIG.OLD` and press **Enter**. This copies your current CONFIG.SYS file as CONFIG.OLD in case you need it for future reference.
5. Type `CD \DOS` and press **Enter**.
6. Type `E C:\CONFIG.SYS` and press **Enter**.
7. When you are done working on the file, press **F4** (File) to save the file and exit from the editor.
8. Shut down your computer. (You must restart your computer in order for the changes to take effect.)

Recovering from OS/2 Warp Problems

The following are some problems that might occur when you try to start your system or switch from one operating system to another.

- **Internal Processing Error Message Appears**

  Symptom: The system stops and the screen displays `INTERNAL PROCESSING ERROR` at the top of the message.

  Action: Record the information exactly as it is displayed on the screen, and write a description of what you were doing when the problem occurred. Contact an IBM HelpWare technician for assistance.
- **Unable to switch from DOS or Windows to OS/2 Warp**

  Symptom (DOS): Unable to switch from DOS to OS/2 using the `C:\OS2\BOOT /OS2` command.

  Symptom (Windows): Unable to switch from DOS with Windows to OS/2 using the Go to Warp icon.

  Action: You might have one or more active terminate-and-stay-resident (TSR) or DOS cache programs that take up the available computer memory. End the TSR programs before attempting to switch to OS/2 Warp.

If you suspect the problem is caused by TSR programs that are loaded from the AUTOEXEC.BAT file, deactivate the programs before attempting to switch to OS/2 Warp. Refer to the instructions that come with your TSR program. If this solves the problem, you might need to deactivate the TSR programs each time you want to switch to OS/2 Warp.

- **System Stops Working**

  Symptom: The system stops and the keyboard and mouse do not respond.

  Action: Press **Ctrl**+**Esc** or **Alt**+**Esc** and wait a few seconds to see if the system responds. If this does not resolve the problem, do the following:
  1. Determine if you can move the mouse pointer, but cannot select any object when you press mouse button 1.
  2. Press the Caps Lock and Num Lock keys to see if their status lights come on.
  3. Record a description of what you were doing when the system stopped. If any messages appeared on the screen, record the message text and number.
  4. Call a HelpWare technician for assistance.

- **Stacked Icons**

  Symptom: Some of the icons on your Desktop appear to be stacked on each other.

  Action: Refresh your Desktop by doing the following:
  1. Position the pointer on a blank area of the Desktop.
  2. Press mouse button 2. A pop-up menu appears.
  3. Select **Refresh**.
  4. If your screen goes blank, press **Alt**+**Esc** to switch between programs and force “repainting” of your screen.

- **Folders open and close immediately**

  Symptom: When you attempt to open a folder, it will not stay open.

  Action: Use the OS/2 Warp Recovery Choices Program to recover a set of archived system files. See “OS/2 Warp Recovery Choices Program” on page 232 for instructions.

Recovering from Errors on the Hard Disk

You can use the CHKDSK command with the /F parameter to check the hard disk for errors and, if any errors are found, correct them.

Correcting Disk Errors from DOS

To run the CHECKDSK program from DOS:

1. Close all active programs, including Windows.
2. At the DOS command prompt type `CHKDSK /F` and press **Enter**.

The program will check the hard disk and correct any errors found.

Correcting Disk Errors from the DOS Diskette

If you cannot get to a DOS command prompt from your hard disk, use the following procedure.

1. Insert PC DOS *Disk 1* in your diskette drive.
2. Power-on the computer. If the computer is already on, restart the computer using the **Ctrl**+**Alt**+**Del** key sequence.
3. When the following prompt appears:

   Do you want to install PC DOS 7 (Y,N)?

   type `N`. The command prompt appears.
4. Type `COPY C:\CONFIG.SYS CONFIG.OLD` and press **Enter**. This copies your current CONFIG.SYS file as CONFIG.OLD in case you need it for future reference.
5. At the DOS command prompt type `CHKDSK /F` and press **Enter**.

Correcting Disk Errors from OS/2 Warp

When you use the CHKDSK /F command, you cannot have any other activity on that disk. Therefore, if you need to use the CHKDSK /F command on the disk where OS/2 is installed, you must shut down OS/2 and use the OS/2 Warp Utility Diskettes.

To correct disk errors on the disk where OS/2 Warp is installed:

1. Shut down OS/2.
2. Insert *Utility Diskette 1* in your diskette drive.
3. Power-on your computer. If the computer is already on, restart it using the **Ctrl**+**Alt**+**Del** key sequence.
4. Follow the instructions on the screen until you get to a command prompt.
5. Insert *Utility Diskette 3*.
6. Type `CHKDSK C:/F:2`; then press **Enter**. (C is the drive on which OS/2 is installed.)
7. Follow any instructions that appear on the screen.
8. Remove the diskette from drive A.
9. Restart your computer using the **Ctrl**+**Alt**+**Del** key sequence.

To correct disk errors on another drive:

1. On the Desktop, double-click on **OS/2 System**.
2. Double-click on **Command Prompts**.

3. Double-click on **OS/2 Window** or **OS/2 Full Screen**.
4. Type `CHKDSK D: /F:2` and press **Enter**. (If you are checking a drive other than D, substitute that drive letter for the D used in this example.)
5. Follow any instructions that appear on the screen.

Recovering from a Forgotten OS/2 Password

If you forget your OS/2 lockup password, use the following procedure.

1. Power-on the computer.
2. When a small white box appears in the upper left-hand corner of the screen, press **Alt**+**F1**.
3. When the Recovery Choices screen appears, press **C**.
4. Type `CD \OS/2` and press **Enter**.
5. Type the following:

   ```
   MAKEINI OS2.INI LOCK.RC
   ```

6. Press **Enter**.
7. Restart the computer.

Backing Up and Restoring Files

The backup routines provided with OS/2 and DOS allow you to back up a single file, a directory, or the entire contents of a disk. Backing up files that contain your day-to-day work will help to protect you from losing data that cannot be recovered from another source. Backing up the entire contents of each disk takes longer, but ensures that you can reinstall your operating system, programs, and data files *exactly* as they were before a major problem occurred.

Procedures for backing up and restoring files using DOS are in the DOS/Windows users guide. Procedures for backing up and restoring files using OS/2 Warp are in the online *OS/2 Command Reference*.

If a problem occurs, you might not be able to view the online *OS/2 Command Reference*, or you might not be able to get to a command prompt. Therefore, the following short procedures have been included to help you to back up and restore the entire contents of your hard disk using the OS/2 Warp Utility Diskettes.

Backing Up Your Hard Disk

To back up the entire contents of your hard disk:

1. Insert *Utility Diskette 1* in your diskette drive.
2. Power-on the computer. If the computer is already on, restart the computer using the **Ctrl**+**Alt**+**Del** key sequence.
3. Follow the instructions on the screen until you get to a command prompt.
4. Insert *Utility Diskette 3*.

5. To backup the entire contents of drive C, type

   ```
   BACKUP C:\*.* A: /S
   ```

   and press **Enter**. (To back up another drive, substitute that drive letter for the C in this example.)
6. Follow the instructions on the screen. Be sure to label the diskettes in the correct sequence.

Restoring the Hard Disk

The hard disk must have a formatted partition before you can use the following procedure. If your hard disk does not already have a formatted partition, you can create one using the FDISK and FORMAT programs on *Utility Diskette 3*.

To restore the entire contents of your hard disk:

1. Insert *Utility Diskette 1* in your diskette drive.
2. Power-on the computer. If the computer is already on, restart the computer using the **Ctrl**+**Alt**+**Del** key sequence.
3. Follow the instructions on the screen until you get to a command prompt.
4. Insert *Utility Diskette 3*.
5. To restore the entire contents of drive C, type

   ```
   RESTORE A: C:\*.* /S
   ```

   and press **Enter**. (To restore the data to another drive, substitute that drive letter for the C in this example.)
6. Follow the instructions on the screen.

IBM Wireless LAN

This section provides information on the IBM Wireless LAN. For additional help, detailed messages, and recommended actions, refer to the *Installing and Operating Your Network* manual, supplied with the IBM Wireless LAN product.

ISA Bus Switch Settings

To install the adapter in a computer with an ISA bus, set the dip switches as shown below:

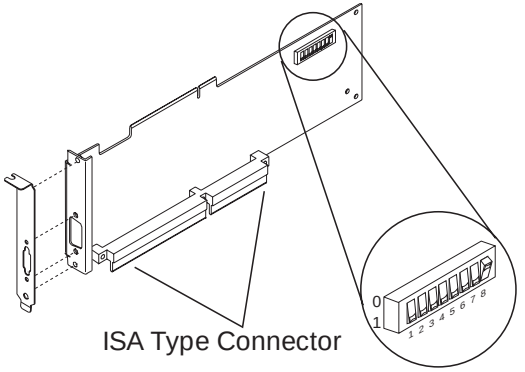


Figure 1. Preparing the Adapter Card for an ISA Based Computer

The switch positions shown in Figure 1 represent the value 00000001, that is, switch 8 has been set to value 1 (one), the others are set to value 0 (zero).

Important

- **For setting the switch positions 0 or 1, use the values shown on the adapter card. DO NOT use the values printed or inscribed on the switch itself.**
- The settings shown in Figure 1 apply to most computer configurations.

ISA Mode Operations Parameters

The following provides the possible values for ISA mode operation parameters that you can select according to your system configuration:

- **Input/Output (I/O) Base Address** (this is used by the computer to identify and communicate with each individual adapter).

Table 1. I/O Base Address, ISA Mode	
Switch Positions 1 2 3	**I/O Base Address**
0 0 0	86A0
1 0 0	96A0
0 1 0	A6A0
1 1 0	B6A0
0 0 1	C6A0
1 0 1	D6A0
0 1 1	E6A0
1 1 1	F6A0

- **Remote Program Loading (RPL) capability** (this allows you to enable or disable the RPL memory).

Table 2. RPL Memory Enable, ISA Mode	
Switch Position 4	**RPL Memory**
0	Disabled (***not*** using the RPL feature)
1	Enabled

- **Interrupt Level, also called Interrupt Request Level IRQ** (this establishes the priority by which the adapter can interrupt the computer, the lowest value is given the highest priority).

Table 3. Interrupt Level (IRQ), ISA Mode	
Switch Positions 5 6	**Interrupt Level**
0 0	9
1 0	10
0 1	11
1 1	15

Important

The IBM Wireless LAN adapter does not support interrupt level sharing. Therefore, make sure that no other adapter in your computer uses the same interrupt level. If necessary, change the interrupt level of the IBM Wireless LAN adapter.

If you want to use interrupt level 9 for the IBM Wireless LAN adapter, make sure that no other adapter in your computer uses interrupt level 2.

- **Direct Memory Access (DMA) arbitration level** (this establishes the priority by which the adapter can access the computer memory, the lowest value is given the highest priority. **The recommended value is 3**).

Table 4. DMA Arbitration Level, ISA Mode	
Switch Positions 7 8	**ISA DMA Level**
0 0	0
1 0	1
0 1	3
1 1	Invalid

Important

- Some values are recommended for specific machine types. For further information, refer to the README.OS2 file, on the IBM Wireless LAN 'OS/2 Base-Workstation diskette' (volume 2).
- Make sure that no other adapter in your computer uses the same DMA level.

Micro Channel Adapter Installation

The IBM Wireless LAN 'OS/2 Base-Workstation diskette' (volume2), is the option diskette and contains the adapter description file (**ADF**).

PCMCIA Portable Computer Support

To operate a Wireless adapter and NDIS Device Driver in a computer using PCMCIA, **you must have installed and configured the set of Card and Socket Services support supplied with your computer**, by following the instructions in the computer documentation. The chosen set of Card and Socket Services must match the machine model and operating system used.

This section also applies to computers with a PCMCIA slot connected to a PCI bus.

Initialization Failure

If the set of Card and Socket Services support supplied with your computer is installed and configured and you have an initialization failure, you might have one of the following problems.

Problem 1 - Memory Allocation Conflict between EMM386 (DOS or Windows) and Resource Manager

- **NDIS Workstations:** You must reserve 16K of memory to be used as attribute memory for PC cards. This is the `/MA` parameter for Resource Manager, from the Card and Socket Services you are using, and the `X=nnnn` parameter for EMM386 in the CONFIG.SYS file.

  For example:

```
DEVICE=C:\DOS\EMM386.EXE RAM X=C000-C3FF
```

- **ODI Workstations:**
  - If you are using Enabler, you must:
    1. Edit the NET.CFG file and add: `/R:C000` to the following statement:
       `Enabler c:\xxxx\IBMWLENA.EXE`
       where `C000` is a memory zone between C000 to EF00 in multiples of 100 and `xxxx` is the directory where the IBM Wireless LAN has been installed, for example, WIRELESS.
    2. Exclude memory area C000 to C1FF in the parameter for EMM386 in the CONFIG.SYS file.

       ```
       DEVICE=C:\DOS\EMM386.EXE RAM X=C000-C1FF
       ```
  - If you are using both Enabler and Card and Socket Services and your PCMCIA machine does not have an INTEL® 82365SL or compatible port controller, you must exclude only the memory area used by the Enabler.

Problem 2 - Incorrect or Missing Parameters for Multiple Adapter Slots: For a PCMCIA machine with multiple adapter slots, update the corresponding switch parameter according to the documentation supplied with your socket services support.

Problem 3 - Incompatibility with Card and Socket Services: Compatibility problems may exist with non-IBM PCMCIA Card & Socket Services. In such cases you are recommended to use "universal" Card and Socket Services such as "PlayAtWill" (Ref: 5764-085) when available.

Important

When using PlayAtWill, make sure that no statements from a former Card and Socket Services installation are left in your CONFIG.SYS.

Problem 4 - IO Base Address or Interrupt Level Conflicts

Sometimes the Resource Manager (part of Card and Socket Services support) returns an IRQ (INT parameter) or an IO Base Address (PORT parameter) as valid, even if already used by the system.

To resolve the conflicts, you must:

1. Find available values by using a configuration analysis program such as: CardView, CardInfo, MSD, and EZPlay.

2. Change the value(s):
    - Of your computer feature by using its utilities.
    - Of the IBM Wireless LAN adapter by updating these parameters in the PROTOCOL.INI file for NDIS workstations or, in the NET.CFG file for ODI workstations.

Problem 5 - Detection Problem for ODI Workstations

Important

This section only applies to **DOS and Windows ODI wireless workstations** with a PCMCIA Type II slot.

If the PCMCIA Credit Card is not detected when you start your computer:

1. Be sure there is no potential conflict (memory allocation, IRQ, PORT ...)
2. Your PCMCIA machine does not have an INTEL 82365SL or compatible port controller. You must add Card and Socket Services support to your machine.

Radio Interference Problem

If there is radio interference caused by other equipment, follow these steps:

- Determine what equipment is creating the interference. For example, a microwave oven or any product working in the 2.4 to 2.5 GHz frequency band.
- Move the base radio module.
- Move the equipment (if possible) that is causing the interference.
- Move the base itself.
- When you have identified the frequency on which there is interference, go to the NAP and forbid that frequency.

See *Installing and Operating Your Network* manual for a table of radio allocations by country.

Running Adapter Diagnostics from the Utilities Diskette

To run the adapter diagnostics, do the following:

1. Insert the IBM Wireless LAN 'Utilities diskette' in drive A, and restart the workstation by pressing **Ctrl+Alt+Del**.

Important

Wireless Utilities for MCA Bus with Ethernet Adapter: Computers with an MCA bus and an Ethernet adapter may lock up if the Wireless 'Utilities diskette' is booted when the Ethernet cable is not present or unplugged. A specific message identifies the problem (Code 06421 referring to Ethernet cable unplugged). Once the cable is plugged back in, the 'Utilities diskette' works properly.

2. If the workstation has a PCMCIA Type II slot and you have problems when booting the 'Utilities diskette', you would need to modify your 'Utilities diskette' CONFIG.SYS file to call DOS Card and Socket Services support. This may be the case if your PCMCIA machine does not have an INTEL 82365SL or compatible port controller.

   The following are samples from the CONFIG.SYS file:

   ```
   DEVICE=C:\IBMDSS02.SYS
   DEVICE=C:\IBMDOSCS.SYS
   DEVICE=C:\DICRMU02.SYS
   DEVICE=C:\$ICPMDOS.SYS
   ```

3. Select **Diagnostics Utilities** from the main menu, wait for the diagnostics to complete and follow the recommended action.

Troubleshooting Wireless Network Problems

If you are experiencing wireless network problems and tests of the adapter and radio are OK (through diagnostics from the 'Utilities diskette'), you might have a **wireless software problem** (such as product installation, configuration) or a **networking problem**.
The *Installing and Operating Your Network* manual supplied with the product contains a troubleshooting appendix with the following specific sections:

- Base or NAP station initialization failure,
- Base status is 'Not Ready' at the NAP,
- The NAP application is not available,
- OS/2 bridge does not operate,
- Data exchange problems through OS/2 bridged base,
- Workstation registration problems (all red RSSI),
- Communication problems when using 3270 emulation,
- Workstation performance problems,
- Network management does not operate (NetView 6000, NMS,WNM).

Problem Resolution Worksheet

Before calling your service representative:

1. Make a copy of the problem resolution worksheet contained in the *Installing and Operating Your Network* manual or in the README.OS2 file available on the IBM Wireless LAN 'OS/2 Base - Workstation diskette' (volume2).
2. Collect and fill in the information listed in it (see "Obtaining the Necessary Data").
3. Make a backup copy of the important files, depending on your station type (see "Making a Backup Copy of Files" on page 246).

Obtaining the Necessary Data

- Find the level of the operating system, and the date and size of certain system files:
  - **OS/2 base**:
    - Type `SYSLEVEL` at the OS/2 Prompt and record the IBM Wireless LAN application level.
    - Get the size and dates for files by typing: `DIR IBMWLB.OS2 /S`.
  - **NetWare Base**:

    Type `MODULE` at the server prompt on the system console and get size and dates for the following modules:
    - IBMWLCOM.NLM
    - IBMWLNAP.NLM
    - IBMWLWNC.NLM
    - IBMWLWCA.NLM
    - IBMWLERL.NLM or IBMWLPRX.NLM
    - IBMWL.LAN
  - **OS/2 Workstation**:
    - Type `SYSLEVEL` at the OS/2 Prompt and record the IBM Wireless LAN application level.
    - For an NDIS workstation, get size and dates for files by typing `DIR IBMWLO.OS2 /S`.
    - For an ODI workstation, get size and dates for files by typing `DIR IBMWL*.SYS /S`.
  - **DOS/Windows Remote station**
    - For an NDIS workstation:
      - Type `IBMWLLV2` at the DOS Prompt and record the IBM Wireless LAN application level.
      - Get the size and dates for files by typing `DIR IBMWL.DOS /S`.

    - For an ODI workstation:
        - Type `IBMWLLV1` at the DOS Prompt and record the IBM Wireless LAN application level.
        - Get the size and dates for files by typing `DIR IBMWL*.COM /S`.

- Obtain vital product data (**VPD**) for adapter and radio. To do so, follow these steps:
    - Insert the IBM Wireless LAN Utilities diskette in drive A.
    - Restart your workstation.
    - Select **Diagnostic Utilities** from the main menu.
    - When the first set of instruction panels is displayed note the following information:
        - Hardware Change Level
        - Product change level
        - Radio Type and Model
        - Radio Country Type.

Making a Backup Copy of Files

- For a NetWare base (directory: SYS:\SYSTEM\):
    - IBMWL*.LOG
    - IBMWL*.BAK
    - IBMWL.NCF
    - AUTOEXEC.NCF
- For an OS/2 base:
    - IBMWL*.LOG
    - IBMWL*.BAK
    - IBMWL.NCF
    - AUTOEXEC.NCF
    - LANTRAN.LOG
    - CONFIG.SYS
    - PROTOCOL.INI
- For an ODI wireless workstation:
    - CONFIG.SYS
    - NET.CFG
    - AUTOEXEC.BAT, if this workstation is running under DOS or Windows.
- For an NDIS wireless workstation:
    - CONFIG.SYS
    - PROTOCOL.INI
    - LANTRAN.LOG, if this workstation is running under OS/2.
    - WIRELESS.LOG and AUTOEXEC.BAT, if this workstation is running under DOS or Windows.

Upgrading Adapter Microcode from the Utilities Diskette

Warning: When you update the adapter functional code on a wireless workstation, data traffic on the wireless workstation is stopped.

To update the adapter functional code, do the following:

1. Stop all operations on your computer (by using the Shutdown function if you are in OS/2), then insert the IBM Wireless LAN 'Utilities diskette' in drive A.
2. Restart the workstation by pressing **Ctrl+Alt+Del**. If you have a PCMCIA slot and you experience problems when you start your system, refer to the step 2 on page 244.
3. Select **Wireless LAN Adapter Utilities** from the main menu and press **Enter**.
4. Select **Functional Code Update** from the Utility menu, press **Enter** and follow the instructions on the screen.

   Note: Code update files (IBMWLMC1.UPD for ISA/MCA and IBMWLMC2.UPD for PCMCIA) are available from the current IBM Wireless 'Utilities diskette' or from a Corrective Service Diskette.

System Board Memory

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.

Attention

For SIMM memory, PC 300/700 Series computers support gold-plated SIMMs, **except** Types 6560, 6576/6586, 6577/6587, 6598, and 6877/6887 that support only tin-lead SIMMS.

Computer Name	Memory Module		
	Size	Speed	Type
PC 300 Pentium Models 133/233 MHz Type 6272, 6282, 6284	8 MB 16 MB 32 MB 64 MB 128 MB Maximum	60 ns	EDO Non-Parity or SDRAM Industry Standard
PC 300 Pentium II Models 300/333/350/ 400 MHz Type 6275, 6285	16 MB 32 MB 64 MB 128 MB 384 MB Maximum	100 MHz.	SDRAM ECC or Non-Parity Industry Standard
PC 300 Pentium II Models 233/266/333 MHz Type 6561, 6591	16 MB 32 MB 64 MB 128 MB 256 MB Maximum	66 MHz	SDRAM Non-Parity or ECC Industry Standard
PC 300 Pentium Models 166/200/233 MHz Type 6562, 6592	16 MB 32 MB 64 MB 128 MB 384 MB Maximum	60 ns	EDO Non-Parity or ECC Industry Standard
PC 300 Pentium II Models 233/266 MHz Type 6588	16 MB 32 MB 64 MB 128 MB 256 MB 512 MB Maximum	60 ns	EDO Non-Parity or ECC Industry Standard

Computer Name	Memory Module		
	Size	Speed	Type
PC 330/350 80486 Models Type 6571, 6573 6581, 6583	4 MB 8 MB 128 MB Maximum	70 ns	Parity or Non-Parity Gold-plate 72-pin Industry Standard
PC 330/350 Pentium 60 MHz Model Type 6575, 6585	16 MB 32 MB 128 MB Maximum	70 ns	Parity or Non-Parity Gold-plate 72-pin Industry Standard (Matched pairs)
PC 340 Pentium Models 100/133 MHz Type 6560	4 MB 8 MB 16 MB 32 MB 128 MB Maximum	60 ns	Non-Parity Tin-lead 72-pin EDO Industry Standard (Matched pairs)
PC 330/350 Pentium Models 75/90/100/120 133/150/166 MHz Type 6576, 6586	16 MB 32 MB 128 MB Maximum	70 ns	Parity or Non-Parity Tin-lead 72-pin Industry Standard (Matched pairs)
PC 330/350 Pentium Models 100/133/166/ 200 MHz Type 6577, 6587	4 MB 8 MB 16 MB 32 MB 192 MB Maximum	70 ns	Parity or Non-Parity Tin-lead 72-pin Industry Standard (Matched pairs)
PC 360-S150 Pentium Pro™ Models 150/200 MHz Type 6598	8 MB 16 MB 32 MB ECC 128 MB Maximum	60 ns Fast Page	Non-Parity Tin-lead 72-pin Industry Standard (Matched pairs)

Computer Name	Memory Module		
	Size	Speed	Type
PC 365 Pentium Pro Models 180/200 MHz Type 6589	16 MB 32 MB 512 MB Maximum	60 ns EDO	Non-Parity or Parity or ECC Industry Standard
PC 300 Pentium II Models 266/300/350/ 400 MHz Type 6862, 6892	16 MB 32 MB 64 MB 128 MB 384 MB Maximum	100 MHz.	SDRAM ECC or Non-Parity Industry Standard
PC 730/750 Pentium Models 75/90/100 120/133 MHz Type 6875, 6876, 6885, 6886	4 MB 8 MB 16 MB 32 MB 192 MB Maximum	70 ns	Parity Gold-plate 72-pin Industry Standard (Matched pairs)
PC 730/750 Pentium Models 100/133 150/166 MHz Type 6877, 6887	4 MB 8 MB 16 MB 32 MB 128 MB Maximum	60 ns	Parity Gold-plate 72-pin Industry Standard (Matched pairs)
IntelliStation Pentium II Models 266 MHz Type 6888	16 MB 32 MB 64 MB 128 MB 256 MB 512 MB Maximum	60 ns	EDO Non-Parity or ECC Industry Standard
IntelliStation Pentium II Models 350/400 MHz Type 6889	32 MB 64 MB 128 MB 256 MB 1 GB Maximum	100 MHz	SDRAM ECC or Non-Parity Industry Standard
IntelliStation Pentium II Models 350/400 MHz Type 6893	16 MB 32 MB 64 MB 128 MB 384 MB Maximum	100 MHz.	SDRAM ECC Industry Standard

Computer Name	Memory Module		
	Size	Speed	Type
IntelliStation Pentium II Models 233/266/300 MHz Type 6898	32 MB 64 MB 128 MB 256 MB 512 MB Maximum	66 MHz or faster	SDRAM ECC or Non-Parity Industry Standard
IntelliStation Pentium Pro Models 200 MHz Type 6899	16 MB 32 MB 64 MB 128 MB 256 MB 1 GB Maximum	60 ns	EDO or ECC Industry Standard

Supported Memory Configurations

Refer to the following tables for the acceptable memory-module kit combinations.

PC 300 (Type 6272, 6282, 6284): Any combination of DIMM sizes, up to 128 MB, is acceptable. Only non-parity DIMMs are supported. EDO, SDRAM, or a mix of EDO/SDRAM DIMMs are supported. DIMM height must not exceed 1.2 inches. See “System Board Memory” on page 248 for DIMM size, speed, and type.

PC 300 (Type 6275, 6285): DIMM sizes of 16 MB, 32 MB, 64 MB, and 128 MB are acceptable. Start filling DIMM socket 0, then 1, then 2. Use 3.3 V unbuffered 100 MHz. SDRAM Non-Registered DIMMs only. Non-parity or ECC DIMMs are supported. Install only ECC DIMMs to enable ECC. See “System Board Memory” on page 248 for DIMM size, speed, and type.

PC 300 (Type 6561, 6591): Any combination of 16 MB, 32 MB, 64 MB, or 128 MB DIMM sizes, are acceptable. Start filling DIMM socket 0, then 1. Use 3.3 V unbuffered DIMMs only. Non-parity or ECC DIMMs are supported. Install only ECC DIMMs to enable ECC. See “System Board Memory” on page 248 for DIMM size, speed, and type.

PC 300 (Type 6562, 6592): Any combination of DIMM sizes, up to 128 MB is acceptable. Start filling DIMM socket 0, then 1, then 2. Use 3.3 V unbuffered EDO DIMMs only. Non-parity or ECC DIMMs are supported. Install only ECC DIMMs to enable ECC. See “System Board Memory” on page 248 for DIMM size, speed, and type.

PC 300 (Type 6588): Any combination of DIMM sizes is acceptable. DIMM height must not exceed 1.2 inches. If EDO NP (non-parity) DIMMs and EDO ECC DIMMs are mixed, they will configure as non-parity. Install only EDO ECC DIMMs to enable parity. See “System Board Memory” on page 248 for DIMM size, speed, and type.

PC 330/350 Series (Type 6571, 6573, 6581, 6583) - 80486: These are the recommended combinations of memory-module kits.

Memory	MEM1	MEM2	MEM3	MEM4
4 MB	4 MB	–	–	–
8 MB	4 MB	4 MB	–	–
8 MB	8 MB	–	–	–
12 MB	4 MB	4 MB	4 MB	–

Memory	MEM1	MEM2	MEM3	MEM4
12 MB	4 MB	8 MB	–	–
16 MB	16 MB	–	–	–
16 MB	4 MB	4 MB	8 MB	–
16 MB	8 MB	8 MB	–	–
16 MB	4 MB	4 MB	4 MB	4 MB
20 MB	4 MB	8 MB	8 MB	–
20 MB	4 MB	16 MB	–	–
24 MB	8 MB	8 MB	8 MB	–
24 MB	4 MB	4 MB	8 MB	8 MB
24 MB	4 MB	4 MB	16 MB	–
28 MB	4 MB	8 MB	8 MB	8 MB
28 MB	4 MB	4 MB	16 MB	4 MB
32 MB	16 MB	16 MB	–	–
32 MB	32 MB	–	–	–
32 MB	8 MB	8 MB	16 MB	–
32 MB	8 MB	8 MB	8 MB	8 MB
36 MB	4 MB	16 MB	16 MB	–
40 MB	4 MB	4 MB	32 MB	–
40 MB	4 MB	4 MB	16 MB	16 MB
48 MB	16 MB	16 MB	16 MB	–
48 MB	8 MB	8 MB	32 MB	–
48 MB	8 MB	8 MB	16 MB	16 MB
52 MB	4 MB	16 MB	16 MB	16 MB
64 MB	32 MB	32 MB	–	–
64 MB	16 MB	16 MB	32 MB	–
64 MB	16 MB	16 MB	16 MB	16 MB
68 MB	4 MB	32 MB	16 MB	16 MB
72 MB	4 MB	4 MB	32 MB	32 MB
80 MB	8 MB	8 MB	32 MB	32 MB
84 MB	4 MB	32 MB	32 MB	16 MB
96 MB	32 MB	32 MB	32 MB	–
96 MB	16 MB	16 MB	32 MB	32 MB
100 MB	4 MB	32 MB	32 MB	32 MB
128 MB	32 MB	32 MB	32 MB	32 MB

PC 330/350 Series (Type 6575, 6585) - Pentium 60 MHz: These are the recommended combinations of memory-module kits. Each bank must contain a matched pair of SIMMs having the same size and speed.

Total Memory	Bank 1 MEM 1/2	Bank 2 MEM 3/4
8 MB	4 MB	–
16 MB	4 MB	4 MB
16 MB	8 MB	–
24 MB	8 MB	4 MB
32 MB	8 MB	8 MB
32 MB	16 MB	–
40 MB	16 MB	4 MB
48 MB	16 MB	8 MB
64 MB	16 MB	16 MB
64 MB	32 MB	–
72 MB	32 MB	4 MB
80 MB	32 MB	8 MB
96 MB	32 MB	16 MB
128 MB	32 MB	32 MB

PC 340 Series (Type 6560) - Pentium 100/133/166 MHz: You can install a maximum of four single inline memory modules (SIMMs) in the computer. The system supports a minimum of 8 MB and a maximum of 128 MB of memory. Use only tin lead, 72-pin, 60 ns, Industry Standard EDO, non-parity SIMMs.

Memory modules are installed in two memory banks, Bank 0 and Bank 1 (see “PC 340 Series (Type 6560) - Pentium 100/133/166 MHz System Board” on page 348). Each bank supports 4, 8, 16, or 32 MB single- or double-density SIMMs. Each bank used must contain a pair of SIMMs of the same size and density. For best performance, fill Bank 0 first.

The following table shows some possible SIMM combinations and the total memory size for each combination:

Bank 0		Bank 1		Total
SIMM 1	SIMM 2	SIMM 3	SIMM 4	
4 MB (single)	4 MB (single)	–	–	8 MB
4 MB (single)	4 MB (single)	4 MB (single)	4 MB (single)	16 MB
8 MB (double)	8 MB (double)	–	–	16 MB
8 MB (double)	8 MB (double)	8 MB (double)	8 MB (double)	32 MB
8 MB (double)	8 MB (double)	16 MB (single)	16 MB (single)	48 MB

16 MB (single)	16 MB (single)	–	–	32 MB
16 MB (single)	16 MB (single)	16 MB (single)	16 MB (single)	64 MB
32 MB (double)	32 MB (double)	–	–	64 MB
32 MB (double)	32 MB (double)	4 MB (single)	4 MB (single)	72 MB
32 MB (double)	32 MB (double)	8 MB (double)	8 MB (double)	80 MB
32 MB (double)	32 MB (double)	16 MB (single)	16 MB (single)	96 MB
32 MB (double)	32 MB (double)	32 MB (double)	32 MB (double)	128 MB

PC 330/350 Series (Type 6576, 6586) - Pentium 75/90/100/120/133/150/166 MHz:

These are the recommended combinations of memory-module kits. Each bank must contain a matched pair of SIMMs having the same size and speed.

Total Memory	Bank 0	Bank 1
8 MB	4 MB	–
16 MB	4 MB	4 MB
16 MB	8 MB	–
24 MB	4 MB	8 MB
24 MB	8 MB	4 MB
32 MB	8 MB	8 MB
32 MB	16 MB	–
40 MB	4 MB	16 MB
40 MB	16 MB	4 MB
72 MB	4 MB	32 MB
72 MB	32 MB	4 MB
80 MB	8 MB	32 MB
80 MB	32 MB	8 MB
128 MB	32 MB	32 MB

PC 330/350 Series (Type 6577, 6587) - Pentium 100/133/166/200 MHz

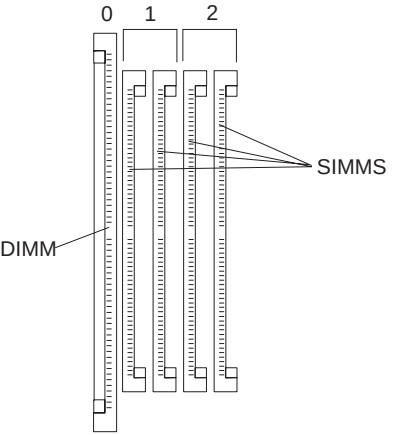
These are the recommended combinations of memory-module kits. Each bank must contain a matched pair of SIMMs having the same size and speed. The maximum (SIMMs/DIMMs) memory supported is 192 MB.

DIMM (0) and SIMMs (1 and 2) in the following figure correspond to the memory banks (0, 1, and 2).

Bank 0 holds DIMM memory modules. Bank 1 and Bank 2 hold matched-pair SIMM memory modules. The banks are filled according to the following memory tables. When installing SIMM memory, a matched-pair is first installed into Bank 1, and then into Bank 2.

Notes:

1. Industry standard 72-pin tin-lead SIMMs and 168-pin gold-lead DIMMs are supported.
2. Install only parity SIMMs/DIMMs to enable parity.
3. A mix of parity and non-parity SIMMs/DIMMs will configure as non-parity.
4. A mix of EDO and FP SIMMs/DIMMs will work, provided that matched pairs are installed in each bank.
5. The Configuration/Setup Utility must be used to install 70 ns memory modules.



Important

Only memory modules with a maximum height of no more than 3.05 cm (1.2 inches) can be installed on the Type 6577, 6587 system board.

The following table shows the 8 MB and 16 MB standard memory-module configurations.

Type	Speed	EDO	Parity	Size	Memory
SIMMs	60 ns	EDO	N	4, 4 MB	8 MB
DIMM	60 ns	EDO	N	16 MB	16 MB

The following table shows the SIMMs and DIMMs that are supported.

Type	Speed	EDO, FP	Parity	Sizes Supported
SIMM	60 ns	EDO	N	4, 8, 16, 32 MB
SIMM	60 ns	FP	Y	4, 8, 16, 32 MB
SIMM	70 ns	FP	N	4, 8, 16, 32 MB
SIMM	70 ns	FP	Y	4, 8 MB
DIMM	60 ns	EDO	N	8, 16, 32 MB
DIMM	60 ns	FP	Y	8, 16, 32 MB

PC 360-S150 Series (Type 6598) - Pentium Pro 150/200 MHz: These are the recommended combinations of memory-module kits. Each bank must contain a matched pair of SIMMs having the same size and speed. **Important**: If all four banks are populated, all memory SIMMs must be the same size and speed.

Total Memory	Bank 1	Bank 0
16 MB	8 MB	–
32 MB	8 MB	8 MB
32 MB	16 MB	–
64 MB	16 MB	16 MB
64 MB	32 MB	–
128 MB	32 MB	32 MB

PC 365 Series (Type 6589) - Pentium Pro 180/200 MHz: These are the recommended combinations of DIMMs. However, any combination of DIMM sizes is acceptable. DIMM height must not exceed 1.2 inches. If EDO NP (non-parity) DIMMs and EDO ECC DIMMs are mixed, they will configure as non-parity. Install only EDO ECC DIMMs to enable parity.

Total Memory	Mem 1	Mem 2	Mem 3	Mem 4
16 MB	16 MB	–	–	–
32 MB	32 MB	–	–	–
32 MB	16 MB	16 MB	–	–
48 MB	32 MB	16 MB	–	–
48 MB	16 MB	16 MB	16 MB	–
64 MB	64 MB	–	–	–
64 MB	32 MB	32 MB	–	–
64 MB	32 MB	16 MB	16 MB	–

Total Memory	Mem 1	Mem 2	Mem 3	Mem 4
96 MB	32 MB	32 MB	32 MB	–
128 MB	128 MB	–	–	–
128 MB	64 MB	64 MB	–	–
256 MB	128 MB	128 MB	–	–
256 MB	128 MB	64 MB	64 MB	–
512 MB	128 MB	128 MB	128 MB	128 MB

PC 300 (Type 6862, 6892): DIMM sizes of 16 MB, 32 MB, 64 MB, and 128 MB are acceptable. Start filling DIMM socket 0, then 1, then 2. Use 3.3 V unbuffered 100 MHz. SDRAM Non-Registered DIMMs only. Non-parity or ECC DIMMs are supported. Install only ECC DIMMs to enable ECC. See "System Board Memory" on page 248 for DIMM size, speed, and type.

PC 730/750 Series (Type 6875, 6876, 6885, 6886) - Pentium 75/90/100/120/133 MHz:

These are the recommended combinations of memory-module kits. Each bank must contain a matched pair of SIMMs having the same size and speed.

