

IBM Personal Computer

**PC 300 Series  
IntelliStation**

**Volume 3:**

**Hardware  
Maintenance  
Manual**

**June, 2000**

**We Want Your Comments!  
(Please see page 339)**

**This Manual Supports:**

300 Series, Type

6584

6594

IntelliStation, Type

6866

6867



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(Please see page 339)**



**Note**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 348.

**Second Edition (January 2000)**

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## About this manual

This (Volume 3) manual contains service and reference information for the IBM Personal Computer 300 Series, and the IBM Profession Workstation IntelliStation Type computers listed in front of this manual.

For other type PC300/700, IntelliStation computers, refer to:

- IBM Personal Computer, Volume 1, Hardware Maintenance Manual, form number S83G-7789
- IBM Personal Computer, Volume 2, Hardware Maintenance Manual, (including the Aptiva 2173/2178/2198), form number, S00N-4019.

This manual is divided into product service sections, by type, and a related service section as follows:

- The product service sections include procedures for isolating problems to a FRU, a Symptom-to-FRU Index, additional service information, models listing, and an illustrated parts catalog.
- The related service section includes safety notices and safety information, and problem determination tips.

### 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 308 and "Safety information" on page 332.

## Important safety information

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

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

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## 注意和危險聲明(简体中文)

### 重要事項:

本書中的所有注意和危險聲明之前都有編號。該編號用於英語的注意或危險聲明與 *Safety Information* 一書中可以找到的翻譯版本的注意或危險聲明進行交叉引用。

例如，如果一個注意聲明以編號 1 開始，那麼對該注意聲明的翻譯出現在 *Safety Information* 一書中的聲明 1 中。

在按說明執行任何操作前，請務必閱讀所有注意和危險聲明。

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## 注意及危險聲明(中文)

### 重要資訊：

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

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

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

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

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

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

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## 주의 및 위험 경고문(한글)

### 중요:

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

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

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

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

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## 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
PC300/700 and IntelliStation computers - Volume 1 HMM	IBM Personal Computer Hardware Maintenance Manual Volume 1 (S83G-7789)
PC300 and IntelliStation computers (Including Aptiva 2173, 2178, 2198) - Volume 2 HMM	IBM Personal Computer Hardware Maintenance Manual Volume 2 (S00N-4019)
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)

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## IBM PC Enhanced Diagnostics error codes

Refer to the following Diagnostic Error Codes when using the IBM PC Enhanced Diagnostics test. See "Diagnostic and test information" section for information about the IBM PC Enhanced Diagnostics program.

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

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

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

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>001-035-XXX</b> System Device Reset condition detected	1. <b>System board</b>
<b>001-036-XXX</b> System Register error	1. <b>System board</b>
<b>001-038-XXX</b> System Extension failure	1. <b>Adapter card</b> 2. System board
<b>001-039-XXX</b> System DMI data structure error	1. <b>Flash the system</b> 2. System board
<b>001-040-XXX</b> System IRQ failure	1. <b>Power-off/on system and re-test</b> 2. System board
<b>001-041-XXX</b> System DMA failure	1. <b>Power-off/on system and re-test</b> 2. System board
<b>001-195-XXX</b> System Test aborted by user	1. <b>Information</b> 2. Re-start the test, if need to
<b>001-196-XXX</b> System test halt, error threshold exceeded	1. <b>Depress F3 to review the log file.</b> 2. Re-start the test to reset the log file.
<b>001-197-XXX</b> System test warning	1. <b>Make sure component that is called out is enabled and/or connected</b> 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
<b>001-198-XXX</b> System test aborted	1. <b>If a component is called out, make sure it is enabled and/or connected</b> 2. Flash the system and re-test 3. Go to "Undetermined problem" section.
<b>001-199-XXX</b> System test failed, cause unknown	1. <b>Go to "Undetermined problem" section.</b> 2. Flash the system and re-test 3. Replace component under function test.
<b>001-250-XXX</b> System ECC error	1. <b>System board</b>
<b>001-254-XXX</b> <b>001-255-XXX</b> <b>001-256-XXX</b> <b>001-257-XXX</b> System DMA error	1. <b>System board</b>