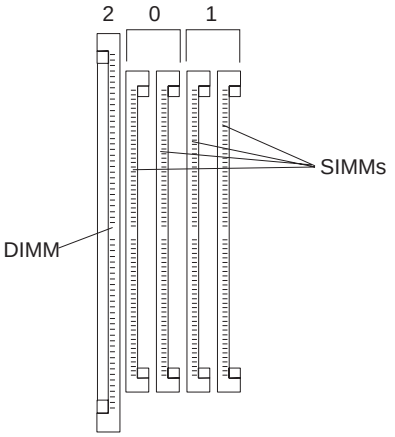
Total Memory	Bank 1 MEM 1/2	Bank 2 MEM 3/4	Bank 3 MEM 5/6
8 MB	4 MB	–	–
16 MB	4 MB	4 MB	–
16 MB	8 MB	–	–
24 MB	4 MB	4 MB	4 MB
24 MB	8 MB	4 MB	–
32 MB	8 MB	8 MB	–
32 MB	16 MB	–	–
40 MB	8 MB	8 MB	4 MB
40 MB	16 MB	4 MB	–
48 MB	8 MB	8 MB	8 MB
48 MB	16 MB	8 MB	–
64 MB	16 MB	16 MB	–
64 MB	32 MB	–	–
72 MB	16 MB	16 MB	4 MB
72 MB	32 MB	4 MB	–
80 MB	16 MB	16 MB	8 MB
80 MB	32 MB	8 MB	–
96 MB	16 MB	16 MB	16 MB
96 MB	32 MB	16 MB	–
128 MB	32 MB	32 MB	–

Total Memory	Bank 1 MEM 1/2	Bank 2 MEM 3/4	Bank 3 MEM 5/6
136 MB	32 MB	32 MB	4 MB
144 MB	32 MB	32 MB	8 MB
160 MB	32 MB	32 MB	16 MB
192 MB	32 MB	32 MB	32 MB

PC 730/750 Series (Type 6877, 6887) - Pentium 100/133/150/166 MHz: These are the recommended combinations of memory-module kits. Each bank must contain a matched pair of SIMMs having the same size and speed.

DIMM (2) and SIMMs (0 and 1) in the following figure correspond to the memory banks (0, 1, and 2).

Bank 0 and Bank 1 hold matched-pair SIMM memory modules. Bank 2 holds DIMM memory modules. The banks are filled according to the following memory table. When installing SIMM memory, a matched-pair is first loaded into Bank 0, and then into Bank 1 as required.



Important

Only memory modules with a maximum height of no more than 3.05 cm (1.2 inches) can be installed on the Type 6877, 6887 system board.

Type	Speed	Memory-Module Size
SIMM	60 ns	4 MB, 8 MB, 16 MB, 32 MB
DIMM	60 ns	8 MB, 16 MB, 32 MB, 64 MB

Total Memory	Bank 0 SIMM 3,4	Bank 1 SIMM 1,2	Bank 2 DIMM
16 MB	0,0	0,0	16
16 MB	4,4	4,4	0
24 MB	0,0	4,4	16
24 MB	4,4	0,0	16
32 MB	0,0	0,0	32
32 MB	8,8	8,8	0
40 MB	4,4	8,8	16
40 MB	0,0	4,4	32
48 MB	4,4	4,4	32
64 MB	8,8	8,8	32
72 MB	4,4	16,16	32
80 MB	8,8	16,16	32
96 MB	16,16	16,16	32
128 MB	16,16	32,32	32

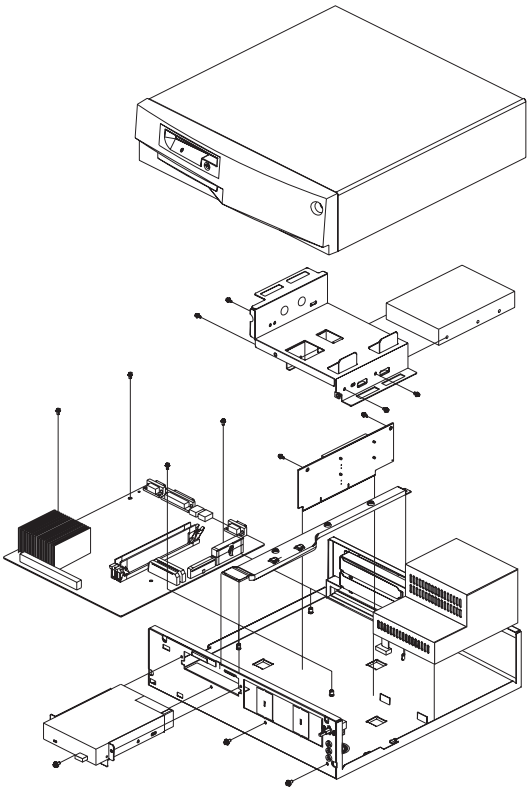
IntelliStation (Type 6888, 6899): Any combination of DIMM sizes is acceptable. DIMM height must not exceed 1.2 inches. If EDO NP (non-parity) DIMMs and EDO ECC DIMMs are mixed, they will configure as non-parity. Install only EDO ECC DIMMs to enable parity. See “System Board Memory” on page 248 for DIMM size, speed, and type.

IntelliStation (Type 6889): DIMM sizes of 32, 64, 128, and 256 MB are acceptable. Use 100 MHz. SDRAM DIMMs. Do not mix Registered and Non-Registered DIMMs. When installing or removing memory, any sequence of DIMM size is allowed. Fill each DIMM connector sequentially, starting at DIMM socket 0. If SDRAM ECC and SDRAM (non-parity) DIMMs are mixed, they will configure as non-parity ECC. Install only SDRAM ECC DIMMs to enable ECC. See “System Board Memory” on page 248 for DIMM size, speed, and type.

IntelliStation (Type 6893): DIMM sizes of 16 MB, 32 MB, 64 MB, and 128 MB are acceptable. Start filling DIMM socket 0, then 1, then 2. Use 3.3 V unbuffered 100 MHz. SDRAM Non-Registered DIMMs only. Only ECC DIMMs are supported. See “System Board Memory” on page 248 for DIMM size, speed, and type.

IntelliStation (Type 6898): DIMM sizes of 16, 32, 64, and 128 MB are acceptable. Use Non-Registered DIMMs. DIMM height must not exceed 2.5 inches. If SDRAM ECC and SDRAM (non-parity) DIMMs are mixed, they will configure as non-parity ECC. Install only SDRAM ECC DIMMs to enable ECC. See “System Board Memory” on page 248 for DIMM size, speed, and type.

Computer Exploded View (Type 6272)

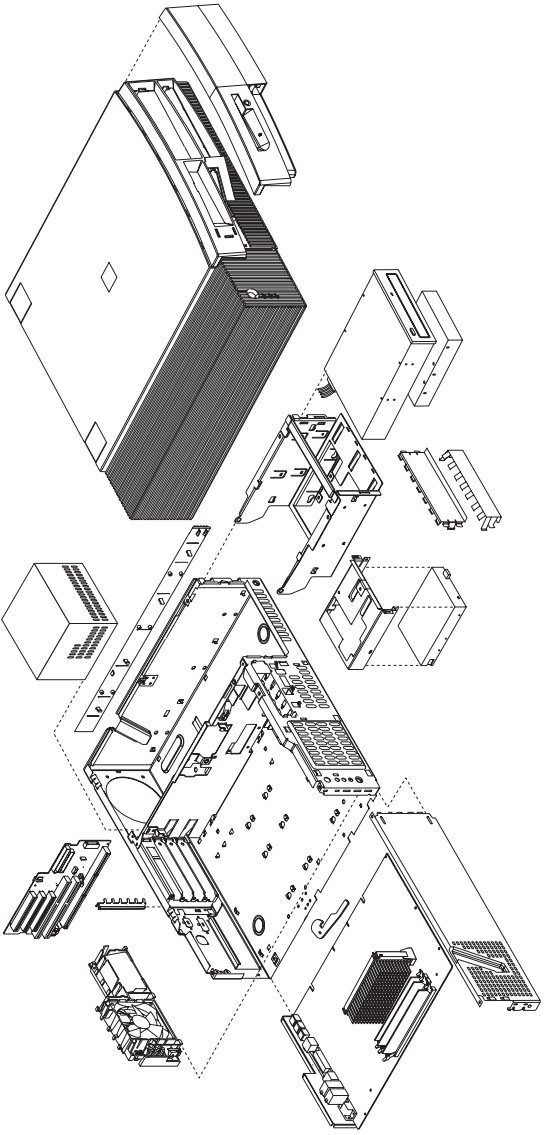


Note

For models 88X, 89X, 90X, 91X, use a T15 Torx driver to remove the top cover.

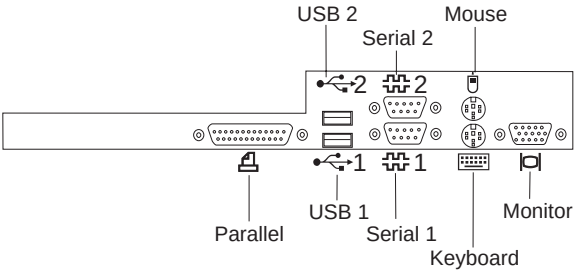
The 88X, 89X, 90X, 91X models do not have a CD-ROM drive or diskette drive. To perform general checkout and diagnostics for these models, see “General Checkout (Type 6272 Models 88X, 89X, 90X, 91X)” on page 5 and “Diagnostics Test Programs” on page 205.

Computer Exploded View (Type 6275)

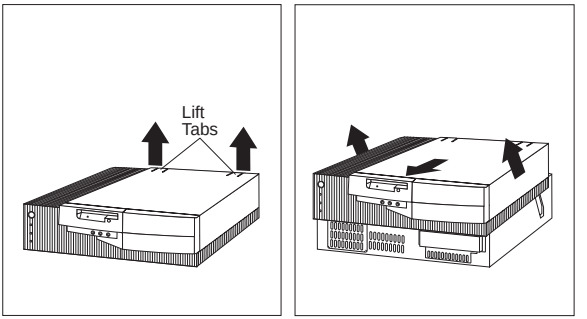


Input/output connectors and removal/service procedures for the cover, system board, and drive cage are on the following pages.

Input/Output Connectors (Type 6275)

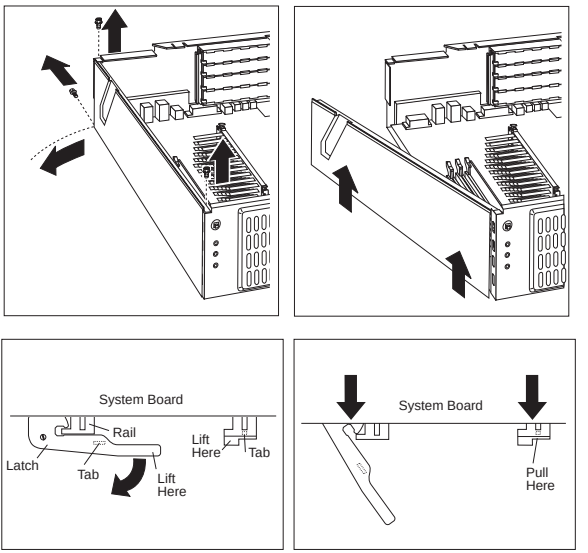


Cover Removal (Type 6275)

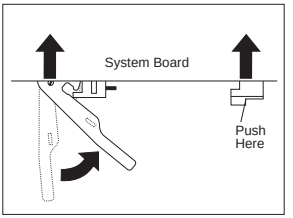


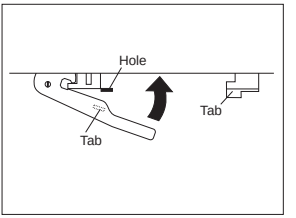
Unlock cover from back of the system unit before removing cover.

System Board Removal (Type 6275)

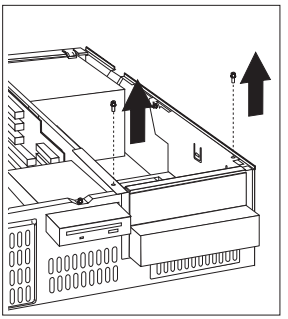


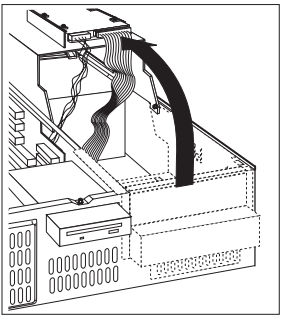
System Board Installation (Type 6275)

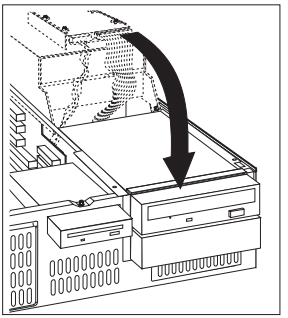


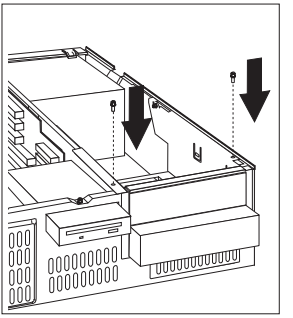


Drive Cage Service (Type 6275)

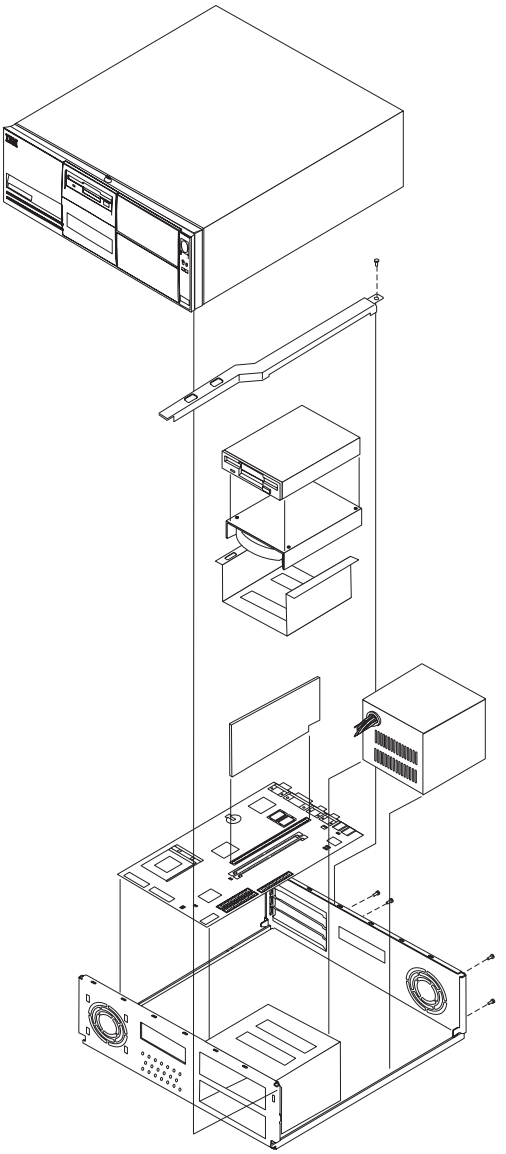




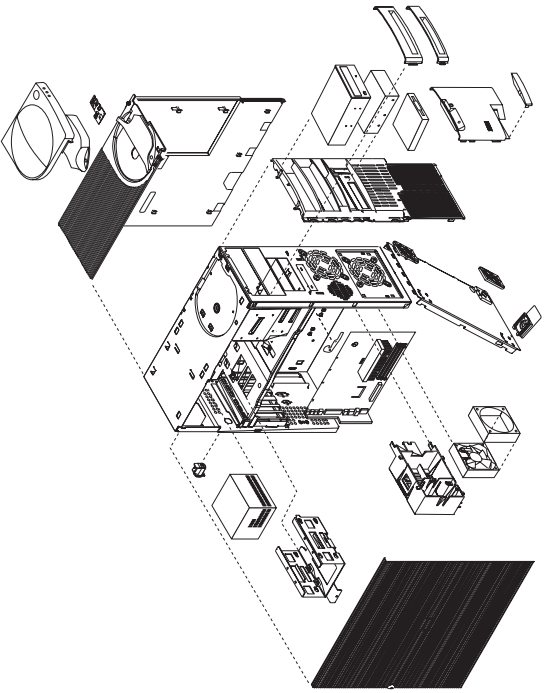




Computer Exploded View (Type 6282, 6284)

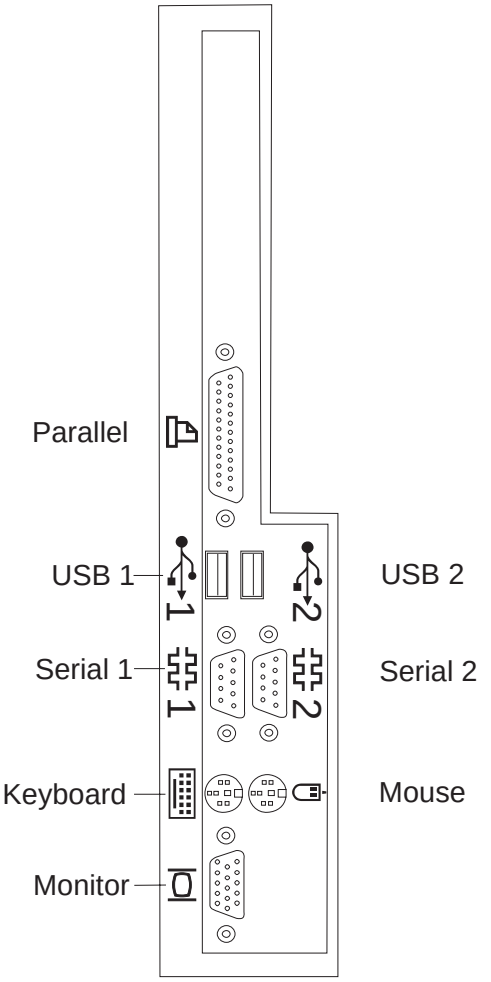


Computer Exploded View (Type 6285)

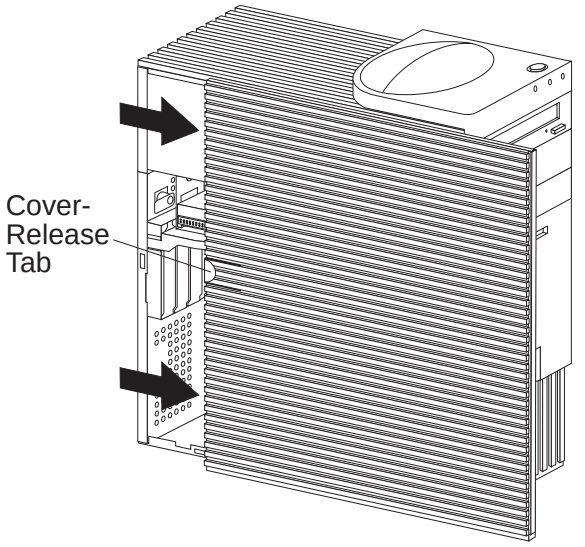


Input/output connectors and removal procedures for the cover, system board, and hard disk drive cage are on the following pages.

Input/Output Connectors (Type 6285)

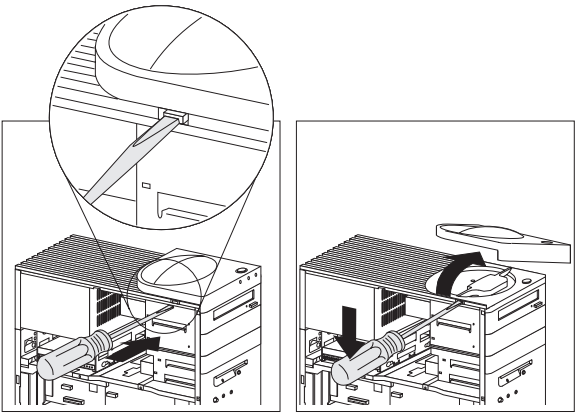


Cover Removal (Type 6285)



Unlock cover from back of the system unit before removing cover.

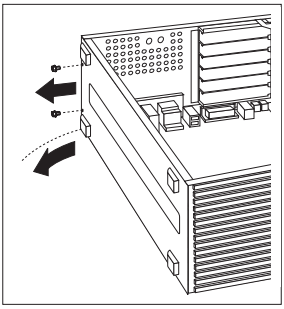
Top Handle Cover Removal (Type 6285)

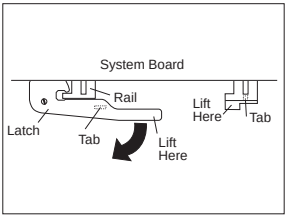


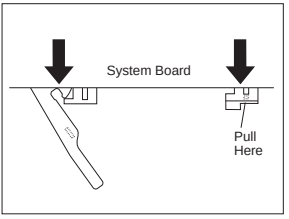
Attention

Do not lift handle cover too high or the tabs will break.

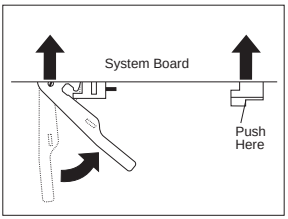
System Board Removal (Type 6285)

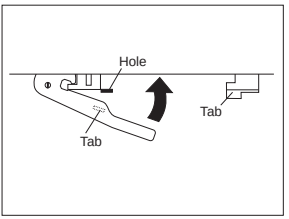




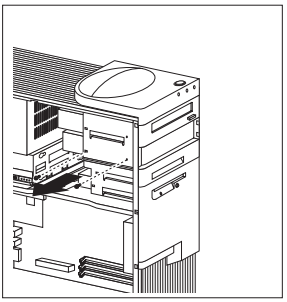


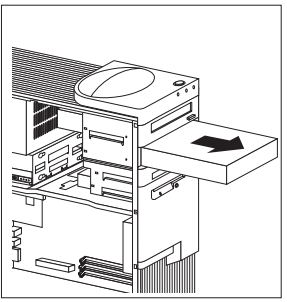
System Board Installation (Type 6285)



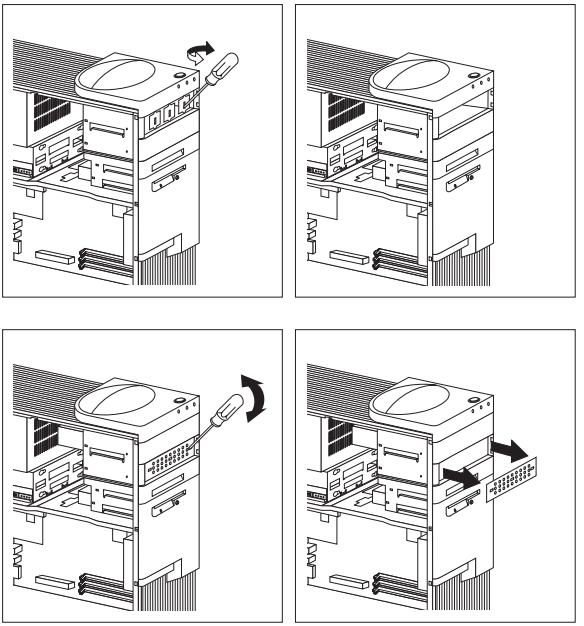


Non removable Hard Disk Drive Cage (Type 6285)

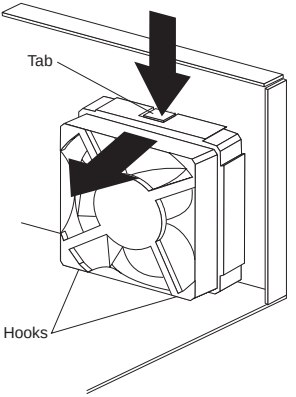




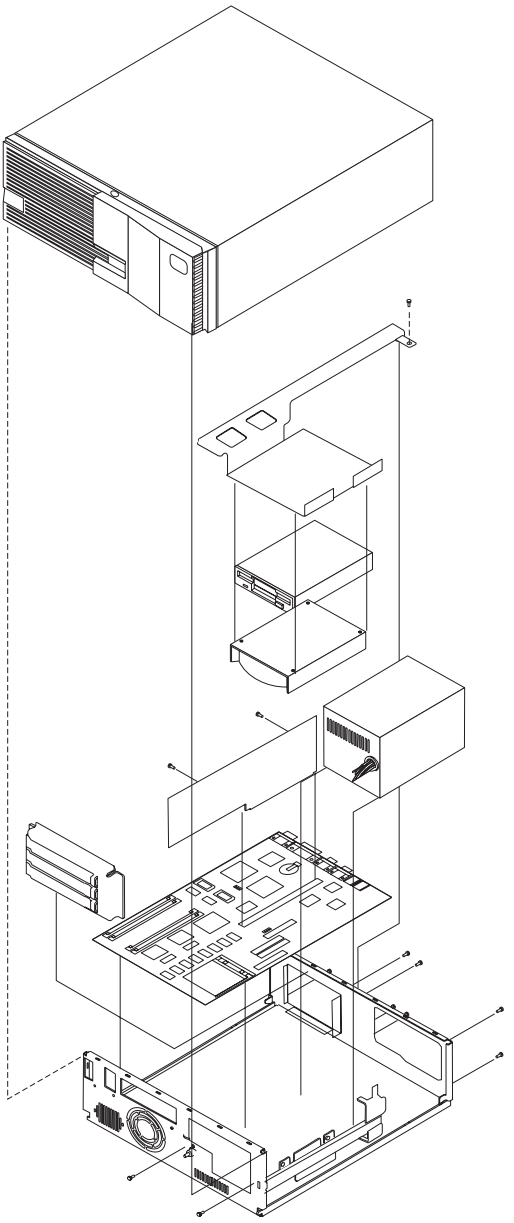
Tab Removal (Type 6285)



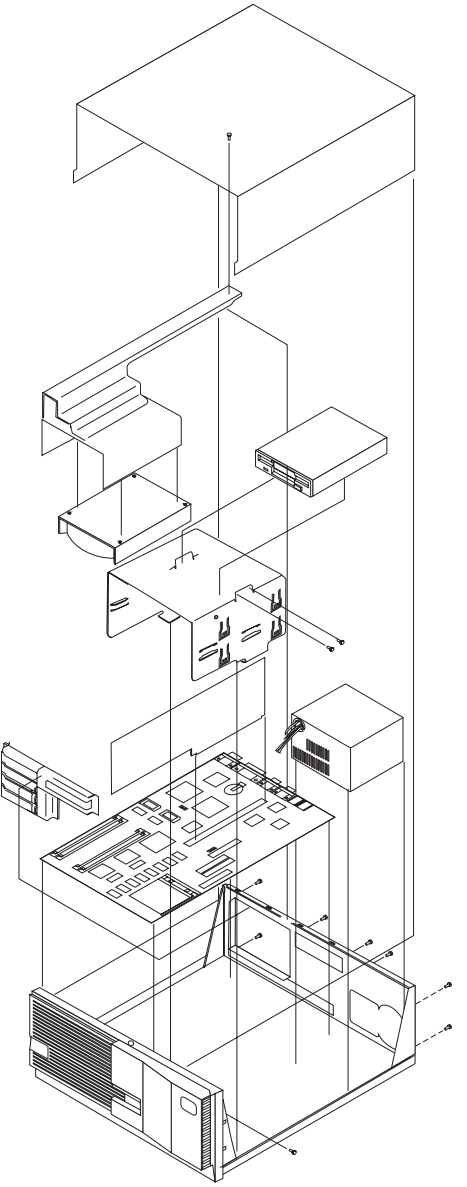
Fan Removal (Type 6285)



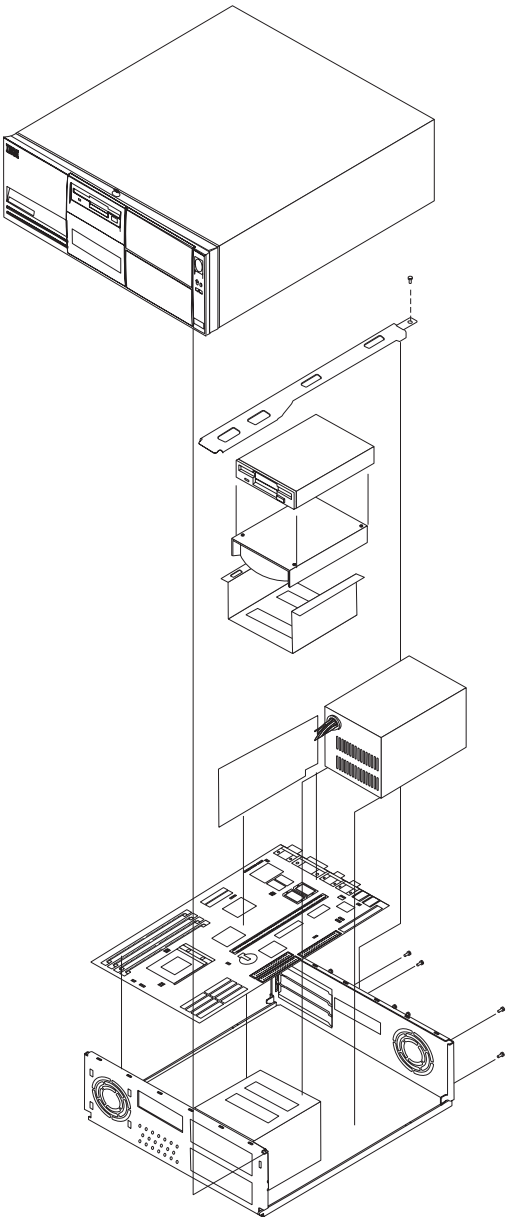
Computer Exploded View (Type 6X7X)



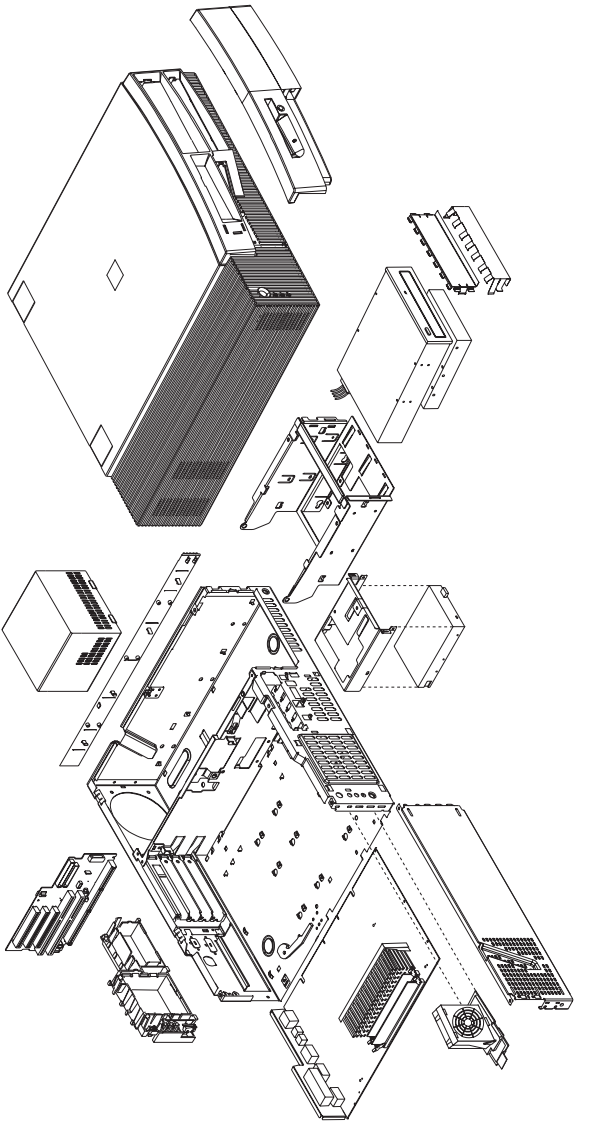
Computer Exploded View (Type 6X8X)



Computer Exploded View (Type 6560)

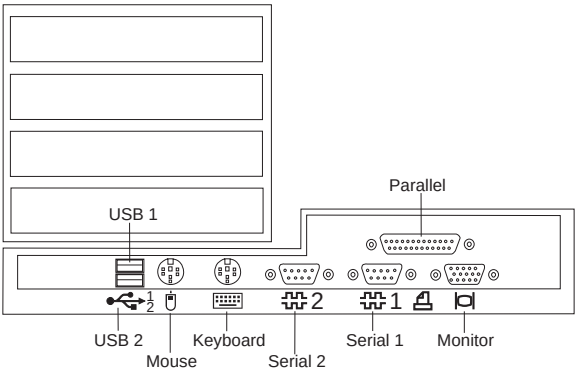


Computer Exploded View (Type 6561)



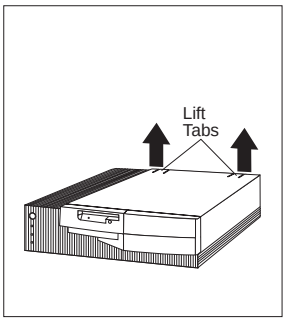
Input/Output connectors and removal procedures for the cover, system board, drive cage, and fan are on the following pages.

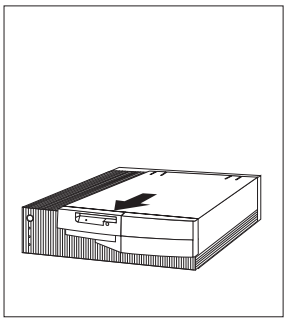
Input/Output Connectors (Type 6561)

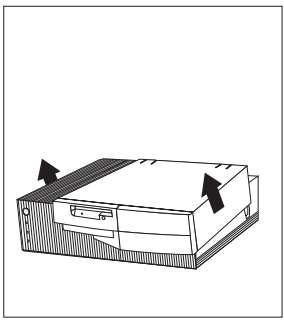


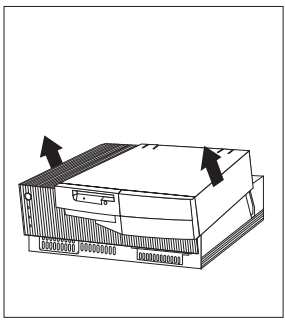
Cover Removal (Type 6561)

Unlock cover from back of the system unit before removing cover.

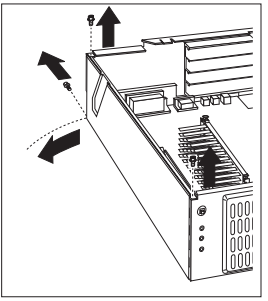


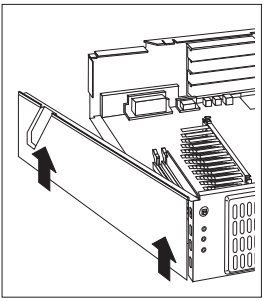






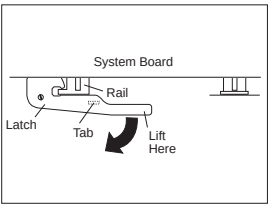
System Board Removal (Type 6561)

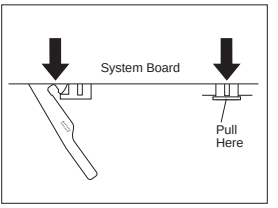




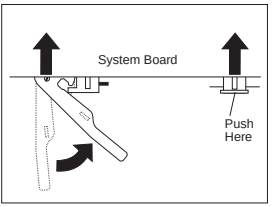
The computer you are servicing might have one of two styles of the right system board rail. Below are the removal and install procedures for both rail styles.

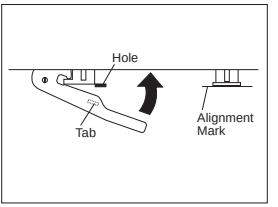
Style 1 system board rail with **scribe line**:





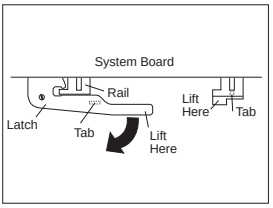
After unlatching and extending the system board latch handle, grasp both system board rails and carefully slide the system board out from the chassis.

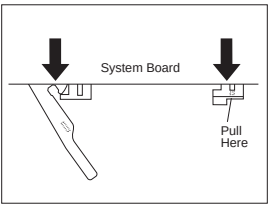




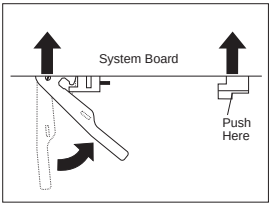
Rotate the latch handle and firmly push in on the end of the right-hand rail. When the system board is fully seated, the alignment mark on the chassis is visible.

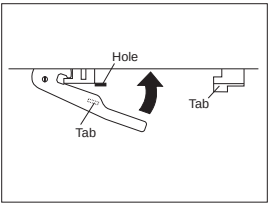
Style 2 system board rail with **latching tab**:





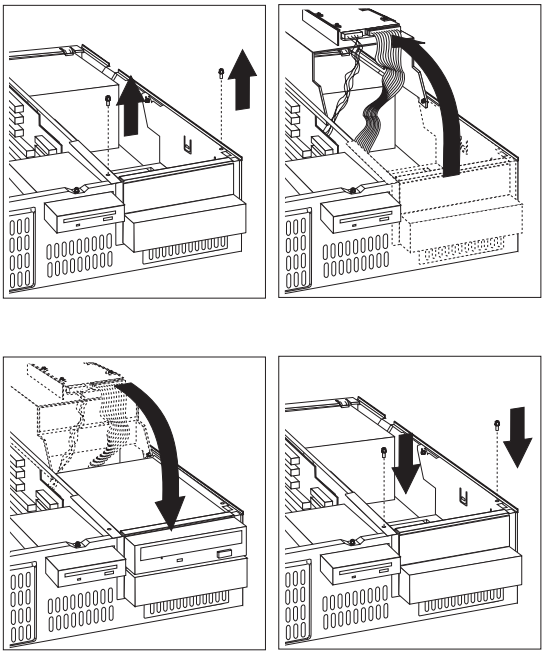
Lift the end of the right-hand rail to disengage the plastic tab from the bottom of the chassis.



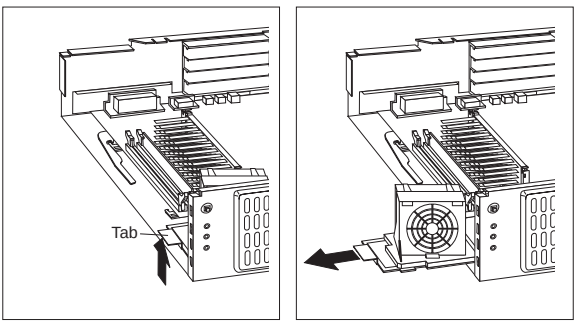


Rotate the latch handle and firmly push in on the end of the right-hand rail to engage the tab in the opening of the chassis.

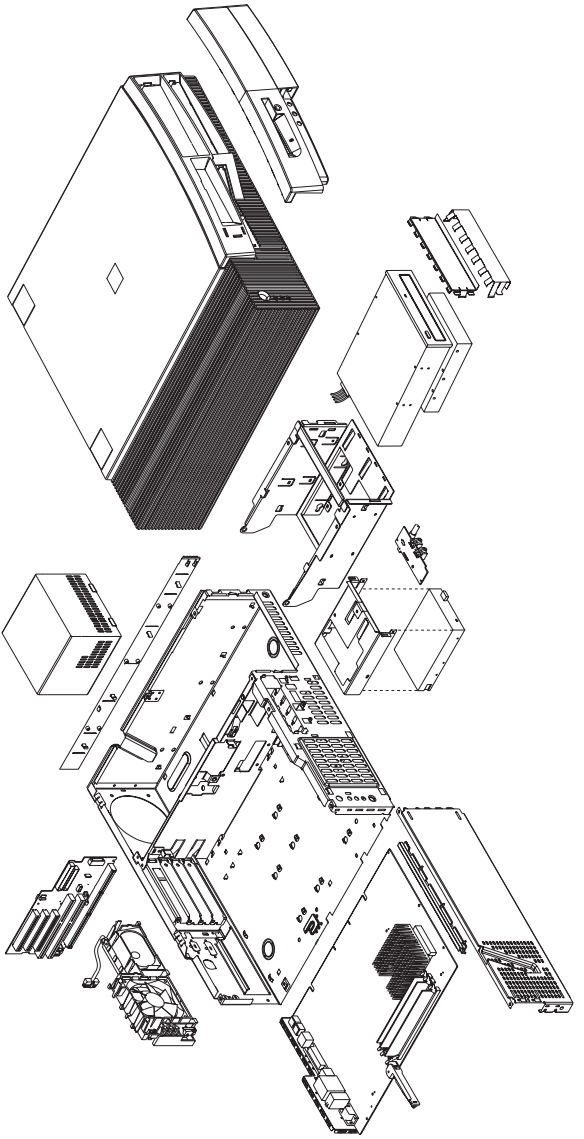
Drive Cage Service (Type 6561)



Fan Removal (Type 6561)

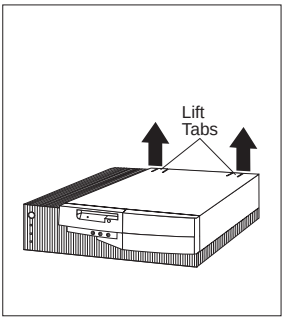


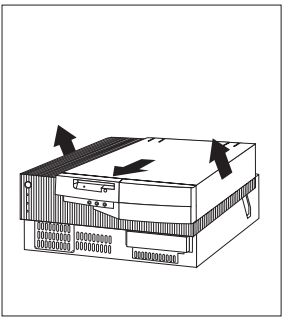
Computer Exploded View (Type 6562)



Removal and service procedures for the cover, system board, and drive cage are on the following pages.

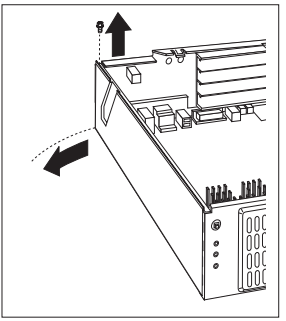
Cover Removal (Type 6562)

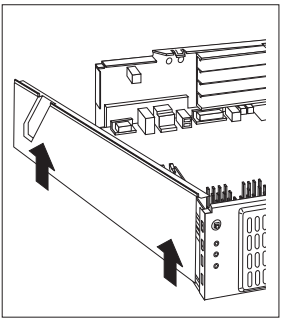


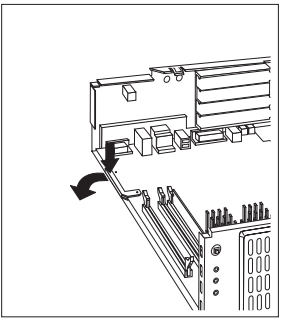


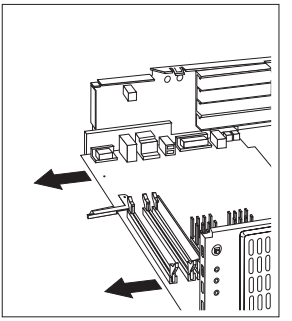
Unlock cover from back of the system unit before removing cover.

System Board Removal (Type 6562)

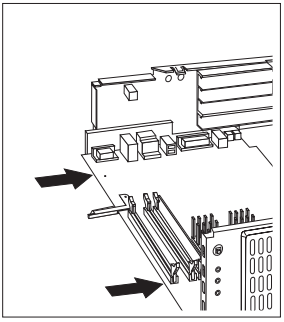


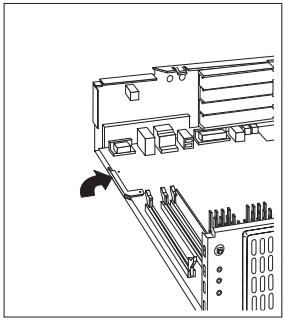


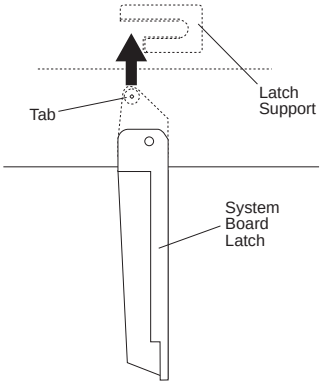


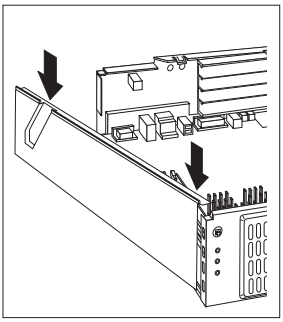


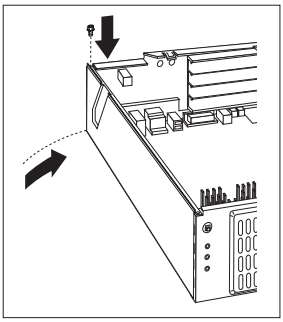
System Board Installation (Type 6562)



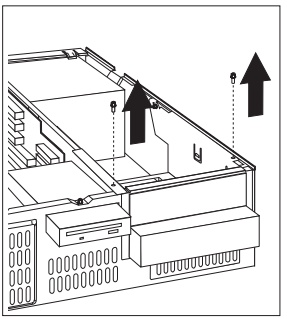


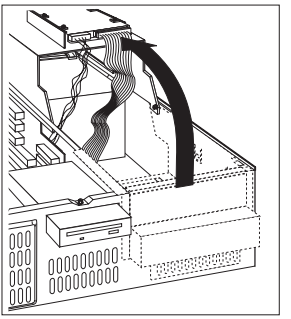


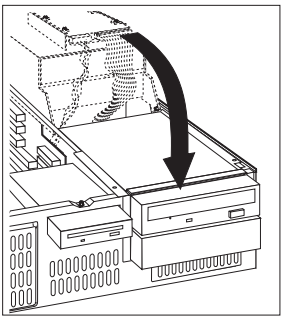


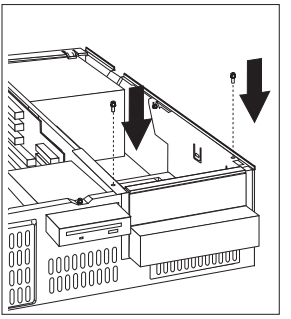


Drive Cage Service (Type 6562)

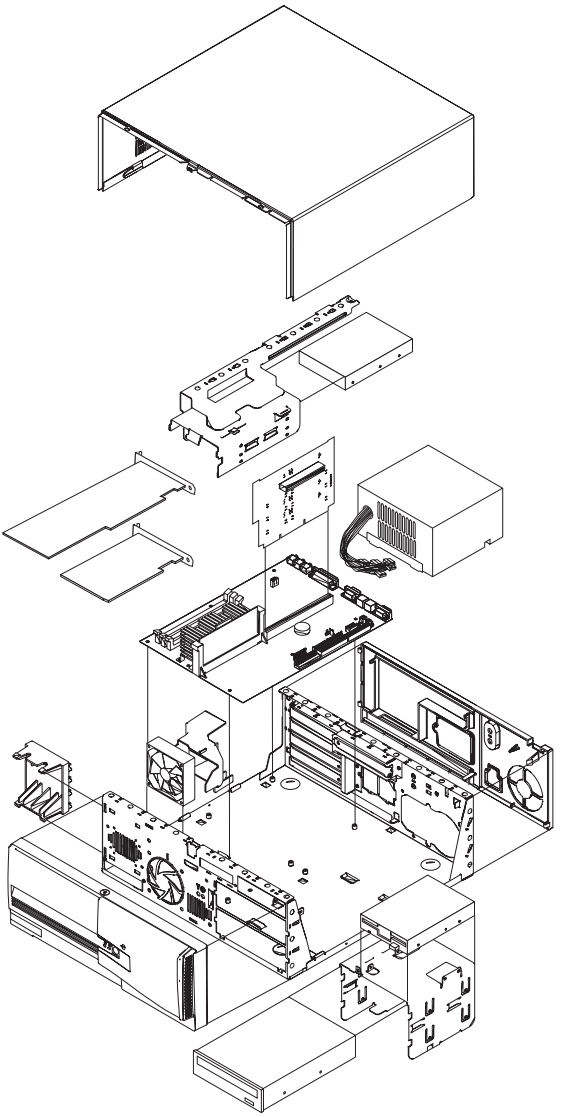






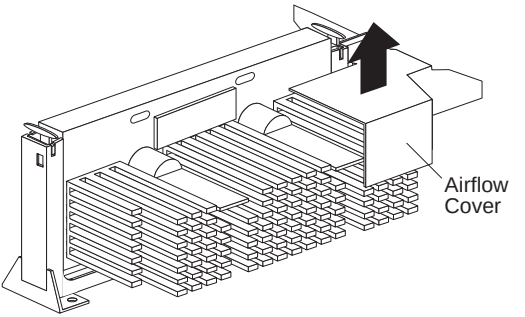


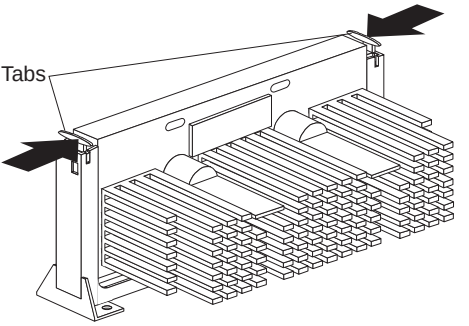
Computer Exploded View (Type 6588, 6888)



Removal and installation of the Pentium II microprocessor and the retainer bracket and system board plate are on the following pages.

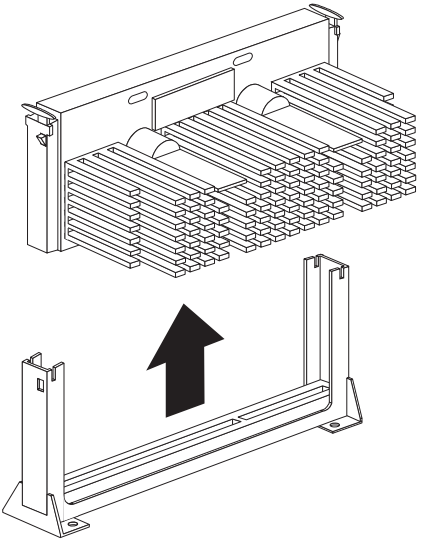
Microprocessor Removal (Type 6588, 6888)





Push in until the tabs release.

Microprocessor Removal (Type 6588, 6888) - continued

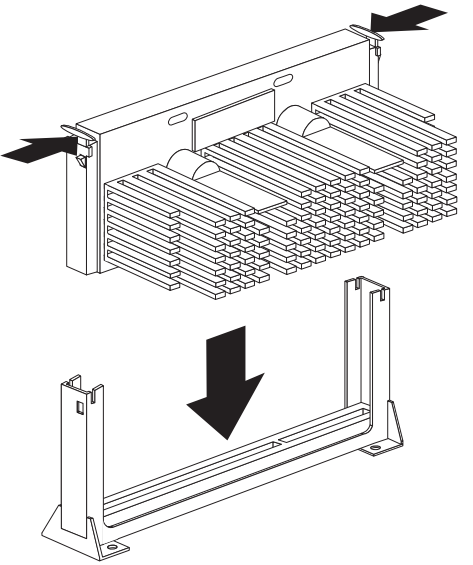


Carefully place one hand on the system board and pull the microprocessor up and out of the connector with the other hand.

Note

To install the Pentium II microprocessor, see “Microprocessor Installation (Type 6588, 6888)” on page 286.

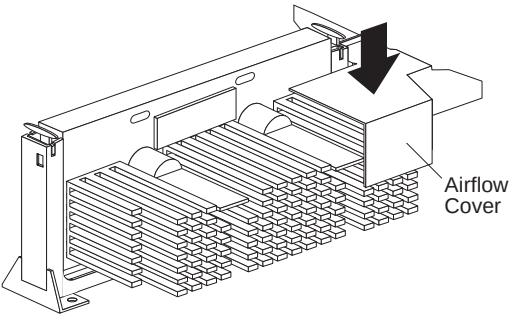
Microprocessor Installation (Type 6588, 6888)



Tabs can be pressed in or out.

Press the microprocessor down until it seats in the connector.

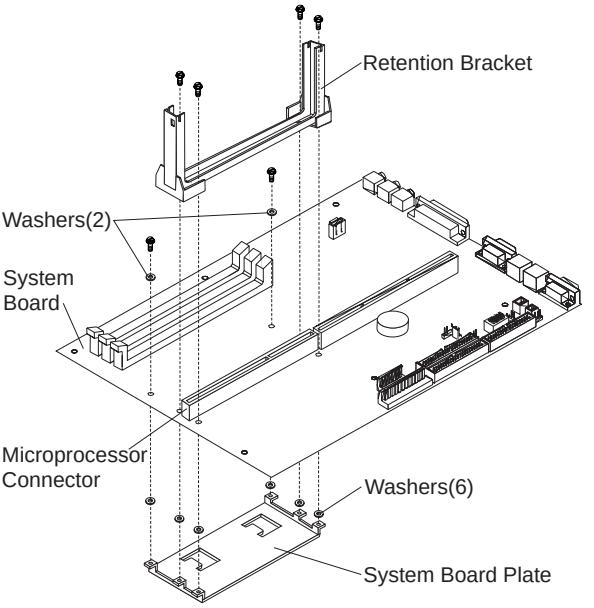
Press the tabs out to latch the microprocessor in place.



Note

See “Microprocessor Bracket and Plate Removal/Installation (Type 6588, 6888)” on page 287 when replacing the system board.

Microprocessor Bracket and Plate Removal/Installation (Type 6588, 6888)



When replacing the system board, keep the following:

- Retention Bracket
- System Board Plate
- Screws and Washers

Install these parts on the new system board.

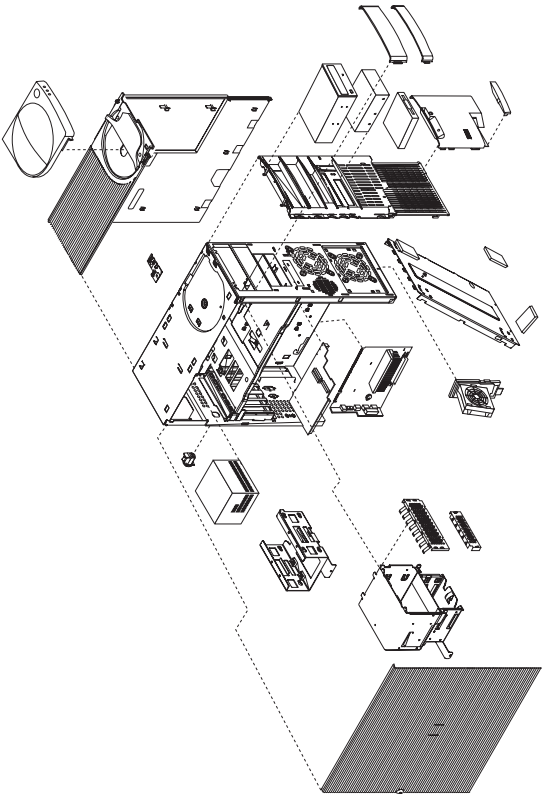
See “System Board Replacement (Type 6588, 6888)” on page 83.

Important

Make sure the plastic washers are attached to the six mounting tabs of the system board plate, and that the washers are under the two front screw heads that secure the system board plate.

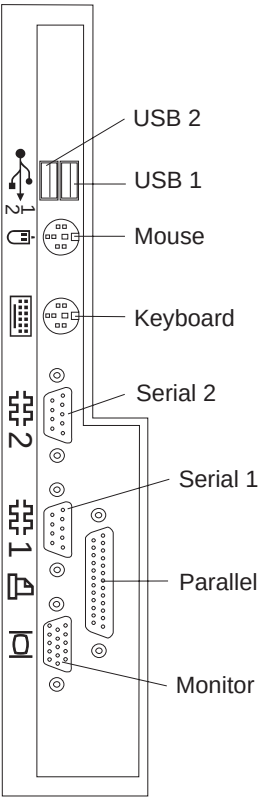
If any of the washers are not installed, the system board can be damaged.

Computer Exploded View (Type 6591)

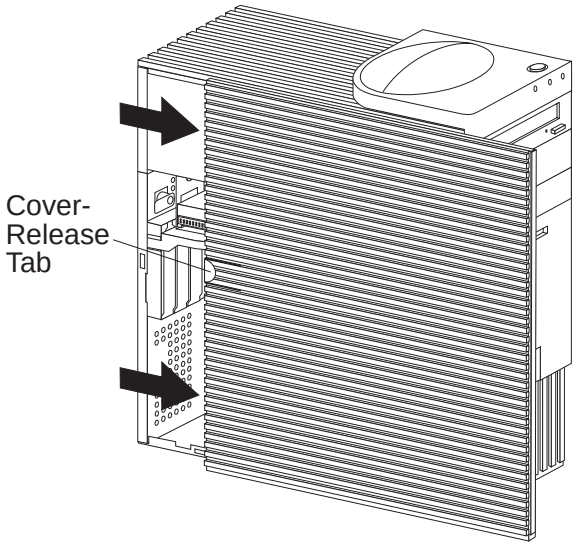


Input/Output connectors and removal procedures for the cover, system board, drive cage, and fan are on the following pages.

Input/Output Connectors (Type 6591)

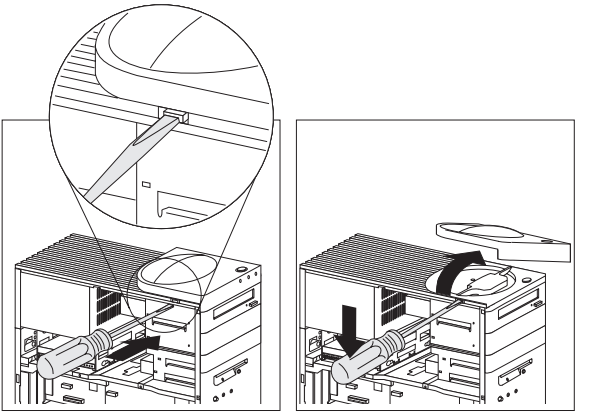


Cover Removal (Type 6591)



Unlock cover from back of the system unit before removing cover.

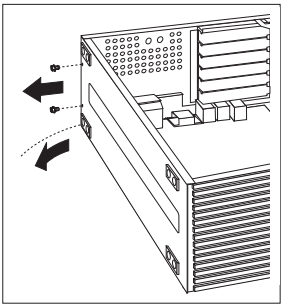
Top Handle Cover Removal (Type 6591)

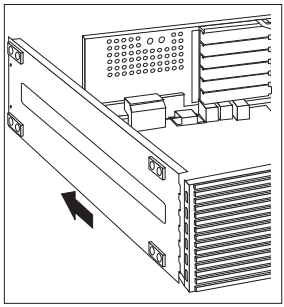


Attention

Do not lift handle cover too high or the tabs will break.

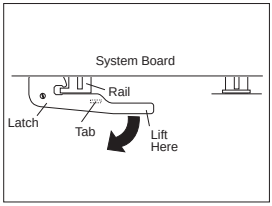
System Board Removal (Type 6591)

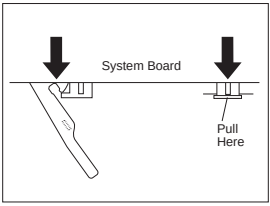




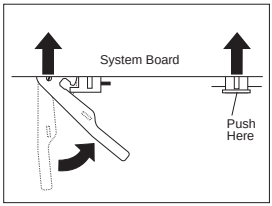
The computer you are servicing might have one of two styles of the right system board rail. Below are the removal and install procedures for both rail styles.

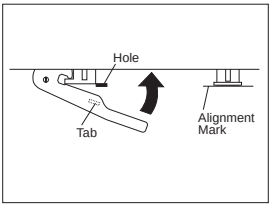
Style 1 system board rail with **scribe line**:





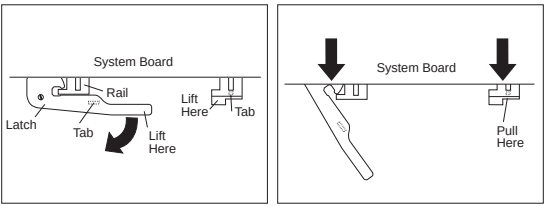
After unlatching and extending the system board latch handle, grasp both system board rails and carefully slide the system board out from the chassis.



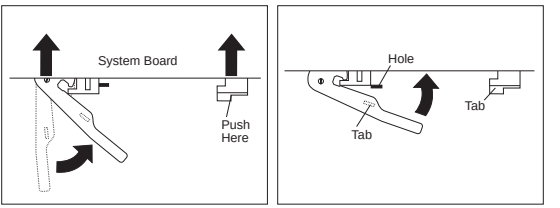


Rotate the latch handle and firmly push in on the end of the right-hand rail. When the system board is fully seated, the alignment mark on the chassis is visible.

Style 2 system board rail with **latching tab**:

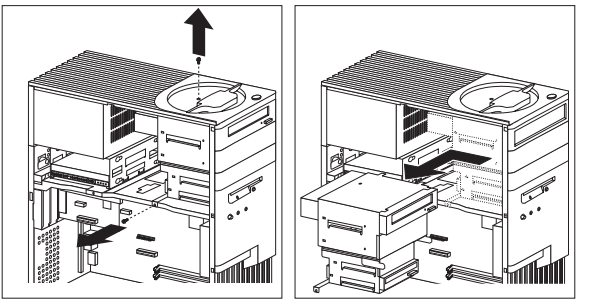


Lift the end of the right-hand rail to disengage the plastic tab from the bottom of the chassis.



Rotate the latch handle and firmly push in on the end of the right-hand rail to engage the tab in the opening of the chassis.

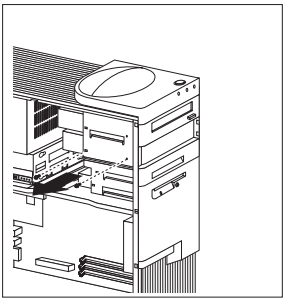
Drive Cage Removal (Type 6591)

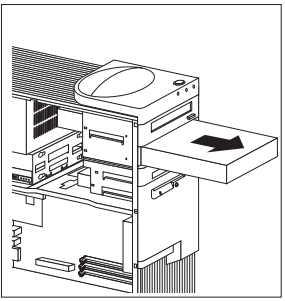


Note

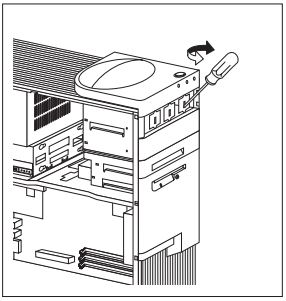
Some Type 6591 computers have a non-removable drive cage. See “Non removable Drive Cage (Type 6591)” on page 293 and “Tab Removal (Type 6591)” on page 293.

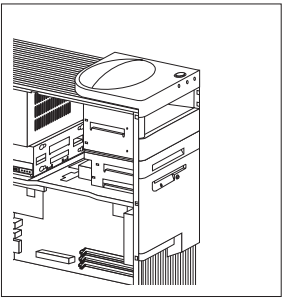
Non removable Drive Cage (Type 6591)

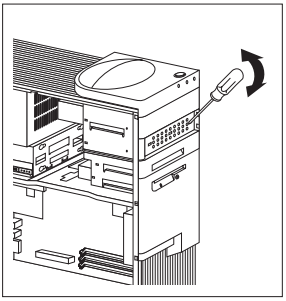


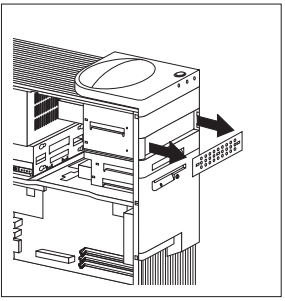


Tab Removal (Type 6591)

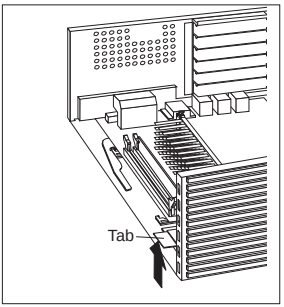


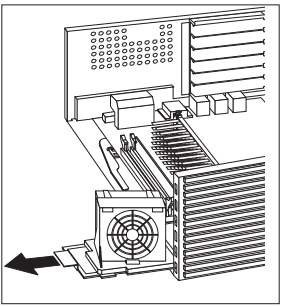




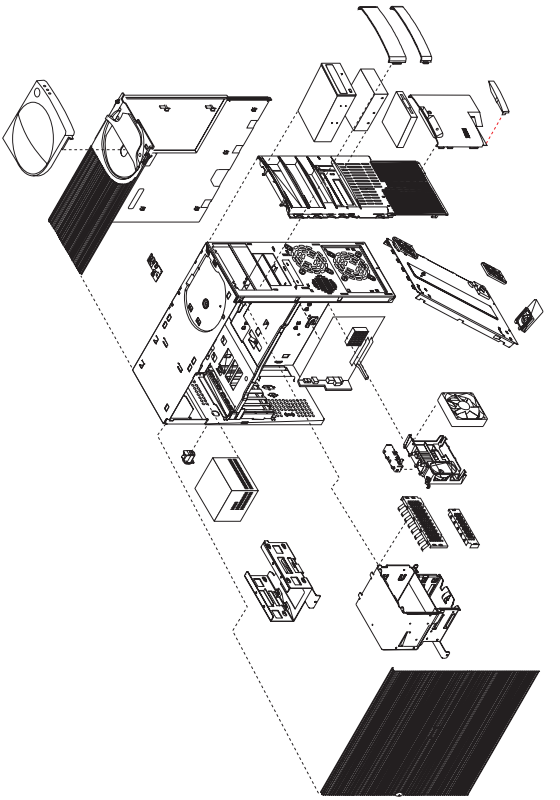


Fan Removal (Type 6591)



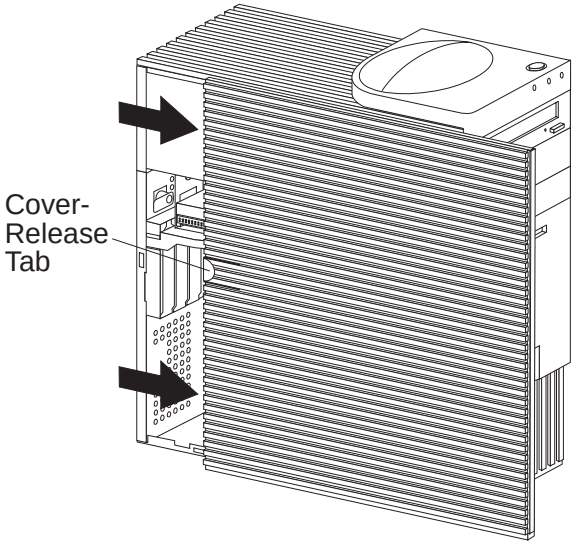


Computer Exploded View (Type 6592)



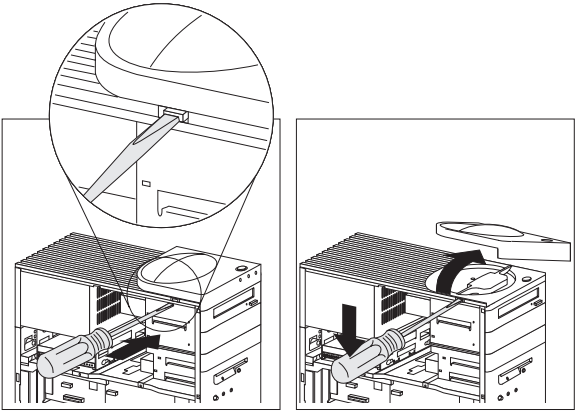
Removal procedures for the cover, system board, and drive cage are on the following pages.

Cover Removal (Type 6592)



Unlock cover from back of the system unit before removing cover.

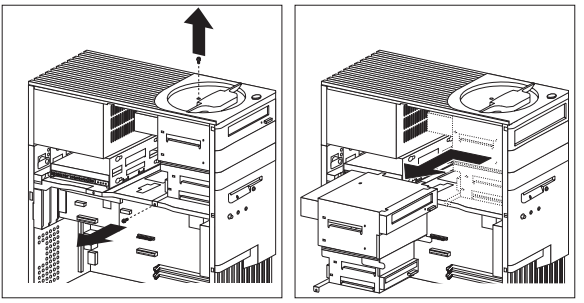
Top Handle Cover Removal (Type 6592)



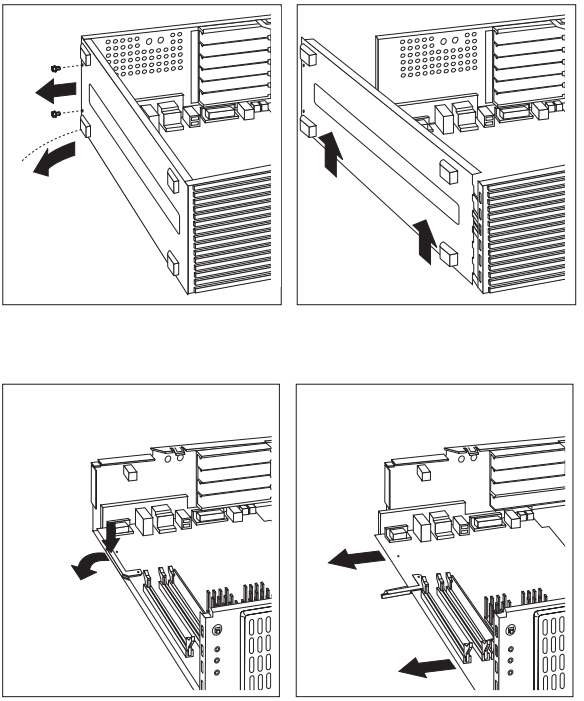
Attention

Do not lift handle cover too high or the tabs will break.

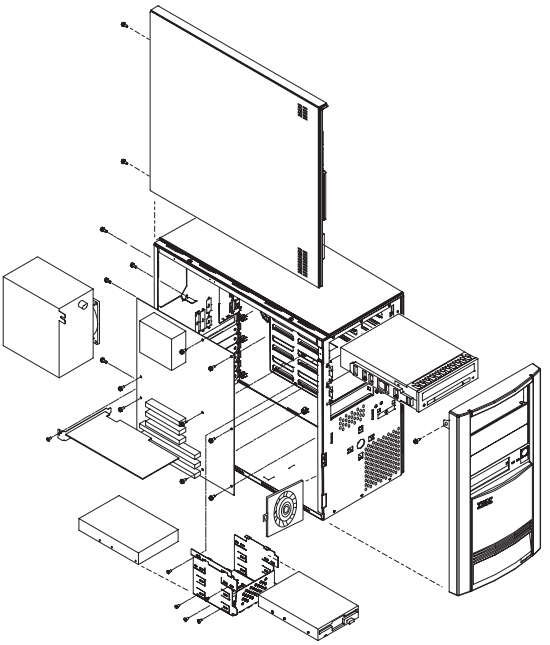
Drive Cage Removal (Type 6592)



System Board Removal (Type 6592)

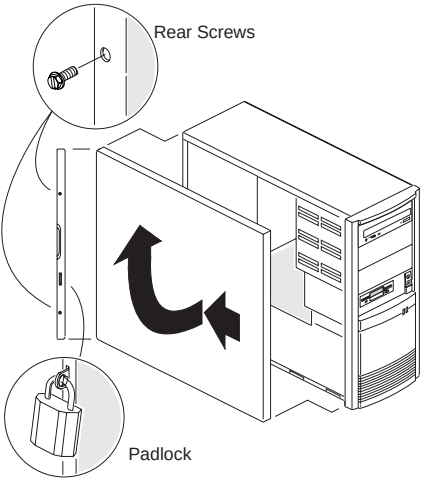


Computer Exploded View (Type 6598)

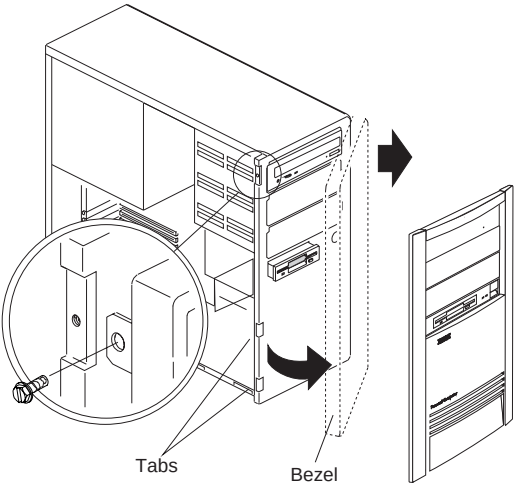


Removal procedures for the side cover, bezel, and processor are on the following page.

Side Cover Removal



Bezel Removal

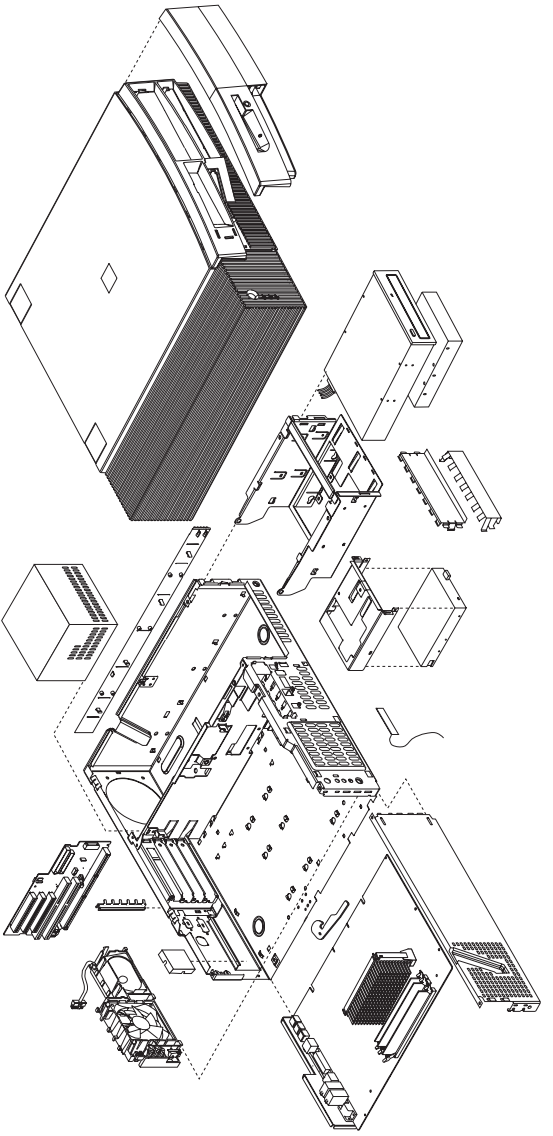


Processor Removal

Attention

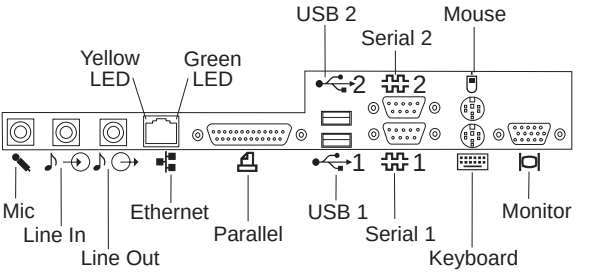
Do not flex or twist the system board while removing or installing the processor. The system board can be damaged during this procedure.

Computer Exploded View (Type 6862)

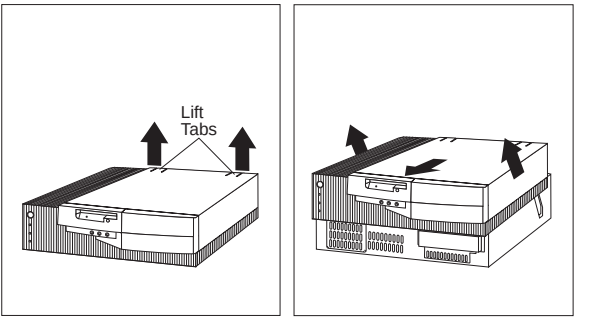


Input/output connectors and removal/service procedures for the cover, system board, and drive cage are on the following pages.