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>001-260-XXX</b> <b>001-264-XXX</b> System IRQ error	1. <b>System board</b>
<b>001-268-XXX</b> System IRQ1 failure	1. <b>device on IRQ1</b> 2. System board
<b>001-269-XXX</b> System IRQ2 failure	1. <b>device on IRQ2</b> 2. System board
<b>001-270-XXX</b> System IRQ3 failure	1. <b>device on IRQ3</b> 2. System board
<b>001-271-XXX</b> System IRQ4 failure	1. <b>device on IRQ4</b> 2. System board
<b>001-272-XXX</b> System IRQ5 failure	1. <b>device on IRQ5</b> 2. System board
<b>001-273-XXX</b> System IRQ6 (diskette drive) failure	1. <b>Diskette Cable</b> 2. Diskette drive 3. System board
<b>001-274-XXX</b> System IRQ7 failure	1. <b>device on IRQ7</b> 2. System board
<b>001-275-XXX</b> System IRQ8 failure	1. <b>device on IRQ8</b> 2. System board
<b>001-276-XXX</b> System IRQ9 failure	1. <b>device on IRQ9</b> 2. System board
<b>001-277-XXX</b> System IRQ10 failure	1. <b>device on IRQ10</b> 2. System board
<b>001-278-XXX</b> System IRQ11 failure	1. <b>device on IRQ11</b> 2. System board
<b>001-279-XXX</b> System IRQ12 failure	1. <b>device on IRQ12</b> 2. System board
<b>001-280-XXX</b> System IRQ13 failure	1. <b>device on IRQ13</b> 2. System board
<b>001-281-XXX</b> System IRQ14 (hard disk drive) failure	1. <b>Hard disk drive Cable</b> 2. Hard disk drive 3. System board
<b>001-282-XXX</b> System IRQ15 failure	1. <b>device on IRQ15</b> 2. System board
<b>001-286-XXX</b> <b>001-287-XXX</b> <b>001-288-XXX</b> System Timer failure	1. <b>System board</b>
<b>001-292-XXX</b> System CMOS RAM error	1. <b>Run Setup and re-test</b> 2. System board
<b>001-293-XXX</b> System CMOS Battery	1. <b>Battery</b> 2. System board
<b>001-298-XXX</b> System RTC date/time update failure	1. <b>Flash the system</b> 2. System board
<b>001-299-XXX</b> System RTC periodic interrupt failure	1. <b>System board</b>

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>001-300-XXX</b> System RTC Alarm failure	1. <b>System board</b>
<b>001-301-XXX</b> System RTC Century byte error	1. <b>Flash the system</b> 2. System board
<b>005-000-XXX</b> Video Test Passed	1. <b>No action</b>
<b>005-00X-XXX</b> Video error	1. <b>Video card, if installed</b> 2. System board
<b>005-010-XXX</b> <b>005-011-XXX</b> <b>005-012-XXX</b> <b>005-013-XXX</b> Video Signal failure	1. <b>Video card, if installed</b> 2. System board
<b>005-016-XXX</b> Video Simple Pattern test failure	1. <b>Video Ram</b> 2. Video card, if installed 3. System board
<b>005-024-XXX</b> Video Addressing test failure	1. <b>Video card, if installed</b> 2. System board
<b>005-025-XXX</b> Video Checksum Value error	1. <b>Video card, if installed</b> 2. System board
<b>005-027-XXX</b> Video Configuration/Setup error	1. <b>Run Setup</b> 2. Video drivers update 3. Video card, if installed 4. System board
<b>005-031-XXX</b> Video Device Cable failure	1. <b>Video cable</b> 2. Monitor 3. Video card, if installed 4. System board
<b>005-032-XXX</b> Video Device Controller failure	1. <b>Video card, if installed</b> 2. System board
<b>005-036-XXX</b> Video Register error	1. <b>Video card, if installed</b> 2. System board
<b>005-038-XXX</b> System BIOS extension failure	1. <b>Video card, if installed</b> 2. System board
<b>005-040-XXX</b> Video IRQ failure	1. <b>Video card, if installed</b> 2. System board
<b>005-195-XXX</b> Video Test aborted by user	1. <b>Information</b> 2. Re-start the test, if need to
<b>005-196-XXX</b> Video test halt, error threshold exceeded	1. <b>Depress F3 to review the log file.</b> 2. Re-start the test to reset the log file.