Input/Output Connectors (Type 6862)

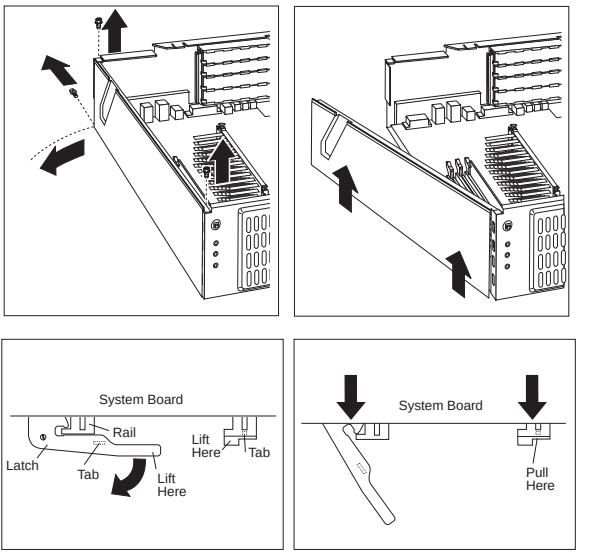


Cover Removal (Type 6862)

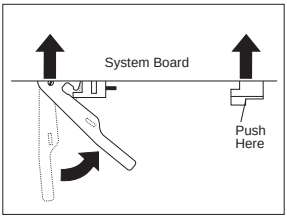


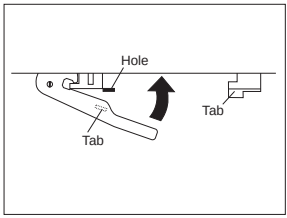
Unlock cover from back of the system unit before removing cover.

System Board Removal (Type 6862)

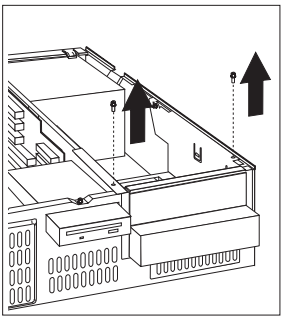


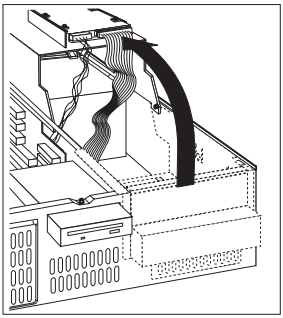
System Board Installation (Type 6862)

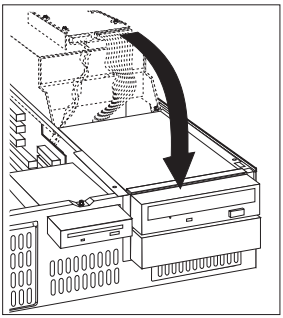


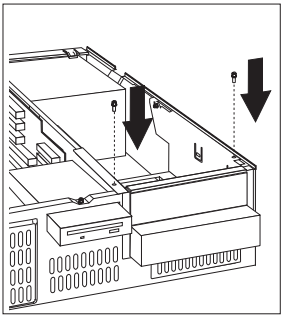


Drive Cage Service (Type 6862)

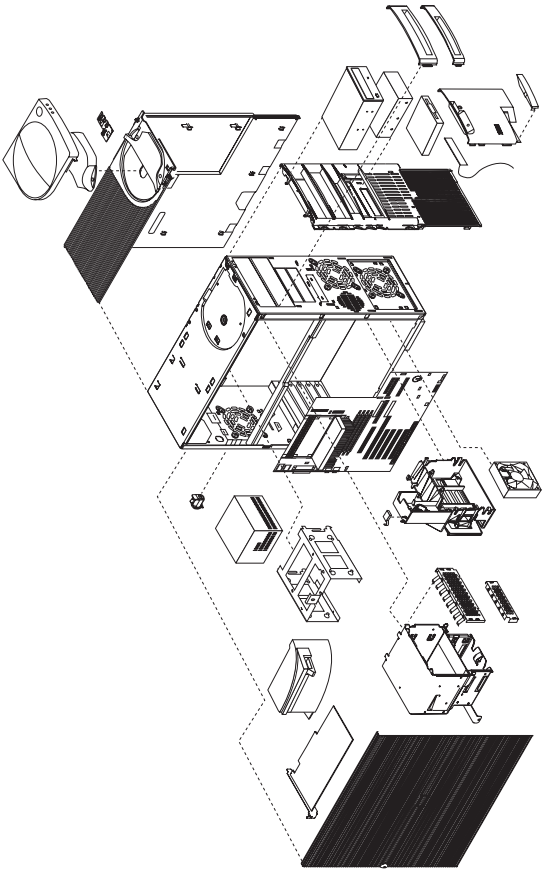






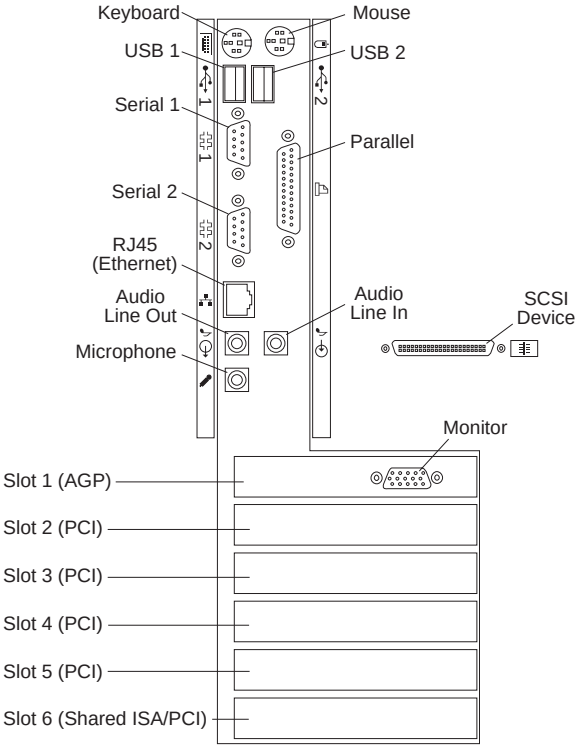


Computer Exploded View (Type 6889)

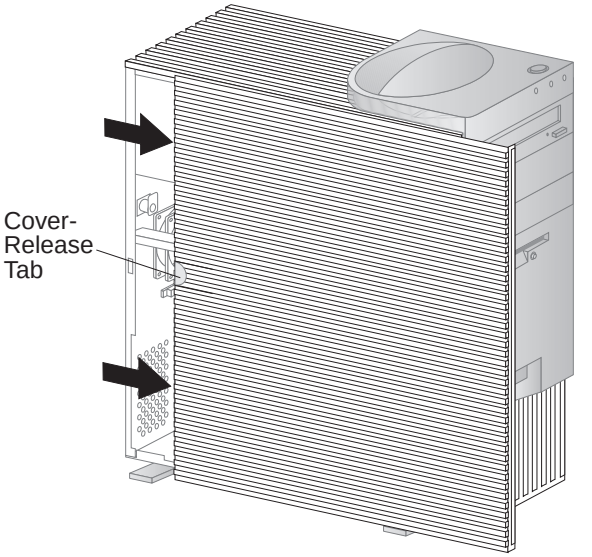


Input/Output connectors and removal procedures for the cover, drive cages, and baffle are on the following pages.

Input/Output Connectors (Type 6889)

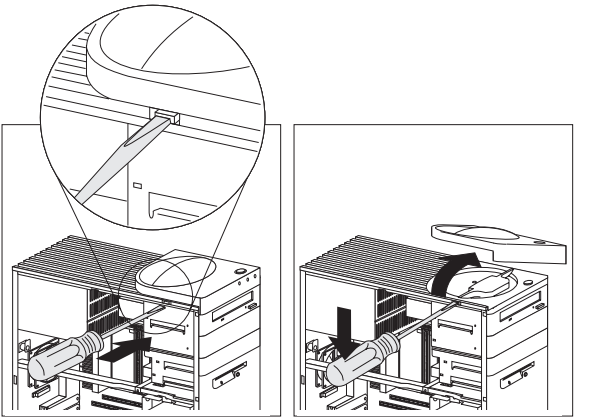


Side Cover Removal (Type 6889)



Unlock cover from back of the system unit before removing cover.

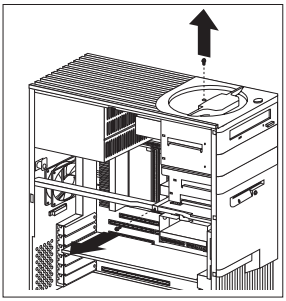
Top Handle Cover Removal (Type 6889)

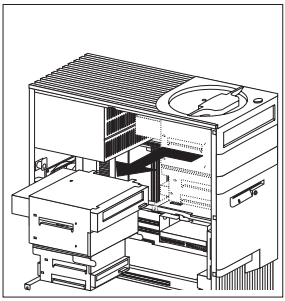


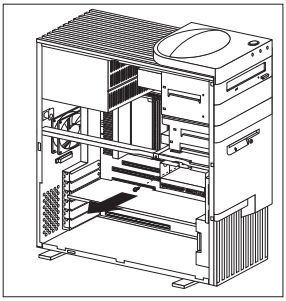
Attention

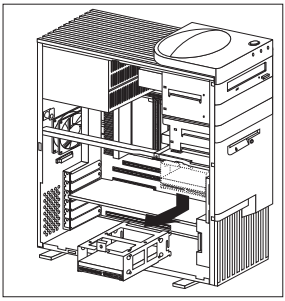
Do not lift handle cover too high or the tabs will break.

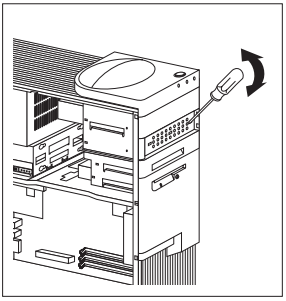
Cage Removal (Type 6889)

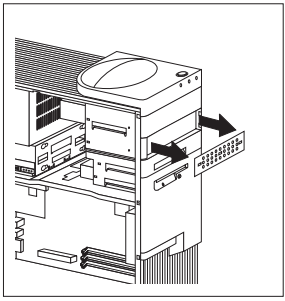




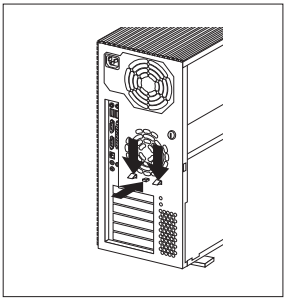


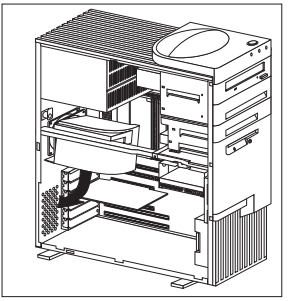






Baffle Removal (Type 6889)



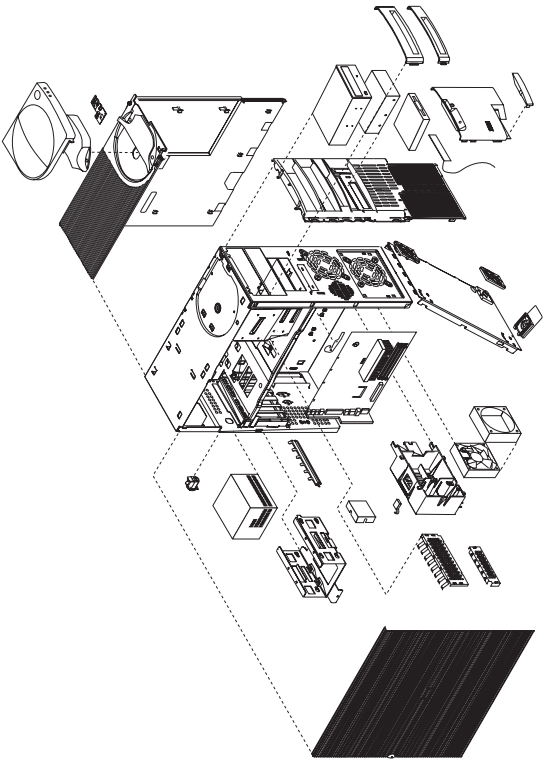


Carefully remove the SCSI signal cable from the baffle before removing the baffle.

Note

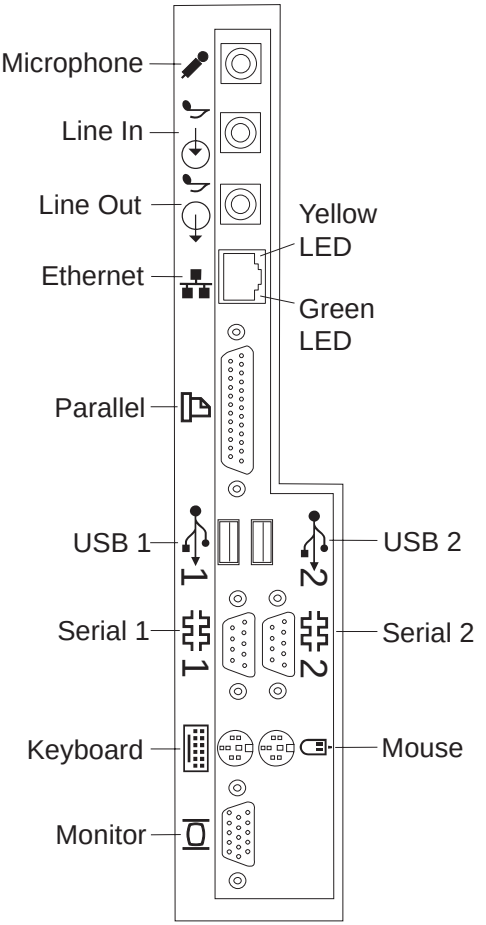
The baffle must be installed for proper air flow to the microprocessor(s).

Computer Exploded View (Type 6892)

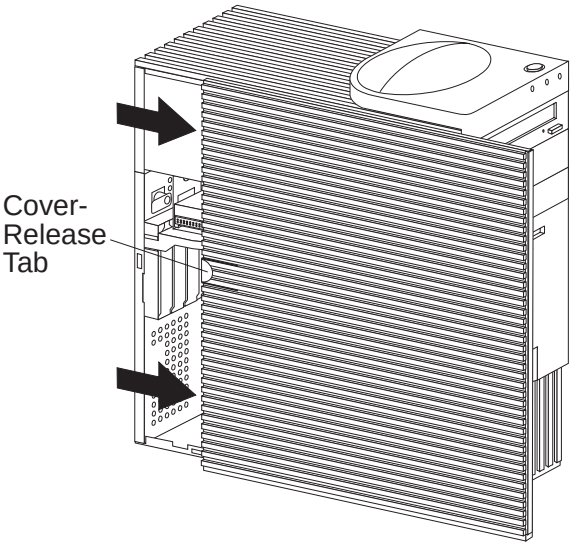


Input/output connectors and removal procedures for the cover, system board, and hard disk drive cage are on the following pages.

Input/Output Connectors (Type 6892)

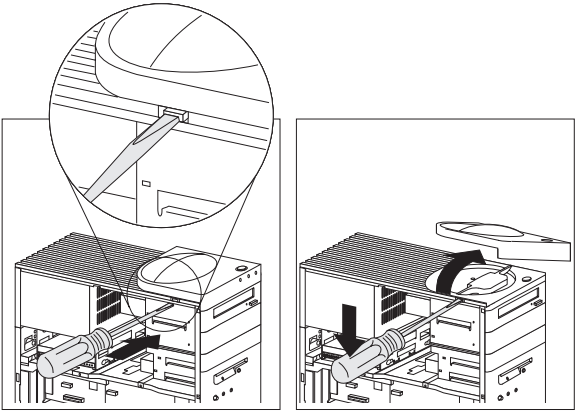


Cover Removal (Type 6892)



Unlock cover from back of the system unit before removing cover.

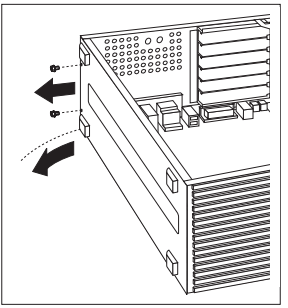
Top Handle Cover Removal (Type 6892)

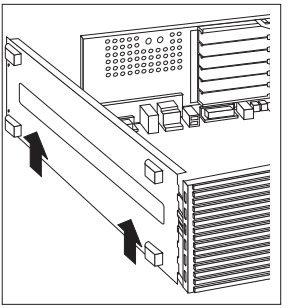


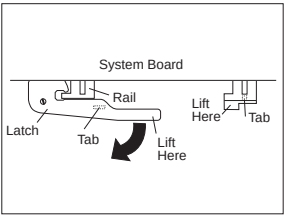
Attention

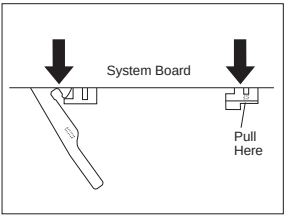
Do not lift handle cover too high or the tabs will break.

System Board Removal (Type 6892)

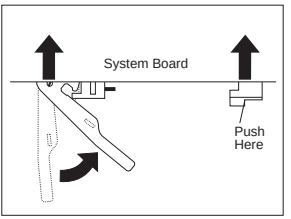


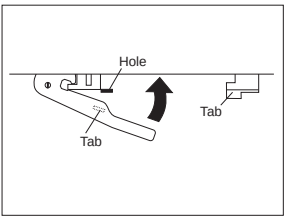




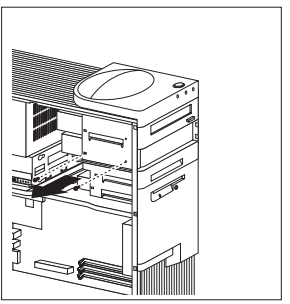


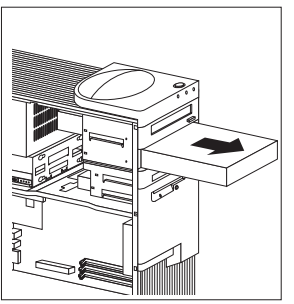
System Board Installation (Type 6892)



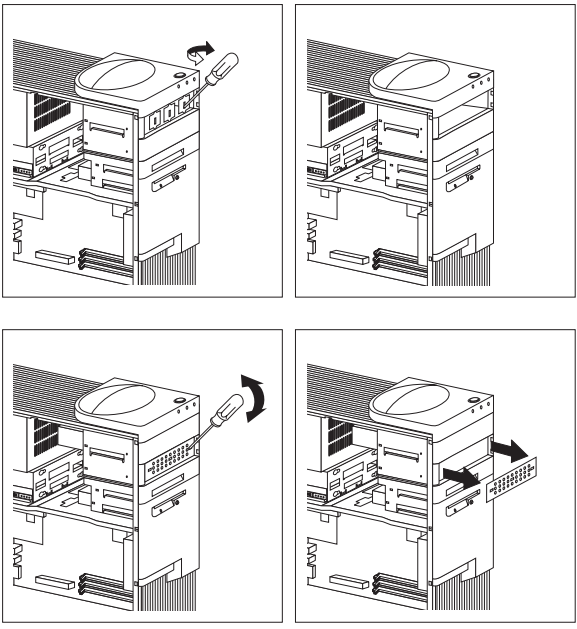


Non removable Hard Disk Drive Cage (Type 6892)

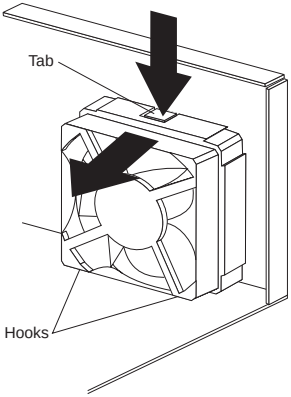




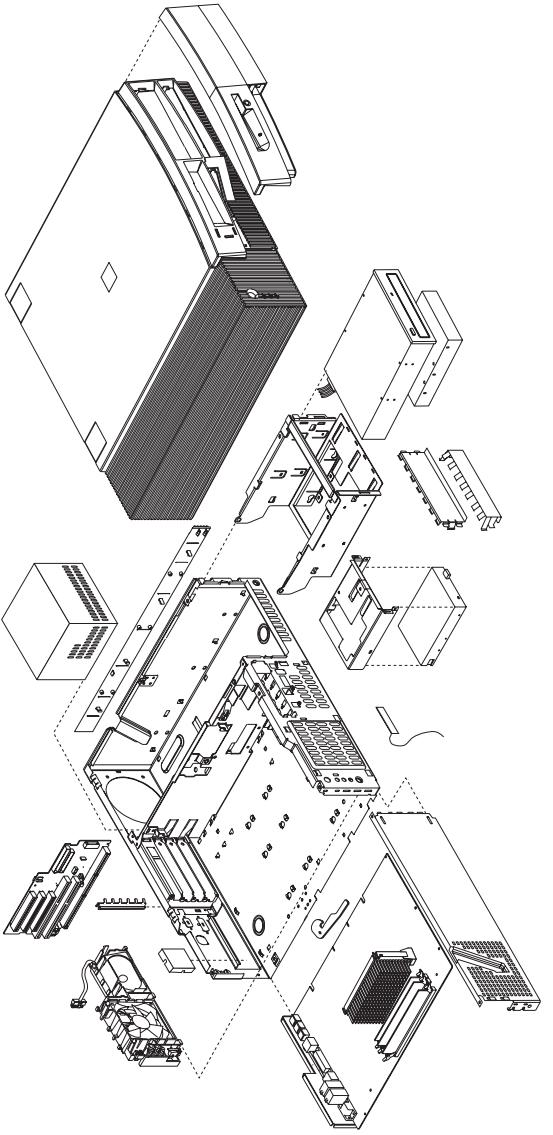
Tab Removal (Type 6892)



Fan Removal (Type 6892)

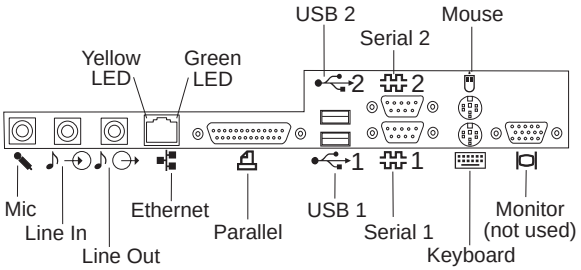


Computer Exploded View (Type 6893)

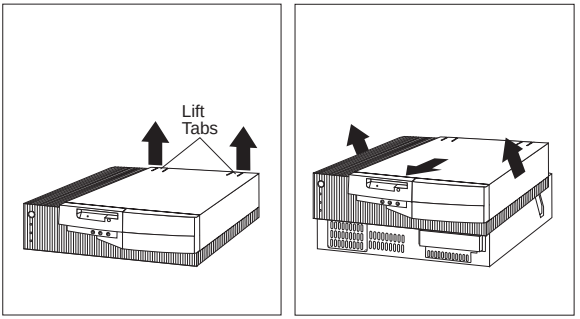


Input/output connectors and removal/service procedures for the cover, system board, and drive cage are on the following pages.

Input/Output Connectors (Type 6893)

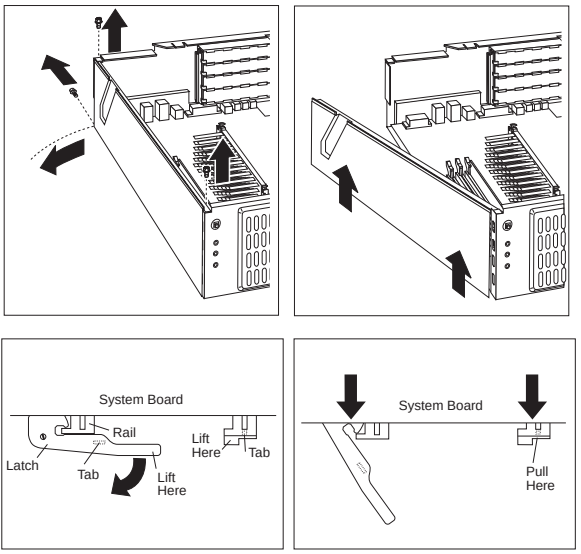


Cover Removal (Type 6893)

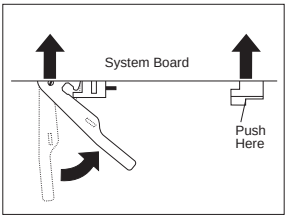


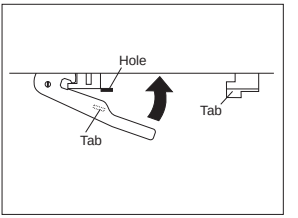
Unlock cover from back of the system unit before removing cover.

System Board Removal (Type 6893)

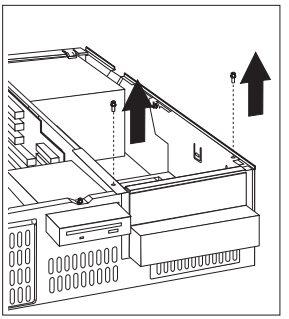


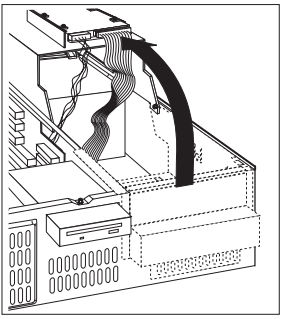
System Board Installation (Type 6893)

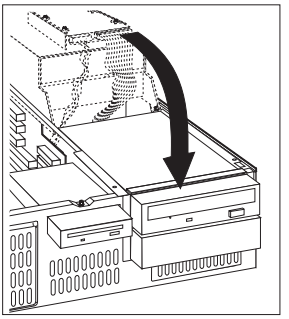


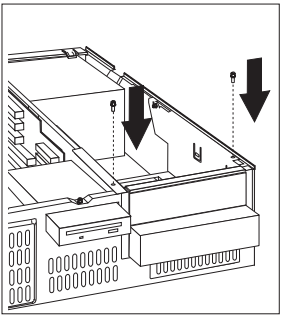


Drive Cage Service (Type 6893)

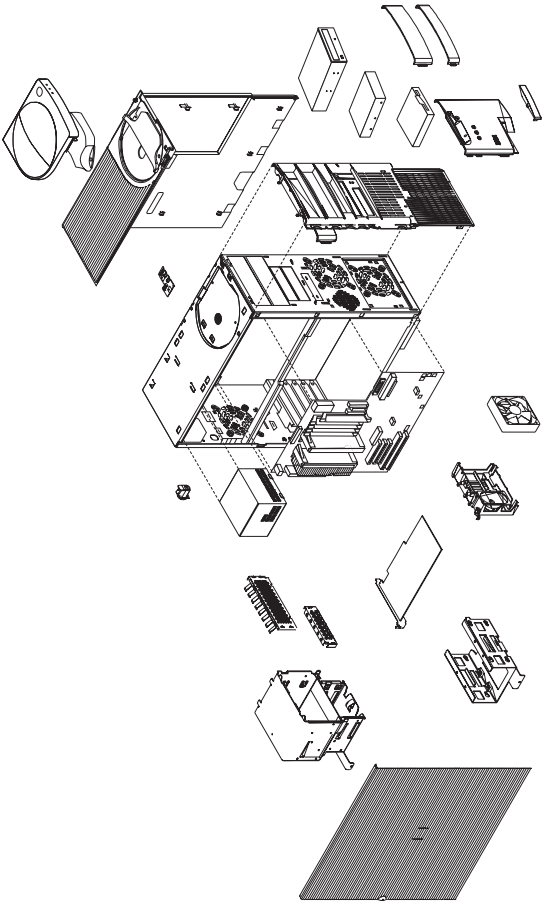








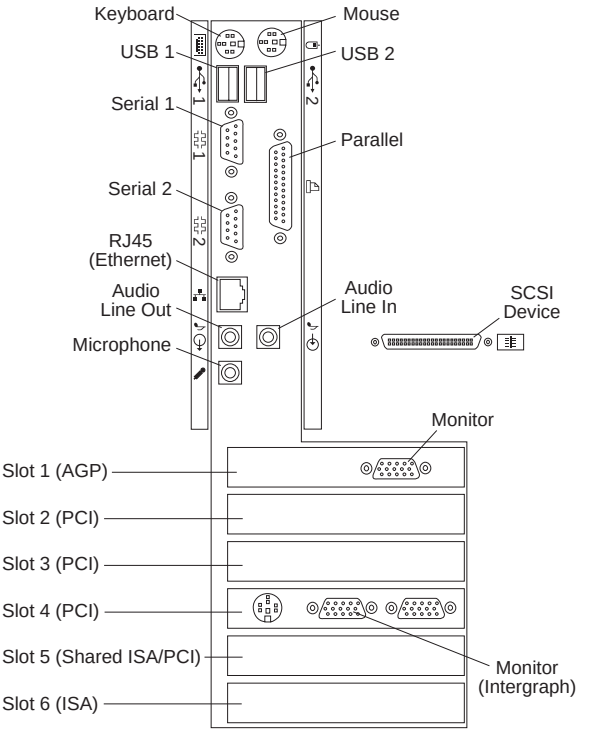
Computer Exploded View (Type 6898)



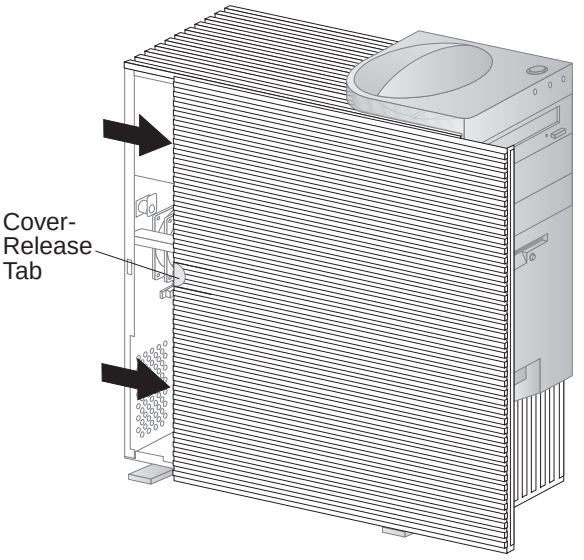
Input/Output connectors and removal procedures for the cover and drive cages are on the following pages.

For system board installation notice, see “System Board Replacement (Type 6898)” on page 84.

Input/Output Connectors (Type 6898)

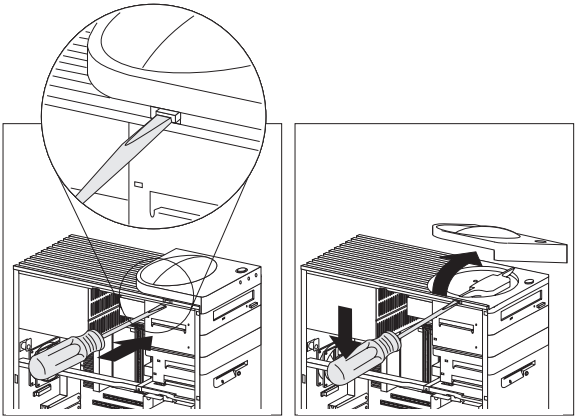


Side Cover Removal (Type 6898)



Unlock cover from back of the system unit before removing cover.

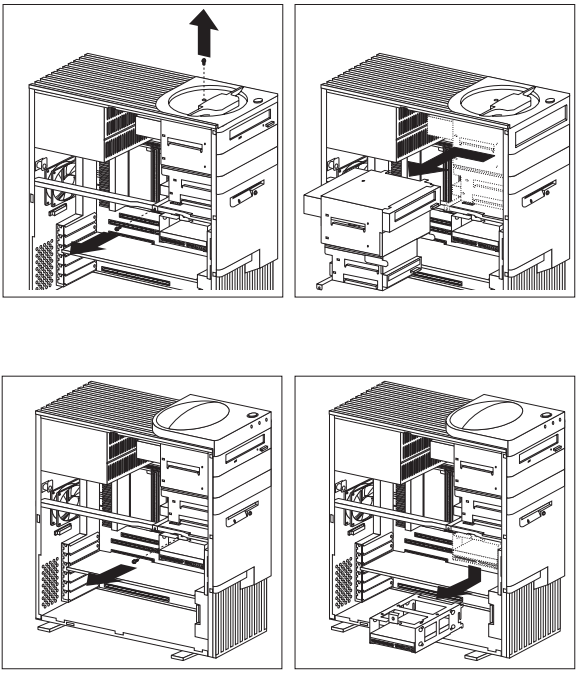
Top Handle Cover Removal (Type 6898)



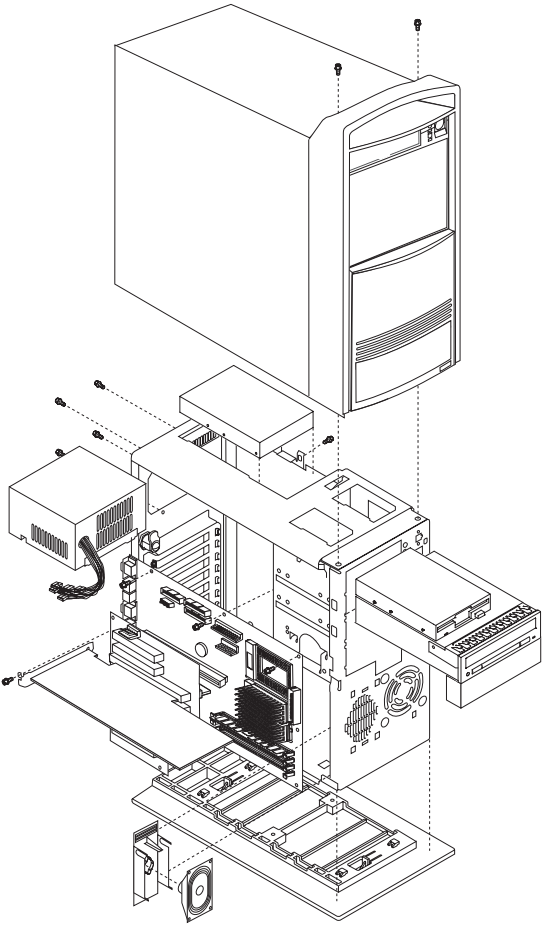
Attention

Do not lift handle cover too high or the tabs will break.

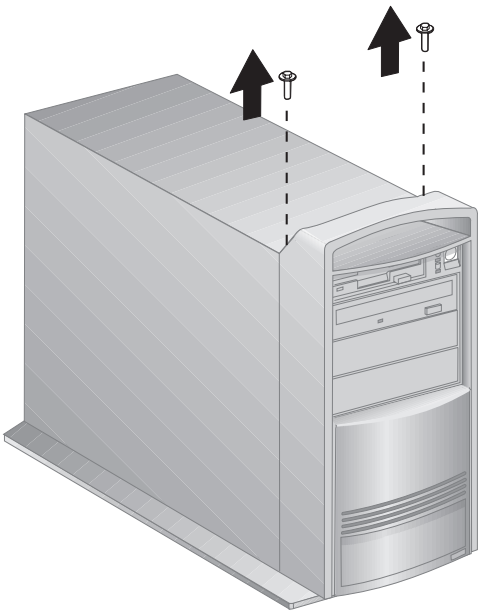
Cage Removal (Type 6898)

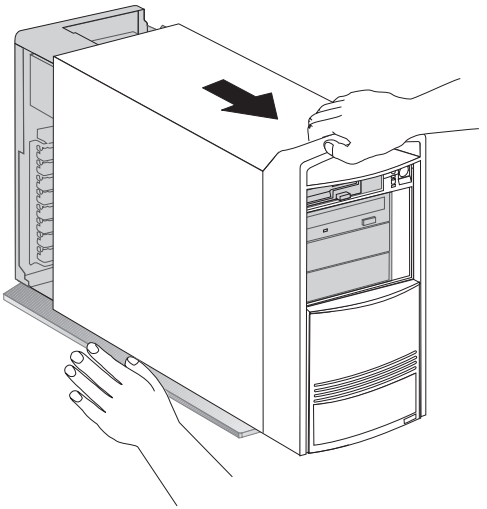


Computer Exploded View (Type 6899)



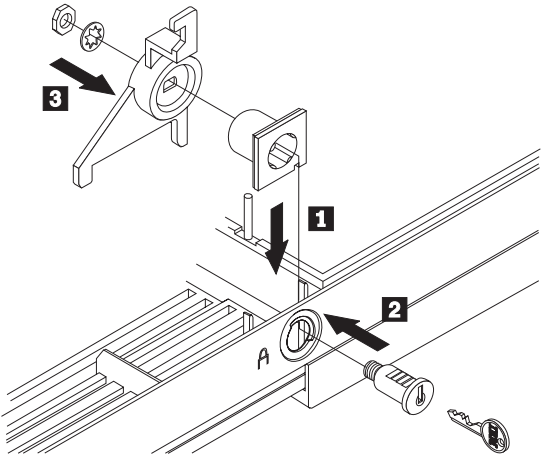
Removal procedures for the top cover is on the following page.





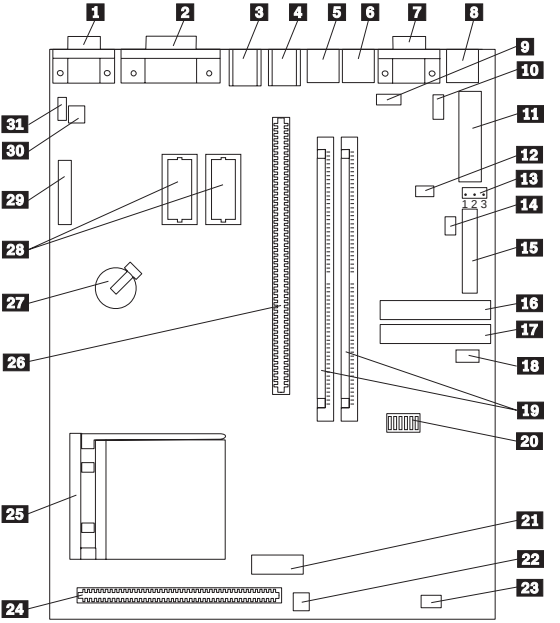
Unlock the cover before removing.

Keylock Assembly Exploded View (Desktop Models)



System Board Layouts

PC 300 (Type 6272, 6282, 6284) - Pentium 133/233 MHz System Board



PC 300 (Type 6272, 6282, 6284) - Pentium 133/233 MHz System Board Locations

1	Monitor connector
2	Parallel port connector
3	USB (Universal Serial Bus) 2 connector
4	USB (Universal Serial Bus) 1 connector
5	Mouse connector
6	Keyboard connector
7	Serial port A connector (Serial port B connector located on back of base frame)
8	Ethernet connector (All models Type 6272; some models Type 6282)
9 - J11	Serial port B system board connector
10	AUI Ethernet connector
11	Main power connector
12 - J9	5 V auxiliary connector
13 - J6	CMOS clear (password) jumper
14 - J7	Power switch connector
15	Diskette drive connector
16	Primary EIDE connector
17	Secondary EIDE connector
18 - J8	Hard disk drive and power LED connector
19	DIMM connectors
20	Switch set (SW1)
21	Power connector (3.3 V)
22	Fan connector
23	LAN activity LED connector
24	L2 Cache connector
25	microprocessor socket
26	Riser card connector
27	Battery
28	Video memory sockets
29	VESA feature connector
30 - J28	Wake-Up on LAN connector
31 - J27	Modem wake-up connector

PC 300 (Type 6272, 6282, 6284) - Pentium 133/233 MHz Switch/Jumper Settings

The following tables contain the switch and jumper setting information. (D) indicates the default setting.

Processor Speed Switch Setting (SW1 1-4)

Speed	SW1-1	SW1-2	SW1-3	SW1-4
75 MHz	Off	Off	On	On
90 MHz	Off	Off	On	Off
100 MHz	Off	Off	Off	On
120 MHz	On	Off	On	Off
133 MHz	On	Off	Off	On
150 MHz	On	On	On	Off
166 MHz	On	On	Off	On
200 MHz	Off	On	Off	On
233 MHz	Off	Off	Off	On

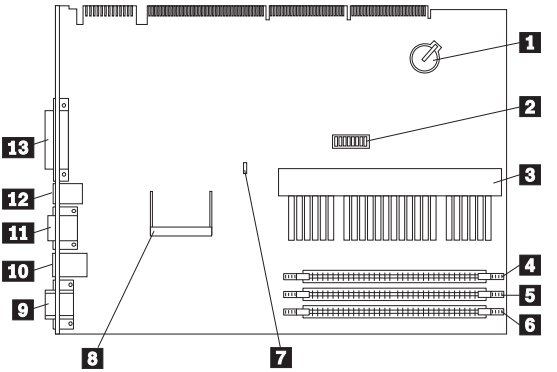
Additional Switch Settings (SW1 5-6)

Description	SW1-5	SW1-6
Option	Off (D)	N/A
Option	On	N/A
Normal Diskette Operation	N/A	Off (D)
Read-Only Diskette Operation	N/A	On

Jumper Settings

Jumper	Setting	Description
J6	1-2 (D) 2-3	Password Enabled Password Disabled (Clear CMOS)

PC 300 Series (Type 6275, 6285) - Pentium II 300/333/350/400 MHz System Board



Note

For other system connectors, see “Riser Card Layouts” on page 388 under Type 6275, 6285.

PC 300 Series (Type 6275, 6285) - Pentium II 300/333/350/400 MHz System Board Locations

1	Battery
2	Switch SW1
3	Microprocessor socket
4	DIMM socket 0
5	DIMM socket 1
6	DIMM socket 2
7	CMOS clear Jumper J9
8	Video Memory connector
9	Display connector
10	Mouse/Keyboard connectors (top=mouse, bottom=keyboard)
11	Serial connectors (top=serial port 2, bottom=serial port 1)
12	USB connectors (top=USB2, bottom=USB1)
13	Parallel connector

PC 300 Series (Type 6275, 6285) - Pentium II 300/333/350/400 MHz Jumper/Switch Settings

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

Jumper	Setting	Description
CMOS Reset J9	2-3 1-2 (D)	CMOS reset. Normal

The following tables contains the switch setting information. (D) indicates the default setting.

Pentium II Processor Speed Switch Setting (SW1 1-4)

CPU Switch Settings	SW1-1	SW1-2	SW1-3	SW1-4
233/66 MHz	Off	Off	On	On
266/66 MHz	On	On	Off	On
300/66 MHz	Off	On	Off	On
333/66 MHz	On	Off	Off	On
350/100 MHz	Off	Off	On	On
400/100 MHz	On	On	Off	On

ROM Operation Switch (SW1-5)

ROM Operation	SW1-5
ROM Recovery Mode	On
Normal ROM Operation	Off (D)

Reserved Switch (SW1-6)

Reserved	SW1-6
Reserved	Off (D)

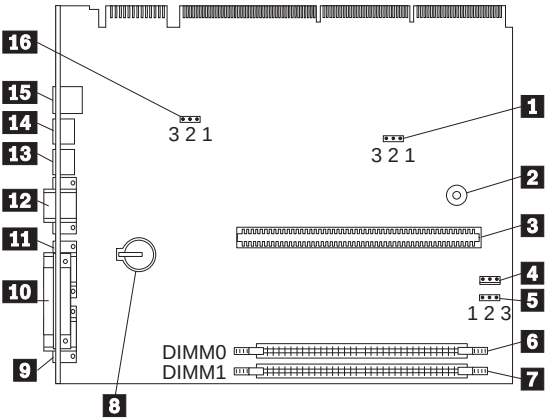
Privilege Access Password (PAP) Switch (SW1-7)

PAP	SW1-7
Disable	Off (D)
Enable	On

Diskette Write Access Switch (SW1-8)

Diskette Access	SW1-8
Write Enabled	Off (D)
Write Protected	On

PC 300 Series (Type 6561, 6591) - Pentium II 233/266/333 MHz System Board



Notes

For other system connectors, see “Riser Card Layouts” on page 388 under Type 6561 and Type 6591.

For main power supply connection, see “20-Pin Main Power Supply Connection” on page 30.

For Type 6561 system board input/output connectors, see “Input/Output Connectors (Type 6561)” on page 275.

For Type 6591 system board input/output connectors, see “Input/Output Connectors (Type 6591)” on page 289.

PC 300 Series (Type 6561, 6591) - Pentium II 233/266/333 MHz System Board Locations

1	CMOS Clear Jumper (J6C1)
2	Buzzer
3	Processor socket
4	Fan Connector for processor Fansink if required.
5	Reserved Jumper (J2A1)
6	DIMM socket 0
7	DIMM socket 1
8	Battery
9	Monitor Connector
10	Parallel connector
11	Serial 1 connector
12	Serial 2 connector
13	Keyboard connector
14	Mouse connector
15	USB connectors (top=USB1, bottom=USB2)
16	Boot Block Recovery Jumper (J7H1)

PC 300 Series (Type 6561, 6591) - Pentium II 233/266/333 MHz Jumper Settings

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

Jumper	Setting	Description
CMOS Clear J6C1	2-3 1-2 (D)	CMOS Clear Normal
Boot Block Recovery J7H1	2-3 1-2 (D)	Recovery Normal
Reserved Jumper J2A1	1,2 2-3 (D)	Reserved Normal

Note

Settings such as **Diskette write enable** and **Processor speed control** are performed within the Configuration/Setup Utility.

To start the Configuration/Setup Utility, see “Setup Utility Program” on page 220.

Listed below are some of the settings in the Configuration/Setup Utility:

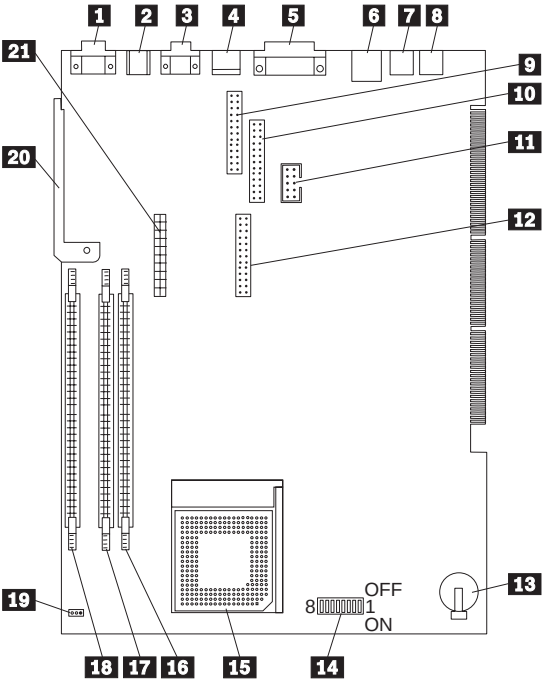
System Security

- Secure IDE Devices and Diskette Drives
- Remote Administration
- Power-on Password
- Administrator Password
- Adapter ROM Security

Advanced Setup

- Cache Control
- ROM Shadowing
- PCI Control
- Plug and Play Control
- Processor Speed Control

PC 300 Series (Type 6562, 6592) - Pentium Pro 166/200/233 MHz System Board



Note

For other system connectors, see “Riser Card Layouts” on page 388 under Type 6562, 6592.

PC 300 Series (Type 6562, 6592) - Pentium Pro 166/200/233 MHz System Board Locations

1	Display connector
2	Mouse/Keyboard connectors (top=mouse, bottom=keyboard)
3	Serial connectors (top=serial port 2, bottom=serial port 1)
4	USB connectors (top=USB2, bottom=USB1)
5	Parallel connector
6	Ethernet RJ45 connector
7	Audio line in
8	Audio line out
9	Matrox Rainbow Runner Studio upgrade connector
10	VESA feature connector
11	115 Kbps infrared connector
12	Video memory or Rainbow Runner Studio upgrade connector
13	Battery
14	Switch SW1
15	Processor socket
16	DIMM socket 0
17	DIMM socket 1
18	DIMM socket 2
19	CMOS clear Jumper J15
20	System board latch
21	Video memory or Rainbow Runner Studio upgrade connector

PC 300 Series (Type 6562, 6592) - Pentium Pro 166/200/233 MHz Jumper/Switch Settings

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

Jumper	Setting	Description
CMOS Reset J15	2-3 1-2 (D)	CMOS reset. Normal

The following tables contains the switch setting information. (D) indicates the default setting.

P55C Processor Speed Switch Setting (SW1 1-4)

CPU Switch Settings	SW1-1	SW1-2	SW1-3	SW1-4
166 MHz	On	On	On	Off
200 MHz	Off	On	On	Off
233 MHz	Off	Off	On	Off

Reserved Switch (SW1-5)

Reserved	SW1-5
Reserved	Off (D)

System Board Ethernet Disable Switch (SW1-6)

System Board Ethernet Disable	SW1-6
Disable	On
Enable	Off (D)

Privilege Access Password (PAP) Switch (SW1-7)

PAP	SW1-7
Disable	Off (D)
Enable	On

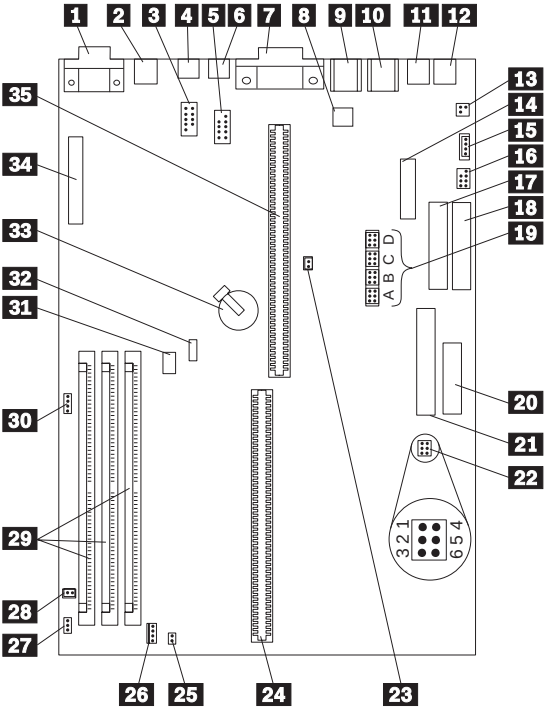
Diskette Write Access Switch (SW1-8)

Diskette Access	SW1-8
Write Enabled	Off (D)
Write Protected	On

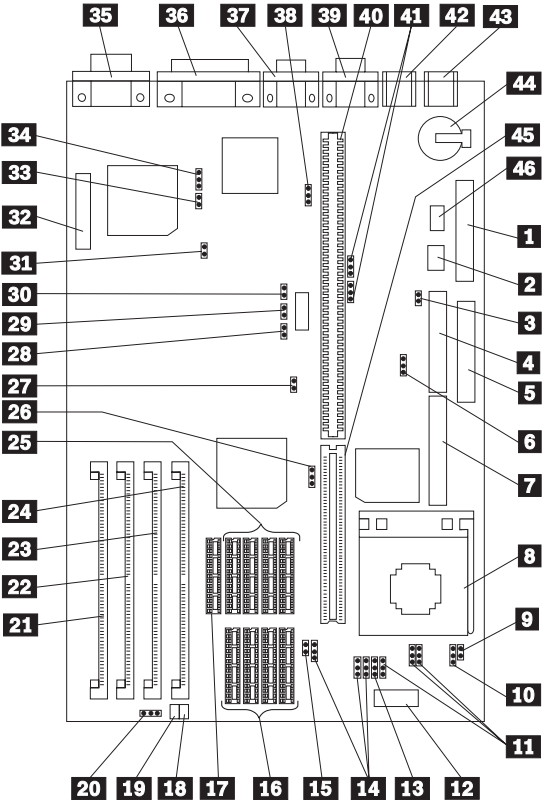
PC 300 (Type 6588) - Pentium II 233/266 MHz System Board

Note

The PC 300 (Type 6588) system board and system board jumper settings are the same as the IntelliStation (Type 6888). See “IntelliStation (Type 6888) - Pentium II 266/300 MHz System Board” on page 371 for system board locations and jumper settings.



PC 330/350 Series (Type 657X, 658X) - 80486 System Board



PC 330/350 Series (Type 657X, 658X) - 80486 System Board Locations

1	- J8	Power supply connector
2		On/Off Switch Power Supply Connector
3	- JP1	Diskette drive write protect jumper
4	- J7	Diskette drive connector
5	- J9	Primary hard disk drive connector
6		Modem Ring Detect jumper
7	- J10	Secondary hard disk drive connector
8		Processor socket
9	- J24	SX/DX CPU selection jumper
10	- J23	P24T, CPU selection jumper
11	- JP3	Local bus configuration jumper
11	- JP4	Local bus configuration jumper
11	- JP7	Local bus configuration jumper
12		Processor Regulator Connector
13	- JP10	DX4 clock selection jumper

14	- J16	Cache size selection jumper
14	- J17	Cache size selection jumper
14	- J38	Cache size selection jumper
15	- JP13	VESA/PCI jumper
16		128K cache memory connectors
17		Cache TAG RAM connector
18		Power LED connector
19		Hard disk drive LED connector
20	- J27	Speaker connector, with enable jumper
21	- J19	Memory module connector, MEM 4
22	- J20	Memory module connector, MEM 3
23	- J21	Memory module connector, MEM 2
24	- J22	Memory module connector, MEM 1
25		256K cache memory connectors
26	- JP11	VHIMEM jumper
27	- JP12	IRQ12 jumper
28	- J37	CPU speed selection
29	- J36	CPU speed selection
30	- J35	CPU speed selection
31	- JP15	IRQ9 jumper
32	- J14	VESA feature connector
33	- JP14	Power-on password jumper
34	- J15	VGA jumper
35	- J6	Display connector
36	- J5	Parallel connector
37	- J4	Serial connector, COM2
38	- J13	Flash jumper
39	- J3	Serial connector, COM1
40	- J11	ISA riser connector
41	- JP8	ECP DMA-selection jumper
41	- JP9	ECP DMA-selection jumper
42	- J2	Mouse connector
43	- J1	Keyboard connector
44		Battery
45	- J34	VL riser connector
46		On/Off Switch Connector

See “PC 330/350 Series (Type 657X, 658X) - 80486 Jumper Settings” on page 337 for jumper settings.

PC 330/350 Series (Type 657X, 658X) - 80486 Jumper Settings

The following tables contain the jumper setting information. (D) indicates the default setting.

CPU Type Selection

Processor	J23	J24
486SX (D)	1-2	Open
486DX	2-3	Open
P24T	2-3	Closed

CPU Speed Selection

Speed	J35	J36	J37
20 MHz	On	Off	Off
25 MHz (D)	Off	On	On
33 MHz	Off	On	Off
40 MHz	Off	Off	On
50 MHz	Off	Off	Off

Cache Size Selection

Size	J16	J17
256 K (D)	1-2	Close
128 K	2-3	Open

P24 Clock Selection

JP10	1-2	3-4
Internal Clock - X3 (D)	Off	Off
Internal Clock - X2	Off	On
Other Multiplier	On	Off

ECP DMA Selection

Setting	JP8	JP9
DRQ3 (D)	1-2	1-2
DRQ1	2-3	2-3

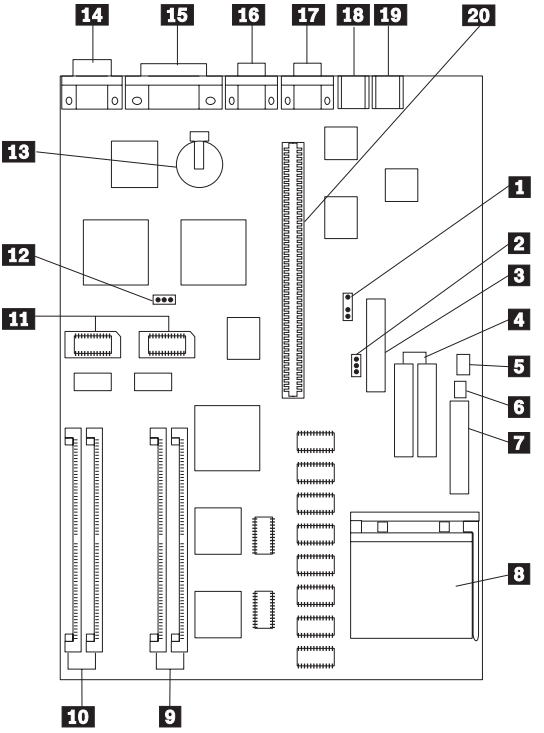
Local Bus Configuration

Selection	JP3	JP4
VESA Local BUS	1-2	1-2
PCI Local BUS	2-3	2-3

Miscellaneous Jumpers

Jumper	Setting	Description
J15	1-2 2-3	Enable system board VGA (D) Disable system board VGA
J13	1-2 2-3	Program Flash Disable (D) Program Flash Enable
JP14	1-2 2-3	Normal (D) Discard CMOS Data

PC 330/350 Series (Type 65X5) - Pentium 60 MHz System Board



PC 330/350 Series (Type 65X5) - Pentium 60 MHz System Board Locations

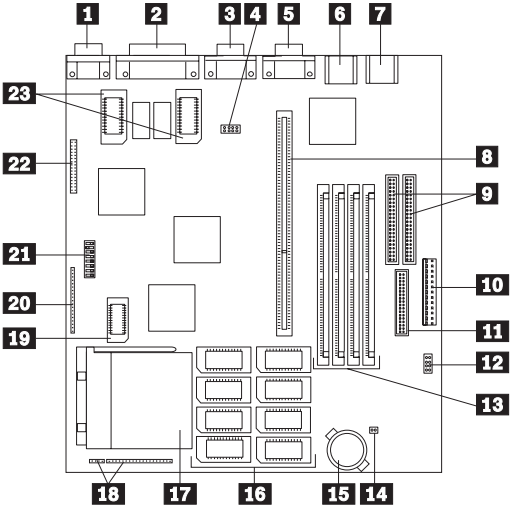
1		Modem Ring Detect jumper
2	- WP	Diskette drive write protect jumper
3		Diskette drive connector
4		Hard disk drive connectors
5	- J38	On/Off Switch Power Supply Connector
6	- J37	On/Off Switch Connector
7		Power supply connectors
8		Processor connector
9		Memory connectors (Bank 1)
10		Memory connectors (Bank 2)
11		Video memory modules
12	- PWD	Power-on password jumper
13		Battery
14		Display connector
15		Parallel connector
16		Serial connector
17		Serial connector
18		Keyboard connector
19		Mouse connector
20		Riser connector

PC 330/350 Series (Type 65X5) - Pentium 60 MHz Jumper Settings

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

Jumper	Setting	Description
MRD	2-3 (D) 1-2	Modem answer on ring. Modem no answer on ring.
WP	2-3 (D) 1-2	Enable writing to a diskette Disable writing to a diskette.
PWD	1-2 (D) 2-3	Password enabled. Password reset.

PC 330/350 Series (Type 65X6) - Pentium 75/90/100 MHz System Board



This system board is for models 3XX, 4XX, 5XX.

See “PC 330/350 Series (Type 65X6) - Pentium 133/166 MHz System Board” on page 345 for 6XX, 7XX, 8XX, and 9XX models.

PC 330/350 Series (Type 65X6) - Pentium 75/90/100 MHz System Board Locations

1		Video display connector
2		Parallel port connector
3		Serial port connector
4	- J5J1	BIOS Flash jumper
5		Serial port connector
6		Mouse port connector
7		Keyboard connector
8		PCI/ISA Riser connector
9		Primary (outer) IDE connectors
9		Secondary (inner) IDE connectors
10		Power connector
11	- J9D1	Diskette drive connector
12	- J9C1	Processor VRE Enable
13		Memory module connectors
14		CPU 3.3V voltage regulator
15		RTC Battery
16		512 KB Cache memory connectors
17		Processor connector
18	- J2A2	Front panel I/O connector
19		Cache Tag memory connector
20	- J1D1	Front panel I/O connector
21	- SW1	Configuration switch block - L2 Cache - CMOS settings - Power-on password - Processor type
22		VESA connector
23		2MB Video memory connectors

See “PC 330/350 Series (Type 65X6) - Pentium 75/90/100 MHz Jumper Settings” on page 343 for jumper and switch settings.

PC 330/350 Series (Type 65X6) - Pentium 75/90/100 MHz Jumper Settings

The following tables contain the jumper and switch setting information. (D) indicates the default setting.

L2 Cache Size - SW1 Switch 1, 2

L2 Cache Size	Switch 1	Switch 2
0 KB	On	N/A
256 KB	Off	Off
512 KB	Off	On

CMOS Setup Utility - SW1 Switch 3, 4, 5

Description	Switch 3	Switch 4	Switch 5
Power-on Password Enabled	Off (D)	Off	Off
Power-on Password Reset	On (D)	Off	Off
Normal CMOS Settings	Off	Off (D)	Off
Reset CMOS Settings	Off	On	Off

Processor Type - SW1 Switch 6, 7, 8

Processor	Switch 6	Switch 7	Switch 8
50/75 MHz	Off	Off	Off
60/90 MHz	Off	On	Off
66/100 MHz	Off	Off	On
Reserved	Off	N/A	N/A

BIOS Flash Reset - J5J1

Jumper	Position	Description
J5J1	1-3	Normal (D)
J5J1	1-2	Reset

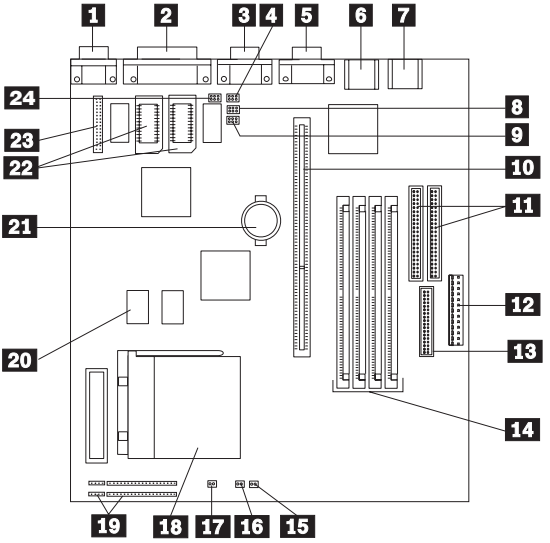
ISA Bus Clock Speed Jumper - J5J1

CPU External Clock Speed	ISA 1/6 Clock Speed Jumper 5-7 Not Installed	ISA 1/8 Clock Speed Jumper 5-7 Installed
50/75 MHz	8.33 MHz (D)	6.25 MHz
60/90 MHz	10 MHz	7.5 MHz (D)
66/100 MHz	11 MHz	8.25 MHz
Note: J5J1 pins 4, 6, and 8 are reserved and should not be jumpered.		

Processor VRE Enable - J9C1

Jumper	Description
J9C1 1-3 (D)	Standard Voltage Processor
J9C1 5-7	VRE Rated Processor

PC 330/350 Series (Type 65X6) - Pentium 133/166 MHz System Board



This system board is for models 6XX, 7XX, 8XX, 9XX.

See “PC 330/350 Series (Type 65X6) - Pentium 75/90/100 MHz System Board” on page 341 for 3XX, 4XX, and 5XX models.

PC 330/350 Series (Type 65X6) - Pentium 133/166 MHz System Board Locations

1		Video Port
2		ECP/EPP Parallel Port
3		Serial (B) Port
4	- J4K2	Configuration Jumpers
5		Serial (A) Port
6		Mouse Port
7		Keyboard Port
8	- J4J2	Configuration Jumpers
9	- J4J1	Configuration Jumpers
10		ISA/PCI Riser Connector
11		Enhanced IDE Connectors
12		Primary Input Power Supply
13		Diskette Connector
14		Four SIMM Sockets (Two Banks)
15		Power-On LED Connector
16		Hard Disk Activity LED Connector
17		Auxiliary Fan Connector
18		Processor Socket (7)
19		Speaker Connector
20		256 KB L2 Cache Sockets
21		Battery
22		1MB Video Memory Sockets (Optional)
23		VESA Feature Connector
24	- J4K1	Configuration Jumpers

See “PC 330/350 Series (Type 65X6) - Pentium 133/166 MHz Jumper Settings” on page 347 for jumper and switch settings.

PC 330/350 Series (Type 65X6) - Pentium 133/166 MHz Jumper Settings

The following tables contain the jumper setting information. (D) indicates the default setting.

Processor Speed - J4J1, J4J2, J4K1

Processor	J4J1	J4J2	J4K1
75 MHz	Pin 2-3 Pin 4-5	Pin 2-3 Pin 4-5	Pin 2-3
90 MHz	Pin 2-3 Pin 5-6	Pin 2-3 Pin 4-5	Pin 1-2
100 MHz	Pin 1-2 Pin 4-5	Pin 2-3 Pin 4-5	Pin 1-2
120 MHz	Pin 2-3 Pin 5-6	Pin 2-3 Pin 5-6	Pin 1-2
133 MHz	Pin 1-2 Pin 4-5	Pin 2-3 Pin 5-6	Pin 1-2
150 MHz	Pin 2-3 Pin 5-6	Pin 1-2 Pin 5-6	Pin 1-2
166 MHz	Pin 1-2 Pin 4-5	Pin 1-2 Pin 5-6	Pin 1-2

CMOS Setup Access and ISA Bus Speed - J4K1

Jumper	Position	Description
J4K1	1-2	1/4 PCI (D)
J4K1	2-3	1/3 PCI
J4K1	4-5	Enabled (D)
J4K1	5-6	Disabled

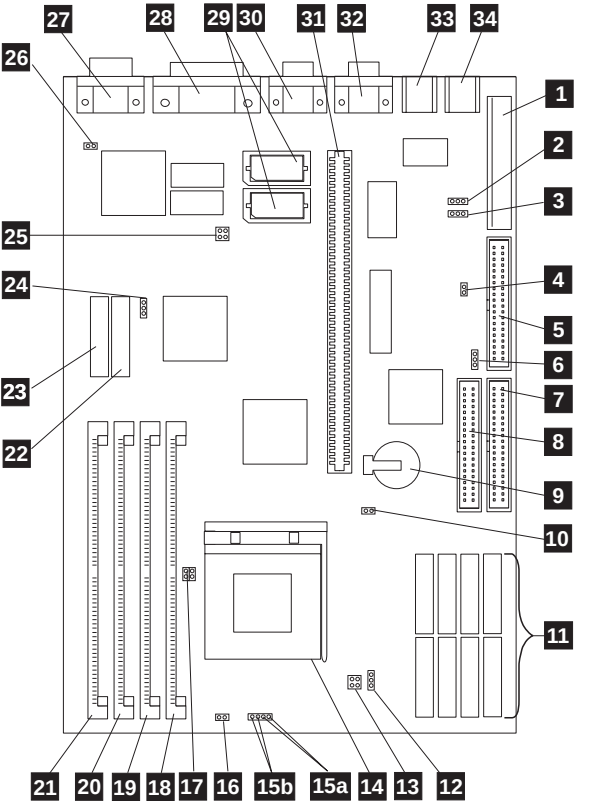
CMOS and Power-on Password - J4K2

Jumper	Position	Description
J4K2	1-2	Normal (D)
J4K2	2-3	Reset CMOS
J4K2	4-5	Normal (D)
J4K2	5-6	Reset Password

BIOS Flash Recovery - J4A2

Jumper	Position	Description
J4A2	1-2	Normal (D)
J4A2	2-3	Flash Enabled
J4A2	4-5	Reserved

PC 340 Series (Type 6560) - Pentium 100/133/166 MHz System Board



See page 349 for Cache information.

PC 340 Series (Type 6560) - Pentium 100/133/166 MHz System Board Locations

1	- J3	Power supply connector
2	- JP11	Flash Jumper
3	- JP21	FDD write protect
4	- JP4	PS/2 Mouse Enable/Disable
5	- J5	Diskette drive connector
6	- JP23	HDD Detect
7	- J8	Primary IDE hard disk drive connector
8	- J7	Secondary IDE hard disk drive connector
9		Battery
10	- J9	Power-on password/CMOS mode
11		CACHE memory connectors (soldered cache for Models 4XX, 5XX, 6XX)
12	- JP22	Burst Mode
13	- JP19	CPU voltage
14		Processor socket
15a	- J12	Hard disk drive LED connector
15b	- J12	Power LED connector
16	- J13	CPU fan connector
17	- JP17	CPU clock
18		Memory module connector 1 - Bank1
19		Memory module connector 2 - Bank1
20		Memory module connector 3 - Bank0
21		Memory module connector 4 - Bank0
22		Tag RAM socket
23	- J6	Feature connector
24	- JP13	Cache memory size
25	- JP14	CPU Bus clock
26	- JP3	On-board VGA
27	- P4	Display connector
28	- P1	Parallel connector
29		Video memory sockets
30	- P2	Serial connector COM2
31		PCI/ISA riser connector
32	- P3	Serial connector COM1
33	- J2	Mouse connector
34	- J1	Keyboard connector

See “PC 340 Series (Type 6560) - Pentium 100/133/166 MHz System Board Jumper Settings” on page 350 for jumper settings.

PC 340 Series (Type 6560) - Pentium 100/133/166 MHz System Board Jumper Settings

The following tables contain the jumper setting information. A (D) indicates the default setting.

Processor Type Selection

Processor	JP14	JP17
P75 MHz	1-2	Open
P90 MHz	3-4	Open
P100 MHz	1-2, 3-4	Open
P120 MHz	3-4	1-2
P133 MHz	1-2, 3-4	1-2
P166 MHz	1-2, 3-4	1-2, 3-4

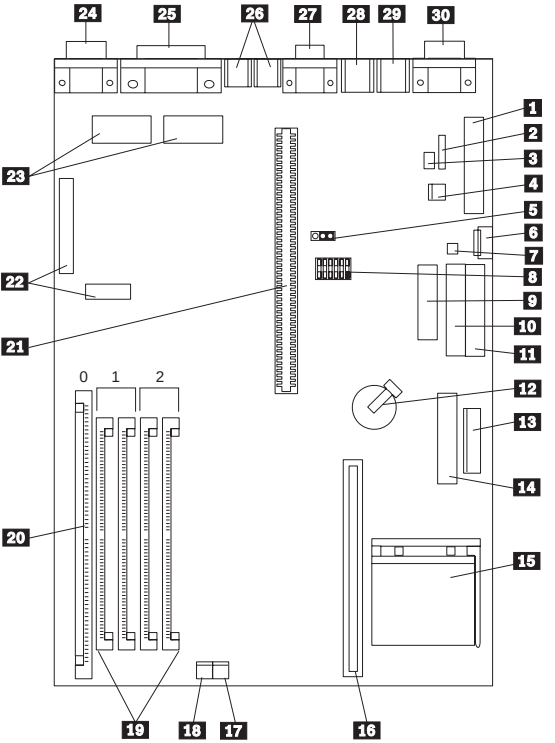
Cache Size Selection

Size	JP13
256 KB (D)	1-2
512 KB	2-3

Miscellaneous Jumpers

Jumper	Setting	Description
JP3	Short Open	Enable on-board VGA (D) Disable on-board VGA
JP4	Short Open	Enable PS/2 mouse (D) Disable PS/2 mouse
J9	1-2 2-3	Normal (D) CMOS Data Clear (all setup data reset to default and Power-On-Password cleared)
JP11	1-2 2-3	Enable Flash (D) Flash Lock
JP19	1-2 2-3	STD 3.3 volt VRE 3.52 volt (D)
JP21	1-2 2-3	FDD protect, Normal (D) FDD Write protect
JP22	1-2 2-3	Non-Linear burst, Async Cache (D) Linear burst, sync Cache (D for models 4XX, 5XX, 6XX only)
JP23	1-2 2-3	HDD detect (D) HDD non-detect

PC 330/350 Series (Type 6577, 6587) - Pentium 100/133/166/200 MHz System Board



PC 330/350 Series (Type 6577, 6587) - Pentium 100/133/166/200 MHz System Board Locations

1. Power connector (5 V)
2. Modem ring
3. LAN Wake-Up
4. Modem ring
5. Password jumper (CMOS clear)
6. Auxiliary power
7. On/Off switch
8. Configuration switch set
9. Diskette connector
10. Primary IDE connector
11. Secondary IDE connector
12. Battery
13. Power connector (3.3 V)
14. Voltage Regulator connector (Pentium MMX only)
15. Processor upgrade socket
16. Cache memory module connector
17. Power LED connector
18. Hard disk access LED connector
19. SIMM connectors (Bank 1/2)
20. DIMM connector (Bank 0)
21. Riser connector
22. VESA passthrough connectors
23. Video upgrade sockets
24. Video port
25. ECP/EPP parallel port
26. USB ports (1, 2)
27. Serial (A) port
28. Mouse port
29. Keyboard port
30. Infrared port

PC 330/350 Series (Type 6577, 6587) - Pentium 100/133/166/200 MHz Switch/Jumper Settings

The following tables contain the switch and jumper setting information. (D) indicates the default setting.

Processor Speed Switch Settings (SW1 1-4)

Speed	SW1-1	SW1-2	SW1-3	SW1-4
75 MHz	Off	Off	On	On
90 MHz	Off	Off	On	Off
100 MHz	Off	Off	Off	On
120 MHz	On	Off	On	Off
133 MHz	On	Off	Off	On
150 MHz	On	On	On	Off
166 MHz	On	On	Off	On
200 MHz	Off	On	Off	On

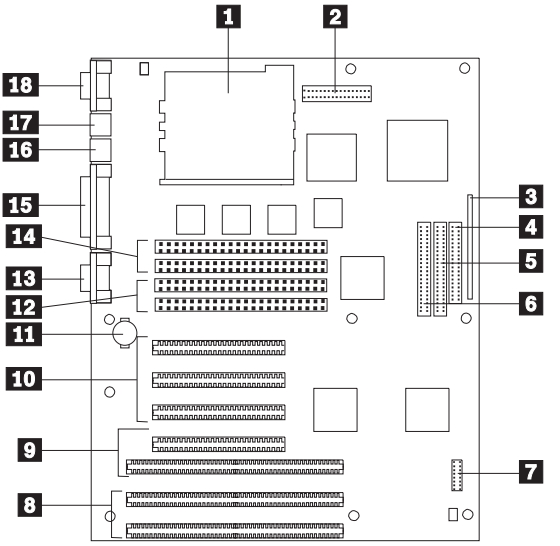
Additional Switch Settings (SW1 5-6)

Description	SW1-5	SW1-6
Normal Diskette Operation	N/A	Off (D)
Read-Only Diskette Operation	N/A	On

Password Jumper Settings

Jumper	Setting	Description
J15	1-2 2-3 (D)	Password Disabled Password Enabled

PC 360-S150 (Type 6598) - Pentium Pro 150/200 MHz System Board



Also see “Matrox Graphics Adapter (MGA) Switch Settings” on page 358 for MGA video adapter locations and switch settings.

PC 360-S150 (Type 6598) - Pentium Pro 150/200 MHz System Board Locations

1. Processor connector
2. Power supply connector
3. Front panel I/O connector
4. Diskette drive connector
5. Hard Disk Drive connector
6. CD-ROM drive connector
7. Configuration jumpers (J25)
8. ISA adapter slots
9. PCI/ISA adapter slots
10. PCI adapter slots
11. Backup battery
12. Bank 0 memory connectors
13. Serial port 2
14. Bank 1 memory connectors
15. Parallel port
16. Mouse port
17. Keyboard port
18. Serial port 1

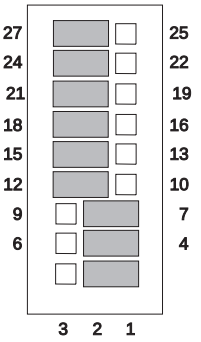
See “PC 360-S150 (Type 6598) - Pentium Pro 150/200 MHz Jumper Settings” on page 356 and “PC 360-S150 (Type 6598) - Pentium Pro 150/200 MHz Jumper Setting Procedures” on page 357 for jumper settings and procedures.

PC 360-S150 (Type 6598) - Pentium Pro 150/200 MHz Jumper Settings

See “PC 360-S150 (Type 6598) - Pentium Pro 150/200 MHz Jumper Setting Procedures” on page 357 for additional jumper procedure information.

Attention

The following are the factory-configuration jumper settings. Do *not* change jumper 26-27 from the factory setting.



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

Jumper	Setting	Description
Bus Speed Clock Ratio PCI/ISA	1-2 4-5 7-8 11-12	**150 MHz Processor** Bus = 60.14 MHz Clock ratio = 5/2 PCI = 30 MHz ISA = 7.51 MHz
Bus Speed Clock Ratio PCI/ISA	2-3 5-6 7-8 10-11	**200 MHz Processor** Bus = 66.48 MHz Clock ratio = 3/1 PCI = 33 MHz ISA = 8.31 MHz
Password	14-15 (D) 13-14	Password Enabled Password Reset
CMOS	17-18 (D) 16-17	CMOS Normal CMOS Reset
Setup Utility	20-21 (D) 19-20	Setup Enabled Setup Disabled
Flash Recovery	23-24 (D) 22-23	Normal Flash Recovery Enabled
Reserved	26-27 (D)	(Do Not Change)

PC 360-S150 (Type 6598) - Pentium Pro 150/200 MHz Jumper Setting Procedures

Processor/Bus-Speed/Clock-Ratio Jumper

Set these jumpers to match the processor installed.

Password Reset

1. Power-off the computer.
2. Move the jumper from pins 14-15 to 13-14.
3. Power-on the computer. This erases both the power-on and administrator passwords.
4. Power-off the computer.
5. Move the jumper from pins 13-14 to 14-15.

CMOS Jumper

1. Power-off the computer.
2. Move the jumper from pins 17-18 to 16-17.
3. Power-on the computer. This erases the CMOS information.
4. Power-off the computer.
5. Move the jumper from pins 16-17 to 17-18.

Configuration/Setup Utility Jumper

This jumper setting enables and disables the Configuration/Setup Utility.

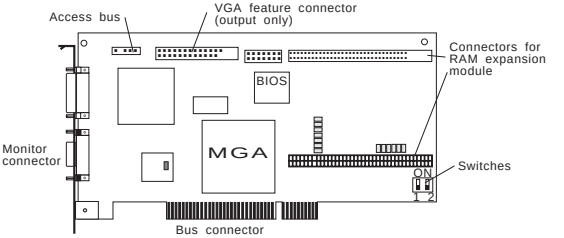
Flash Recovery Jumper

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

1. Power-off the computer.
2. Move the jumper from pins 23-24 to 22-23.
3. Insert the upgrade diskette into the drive A.
4. Power-on the computer and listen to the speaker. You should hear beeps in the following sequence.
   a. After the computer is powered-on, it beeps once. This beep marks the beginning of the POST.
   b. After a short delay (less than 10 seconds), the computer beeps again. This marks the beginning of the recovery process. The recovery code is being copied into the flash component.
   c. After about 30 seconds, the computer beeps twice, marking the end of the recovery process. Wait until the diskette drive in-use light goes out.
5. Power-off the computer and move the jumper from pins 22-23 to 23-24.
6. Leave the upgrade diskette in the diskette drive and power-on the computer.
7. Retry the original upgrade procedure.

Matrox Graphics Adapter (MGA) Switch Settings

There are two switches on the adapter that are used to change the way the adapter operates.



VGA BIOS Flash Upgrade Enable - Switch 1

To upgrade the VGA BIOS, use the software utility diskette and BIOS upgrade file.

1. Remove the adapter to access the switches.
2. Set Switch 1 to On to allow re-programming of the Flash EPROM.

   Note: Do not leave this switch On during normal use, as the Flash EPROM in this state is susceptible to being erased without warning.

3. Reinstall the adapter.
4. Follow the instructions supplied with the flash utility.
5. Power-off the computer and remove the adapter.
6. Set Switch 1 to Off.
7. Reinstall the adapter.
8. Remove the flash utility diskette.

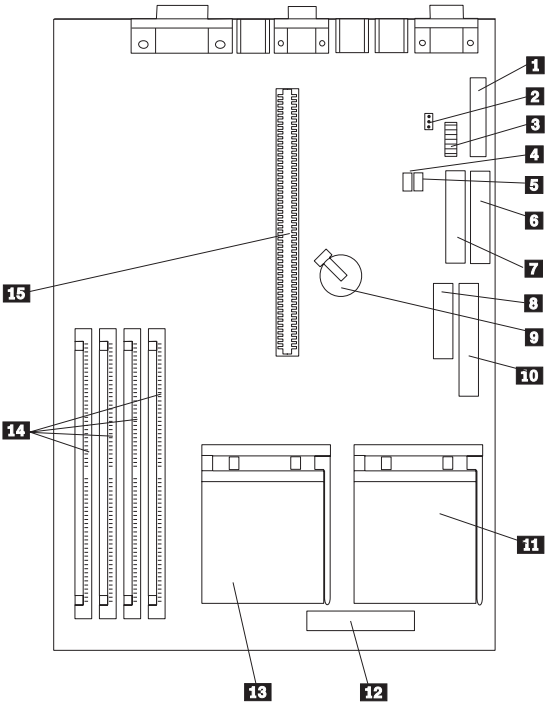
VGA Enable/Disable Switch - Switch 2

By default, the MGA adapter VGA feature is enabled (Switch 2=Off) for single-screen operation, which means that any other installed VGA must be disabled.

This switch should be set to On to support a dual-screen configuration. In this case, a VGA adapter in another expansion slot will be used for output to the second monitor.

1. Remove the adapter to access the switches.
2. Set Switch 2 to On to enable dual-screen operation.
3. Reinstall the adapter.

PC 365 (Type 6589) - System Board



Also see “Matrox Graphics Adapter (MGA) Switch Settings” on page 358 for MGA video adapter locations and switch settings.

PC 365 (Type 6589) - System Board Locations

1. Diskette drive connector
2. CMOS, Password Jumper
3. Processor, Diskette Switch
4. Wake on Ring connector J13 (style 1)
5. Wake on Ring connector J11 (style 2)
6. Secondary IDE connector
7. Primary IDE connector
8. 3.3V power connector
9. Battery
10. Main power connector
11. Second processor connector
12. Voltage regulator module (VRM) connector for second processor
13. Primary processor connector
14. Memory connectors
15. Riser-card connector

Note

The two Wake on Ring connectors, J13 and J11, accommodate two different style connectors. The two connectors share the same function.

PC 365 (Type 6589) Switch Settings

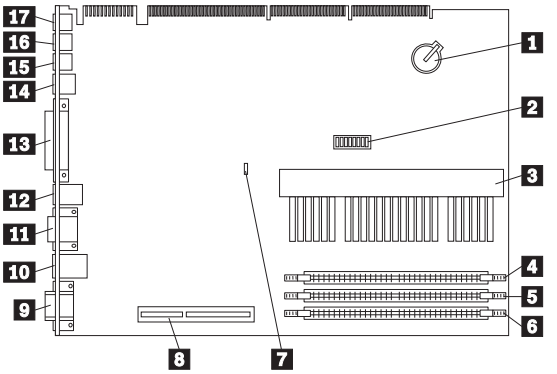
The following table contains the switch setting information. (D) indicates the default setting.

Description	Setting
180 MHz Processor	1, 3, 4, 5 On 2, 6, 7, 8 Off
200 MHz Processor	1, 3, 4, 6 On 2, 5, 7, 8 Off
Normal Diskette Operation	8 On (D)
Read-only Diskette Operation	8 Off
Password/CMOS Enabled	J8 1-2 (D)
Password/CMOS Erase	J8 2-3

Note

Refer to Configuration/Setup for other system parameter settings.

PC 300 Series (Type 6862, 6892) - Pentium II 266/300/333/350/400 MHz System Board



Note

For other system connectors, see “Riser Card Layouts” on page 388 under Type 6862, 6892.

PC 300 Series (Type 6862, 6892) - Pentium II 266/300/333/350/400 MHz System Board Locations

1	Battery
2	Switch SW1
3	Microprocessor socket
4	DIMM socket 0
5	DIMM socket 1
6	DIMM socket 2
7	CMOS clear Jumper J9
8	AGP 2X connector
9	Display connector
10	Mouse/Keyboard connectors (top=mouse, bottom=keyboard)
11	Serial connectors (top=serial port 2, bottom=serial port 1)
12	USB connectors (top=USB2, bottom=USB1)
13	Parallel connector
14	Ethernet RJ45 connector
15	Audio line out
16	Audio line in
17	Microphone connector

PC 300 Series (Type 6862, 6892) - Pentium II 266/300/333/350/400 MHz Jumper/Switch Settings

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

Jumper	Setting	Description
CMOS Reset J9	2-3 1-2 (D)	CMOS reset. Normal

The following tables contains the switch setting information. (D) indicates the default setting.

Pentium II Processor Speed Switch Setting (SW1 1-4)

CPU Switch Settings	SW1-1	SW1-2	SW1-3	SW1-4
233/66 MHz	Off	Off	On	On
266/66 MHz	On	On	Off	On
300/66 MHz	Off	On	Off	On
333/66 MHz	On	Off	Off	On
350/100 MHz	Off	Off	On	On
400/100 MHz	On	On	Off	On

ROM Operation Switch (SW1-5)

ROM Operation	SW1-5
ROM Recovery Mode	On
Normal ROM Operation	Off (D)

Reserved Switch (SW1-6)

Reserved	SW1-6
Reserved	Off (D)

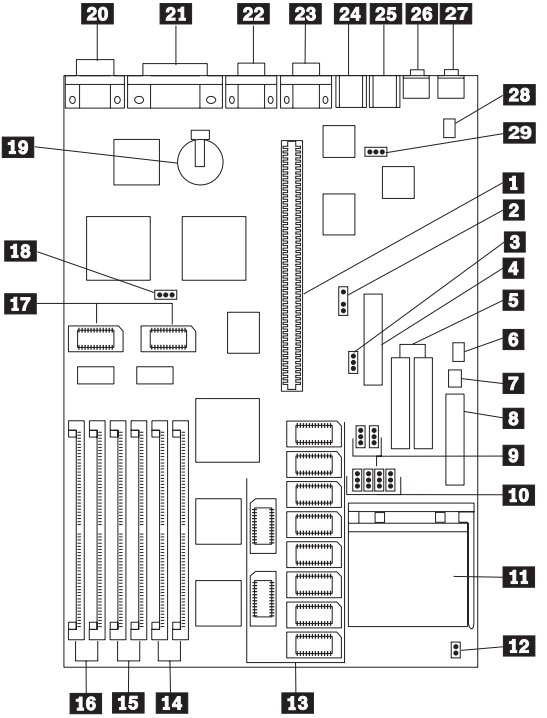
Privilege Access Password (PAP) Switch (SW1-7)

PAP	SW1-7
Disable	Off (D)
Enable	On

Diskette Write Access Switch (SW1-8)

Diskette Access	SW1-8
Write Enabled	Off (D)
Write Protected	On

PC 730/750 Series (Type 6875, 6876, 6885, 6886) - Pentium 75/90/100/120/133 MHz System Board



PC 730/750 Series (Type 6875, 6876, 6885, 6886) - Pentium 75/90/100/120/133 MHz System Board Locations

1		Riser connector
2	- J15	Modem Ring Detect connector
3	- J29	Diskette drive write protect jumper
4		Diskette drive connector
5		Hard disk drive connectors
6	- J38	On/Off Switch power supply connector
7	- J37	On/Off Switch connector
8		Power supply connectors
9		Bus/CPU Speed (MHz)
10		L2 Cache size jumpers
11		Processor connector
12	- J19	Bus/Core Ratio
13		Cache connectors
14		Memory connectors (Bank 2)
15		Memory connectors (Bank 1)
16		Memory connectors (Bank 3)
17		Video memory connectors
18	- J40	Power-on password jumper
19		Battery
20		Display connector
21		Parallel connector
22		Serial connector
23		Serial connector
24		Mouse connector
25		Keyboard connector
26		Audio jack
27		Audio jack
28		IDE CD-ROM audio connector
29	- J28	Mouse jumper

See “PC 730/750 Series (Type 6875, 6876, 6885, 6886) - Pentium 75/90/100/120/133 MHz Jumper Settings” on page 367 for jumper settings.

PC 730/750 Series (Type 6875, 6876, 6885, 6886) - Pentium 75/90/100/120/133 MHz Jumper Settings

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

Jumper	Setting	Description
J19	open (D) short	2/3 Bus/Core Ratio 1/2 Bus/Core Ratio
J28	1-2 (D) 2-3	Mouse enabled Mouse disabled
J29 (WP)	2-3 (D) 1-2	Enable writing to a diskette Disable writing to a diskette.
J40 (PWD)	1-2 (D) 2-3	Password enabled. Password reset.

Bus/CPU Speed MHz Setting

The following table contains the Bus/CPU Speed settings.

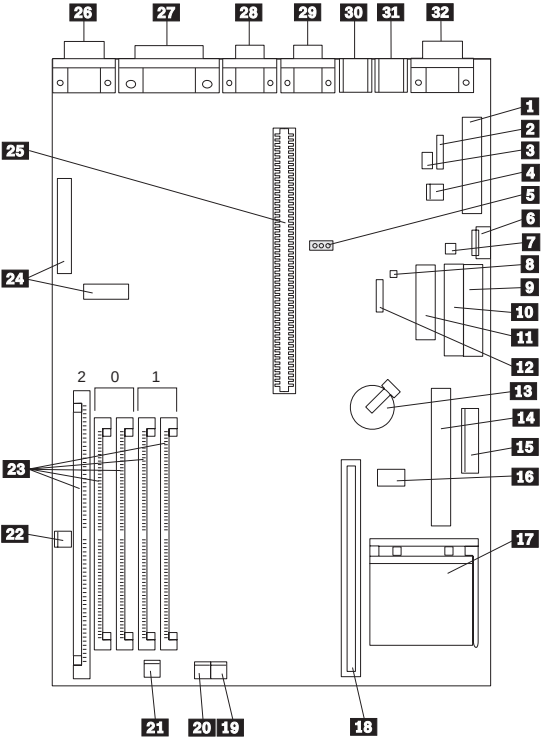
Jumper	50/75	60/90 60/120	66/100 66/133
J26 J27	2-3 2-3	2-3 1-2	1-2 1-2

Cache Jumper Settings

The following table contains the cache jumper settings.

Cache	J21	J22	J23	J24
256 KB	1-2	1-2	1-2	1-2

PC 730/750 Series (Type 6877, 6887) - Pentium 100/133/150/166 MHz System Board



PC 730/750 Series (Type 6877, 6887) - Pentium 100/133/150/166 MHz System Board Locations

1		Power connector (5 V)
2	- J9	Modem ring
3	- J14	LAN wake-up
4	- J13	External ring wake-up
5	- J15	Password jumper (CMOS Clear)
6	- J16	Auxiliary power
7	- J18	On/Off switch
8	- J19	Tamper connector
9		Secondary IDE connector
10		Primary IDE connector
11		Diskette connector
12		Tamper (Reserved)
13		Battery
14		Voltage regulator connector
15		Power connector (3.3 V)
16		Switch set (SW1)
17		Processor socket
18		Cache memory module connector
19		Power LED connector
20		Hard Disk access LED connector
21		Speaker connector
22		DSP Audio connector
23		DIMM/SIMM connectors
24		VESA passthrough connector
25		Riser connector
26		Video port
27		ECP/EPP parallel port
28		Serial (B) port
29		Serial (A) port
30		Mouse port
31		Keyboard port
32		Infrared port

PC 730/750 Series (Type 6877, 6887) - Pentium 100/133/150/166 MHz Switch/Jumper Settings

The following tables contain the switch and jumper setting information. (D) indicates the default setting.

Processor Speed Switch Settings (SW1 1-4)

Speed	SW1-1	SW1-2	SW1-3	SW1-4
75 MHz	Off	Off	On	On
90 MHz	Off	Off	On	Off
100 MHz	Off	Off	Off	On
120 MHz	On	Off	On	Off
133 MHz	On	Off	Off	On
150 MHz	On	On	On	Off
166 MHz	On	On	Off	On

Additional Switch Settings (SW1 5-6)

Description	SW1-5	SW1-6
Administrator Password Enabled	On (D)	N/A
Administrator Password Disabled	Off	N/A
Normal Diskette Operation	N/A	Off (D)
Read-Only Diskette Operation	N/A	On

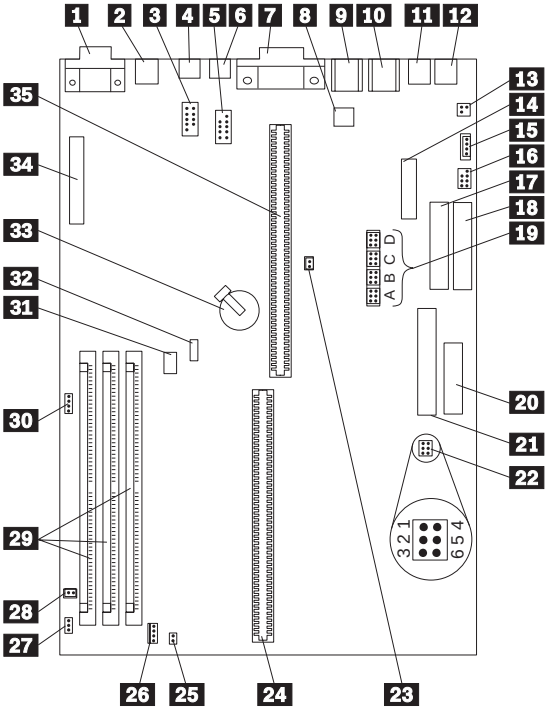
Jumper Settings

Jumper	Setting	Description
J15	1-2 (D) 2-3	Password Enabled Password Disabled

IntelliStation (Type 6888) - Pentium II 266/300 MHz System Board

Note

This system board and jumper settings are the same as the PC 300 (Type 6588).



IntelliStation (Type 6888) - Pentium II 266/300 MHz System Board Locations

1 Display connector
2 Ethernet RJ45 connector
3 Infrared connector (J3M1)
4 USB (Universal Serial Bus) 2 connector
5 Serial port system board connector (J4M1) (Serial port A located in back of chassis)
6 USB (Universal Serial Bus) 1 connector
7 Parallel port connector
8 5 V auxiliary connector
9 Mouse connector
10 Keyboard connector
11 Audio line out
12 Audio line in
13 Tela jack audio
14 Diskette drive connector
15 CD-ROM connector
16 Wave table audio
17 Primary IDE connector
18 Secondary IDE connector
19 System board jumper block
20 Power connector (3.3 V)
21 Main power connector
22 Boot block recovery jumper
23 Chassis security connector
24 Microprocessor connector
25 Power switch connector
26 Power LED/hard disk LED connector
27 Processor fan connector (300 MHz model only)
28 Fan connector
29 DIMM connectors
30 SCSI activity LED connector
31 Wake-Up on LAN
32 Modem Wake-Up
33 Battery
34 Feature connector
35 Riser card connector

IntelliStation (Type 6888) - Pentium II 266/300 MHz Jumper Settings

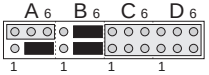
The following tables contain the jumper setting information. (D) indicates the default setting.

Note

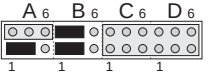
These jumper settings also apply to (Type 6588)

System Board Jumper Block

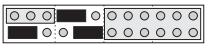
233 MHz



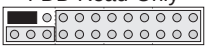
266 MHz



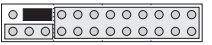
300 MHz



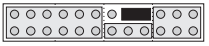
FDD Read-Only



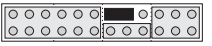
FDD Read/Write



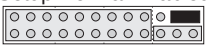
Normal CMOS



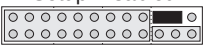
Clear CMOS



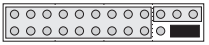
Setup Normal Enabled



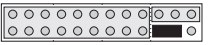
Setup Disabled



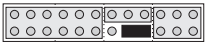
Password Normal



Password Reset



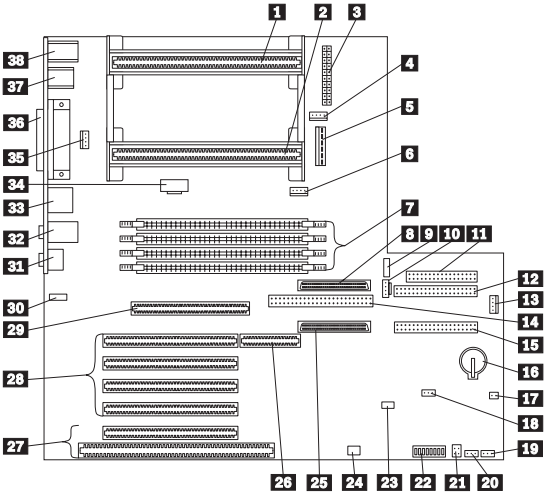
Reserved



Boot Block Recovery Jumper

Jumper	Setting	Description
Boot Block Recovery	5-6 (D) 4-5	Normal Recover

IntelliStation (Type 6889) - Pentium II 350/400 MHz System Board



IntelliStation (Type 6889) - Pentium II 350/400 MHz System Board Locations

1	- U25	Secondary microprocessor socket
2	- U24	Primary microprocessor socket
3	- J5M1	Power connector
4	- J4	Secondary microprocessor fansink connector
5	- J2M1	Power connector
6	- J3	Primary microprocessor fansink connector
7	-	DIMM connectors (DIMM 0,1,2,3)
8	- J10D1	SCSI channel B 16-bit connector
9	- J9L1	Power switch and LED connector
10	- J11B1	Hard disk LED connector
11	- J8F2	Diskette drive connector
12	- J9F1	Primary IDE connector
13	- J15	RF ID antenna connector
14	- J10E1	SCSI channel B 8-bit connector
15	- J8F1	Secondary IDE connector
16		Battery
17	- J12B3	Internal speaker connector
18	- J7E1	Clear CMOS jumper
19	- J5	Fan connector, front panel
20	- J6	Fan connector, front panel
21	- J12B1	Tamper detect switch connector
22	- SW12A1	Switches
23	- J6D1	Wake On LAN connector
24	- J13	Wake On Modem connector
25	- J10F1	SCSI channel A connector
26	- J4D1	RAIDport extension
27		Shared ISA/PCI connectors
28		PCI slot connectors
29	- J2E3	AGP slot connector
30	- J1F1	CD audio connector
31		Microphone connector
32		Audio line In/Out connector
33		RJ-45 Ethernet connector
34	- J4F1	JTAG
35	- J7	Rear panel fan connector
36		Parallel/Serial 1/Serial 2 connectors
37		USB 1/USB 2 connectors
38		Keyboard/Mouse connectors

IntelliStation (Type 6889) - Pentium II 350/400 MHz Switch/Jumper Settings

The following tables contain the switch and jumper setting information. (D) indicates the default setting.

Processor Speed Switch Setting (SW1 1-4)

Speed	SW1-1	SW1-2	SW1-3	SW1-4
350 MHz	Off	Off	On	On
400 MHz	On	On	Off	On

Normal ROM Operation Switch (SW1-5)

ROM Operation	SW1-5
Normal	Off (D)
ROM Recovery Mode	On

Enet Normal Operation Switch (SW1-6)

Enet Operation	SW1-6
Normal	Off (D)
Enet Disabled	On

Admin Password Lock Switch (SW1-7)

Admin Password	SW1-7
Locked	Off (D)
Unlocked	On

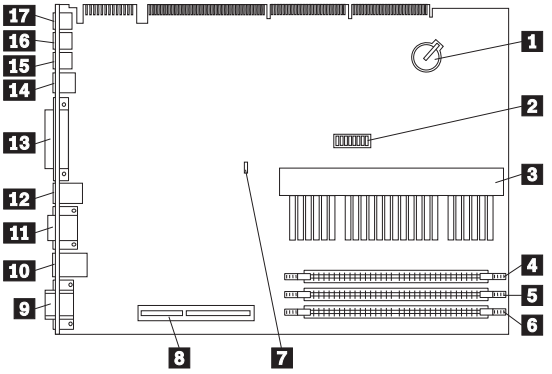
Diskette Operation Switch (SW1-8)

Diskette Operation	SW1-8
Normal	Off (D)
Read Only	On

Clear CMOS Request Jumper Setting

Jumper	Setting	Description
J7E1	1-2 (D) 2-3	Normal Operation Erase Password and Configuration (Clear CMOS)

IntelliStation (Type 6893) - Pentium II 350/400 MHz System Board



Note

For other system connectors, see “Riser Card Layouts” on page 388 under Type 6893.

IntelliStation (Type 6893) - Pentium II 350/400 MHz System Board Locations

1	Battery
2	Switch SW1
3	Microprocessor socket
4	DIMM socket 0
5	DIMM socket 1
6	DIMM socket 2
7	CMOS clear Jumper J9
8	AGP 2X connector
9	Display connector (not used)
10	Mouse/Keyboard connectors (top=mouse, bottom=keyboard)
11	Serial connectors (top=serial port 2, bottom=serial port 1)
12	USB connectors (top=USB2, bottom=USB1)
13	Parallel connector
14	Ethernet RJ45 connector
15	Audio line out
16	Audio line in
17	Microphone connector

IntelliStation (Type 6893) - Pentium II 350/400 MHz Jumper/Switch Settings

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

Jumper	Setting	Description
CMOS Reset J9	2-3 1-2 (D)	CMOS reset. Normal

The following tables contains the switch setting information. (D) indicates the default setting.

Pentium II Processor Speed Switch Setting (SW1 1-4)

CPU Switch Settings	SW1-1	SW1-2	SW1-3	SW1-4
233/66 MHz	Off	Off	On	On
266/66 MHz	On	On	Off	On
300/66 MHz	Off	On	Off	On
333/66 MHz	On	Off	Off	On
350/100 MHz	Off	Off	On	On
400/100 MHz	On	On	Off	On

ROM Operation Switch (SW1-5)

ROM Operation	SW1-5
ROM Recovery Mode	On
Normal ROM Operation	Off (D)

Reserved Switch (SW1-6)

Reserved	SW1-6
Reserved	Off (D)

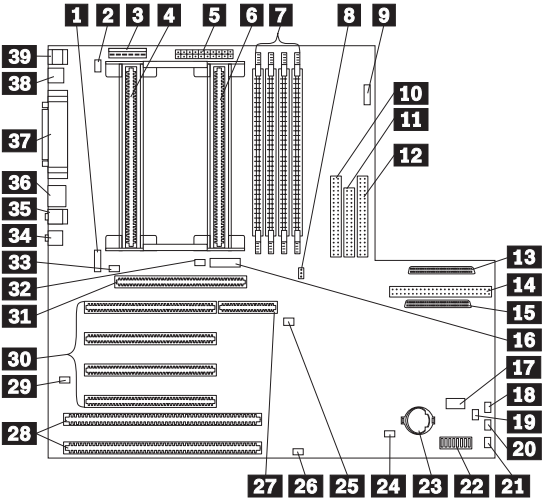
Privilege Access Password (PAP) Switch (SW1-7)

PAP	SW1-7
Disable	Off (D)
Enable	On

Diskette Write Access Switch (SW1-8)

Diskette Access	SW1-8
Write Enabled	Off (D)
Write Protected	On

IntelliStation (Type 6898) - Pentium II 233/266/300 MHz System Board



IntelliStation (Type 6898) - Pentium II 233/266/300 MHz System Board Locations

1	- J1F1	CD-ROM audio connector (MPC3)
2	- J1M1	Fan connector, rear panel
3		3.3 V, 5 V power connector
4		Primary microprocessor socket
5		Power connector
6		Secondary microprocessor socket
7		DIMM connectors (MEM 3,2,1,0)
8	- J7E1	CMOS clear request
9	- J9L1	Power switch and power/Hard disk LED connector
10		Secondary IDE connector
11		Diskette drive connector
12		Primary IDE connector
13		Channel A SCSI connector (68 pin)
14		Channel B SCSI connector (50 pin)
15		Channel B SCSI connector (68 pin)
16	- J4F1	Reserved
17	- J11B1	SCSI LED connector (4 pin)
18	- J12B3	Internal speaker connector
19	- J12B1	Tamper detect switch connector
20	- J12B2	Fan connector, front panel (upper)
21	- J12A1	Fan connector, front panel (lower)
22		Switch set (SW1)
23		Battery
24	- J10A1	SCSI LED connector (2 pin)
25	- J6D1	Wake On LAN connector
26	- J9A1	Wake On Modem connector
27		RAIDport extension
28		ISA slot connectors
29	- J0B1	External SMBus connector
30		PCI slot connectors
31		AGP slot connectors
32	- J3F2	Secondary microprocessor fansink connector
33	- J2E1	Primary microprocessor fansink connector
34		Microphone connector
35		Audio line In/Out
36		RJ-45 Ethernet connector
37		Parallel/Serial 1/Serial 2 connectors
38		USB 1/USB 2 connectors
39		Keyboard/Mouse connectors

IntelliStation (Type 6898) - Pentium II 233/266/300 MHz Switch/Jumper Settings

The following tables contain the switch and jumper setting information. (D) indicates the default setting.

Processor Speed Switch Setting (SW1 1-4)

Speed	SW1-1	SW1-2	SW1-3	SW1-4
233 MHz	Off	Off	On	On
266 MHz	On	On	Off	On
300 MHz	Off	On	Off	On

Normal ROM Operation Switch (SW1-5)

Normal ROM Operation	SW1-5
Normal Operation	Off (D)
ROM Recovery Mode	On

Enet Normal Operation Switch (SW1-6)

Enet Normal Operation	SW1-6
Normal Operation	Off (D)
Enet MAC Disabled	On

Admin Password Lock Switch (SW1-7)

Admin Password Lock	SW1-7
Locked	Off (D)
Unlocked	On

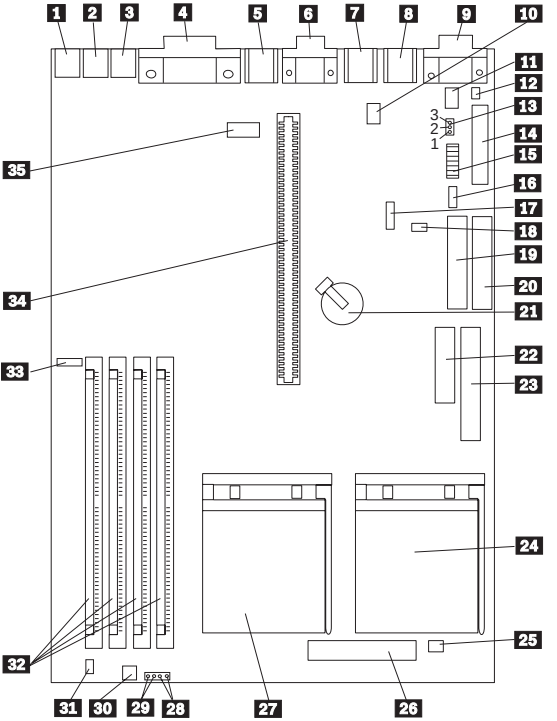
Diskette Operation Switch (SW1-8)

Diskette Operation	SW1-8
Normal Diskette Operation	Off (D)
Read Only Diskette	On

Clear CMOS Request Jumper Setting

Jumper	Setting	Description
J7E1	1-2 (D) 2-3	Normal Operation Erase Password and Configuration (Clear CMOS)

IntelliStation (Type 6899) - Pentium Pro 200 MHz System Board

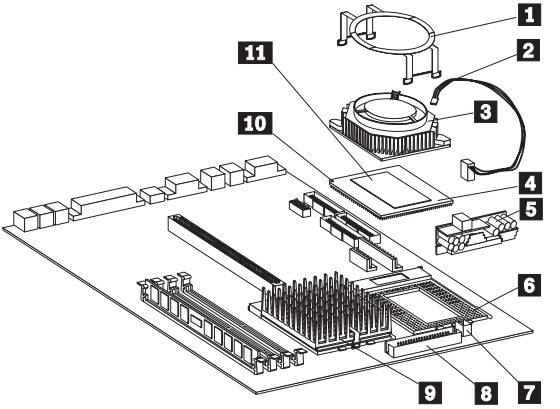


IntelliStation (Type 6899) - Pentium Pro 200 MHz System Board Locations

1		Audio line out
2		Audio line in
3		Microphone
4		Parallel port connector
5		USB (Universal Serial Bus) connector
6		Serial port A connector (Serial port B connector located on back of base frame)
7		Mouse connector
8		Keyboard connector
9		Infrared connector
10	- J15	Wake-Up on LAN
11		5 V auxiliary connector
12		Power switch connector
13	- J8	CMOS clear (password) jumper
14		Diskette drive connector
15		Switch set (SW1)
16		SCSI LED connector
17	- J13	Modem wake-up
18	- J11	Modem wake-up
19		Primary IDE connector
20		Secondary IDE connector
21		Battery
22		Power connector (3.3 V)
23		Main power connector
24		Second microprocessor socket
25	- J12	Fan connector (second microprocessor)
26		Voltage Regulator Module connector (second microprocessor)
27		Primary microprocessor socket
28		Power LED connector
29		Hard disk drive LED connector
30		Fan connector, front panel
31		Internal speaker connector
32		DIMM connectors
33	- J34	CD-ROM audio connector
34		Riser card connector
35	- J20	Serial port B system board connector

IntelliStation (Type 6899) - Pentium Pro 200 MHz Second Microprocessor Option

Some models come with two microprocessors.



1. Fan-sink retaining clip
2. Fan-sink power cable
3. Fan-sink
4. Secondary microprocessor
5. Voltage Regulator Module (VRM)
6. Secondary microprocessor socket
7. Fan-sink power cable connector
8. VRM connector
9. Primary microprocessor socket
10. Pin 1 location
11. Heat spreader

IntelliStation (Type 6899) - Pentium Pro 200 MHz Switch/Jumper Settings

The following tables contain the switch and jumper setting information. (D) indicates the default setting.

Processor Speed Switch Setting (SW1 1-6)

Speed	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6
200 MHz	On	Off	On	On	Off	N/A

Additional Switch Settings (SW1 7-8)

Description	SW1-7	SW1-8
Serial B Enabled	On (D)	N/A
Serial B Disabled	Off	N/A
Normal Diskette Operation	N/A	Off (D)
Read-Only Diskette Operation	N/A	On

Jumper Settings

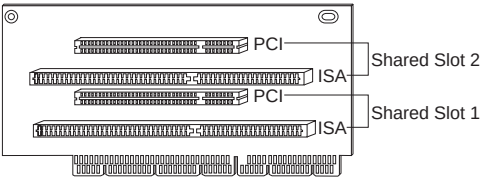
Jumper	Setting	Description
J8	1-2 (D) 2-3	Password Enabled Password Disabled (Clear CMOS)

Riser Card Layouts

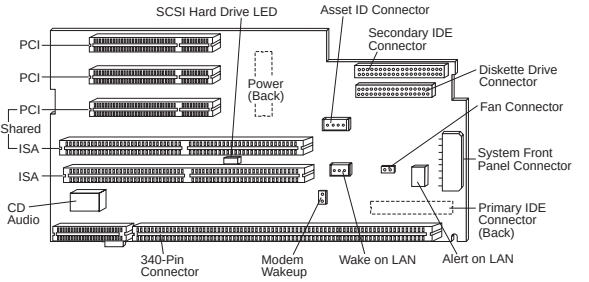
Notes

- PCI adapters plug into the PCI riser slot with the component-side facing the system board.
- ISA adapters plug into the ISA riser slot with the component-side facing upward.

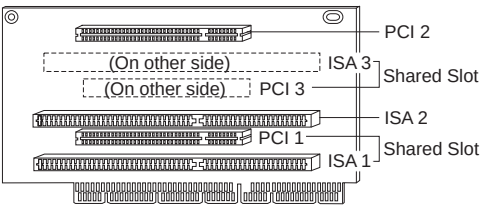
PC 300 (Type 6272) PCI/ISA



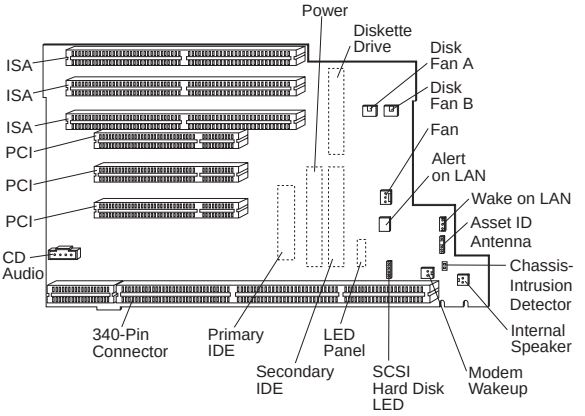
PC 300 (Type 6275) ISA/PCI



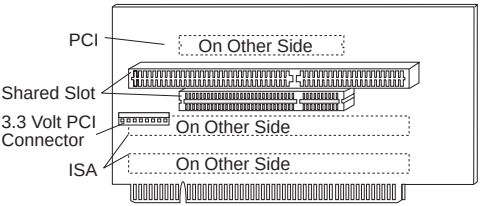
PC 300 (Type 6282, 6284) PCI/ISA



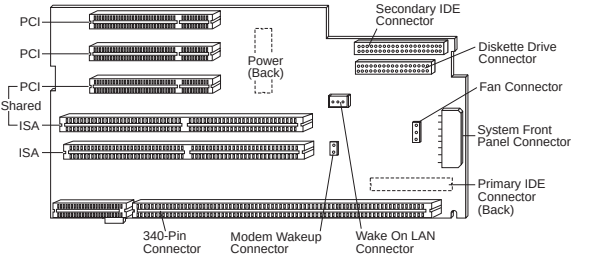
PC 300 (Type 6285) ISA/PCI



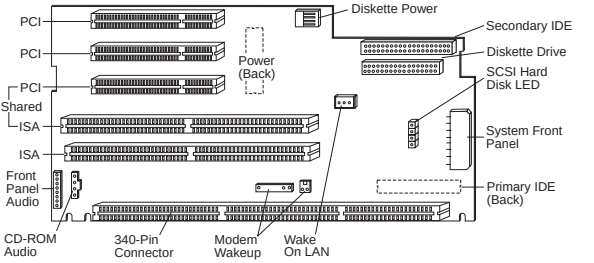
PC 340 (Type 6560) PCI/ISA



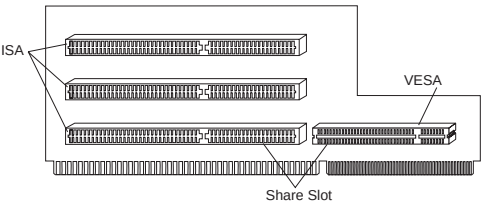
PC 300 (Type 6561) PCI/ISA



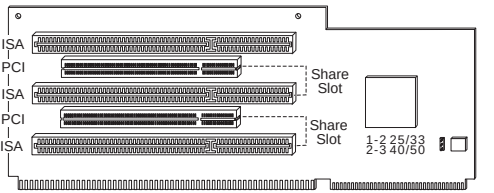
PC 300 (Type 6562) PCI/ISA



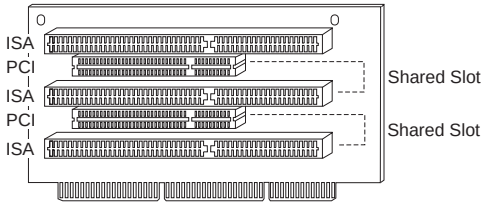
PC 330 (Type 6571) ISA/VESA



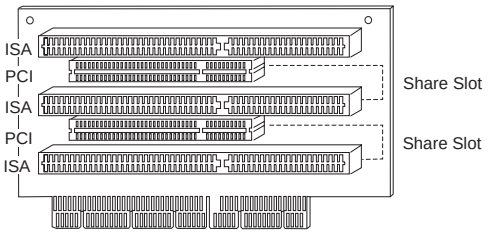
PC 330 (Type 6573) PCI/ISA



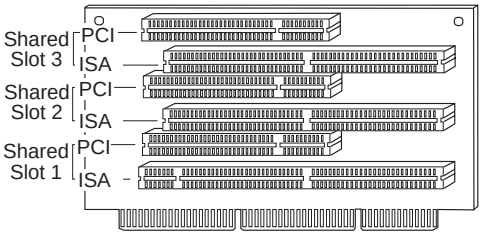
PC 330 (Type 6575) PCI/ISA



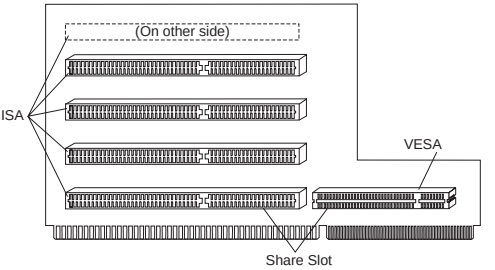
PC 330 (Type 6576) PCI/ISA



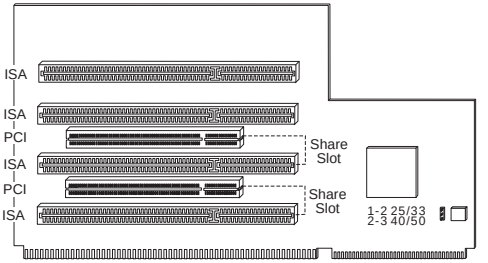
PC 330 (Type 6577) ISA/PCI



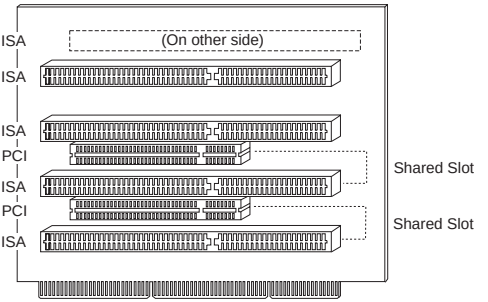
PC 350 (Type 6581) ISA/VESA



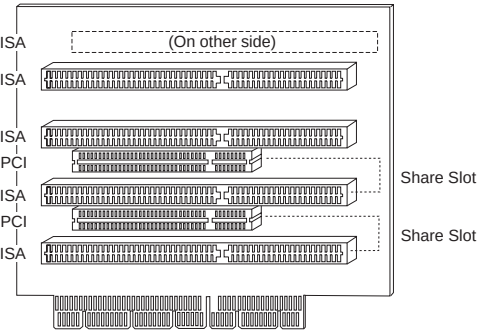
PC 350 (Type 6583) PCI/ISA



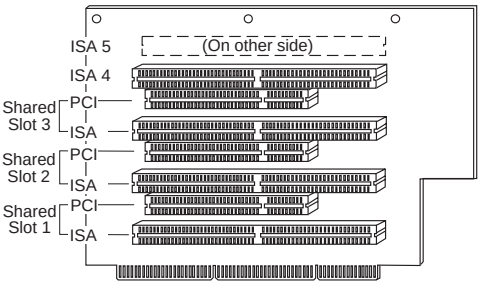
PC 350 (Type 6585) PCI/ISA



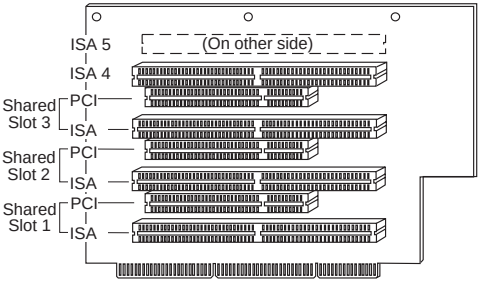
PC 350 (Type 6586) PCI/ISA



PC 350 (Type 6587) ISA/PCI

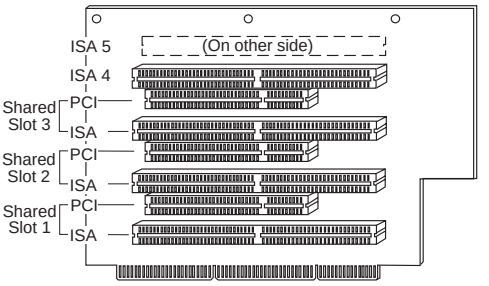


PC 300 (Type 6588) ISA/PCI

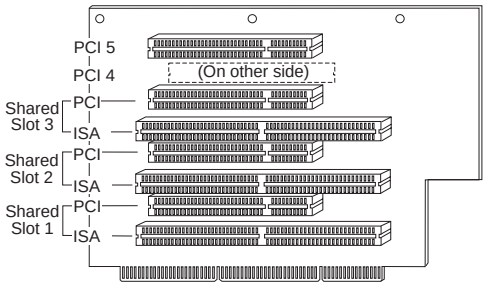


Same as IntelliStation (Type 6888) riser card.

PC 365 (Type 6589) ISA/PCI

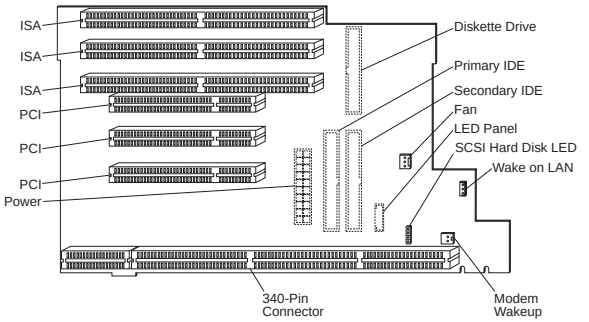


(3 Shared / 2 ISA)

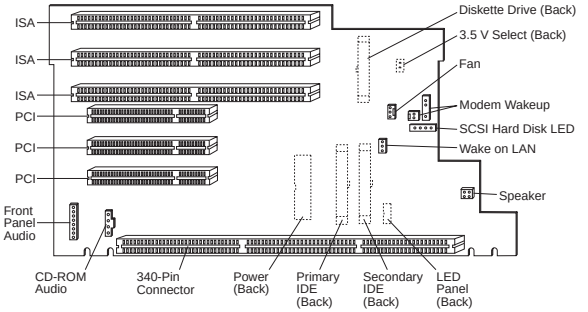


(3 Shared / 2 PCI)

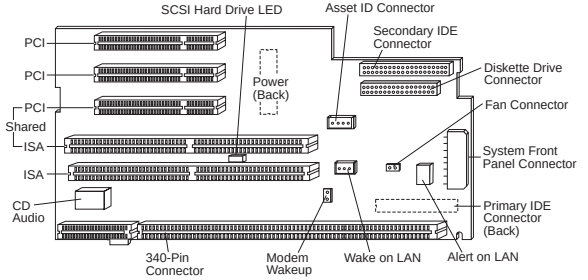
PC 300 (Type 6591) ISA/PCI



PC 300 (Type 6592) ISA/PCI



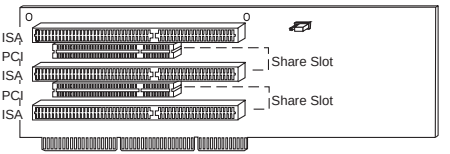
PC 300 (Type 6862) ISA/PCI



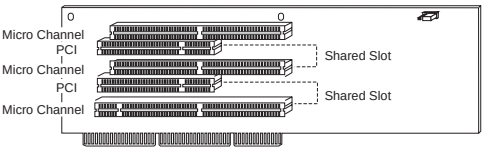
Note

The Fan connector is thermally controlled. The fan can run at high or low speed, or can be turned off depending on the ambient air temperature.

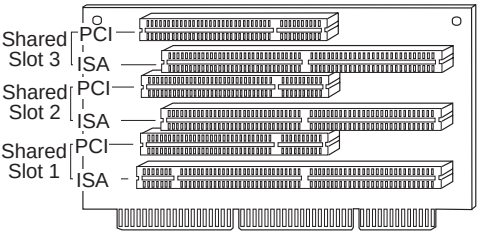
PC 730 (Type 6875) PCI/ISA



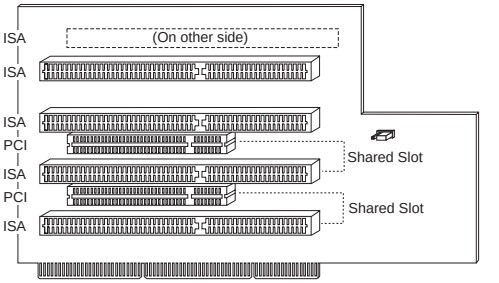
PC 730 (Type 6876) PCI/Micro Channel



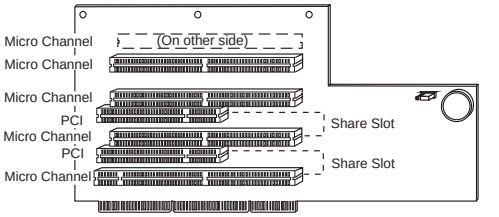
PC 730 (Type 6877) ISA/PCI



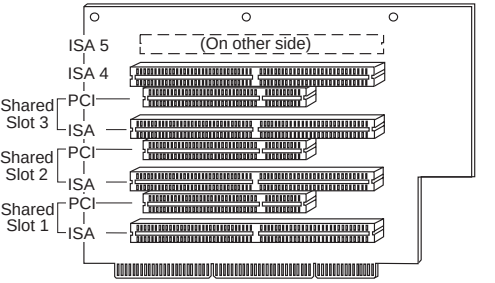
PC 750 (Type 6885) ISA/PCI



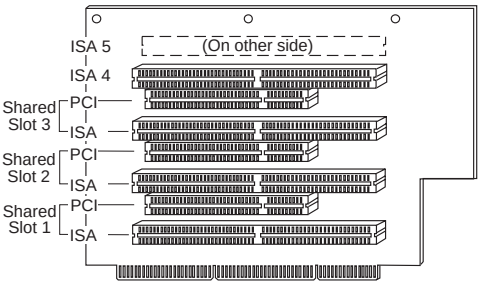
PC 750 (Type 6886) PCI/Micro Channel



PC 750 (Type 6887) ISA/PCI

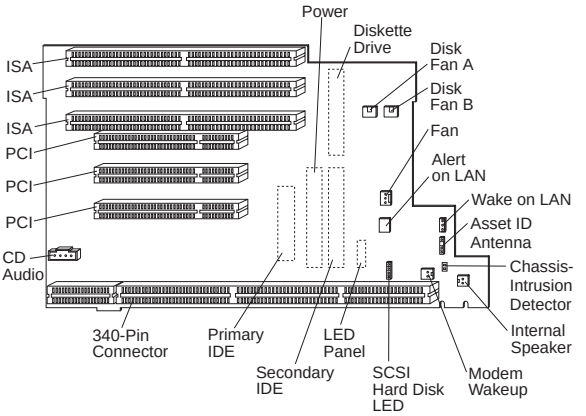


IntelliStation (Type 6888) ISA/PCI



Same as PC 300 (Type 6588) riser card.

PC 300 (Type 6892) ISA/PCI

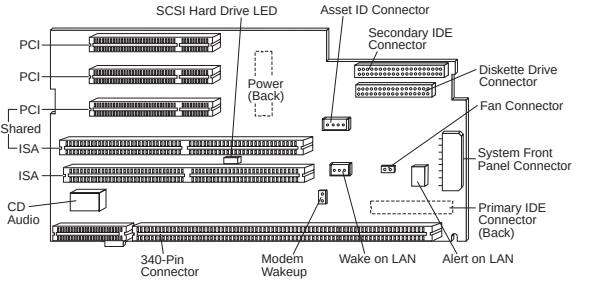


Note

The **Front Fan** and **Disk Fan A** connectors are thermally controlled. These fans can run at high or low speed, or can be turned off depending on the ambient air temperature.

Disk Fan B connector is not thermally controlled. The fan connected to Disk Fan B should be running when the computer is powered on.

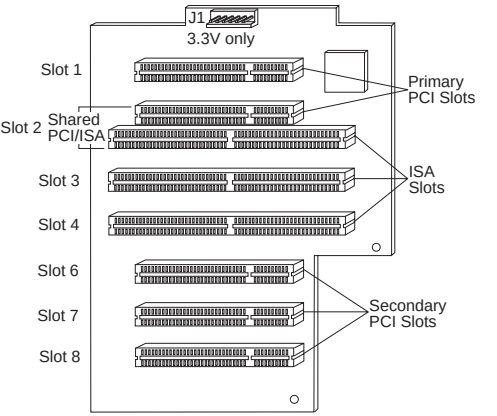
IntelliStation (Type 6893) ISA/PCI



Note

The Fan connector is thermally controlled. The fan can run at high or low speed, or can be turned off depending on the ambient air temperature.

IntelliStation (Type 6899) ISA/PCI



Type/Model Number Conversion

This section provides an explanation of the Type and Model numbers for Type 62XX, 65XX, and 68XX computers.

Note

See “Type/Model Configuration Tables” on page 407 for these Types and Models:

- Type 6272, 6282, 6284
- Type 6275
- Type 6285
- Type 6560 Models 4XX, 5XX, 6XX
- Type 6561
- Type 6562
- Type 6588
- Type 6589
- Type 6591
- Type 6592
- Type 6862
- Type 6892
- IntelliStation Type 6888, 6889, 6893, 6898, 6899

The following numbers identify the features of the computer.

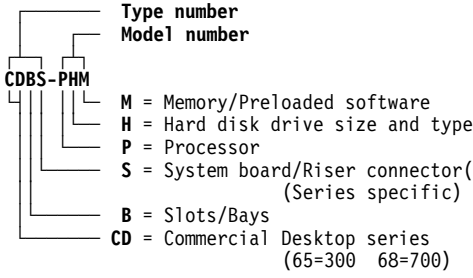
The Type Number contains the following information:

- Commercial Desktop series computer identification (300 or 700)
- Number of slots and bays
- Type of system board/riser connector(s) (Series specific)

The Model Number contains the following information:

- Processor Type
- Hard disk drive size and type
- Amount of memory installed and preloaded software information, if installed

The following figure shows the position of each digit of the type number and model number, and description of each position.



As an example, if the machine type number and model number are **6573-H3C**, each digit decodes as follows:

Digits	Information
65	Commercial Desktop 300 Series computer
7	Computer has 3 slots and 3 bays
3	486 MHz System board with PCI/ISA Riser connector(s) (300 Series computers only)
H	486DX-33 MHz processor installed
3	270 MB IDE hard disk drive installed
C	Shipped with 4 MB of memory and preloaded with OS/2

The codes for the type and model numbers, followed by descriptions for the codes are listed below.

Note

See “Type/Model Configuration Tables” on page 407 for these Types and Models:

- Type 6272, 6282, 6284
- Type 6275
- Type 6285
- Type 6560 Models 4XX, 5XX, 6XX
- Type 6561
- Type 6562
- Type 6588
- Type 6589
- Type 6591
- Type 6592
- Type 6862
- Type 6892
- IntelliStation Type 6888, 6889, 6893, 6898, 6899

CD — Commercial Desktop Series Codes

CD	Commercial Desktop Series
65	300
68	700

B — Slots/Bay Codes

B	Slots and Bays
6	4 Slots and 4 Bays
7	3 Slots and 3 Bays
8	5 Slots and 5 Bays
9	6 Slots and 6 Bays

S — System Board/Riser Connector - 300 Series only

S	System Board/Riser connector
1	486 MHz with VL/ISA
3	486 MHz with PCI/ISA
5	Pentium 5V with PCI/ISA
6, 0	Pentium 3V with PCI/ISA
8	Pentium Pro with PCI/ISA
9	Pentium Pro with PCI/ISA (with Dual Processor capability)

S — System Board/Riser Connector - 700 Series only

S	System Board/Riser Connector
5	Pentium-3V with PCI/ISA (2 PCI Slots)
6	Pentium-3V with PCI/MCA (2 PCI Slots)
7	Pentium-3V with PCI/ISA (3 PCI Slots)

P — Processor, Hard Disk Drive (Type 68X7 Only)

P	Processor, Hard Disk Drive
6	P54C-166 MHz, 1.2 GB IDE
8	P54C-166 MHz, 1.6 GB IDE
9	P54C-166 MHz, 2.0 GB SCSI
E	P54C-100 MHz, Open Bay
F	P54C-133 MHz, Open Bay
H	P54C-166 MHz, Open Bay
K	P54C-100 MHz, 1.2 GB IDE
M	P54C-100 MHz, 1.2 GB SCSI
N	P54C-100 MHz, 1.6 GB IDE
V	P54C-133 MHz, 1.2 GB IDE
X	P54C-133 MHz, 1.2 GB SCSI

P	Processor, Hard Disk Drive
Y	P54C-133 MHz, 1.6 GB IDE

P — Processor (Type 6577, 6587 Only)

P	Processor
K	P55C-166 MHz
L	P55C-200 MHz

P — Processor (All Other Types)

P	Processor
C	S150 Pentium Pro (Type 6598)
G	P54C-200 MHz
H	486DX-33 MHz
K	486DX2-25/50 MHz
L	486DX2-33/66 MHz
P	P54C-90 MHz
R	P54C-100 MHz
T	P54C-133 MHz
W	486DX4-100 MHz with regulator
1	P5-60 MHz or P54C-100 MHz (No Cache)
2	P54C-75 MHz (No Cache)
3	P54C-75 MHz (256 KB L2 Cache)
4	P54C-90 MHz (256 KB L2 Cache)
5	P54C-100 MHz
6	P54C-120 MHz
7	P54C-133 MHz
8	P54C-150 MHz
9	P54C-166 MHz

H — CD-ROM, Network Adapter, DSP/Video (Type 68X7 Only)

H	CD-ROM, Network Adapter, DSP/Video
1	6X CD-ROM, No Network Adapter, DSP
6	6X CD-ROM, No Network Adapter, Matrox Graphics Adapter
A	No Features Installed
B	Ethernet Adapter Only
C	Token-Ring Adapter Only
F	4X CD-ROM, No Network Adapter, DSP
P	4X CD-ROM, No Network Adapter, Matrox Graphics Adapter

H — Hard Disk Drive Size and Type (Type 6577, 6587 Only)

If not in this list, see 'H — Hard Disk Drive Size and Type (All Other Types) in table below.

H	Hard Disk Drive Size and Type
B	2.5 GB IDE
F	1.2 GB IDE with Windows 95
G	2.5 GB IDE with Windows 95
H	4.2 GB IDE with Windows 95
N	1.6 GB IDE with Windows NT
S	2.5 GB IDE with Windows NT
T	4.2 GB IDE with Windows NT

H — Hard Disk Drive Size and Type (All Other Types)

H	Hard Disk Drive Size and Type
0	No Hard Disk Drive Installed
2	170 MB IDE
3	270 MB IDE
4	364 MB IDE
5	540 MB IDE
6	635 MB IDE
7	850 MB IDE
8	1 GB IDE
9	1.2 GB IDE
A	1.6 GB IDE
B	360 MB SCSI
C	540 MB SCSI
D	720 MB SCSI
E	1 GB SCSI
F	2.2 GB SCSI with Multimedia (CD-ROM)
N	270 MB IDE with Multimedia (CD-ROM)
P	364 MB IDE with Multimedia (CD-ROM)
R	540 MB IDE with Multimedia (CD-ROM)
S	850 MB IDE with Multimedia (CD-ROM)
T	1 GB IDE with Multimedia (CD-ROM)
U	Universal
V	Open Bay System
W	Special Bid
Y	635 MB IDE with Multimedia (CD-ROM)
X	1.2 GB IDE with Multimedia (CD-ROM)
Z	1.6 GB IDE with Multimedia (CD-ROM)

M — Memory and Preloaded Software - 300 Series, All Types

M	Memory and Preload Software - U.S. only
A	4 MB (Open Bay System) or 8 MB with DOS/Windows
B	4 MB with DOS and Microsoft Windows
D	4 MB with no Preloaded Software
E	8 MB (Open Bay System)
F	8 MB with SelectaSystem
G	8 MB with OS/2
H	16 MB with SelectaSystem
J	16 MB with OS/2 Warp/Connect Full Pack
K	32 MB with OS/2 Warp/Connect Full Pack
M	16 MB with DOS/Windows
S	8 MB with Windows 95 or DOS and Windows
T	16 MB with Windows 95 or DOS and Windows
U	16 MB
V	32 MB with Windows 95 or DOS and Windows
X	32 MB

M — Memory and Preloaded Software - 700 Series (Type 68X7 Only)

M	Memory and Preload Software - U.S. only
A	16 MB EDO, Ready to Configure
C	16 MB Parity, Ready to Configure
D	32 MB Parity, Ready to Configure
E	16 MB EDO, SelectaSystem Preload
F	32 MB EDO, SelectaSystem Preload
G	16 MB Parity, SelectaSystem Preload
H	32 MB Parity, SelectaSystem Preload
N	16 MB EDO, Windows 95
P	32 MB EDO, Windows 95
R	16 MB Parity, Windows 95
S	32 MB Parity, Windows 95

M — Memory and Preloaded Software - 700 Series (All Other Types)

M	Memory and Preload Software - U.S. only
E	8 MB (Open Bay System)
F	8 MB with DOS and Microsoft Windows

M	Memory and Preload Software - U.S. only
G	8 MB with OS/2
H	16 MB with DOS and Microsoft Windows
J	16 MB with OS/2
M	16 MB with SelectaSystem, High-Video
N	16 MB with OS/2, High-Video

Country/Language Model Configuration

Use this table to identify the country/language of the specific Models that are listed in the “Type/Model Configuration Tables” on page 407.

In most cases, country or language designation will be identified by the last digit of the model number.

Table 5. Country/Language Model Definition.

EMEA	**Model**
EMEA preload	xx**0**
North America	**Model**
US English	xx**U**
Canadian French	xx**F**
Latin America (LA)	**Model**
Portuguese (Brazil)	xx**P**
LA Spanish	xx**S**
LA English	xx**L**
Asia Pacific (AP)	**Model**
AP English w/Keyboard	xx**A**
AP English w/o Keyboard	xx**B**
Japan (Japanese)	xx**J**
Hong Kong (AP English)	xx**H**
China (Chinese)	xx**C**
China (AP English)	xx**D**
Thailand (Thai)	xx**T**
Taiwan (Chinese)	xx**V**
Taiwan (AP English)	xx**W**
Korea (Korean)	xx**K**
Korea (AP English)	xx**R**

Type/Model Configuration Tables

Notes

- Some open bay models are identified as AAP (Authorized Assembler Program) models. AAP models are manufactured by IBM without certain devices such as:
  - Graphics
  - Hard Disk Drive
  - CD-ROM unit
  - Memory
  - Video or other option card
  - Preload

  AAP IBM Dealers and Business Partners install certain devices (IBM options) in these open bay models.

  Other then AAP IBM Dealers and Business Partners can purchase these open bay models.

  The IBM HelpCenter has information, based on system serial number, for identifying installed IBM options in open bay AAP models.
- 16X Max CD-ROM drive runs at a constant speed. This allows for eight-speed reading at the disk hub and sixteen-speed reading at the disk edge. For 24X Max CD-ROM drives, the disk hub and disk edge speeds are 10 and 24. For 32X Max CD-ROM drives, the disk hub and disk edge speeds are 14 and 32.

Table 6 (Page 1 of 2). PC 300 Type 6272

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X	133 MHz	8 MB	1.2 GB IDE	Cirrus 5446, 1 MB	3X2	N/A	Windows 95
12X	166 MHz	16 MB	1.2 GB IDE	Cirrus 5446, 1 MB	3X2	N/A	Windows 95
14X	166 MHz	16 MB	2.5 GB IDE	Cirrus 5446, 2 MB	3X2	N/A	Windows 95
16X	133 MHz	16 MB	2.5 GB IDE	Cirrus 5446, 2 MB	3X2	N/A	Windows 95
76X	166 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	3X2	N/A	Windows 95
77X	166 MHz/MMX	32 MB	4.2 GB IDE	Cirrus 5446, 2 MB	3X2	16X Max	Windows 95
88X	166 MHz/MMX	16 MB	2.5 GB IDE	Cirrus 5446, 2 MB	3X2	N/A	Windows 95
89X	200 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	3X2	N/A	Windows 95
90X - Open Bay	200 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	3X2	N/A	N/A
91X	233 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	3X2	N/A	Windows NT
G2X	233 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	3X2	N/A	Windows 95

Notes:

1. N/A = Not included in model. For last digit model number, see “Country/Language Model Configuration” on page 406.
2. Memory = DIMM, SDRAM, Non-Parity. Video memory = 1 MB soldered; 1 MB with two pluggable modules.
3. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
4. Processors have 256 KB L2 Cache. Processors are Pentium or Pentium MMX™.
5. Models 76X, 77X have Ethernet on the system board. Models 88X, 89X, 91X, have an Ethernet 10/100 Adapter card.
6. See “General Checkout (Type 6272 Models 88X, 89X, 90X, 91X)” on page 5 for models 88X, 89X, 90X, 91X.

Table 6 (Page 2 of 2). PC 300 Type 6272

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
G3X	233 MHz/MMX	32 MB	4.2 GB IDE	Cirrus 5446, 2 MB	3X2	16X Max	Windows 95
G8X	233 MHz/MMX	32 MB	4.2 GB IDE	Cirrus 5446, 2 MB	3X2	N/A	Windows 95

Notes:

1. N/A = Not included in model. For last digit model number, see “Country/Language Model Configuration” on page 406.
2. Memory = DIMM, SDRAM, Non-Parity. Video memory = 1 MB soldered; 1 MB with two pluggable modules.
3. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
4. Processors have 256 KB L2 Cache. Processors are Pentium or Pentium MMX™.
5. Models 76X, 77X have Ethernet on the system board. Models 88X, 89X, 91X, have an Ethernet 10/100 Adapter card.
6. See “General Checkout (Type 6272 Models 88X, 89X, 90X, 91X)” on page 5 for models 88X, 89X, 90X, 91X.

Table 7 (Page 1 of 2). PC 300 Type 6275

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
30X - Open Bay	300 MHz	32 MB SDRAM	N/A	S3-TRIO3D	4X4	N/A	N/A
34X	300 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows 95
35X	300 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows NT
36X	300 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	32X Max	Windows 95
40X - Open Bay	333 MHz	32 MB SDRAM	N/A	S3-TRIO3D	4X4	N/A	N/A
44X	333 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows 95
45X	333 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows NT
46X	333 MHz	64 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows NT
47X	333 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	OS/2 License
50X - Open Bay	350 MHz	64 MB SDRAM	N/A	S3-TRIO3D	4X4	N/A	N/A
54X	350 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows 95

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Processor = Pentium® II with 512 KB L2 Cache = ECC
4. Graphics = S3-TRIO3D with 2 MB VRAM integrated on the system board
5. Model 36X comes with a Waterford 3 Audio adapter.
6. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 7 (Page 2 of 2). PC 300 Type 6275

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
55X	350 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows NT
56X	350 MHz	64 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows NT
60X - Open Bay	400 MHz	64 MB SDRAM	N/A	S3-TRIO3D	4X4	N/A	N/A
64X	400 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows 95
65X	400 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows NT
66X	400 MHz	64 MB SDRAM	6.4 GB EIDE	S3-TRIO3D	4X4	N/A	Windows NT

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Processor = Pentium® II with 512 KB L2 Cache = ECC
4. Graphics = S3-TRIO3D with 2 MB VRAM integrated on the system board
5. Model 36X comes with a Waterford 3 Audio adapter.
6. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 8 (Page 1 of 4). PC 300 Type 6282

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
22X	133 MHz	8 MB	1.2 GB IDE	Cirrus 5446, 1 MB	4X4	N/A	Windows 95
24X	133 MHz	16 MB	1.2 GB IDE	Cirrus 5446, 1 MB	4X4	N/A	Windows 95
26X	133 MHz	16 MB	2.5 GB IDE	Cirrus 5446, 1 MB	4X4	N/A	Windows 95
28X	133 MHz	16 MB	2.5 GB IDE	Cirrus 5446, 1 MB	4X4	N/A	Windows 95
30X	166 MHz	16 MB	1.2 GB IDE	Cirrus 5446, 1 MB	4X4	N/A	Windows 95
32X	166 MHz	16 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	16X Max	Windows 95
34X	166 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows NT
36X	166 MHz	16 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows 95
38X	166 MHz	16 MB	2.5 GB IDE	Cirrus 5446, 1 MB	4X4	N/A	Windows 95
44X - Open Bay	133 MHz	16 MB	N/A	Cirrus 5446, 1 MB	4X4	N/A	N/A

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, SDRAM, Non-Parity
4. Video memory = 1 MB soldered; 1 MB with two pluggable modules
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. Processors have 256 KB L2 Cache. Processors are Pentium or Pentium MMX.
7. Models 24X, 28X, 36X, 48X, 52X, 64X, 67X, 68X, 70X, 71X, 81X, have Ethernet on the system board.

Table 8 (Page 2 of 4). PC 300 Type 6282

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
46X - Open Bay	166 MHz	16 MB	N/A	Cirrus 5446, 1 MB	4X4	N/A	N/A
48X	166 MHz	16 MB	1.2 GB IDE	Cirrus 5446, 1 MB	4X4	N/A	Windows 95
52X	166 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	16X Max	Windows 95
54X	133 MHz	16 MB	1.2 GB IDE	Cirrus 5446, 1 MB	4X4	N/A	Windows 95
58X - Open Bay	166 MHz/MMX	16 MB	N/A	Cirrus 5446, 1 MB	4X4	N/A	N/A
62X - Open Bay	200 MHz	32 MB	N/A	Cirrus 5446, 2 MB	4X4	N/A	N/A
63X	200 MHz	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows 95
64X	200 MHz	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	16X Max	Windows NT
66X	200 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	16X Max	Windows 95
67X	200 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	16X Max	Windows NT

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, SDRAM, Non-Parity
4. Video memory = 1 MB soldered; 1 MB with two pluggable modules
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. Processors have 256 KB L2 Cache. Processors are Pentium or Pentium MMX.
7. Models 24X, 28X, 36X, 48X, 52X, 64X, 67X, 68X, 70X, 71X, 81X, have Ethernet on the system board.

Table 8 (Page 3 of 4). PC 300 Type 6282

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
68X	200 MHz	16 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows 95
69X	166 MHz/MMX	16 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows 95
70X	200 MHz	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	16X Max	Windows 95
72X	166 MHz	16 MB	2.5 GB IDE	Cirrus 5446, 1 MB	4X4	N/A	OS/2 License
78X	200 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	16X Max	Windows 95
79X	200 MHz	16 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows 95
80X	200 MHz/MMX	32 MB	4.2 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows NT
81X	166 MHz/MMX	32 MB	4.2 GB IDE	Cirrus 5446, 2 MB	4X4	16X Max	Windows 95
82X - Open Bay	166 MHz/MMX	32 MB	N/A	Cirrus 5446, 2 MB	4X4	N/A	N/A
83X	200 MHz/MMX	16 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows 95

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, SDRAM, Non-Parity
4. Video memory = 1 MB soldered; 1 MB with two pluggable modules
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. Processors have 256 KB L2 Cache. Processors are Pentium or Pentium MMX.
7. Models 24X, 28X, 36X, 48X, 52X, 64X, 67X, 68X, 70X, 71X, 81X, have Ethernet on the system board.

Table 8 (Page 4 of 4). PC 300 Type 6282

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
84X	200 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	OS/2 License
85X	233 MHz/MMX	32 MB	4.2 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows NT
86X	233 MHz/MMX	32 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows 95
87X - Open Bay	233 MHz/MMX	32 MB	N/A	Cirrus 5446, 2 MB	4X4	N/A	N/A
G4X	200 MHz/MMX	16 MB	2.1 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows 95
G5X	200 MHz/MMX	32 MB	2.1 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows 95
G6X	233 MHz/MMX	16 MB	2.5 GB IDE	Cirrus 5446, 2 MB	4X4	N/A	Windows 95
G7X	233 MHz/MMX	32 MB	4.2 GB IDE	Cirrus 5446, 2 MB	4X4	16X Max	Windows 95

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, SDRAM, Non-Parity
4. Video memory = 1 MB soldered; 1 MB with two pluggable modules
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. Processors have 256 KB L2 Cache. Processors are Pentium or Pentium MMX.
7. Models 24X, 28X, 36X, 48X, 52X, 64X, 67X, 68X, 70X, 71X, 81X, have Ethernet on the system board.

Table 9. PC 300 Type 6284

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X	200 MHz	16 MB	2.1 GB IDE	Cirrus 5446, 1 MB	4X4	N/A	Windows 95

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, SDRAM, Non-Parity
4. Video memory = 1 MB soldered; 1 MB with two pluggable modules
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. Processors have 256 KB L2 Cache. Processors are Pentium or Pentium MMX.

Table 10 (Page 1 of 2). PC 300 Type 6285

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
30X - Open Bay	300 MHz	32 MB SDRAM	N/A	S3-TRIO3D	6X6	N/A	N/A
34X	300 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	6X6	N/A	Windows 95
35X	300 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	6X6	N/A	Windows NT
40X - Open Bay	333 MHz	32 MB SDRAM	N/A	S3-TRIO3D	6X6	N/A	N/A
44X	333 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	6X6	N/A	Windows 95
45X	333 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	6X6	N/A	Windows NT
50X - Open Bay	350 MHz	64 MB SDRAM	N/A	S3-TRIO3D	6X6	N/A	N/A
54X	350 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	6X6	N/A	Windows 95
55X	350 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	6X6	N/A	Windows NT
56X	350 MHz	64 MB SDRAM	6.4 GB EIDE	S3-TRIO3D	6X6	32X Max	Windows NT
60X - Open Bay	400 MHz	64 MB SDRAM	N/A	S3-TRIO3D	6X6	N/A	N/A

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Processor = Pentium® II with 512 KB L2 Cache = ECC
4. Graphics = S3-TRIO3D with 2 MB VRAM integrated on the system board.
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 10 (Page 2 of 2). PC 300 Type 6285

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
64X	400 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	6X6	N/A	Windows 95
65X	400 MHz	32 MB SDRAM	3.2 GB EIDE	S3-TRIO3D	6X6	N/A	Windows NT
66X	400 MHz	64 MB SDRAM	6.4 GB EIDE	S3-TRIO3D	6X6	32X Max	Windows NT

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Processor = Pentium® II with 512 KB L2 Cache = ECC
4. Graphics = S3-TRIO3D with 2 MB VRAM integrated on the system board.
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 11 (Page 1 of 2). PC 300 Type 6560 Models 4xx, 5xx, 6xx.

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
40X	133 MHz	16 MB EDO	N/A	Cirrus 5436, 1 MB	4X4	N/A	N/A
42X	133 MHz	16 MB EDO	1.2 GB	Cirrus 5436, 1 MB	4X4	N/A	DOS/Windows
44X	133 MHz	16 MB EDO	1.2 GB	Cirrus 5436, 1 MB	4X4	N/A	Windows 95
46X	133 MHz	16 MB EDO	2.5 GB	Cirrus 5436, 1 MB	4X4	N/A	Windows 95
48X	133 MHz	16 MB EDO	2.5 GB	Cirrus 5436, 1 MB	4X4	6X	Windows 95
50X	166 MHz	16 MB EDO	N/A	Cirrus 5436, 1 MB	4X4	N/A	N/A
52X	166 MHz	16 MB EDO	2.5 GB	Cirrus 5436, 1 MB	4X4	N/A	Windows 95
56X	120 MHz	16 MB EDO	N/A	Cirrus 5436, 1 MB	4X4	N/A	N/A
58X	120 MHz	8 MB EDO	1.2 GB	Cirrus 5436, 1 MB	4X4	N/A	DOS/Windows
60X	120 MHz	16 MB EDO	1.2 GB	Cirrus 5436, 1 MB	4X4	N/A	DOS/Windows
62X	120 MHz	16 MB EDO	1.2 GB	Cirrus 5436, 1 MB	4X4	N/A	Windows 95
64X	133 MHz	8 MB EDO	850 MB	Cirrus 5436, 1 MB	4X4	N/A	DOS/Windows

Notes:

1. Refer to “Type/Model Number Conversion” on page 399 for 6560 models not listed here.
2. N/A = Not included in model. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = SIMM 60 ns., Non Parity.
4. Processors = Pentium

Table 11 (Page 2 of 2). PC 300 Type 6560 Models 4xx, 5xx, 6xx.

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
66X	166 MHz	16 MB EDO	1.2 GB	Cirrus 5436, 1 MB	4X4	N/A	Windows 95

Notes:

1. Refer to “Type/Model Number Conversion” on page 399 for 6560 models not listed here.
2. N/A = Not included in model. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = SIMM 60 ns., Non Parity.
4. Processors = Pentium

Table 12 (Page 1 of 5). PC 300 Type 6561

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X - Open Bay	233 MHz	32 MB NP	N/A	AGP Cirrus 5465 3-D SVGA	4X4	N/A	N/A
11X	233 MHz	16 MB NP	2.5 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows 95
13X	233 MHz	32 MB NP	2.5 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows 95
15X	233 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows 95
16X	233 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows NT

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. OS/2 License = License Certificate only. No preload.
7. Intel Pentium® II = 512 KB Cache or 512 KB ECC.
8. Intel Celeron™ processor = No Cache

Table 12 (Page 2 of 5). PC 300 Type 6561

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
19X	266 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	OS/2 License
20X - Open Bay	266 MHz Celeron processor	32 MB NP	N/A	AGP Cirrus 5465 3-D SVGA	4X4	N/A	N/A
21X	266 MHz Celeron processor	16 MB NP	2.1 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows 95
22X	266 MHz Celeron processor	32 MB NP	2.1 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows 95
23X	266 MHz Celeron processor	32 MB NP	2.1 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows NT

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. OS/2 License = License Certificate only. No preload.
7. Intel Pentium® II = 512 KB Cache or 512 KB ECC.
8. Intel Celeron™ processor = No Cache

Table 12 (Page 3 of 5). PC 300 Type 6561

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
27X	266 MHz Celeron processor	32 MB ECC	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	32X	Windows NT
28X	233 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	32X	Windows 95
30X - Open Bay	266 MHz	32 MB NP	N/A	AGP Cirrus 5465 3-D SVGA	4X4	N/A	N/A
32X	266 MHz	32 MB NP	2.5 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows 95
34X	266 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows 95

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. OS/2 License = License Certificate only. No preload.
7. Intel Pentium® II = 512 KB Cache or 512 KB ECC.
8. Intel Celeron™ processor = No Cache

Table 12 (Page 4 of 5). PC 300 Type 6561

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
35X	266 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows NT
42X	266 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	32X	Windows 95
45X	266 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	32X	Windows 95
46X	266 MHz	32 MB ECC	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	32X	Windows 95
50X - Open Bay	300 MHz	32 MB NP	N/A	AGP Cirrus 5465 3-D SVGA	4X4	N/A	N/A

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. OS/2 License = License Certificate only. No preload.
7. Intel Pentium® II = 512 KB Cache or 512 KB ECC.
8. Intel Celeron™ processor = No Cache

Table 12 (Page 5 of 5). PC 300 Type 6561

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
53X	300 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows 95
54X	300 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	N/A	Windows NT
55X	300 MHz	32 MB ECC	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	32X	Windows 95
56X	300 MHz	32 MB ECC	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	4X4	32X	Windows NT
60X - Open Bay	333 MHz	64 MB NP	N/A	AGP Cirrus 5465 3-D SVGA	4X4	N/A	N/A

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. OS/2 License = License Certificate only. No preload.
7. Intel Pentium® II = 512 KB Cache or 512 KB ECC.
8. Intel Celeron™ processor = No Cache

Table 13 (Page 1 of 3). PC 300 Type 6562

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X	166 MHz	16 MB EDO NP	2.5 GB EIDE	Matrox Hurricane (3-D)	4X4	N/A	Windows 95
20X	200 MHz	32 MB EDO NP	4.2 GB EIDE	Matrox Hurricane (3-D)	4X4	24X Max	Windows NT
30X	233 MHz	32 MB EDO NP	2.5 GB EIDE	Matrox Hurricane (3-D)	4X4	N/A	Windows NT
32X	166 MHz	32 MB EDO NP	4.2 GB EIDE	Matrox Hurricane (3-D)	4X4	24X Max	Windows 95
34X	200 MHz	32 MB EDO NP	2.5 GB EIDE	Matrox Hurricane (3-D)	4X4	N/A	Windows 95
36X	200 MHz	32 MB EDO NP	4.2 GB EIDE	Matrox Hurricane (3-D)	4X4	N/A	Windows 95

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, EDO Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. OS/2 License = License Certificate only. No preload.
7. Processor = Pentium MMX with 512 KB L2 Cache.

Table 13 (Page 2 of 3). PC 300 Type 6562

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
38X	200 MHz	32 MB EDO NP	4.2 GB EIDE	Matrox Hurricane (3-D)	4X4	24X Max	Windows 95
42X	200 MHz	32 MB EDO ECC	2.1 GB Ultra SCSI	Matrox Hurricane (3-D)	4X4	N/A	OS/2 License
46X	166 MHz	32 MB	2.5 GB EIDE	Matrox Hurricane (3-D)	4X4	N/A	Windows 95
50X	233 MHz	32 MB	4.2 GB EIDE	Matrox Hurricane (3-D)	4X4	24X Max	Windows 95
52X	233 MHz	32 MB	4.2 GB EIDE	Matrox Hurricane (3-D)	4X4	N/A	Windows 95
54X	233 MHz	32 MB	4.2 GB EIDE	Matrox Hurricane (3-D)	4X4	N/A	Windows NT

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, EDO Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. OS/2 License = License Certificate only. No preload.
7. Processor = Pentium MMX with 512 KB L2 Cache.

Table 13 (Page 3 of 3). PC 300 Type 6562

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
84X - Open Bay	166 MHz	32 MB	N/A	Matrox Hurricane (3-D)	4X4	N/A	N/A
86X - Open Bay	200 MHz	32 MB	N/A	Matrox Hurricane (3-D)	4X4	N/A	N/A
88X - Open Bay	233 MHz	32 MB	N/A	Matrox Hurricane (3-D)	4X4	N/A	N/A

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, EDO Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. OS/2 License = License Certificate only. No preload.
7. Processor = Pentium MMX with 512 KB L2 Cache.

Table 14 (Page 1 of 2). PC 300 Type 6588

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X	233 MHz	32 MB EDO	2.5 GB EIDE	S3-V2	5X5	16X Max	Windows NT 4.0
11X	233 MHz	32 MB EDO	2.5 GB EIDE	S3-V2	5X5	N/A	Windows 95
12X	233 MHz	32 MB EDO	2.5 GB EIDE	S3-V2	5X5	N/A	Windows 95
15X - Open Bay	233 MHz	32 MB EDO	N/A	S3-V2	5X5	N/A	N/A
20X	233 MHz	32 MB EDO	4.2 GB EIDE	S3-V2	5X5	16X Max	Windows NT 4.0
30X	233 MHz	32 MB EDO	4.3 GB SCSI	S3-V2	5X5	16X Max	Windows NT 4.0
32X	233 MHz	32 MB EDO	4.3 GB SCSI	S3-V2	5X5	16X Max	OS/2
41X - Open Bay	266 MHz	32 MB EDO	N/A	S3-V2	5X5	N/A	N/A
42X	266 MHz	32 MB EDO	2.5 GB EIDE	S3-V2	5X5	N/A	Windows 95
43X - OPEN BAY	300 MHz	32 MB EDO	N/A	S3-V2	5X5	N/A	N/A
51X	266 MHz	32 MB EDO	4.2 GB EIDE	S3-V2	5X5	16X Max	Windows NT 4.0

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, EDO Non-Parity.
4. Processor = Pentium® II with 512 KB Cache.
5. Graphics = S3-V2 integrated on the system board.
6. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 14 (Page 2 of 2). PC 300 Type 6588

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
53X	300 MHz	32 MB EDO	4.2 GB EIDE	S3-V2	5X5	16X Max	Windows NT 4.0
61X	266 MHz	32 MB EDO	4.3 GB SCSI	S3-V2	5X5	16X Max	Windows NT 4.0
71J	266 MHz	32 MB EDO	4.2 GB EIDE	Matrox Millenium	5X5	16X Max	Windows NT 4.0
72J	233 MHz	32 MB EDO	4.2 GB EIDE	Matrox Millenium	5X5	16X Max	Windows NT 4.0
73J	300 MHz	32 MB EDO	4.2 GB EIDE	Matrox Millenium	5X5	16X Max	Windows NT 4.0

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, EDO Non-Parity.
4. Processor = Pentium® II with 512 KB Cache.
5. Graphics = S3-V2 integrated on the system board.
6. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 15. PC 300 Type 6589

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
11O	200 MHz	32 MB EDO	2.5 GB IDE	S3	3X3	16X Max	Windows NT
13O	180 MHz	32 MB EDO	2.5 GB IDE	S3	3X3	16X Max	Windows NT
15O	200 MHz	32 MB EDO ECC	4.2 GB IDE	Matrox	3X3	16X Max	Windows NT
10X	180 MHz	16 MB EDO	1.6 GB IDE	S3	5X5	N/A	N/A
12X	200 MHz	32 MB EDO	1.6 GB IDE	S3	5X5	8X	Windows NT
14X	200 MHz	32 MB EDO ECC	2.2 GB SCSI	Matrox	5X5	6X PD-CD	Windows NT
17X - Open Bay	180 MHz	32 MB EDO	N/A	S3	5X5	N/A	N/A
18X - Open Bay	200 MHz	32 MB EDO	N/A	S3	5X5	N/A	N/A

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, EDO Non-Parity.
4. Open Bay = Authorized Assembler Program. See the note with
5. Processors = Pentium Pro “Type/Model Configuration Tables” on page 407.

Table 16 (Page 1 of 2). PC 300 Type 6591

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
15X	233 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	6X6	N/A	Windows 95
20X - Open Bay	266 MHz Celeron processor	32 MB NP	N/A	AGP Cirrus 5465 3-D SVGA	6X6	N/A	N/A
22X	266 MHz Celeron processor	32 MB NP	2.1 GB EIDE	AGP Cirrus 5465 3-D SVGA	6X6	N/A	Windows 95
30X - Open Bay	266 MHz	32 MB NP	N/A	AGP Cirrus 5465 3-D SVGA	6X6	N/A	N/A
34X	266 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	6X6	N/A	Windows 95

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. OS/2 License = License Certificate only. No preload.
7. Intel Pentium® II = 512 KB Cache or 512 KB ECC.
8. Intel Celeron™ processor = No Cache

Table 16 (Page 2 of 2). PC 300 Type 6591

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
35X	266 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	6X6	N/A	Windows NT
50X - Open Bay	300 MHz	32 MB NP	N/A	AGP Cirrus 5465 3-D SVGA	6X6	N/A	N/A
54X	300 MHz	32 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	6X6	N/A	Windows NT
60X - Open Bay	333 MHz	64 MB NP	N/A	AGP Cirrus 5465 3-D SVGA	6X6	N/A	N/A
76X	333 MHz	64 MB NP	4.2 GB EIDE	AGP Cirrus 5465 3-D SVGA	6X6	32X	Windows NT

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. OS/2 License = License Certificate only. No preload.
7. Intel Pentium® II = 512 KB Cache or 512 KB ECC.
8. Intel Celeron™ processor = No Cache

Table 17. PC 300 Type 6592

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
12X	200 MHz	32 MB EDO	4.2 GB EIDE	Matrox Hurricane (3-D)	6X6	24X Max	Windows 95
16X	166 MHz	32 MB	2.5 GB EIDE	Matrox Hurricane (3-D)	6X6	N/A	Windows 95
50X	233 MHz	32 MB	4.3 GB Ultra SCSI	Matrox Hurricane (3-D)	6X6	24X Max	Windows NT
84X - Open Bay	200 MHz	32 MB	N/A	Matrox Hurricane (3-D)	6X6	N/A	N/A
86X - Open Bay	233 MHz	32 MB	N/A	Matrox Hurricane (3-D)	6X6	N/A	N/A

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Memory = DIMM, EDO Non-Parity (NP) or ECC
4. Video memory = 2 MB standard; 4 MB maximum
5. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
6. Processor = Pentium MMX with 512 KB L2 Cache.

Table 18 (Page 1 of 2). PC 300 Type 6862

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
11X	333 MHz	64 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	4X4	32X Max	Windows NT
12X	333 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows 95
13X	333 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows NT
14X	350 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows 95
16X	300 MHz	32 MB SDRAM	4.5 GB SCSI	S3-TRIO3D	4X4	N/A	OS/2 License
18X	266 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows 95
20X	266 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows NT
22X	300 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows 95
23X	300 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	4X4	32X Max	Windows 95
24X	350 MHz	64 MB SDRAM	6.4 GB EIDE	S3-TRIO3D	4X4	32X Max	Window NT
25X	400 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows 95

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Processor = Pentium® II with 512 KB L2 Cache = ECC
4. Graphics = S3-TRIO3D integrated on the system board.
5. Standard integrated features = 4 MB VRAM, 10/100 Ethernet, Audio.
6. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 18 (Page 2 of 2). PC 300 Type 6862

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
26X	300 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	4X4	N/A	Windows NT
27X	400 MHz	64 MB SDRAM	6.4 GB EIDE	S3-TRIO3D	4X4	32X Max	Windows NT
80X - Open Bay	333 MHz	32 MB SDRAM	N/A	S3-TRIO3D	4X4	N/A	N/A
82X - Open Bay	266 MHz	32 MB SDRAM	N/A	S3-TRIO3D	4X4	N/A	N/A
83X - Open Bay	300 MHz	32 MB SDRAM	N/A	S3-TRIO3D	4X4	N/A	N/A
84X - Open Bay	350 MHz	64 MB SDRAM	N/A	S3-TRIO3D	4X4	N/A	N/A
85X - Open Bay	400 MHz	64 MB SDRAM	N/A	S3-TRIO3D	4X4	N/A	N/A

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Processor = Pentium® II with 512 KB L2 Cache = ECC
4. Graphics = S3-TRIO3D integrated on the system board.
5. Standard integrated features = 4 MB VRAM, 10/100 Ethernet, Audio.
6. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 19 (Page 1 of 2). PC 300 Type 6892

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
12X	266 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	6X6	N/A	Windows 95
14X	300 MHz	32 MB SDRAM	4.2 GB EIDE	S3-TRIO3D	6X6	32X Max	Windows 95
16X	350 MHz	64 MB SDRAM ECC	4.2 GB EIDE	S3-TRIO3D	6X6	32X Max	Windows NT
20X	400 MHz	64 MB SDRAM	6.4 GB EIDE	S3-TRIO3D	6X6	32X Max	Windows NT
44X	350 MHz	32 MB SDRAM ECC	6.4 GB EIDE	S3-TRIO3D	6X6	32X Max	Windows 95
45X	350 MHz	32 MB SDRAM ECC	6.4 GB EIDE	S3-TRIO3D	6X6	32X Max	Windows NT
46X	400 MHz	64 MB SDRAM ECC	6.4 GB EIDE	S3-TRIO3D	6X6	32X Max	Windows NT
79X - Open Bay	333 MHz	32 MB SDRAM	N/A	S3-TRIO3D	6X6	N/A	N/A

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Processor = Pentium® II with 512 KB L2 Cache = ECC
4. Standard integrated features = 4 MB VRAM, 10/100 Ethernet, Audio.
5. Graphics = S3-TRIO3D integrated on the system board.
6. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 19 (Page 2 of 2). PC 300 Type 6892

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
80X - Open Bay	266 MHz	32 MB SDRAM	N/A	S3-TRIO3D	6X6	N/A	N/A
81X - Open Bay	300 MHz	32 MB SDRAM	N/A	S3-TRIO3D	6X6	N/A	N/A
82X - Open Bay	350 MHz	64 MB SDRAM	N/A	S3-TRIO3D	6X6	N/A	N/A
83X - Open Bay	400 MHz	64 MB SDRAM	N/A	S3-TRIO3D	6X6	N/A	N/A

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Processor = Pentium® II with 512 KB L2 Cache = ECC
4. Standard integrated features = 4 MB VRAM, 10/100 Ethernet, Audio.
5. Graphics = S3-TRIO3D integrated on the system board.
6. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 20. IntelliStation Type 6888

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
22X	266 MHz	64 MB EDO ECC	4.3 GB Ultra SCSI	Matrox Millenium	5X5 Desktop	16X Max	Windows NT 4.0
26X	266 MHz	128 MB EDO ECC	4.3 GB Ultra SCSI	Intense 3D Pro1000/T	5X5 Desktop	16X Max	Windows NT 4.0
28X - Open Bay	266 MHz	32 MB EDO ECC	N/A	N/A	5X5 Desktop	16X Max	N/A
36U	300 MHz	128 MB EDO ECC	4.3 GB Ultra SCSI	Intense 3D Pro1000/T	5X5 Desktop	16X Max	Windows NT 4.0

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Processor = Pentium® II with 512 KB Cache.
4. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
5. Models come with integrated S3-V2 video on the system board. Graphics = Video adapter card.

Table 21 (Page 1 of 2). IntelliStation Type 6889

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X	Pentium II 350 MHz	64 MB SDRAM ECC	6.4 GB IDE	Graphics - AGP Matrox Millennium II	6X6 mini Tower	32X Max	Windows NT 4.0, SP3
11X	Pentium II 400 MHz	64 MB SDRAM ECC	9.1 GB IDE	Graphics - AGP Matrox Millennium II	6X6 Mini Tower	32X Max	Windows NT 4.0, SP3
13X	Pentium II 400 MHz	64 MB SDRAM ECC	9.1 GB Wide Ultra SCSI	Graphics - AGP Matrox Millennium II	6X6 Mini Tower	32X Max	Windows NT 4.0, SP3
14X	Pentium II 400 MHz	128 MB SDRAM ECC	9.1 GB Wide Ultra SCSI	Graphics - PCI Intense 3D 3400	6X6 Mini Tower	32X Max	Windows NT 4.0, SP3
15X	Pentium II 400 MHz	128 MB SDRAM ECC	9.1 GB 7200 IDE	Graphics - AGP Permedia 2V (8 MB)	6X6 Mini Tower	32X Max	Windows NT 4.0, SP3

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
4. Pentium II processors have 512 KB Cache.
5. Standard integrated features = 10/100 Ethernet with Wake on LAN, Audio-(Crystal 4235).
6. CD-ROM drives are EIDE interface.

Table 21 (Page 2 of 2). IntelliStation Type 6889

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
16X	Pentium II 400 MHz	128 MB SDRAM ECC	9.1 GB 7200 Wide Ultra SCSI	Graphics - AGP Permedia 2V (8 MB)	6X6 Mini Tower	32X Max	Windows NT 4.0, SP3
18X - Open Bay	Pentium II 350 MHz	64 MB SDRAM ECC	N/A - SCSI W U interface	N/A - Open graphics adapter	6X6 Mini Tower	32X Max	N/A
19X - Open Bay	Pentium II 400 MHz.	64 MB SDRAM ECC	N/A - SCSI W U interface	N/A - Open graphics adapter	6X6 Mini Tower	32X Max	N/A
50X - Open Bay	N/A	N/A	N/A - SCSI W U interface	N/A - Open graphics adapter	6X6 Mini Tower	32X Max	N/A

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
4. Pentium II processors have 512 KB Cache.
5. Standard integrated features = 10/100 Ethernet with Wake on LAN, Audio-(Crystal 4235).
6. CD-ROM drives are EIDE interface.

Table 22. IntelliStation Type 6893

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X	350 MHz	64 MB SDRAM	6.4 GB EIDE	AGP-Matrox Millennium II	4X4+AGP	32X Max	Windows NT
12X	400 MHz	64 MB SDRAM	6.4 GB EIDE	AGP-Matrox Millennium II	4X4+AGP	32X Max	Windows NT
14X	400 MHz	128 MB SDRAM	4.2 GB SCSI	AGP-Permedia 2A	4X4+AGP	32X Max	Windows NT
18X - Open Bay	400 MHz	64 MB SDRAM	N/A	N/A	4X4+AGP	32X Max	N/A

Notes:

1. N/A = Not included in model.
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Video Card memory = 8 MB
4. Processor = Pentium® II with 512 KB L2 Cache = ECC
5. Standard integrated features = 10/100 Ethernet with Wake on LAN, Audio-(Crystal 4235).
6. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.

Table 23 (Page 1 of 2). IntelliStation Type 6898

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X	Pentium II 233 MHz	32 MB ECC SDRAM	4.2 GB EIDE	Permedia II-8 MB DRAM	6X6 mini Tower	24X Max	Windows NT 4.0, SR3
11X	Pentium II 266 MHz	64 MB ECC SDRAM	4.2 GB EIDE	Permedia II-8 MB DRAM	6X6 Mini Tower	24X Max	Windows NT 4.0, SR3
12X	Pentium II 300 MHz	128 MB ECC SDRAM	4.5 GB Ultra SCSI	Permedia II-8 MB DRAM	6X6 Mini Tower	24X Max	Windows NT 4.0, SR3
13X	Pentium II 300 MHz	64 MB ECC SDRAM	6.4 GB 5400 RPM EIDE	Permedia II-8 MB DRAM	6X6 Mini Tower	24X Max	Windows NT 4.0, SR3
14X	Pentium II 300 MHz	128 MB ECC SDRAM	4.5 GB Ultra SCSI	Intergraph Intense 3D Pro 2200/T-20 MB video memory	6X6 Mini Tower	24X Max	Windows NT 4.0, SR3
18X - Open Bay	Pentium II 266 MHz	32 MB ECC SDRAM	N/A	N/A - Open graphics adapter	6X6 Mini Tower	24X Max	N/A
19X - Open Bay	Pentium II 300 MHz.	32 MB ECC SDRAM	N/A	N/A - Open graphics adapter	6X6 Mini Tower	24X Max	N/A

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
4. Pentium II processors have 512 KB Cache.

Table 23 (Page 2 of 2). IntelliStation Type 6898

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
22X	Pentium II 333 MHz	64 MB ECC SDRAM	6.4 GB 7200 RPM EIDE	Permedia II-8 MB DRAM	6X6 Mini Tower	24X Max	Windows NT 4.0, SR3
24X	Pentium II 333 MHz	128 MB ECC SDRAM	9.1 GB Ultra SCSI 10,000 RPM	Intergraph Intense 3D Pro 2200/T-20 MB video memory	6X6 Mini Tower	24X Max	Windows NT 4.0, SR3
28X - Open Bay	Pentium II 333 MHz	64 MB ECC SDRAM	N/A	N/A - Open graphics adapter	6X6 Mini Tower	24X Max	N/A

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
4. Pentium II processors have 512 KB Cache.

Table 24. IntelliStation Type 6899

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X	200 MHz	32 MB EDO ECC	2.1 GB Ultra SCSI	Matrox Millennium	6X7 mini Tower	16X Max	Windows NT
12X	200 MHz	64 MB EDO ECC	4.5 GB Ultra SCSI	Matrox Millennium	6X7 Mini Tower	16X Max	Windows NT
14X	200 MHz	64 MB EDO ECC	4.5 GB Ultra SCSI	Intergraph Intense 3D	6X7 Mini Tower	16X Max	Windows NT
16X	200 MHz	128 MB EDO ECC	4.5 GB Ultra SCSI	Intergraph Intense 3D	6X7 Mini Tower	16X Max	Windows NT
17X	200 MHz/512 KB Cache	128 MB EDO ECC	4.5 GB Ultra SCSI	Intergraph Intense 3D	6X7 Mini Tower	16X Max	Windows NT
18X - Open Bay	200 MHz	32 MB EDO ECC	N/A	N/A	6X7 Mini Tower	16X Max	N/A
26X	DUAL 200 MHz	128 MB EDO ECC	4.5 GB Ultra SCSI	Intergraph Intense 3D	6X7 Mini Tower	16X Max	Windows NT

Notes:

1. N/A = Not included in model
2. For last digit model number, see “Country/Language Model Configuration” on page 406.
3. Open Bay = Authorized Assembler Program. See the note with “Type/Model Configuration Tables” on page 407.
4. Processors = 200 MHz Pentium Pro with 256 KB Cache unless specified in table.
5. DUAL processor indicates model comes with two processors.

Miscellaneous Information

Acronyms, Abbreviations and Terms

Term	Information
ACPA/A	Audio Capture and Playback Adapter
ADP	Automatic Data Processing
AGP	Advanced Graphics Port
Alt	Alternate
ANSI	American National Standards Institute
ARTIC	A Real Time Interface Coprocessor
ASCII	American National Standard Code for Interface Interchange
AT	Advanced Technology (as in AT Bus)
AVC	Audio Video Connection
BIOS	Basic Input/Output System (Controls System Resources)
bps	Bits Per Second
BPS	Bytes Per Second
CCITT	The International Telephone and Telegraph Consultative Committee
CCS	Common Command Set
CCSB	Common Complete Status Block
CCSB	Configuration Control Sub Board
CD	Compact Disc
CDPD	Cellular Digital Packet Data
CD-ROM	CD Read Only Memory (stores data/audio)
CGA	Color Graphics Adapter (See EGA, VGA, XGA)
CRC	Cyclic Redundancy Check
CRT	Cathode Ray Tube
CSA	Canadian Standards Association
CSD	Corrective Service Diskette
DASD	Direct Access Storage Device (hard disk, diskette)
DMA	Direct Memory Access
DRAM	Dynamic Random Access Memory
ECA	Engineering Change Announcement
ECC	Error Correction Code
EGA	Enhanced Graphics Adapter
ESD	Electrostatic Discharge
ESDI	Enhanced Small Device Interface
EEPROM	Electrically Erasable Programmable Read Only Memory
EWS	Energy Work Station
FRU	Field Replaceable Unit (replaceable part)
GPIB	General Purpose Interface Bus (IEEE 348)
GSA	General Services Administration
Ht	Height
IDE	Integrated Drive Electronics
IC	Integrated Circuit
IEEE	Institute of Electrical and Electronics Engineers
IEC	International Electrotechnical Commission
IML	Initial Machine Load
IPL	Initial Program Load
ISA	Industry Standard Architecture
ISO	International Organization for Standardization
ISDN	Integrated-Services Digital Network
LAN	Local Area Network
LBA	Local Block Address
LTB	Local Transfer Bus
LUN	Logical Unit Number (as in SCSI)
MAP	Maintenance Analysis Procedure

Term	Information
MCGA	Modified Color Graphics Adapter (320 x 200 x 256)
MCA	Micro Channel Architecture (bus structure)
MHz	Mega Hertz (million cycles per second)
MIDI	Musical Instrument Digital Interface
MM	Multimedia
N/A	Not Available or Not Applicable
NDD	National Distribution Division
NDIS	Network Driver Interface Specification
NMI	Non-Maskable Interrupt
NSC	National Support Center
NVRAM	Non Volatile Random Access Memory
OEM	Original Equipment Manufacturer
PCI	Peripheral component interconnect
PCMCIA	Personal Computer Memory Card International Association
POS	Programmable Option Select
PUN	Physical Unit Number (as in SCSI)
RAID	Redundant Array of Inexpensive Disks (disk array models)
RAM	Random Access Memory (read/write)
RGB	Red Green Blue (as in monitors)
RIPL	Remote Initial Program Load
ROM	Read Only Memory
SASD	Sequential Access Storage Device (Tape)
SCB	Subsystem Control Block
SCSI	Small Computer Systems Interface
SCSI ID	SCSI Identification Number (assigned device number)
SPD	Software Product Description
SR	Service Representative
SRAM	Static Random Access Memory
SVGA	Super Video Graphics Array
STN	Super Twisted Nematic
T/A	NDD Technical Advisor (See your Marketing Representative)
TDD	Telecommunications Device for the Deaf
TFT	Thin-Film Transistor
TPF	ThinkPad File
TSR	Terminate and Stay Resident
UL	Underwriters Laboratory
VCA	Video Capture Adapter
VESA	Video Electronics Standards Association
VGA	Video Graphics Array (640x480x16)
VPD	Vital Product Data
VRAM	Video Random Access Memory
WORM	Write Once, Read Many Media
XGA	Extended Graphics Array (1024 x 768 x 256)
Y/C	Luminance/Chrominance Signal (Video)

Send Us Your Comments!

We want to know your opinion about this manual (part number 10L9181). 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 computers do you service most?

   _____

   _____

   _____

   _____

Thanks in advance for your response!

Do You Need Technical References?

We have a wide range of hardware technical references that provide in-depth information about IBM personal computer products. Our Technical Reference Library includes information about:

- Micro Channel, Setup, and Subsystem Control Block architectures
- Common interfaces (including microprocessors, system timers, parallel and serial port controllers, keyboards and keystrokes, SCSI, DMA, video, and more)
- Specific Personal System/2 systems (including system board connectors, jumpers, memory subsystems, I/O subsystems, programming interfaces and registers, and error codes)
- Basic input/output system (BIOS)
- Options and adapters

Note

Technical information manuals for the latest Commercial Desktop computers are available on the World Wide Web at:

http://www.pc.ibm.com/us/cdt/hmm.html

These publications can be viewed online in BookManager format, or they can be downloaded as PostScript files.

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.

- Verify any recent hardware changes. See “Hardware Considerations” on page 452.
- Verify any recent software changes. See “Software Considerations” on page 453.
- Verify the BIOS is at the latest level. See “BIOS” on page 453.
- Verify the drivers are at latest levels. See “Drivers” on page 453.
- Verify the Configuration matches hardware. See “System Resource Conflicts” on page 454.
- Verify the Diagnostic diskette is at latest level. See “File Updates” on page 452.

As you go through problem determination, consider these questions:

- 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?

Important

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

1. Are the exact machine type and model
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.

File Updates

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

For PC Series 300/700 and IntelliStation systems, the WWW address is:

http://www.pc.ibm.com/us/files.html

For IBM PC Servers, the WWW address is:

http://www.pc.ibm.com/us/servers/

The IBM BBS can be reached at (919) 517-0001.

Hardware Considerations

Use the following tools to help identify and resolve hardware-related problems:

- Power-on self-test (POST)
- POST Beep codes
- Test programs
- Error messages

POST does the following:

- 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

Use the test programs that come with this HMM or with the system you are servicing to test the IBM components of the system and some external devices. Also, from the DOS command or from OS/2 Utilities, use the **CHKDSK** command to check and repair hard disk data allocation errors.

Error messages generated by the software, (the operating system or application programs), generally are text messages, however, error messages can be text, numeric, or both text and numeric.

Any time there is an error message indicating a problem with the system, follow the General Checkout procedures in this HMM to resolve the problem.

Basically, there are five types of error messages:

- **POST error messages** are displayed when the POST finds problems with the hardware or detects a change in the hardware configuration.
- **POST Beep codes** are sounds emitted from the speaker if the POST finds a problem. One beep indicates the POST completed successfully. Multiple beeps indicate a problem was found.

- **Diagnostic error messages** are displayed when a test program finds a problem with a hardware component.
- **Software-generated error messages** are displayed 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 the installed software package. Also, refer to "Software Considerations."
- **Multiple messages** occur when the first error causes additional errors. Follow the suggested action of the first error displayed.

Software Considerations

Suspect a software failure if:

- Hardware diagnostics run error-free.
- Swapping hardware components fails to isolate the problem.

A software problem might be the result of a **mismatch between the hardware and the operating system device drivers or direct drivers.**

BIOS: The BIOS acts as an **interface between the system hardware, application software, and the operating system**.

BIOS contains the instructions to operate the basic system components:

- Keyboard
- Serial and parallel ports
- Diskette drive
- Hard disk drive
- VGA display
- Clock
- Memory controller

The BIOS then starts the IPL or Boot functions.

Drivers: Device drivers are the **BIOS for additional hardware.** Device drivers are the communicators of the hardware assignments to the operating system, including:

- IRQ level
- DMA channel
- I/O address
- ROM or RAM

Some device drivers like HIMEM.SYS are position sensitive and must be placed before other device drivers in the CONFIG.SYS file.

All device drivers are not found in the CONFIG.SYS file. Advanced operating systems use .INI files to setup and start devices.

Device drivers can access the hardware five ways.

- **Operating system direct to hardware using a direct driver.** Direct drivers, which bypass BIOS, have the advantage of faster throughput, but the disadvantage of limited error-handling capability and reduced software and hardware compatibility and flexibility. This method is not used in the IBM PC Series systems.
- **Operating system to BIOS to hardware.** This is the recommended way. It's the most flexible because it's independent of the hardware.
- **Applications to operating system to BIOS to hardware.** This method is inflexible and operating system dependent.
- **Applications to BIOS to hardware.** This method has some flexibility but it is BIOS dependent.
- **Applications to hardware.** This method is hardware dependent and very inflexible, however, it is very fast, very efficient, and it has no overhead.

Adding adapters to the System

When adapters are added to the system, an area in memory has to be allocated to run its programs. This can be done with either **hardware switches or software mapping.**

If there is a conflict in software mapping:

- The first device to attach to an IRQ, DMA, I/O Address, or RAM location will probably function. The second device will not be found.
- Standalone diagnostics might function properly because the device that was found is the only device running.

Software configuration conflicts occur when:

- Hardware is configured differently then the software using it expects it to be.
- Hardware memory address space is in conflict with memory used by the application software.

System Resource Conflicts

System failures occur when there are system resource conflicts with the:

- Interrupt Request Queue (IRQ)
- Direct Memory Access (DMA)
- I/O Address
- ROM and RAM Addresses

IRQ:

- Assigns a unique interrupt request line to every I/O device (line numbers range from 0 to 15).
- Interrupts the processor to force it to service the request.
- Handles interrupts on a priority basis (low numbers have the highest priority).

- Queues interrupt request.

IRQ conflicts occur when there are **multiple assignments to the same interrupt level.** If there is an IRQ conflict, the system will hang. Use the systems diagnostics to check for multiple assignments to the same interrupt level before replacing any hardware component.

DMA:

- **Accesses the memory by bypassing the processor**, which allows the processor more time for applications and programs.
- Accesses memory directly from the serial and parallel ports on some systems.
- **Accesses memory directly from some adapters using a DMA channel**, which allows the adapter to operate faster.
- **Provides from 4 to 15 DMA channels**, the number varies depending on the system.

If **multiple assignments of the same DMA channel** occur, the system will hang. Use the system diagnostics to check for multiple assignments to the same DMA channel before replacing any hardware components.

I/O Address:

A unique I/O address is assigned to each system component.

If multiple assignments of the same I/O address occur, the system will hang. Use the **DOS MEM** command to check for multiple assignments to the **same** I/O address before replacing any hardware component.

ROM and RAM Addresses:

Adapter cards with processors can contain RAM and ROM. If the adapter cards have onboard memory, the:

- ROM contains operating instructions for the adapter I/O.
- RAM is used for buffering.

Two adapters using the same memory area will cause a failure. This failure might appear as a hardware failure.

The IRQ levels, DMA channels, I/O address, and ROM and RAM addresses all become potential conflicts and system problems. When conflicts arise, they might show up as system hangs, lost or missing devices, incorrect or bad data, or failing diagnostics. **Always eliminate conflicts in these areas before replacing any hardware components.**

U.S. Authorized Dealers or Servicers

Number	Information
919-517-0001	Bulletin Board Service - PC Company
800-528-7705	Bulletin Board Service - TSS Only
800-937-3737	IBM Business Partner Education
800-426-2472	IBM Customer Engineer Technical Support
800-IBM-DEAL	IBM Dealer Support Center
800-342-6672	IBM Direct Desktop Software Sales
303-924-4015	IBM Part Number ID and Look Up
800-426-7763	IBM PC HelpCenter
800-237-5511	IBM Software Defect Support (CSDs)
800-327-5711	IBM Software Ordering (Publications)
800-426-1484	IBM Supplies Technical Hotline
800-388-7080	IBM Warranty Parts Claims Center

U.S. Customers and Helpware Subscribers

Number	Information
919-517-0001	Bulletin Board Service - PC Company
800-426-8322	Customer Education Business Unit
800-999-0052	Customized Operational Services
800-237-4824	EduQuest (Educational Computers)
800-964-8523	End User HelpDesk Support
800-742-2493	IBM Anti-Virus Services
800-447-4700	IBM Authorized Dealer Referrals
800-426-2468	IBM Dealer Referral
800-426-3333	IBM Information Referral Service
800-IBM-SERV	IBM Service
800-772-2227	IBM PC HelpCenter and HelpDesk
800-426-7282	IBM Technical Manuals
800-426-9402 (Ext. 150)	Multimedia Information Center
800-241-1620	Multimedia HelpCenter
800-342-6672	OS/2 Information Line
800-237-5511	OS/2 Support Services
800-284-5933	Prodigy
914-962-0310	Prodigy User Questions
800-547-1283	Technical Coordinator Program SystemXtra for Personal Systems LAN Automated Distribution/2 OS/2 Bulletin Board OS/2 Application Assistance Center
800-551-2832	Technical Solutions Magazine

Note

Calls from outside the U.S. will be charged international call rates.

IBM Canada Customer and Servicer Support

Number	Information
800-661-PSMT	Business Partner Marketing Support
905-316-5556	Business Partner Marketing Support - Toronto
514-938-6048	Business Partner Marketing Support - French
800-465-4YOU	Customer Relations
800-IBM-SERV	Customer Service Dispatch
800-263-2769	Customer Service Parts
800-465-2222	Customer Support Center (ISC)
416-443-5701	Customer Service Repair Centre
800-505-1855	Dealer Support Group (DSG)
800-465-7999	HelpClub Registration / IBM Direct
800-465-3299	HelpFax
905-316-3299	HelpFax - Toronto
800-565-3344	HelpPC
905-513-3355	IBM Certification Administrator Mail to: 50 Acadia Drive Markham, Ontario L3R 0B3
800-661-2131	IBM Education (A+ Course)
800-268-3100	IBM Information Network Support
800-387-8343	IBM PC Service Partners
800-487-7426	International Warranty Registration
800-663-7662	Lexmark Product Information
800-IBM-9990	PartnerLine
800-263-2769	Parts Orders, Exchange or Emergency
416-443-5808 (Fax)	Parts Regular Orders, Exchange
416-443-5755	Parts Orders, Inquiries
514-938-3022	PC Co Bulletin Board - Montreal
905-316-4255	PC Co Bulletin Board - Markham
604-664-6464	PC Co Bulletin Board - Vancouver
204-934-2735	PC Co Bulletin Board - Winnepeg
800-661-7768	PS Marketing Support (PSMT)
800-565-3344	PS/1 Warranty Customer Helpline
800-387-8483	PS/1 Warranty Service (DOAs)
800-465-1234	Publications Ordering
905-316-4148	Service Management Support
905-316-4100 (Fax)	Service Management Support
905-316-4150	Service (Warranty) Manager
905-316-4100 (Fax)	Service (Warranty) Manager
905-316-4872	Service Quality Programs
905-316-4100 (Fax)	Service Quality Programs
800-661-2131	Skill Dynamics (Education)
800-565-3344	ThinkPad EasyServe
416-443-5835 (Fax)	Warranty Claim Fulfillment
905-316-2445	Warranty Claim Reimbursement
905-316-3515 (Fax)	Warranty Claim Reimbursement
416-443-5778	Warranty Claim Parts Inquiry
800-505-1855	Warranty Provider Support Hotline
800-267-7472	Warranty Service, ThinkPad

Notices

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

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

IBM Director of Licensing
IBM Corporation
500 Columbus Avenue
Thornwood, NY 10594
U.S.A.

Trademarks

The following terms are trademarks of the International Business Machines Corporation in the United States and/or other countries:

Asset ID	AT	BookManager
Business Partner	EduQuest	FaxConcentrator
HelpCenter	HelpClub	HelpFax
HelpWare	IBM	IntelliStation
Micro Channel	NetView	OS/2
PC 300	PC 700	Personal System/2
Portmaster	PS/1	PS/2
PS/ValuePoint	Rapid Resume	SelectaSystem
Skill Dynamics	SystemView	SystemXtra
ThinkPad	TrackPoint	TrackPoint II
Wake on LAN	XGA	

ActionMedia, LANDesk, MMX, Pentium, and ProShare are trademarks or registered trademarks of Intel Corporation in the U.S. and other countries.

Microsoft, Windows, Windows NT, and the Windows logo are registered trademarks of Microsoft Corporation.

Other company, product, and service names used in this publication may be trademarks or service marks of others.

Part Number: 10L9181

Printed in U.S.A.

S83G-7789-16