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

Diagnostic Error Code	FRU/Action
<b>006-198-XXX</b> Diskette interface test aborted	<ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is enabled and/or connected</b></li> <li>2. Flash the system and re-test</li> <li>3. Go to "Undetermined problem" section.</li> </ol>
<b>006-199-XXX</b> Diskette interface test failed, cause unknown	<ol style="list-style-type: none"> <li>1. <b>Go to "Undetermined problem" section.</b></li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test.</li> </ol>
<b>006-25X-XXX</b> Diskette interface Error	<ol style="list-style-type: none"> <li>1. <b>Diskette drive Cable</b></li> <li>2. Diskette drive</li> <li>3. System board</li> </ol>
<b>011-000-XXX</b> Serial port Interface Test Passed	<ol style="list-style-type: none"> <li>1. <b>No action</b></li> </ol>
<b>011-001-XXX</b> Serial port Presence	<ol style="list-style-type: none"> <li>1. <b>Remove external serial device, if present</b></li> <li>2. Run setup, enable port</li> <li>3. System board</li> </ol>
<b>011-002-XXX</b> <b>011-003-XXX</b> Serial port Timeout/Parity error	<ol style="list-style-type: none"> <li>1. <b>System board</b></li> </ol>
<b>011-013-XXX</b> <b>011-014-XXX</b> Serial port Control Signal/Loopback test failure	<ol style="list-style-type: none"> <li>1. <b>System board</b></li> </ol>
<b>011-015-XXX</b> Serial port External Loopback failure	<ol style="list-style-type: none"> <li>1. <b>Wrap plug</b></li> <li>2. System board</li> </ol>
<b>011-027-XXX</b> Serial port Configuration/Setup error	<ol style="list-style-type: none"> <li>1. <b>Run Setup, enable port</b></li> <li>2. Flash the system</li> <li>3. System board</li> </ol>
<b>011-03X-XXX</b> <b>011-04X-XXX</b> Serial port failure	<ol style="list-style-type: none"> <li>1. <b>System board</b></li> </ol>
<b>011-195-XXX</b> Serial port Test aborted by user	<ol style="list-style-type: none"> <li>1. <b>Information</b></li> <li>2. Re-start the test, if need to</li> </ol>
<b>011-196-XXX</b> Serial port test halt, error threshold exceeded	<ol style="list-style-type: none"> <li>1. <b>Depress F3 to review the log file.</b></li> <li>2. Re-start the test to reset the log file.</li> </ol>

Diagnostic Error Code	FRU/Action
<b>011-197-XXX</b> Serial port test warning	<ol style="list-style-type: none"> <li>1. <b>Make sure component that is called out is enabled and/or connected</b></li> <li>2. Re-run test</li> <li>3. Component that is called out in warning statement</li> <li>4. Component under test</li> </ol>
<b>011-198-XXX</b> Serial port test aborted	<ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is enabled and/or connected</b></li> <li>2. Flash the system and re-test</li> <li>3. Go to "Undetermined problem" section.</li> </ol>
<b>011-199-XXX</b> Serial port test failed, cause unknown	<ol style="list-style-type: none"> <li>1. <b>Go to "Undetermined problem" section.</b></li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test.</li> </ol>
<b>011-2XX-XXX</b> Serial port signal failure	<ol style="list-style-type: none"> <li>1. <b>External serial device</b></li> <li>2. System board</li> </ol>
<b>014-000-XXX</b> Parallel port Interface Test Passed	<ol style="list-style-type: none"> <li>1. <b>No action</b></li> </ol>
<b>014-001-XXX</b> Parallel port Presence	<ol style="list-style-type: none"> <li>1. <b>Remove external parallel device, if present</b></li> <li>2. Run setup, enable port</li> <li>3. System board</li> </ol>
<b>014-002-XXX</b> <b>014-003-XXX</b> Parallel port Timeout/Parity error	<ol style="list-style-type: none"> <li>1. <b>System board</b></li> </ol>
<b>014-013-XXX</b> <b>014-014-XXX</b> Parallel port Control Signal/Loopback test failure	<ol style="list-style-type: none"> <li>1. <b>System board</b></li> </ol>
<b>014-015-XXX</b> Parallel port External Loopback failure	<ol style="list-style-type: none"> <li>1. <b>Wrap plug</b></li> <li>2. System board</li> </ol>
<b>014-027-XXX</b> Parallel port Configuration/Setup error	<ol style="list-style-type: none"> <li>1. <b>Run Setup, enable port</b></li> <li>2. Flash the system</li> <li>3. System board</li> </ol>
<b>014-03X-XXX</b> <b>014-04X-XXX</b> Parallel port failure	<ol style="list-style-type: none"> <li>1. <b>System board</b></li> </ol>
<b>014-195-XXX</b> Parallel port Test aborted by user	<ol style="list-style-type: none"> <li>1. <b>Information</b></li> <li>2. Re-start the test, if need to</li> </ol>

Diagnostic Error Code	FRU/Action
<b>014-196-XXX</b> Parallel port test halt, error threshold exceeded	<ol style="list-style-type: none"> <li>1. <b>Depress F3 to review the log file.</b></li> <li>2. Re-start the test to reset the log file.</li> </ol>
<b>014-197-XXX</b> Parallel port test warning	<ol style="list-style-type: none"> <li>1. <b>Make sure component that is called out is enabled and/or connected</b></li> <li>2. Re-run test</li> <li>3. Component that is called out in warning statement</li> <li>4. Component under test</li> </ol>
<b>014-198-XXX</b> Parallel port test aborted	<ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is enabled and/or connected</b></li> <li>2. Flash the system and re-test</li> <li>3. Go to "Undetermined problem" section.</li> </ol>
<b>014-199-XXX</b> Parallel port test failed, cause unknown	<ol style="list-style-type: none"> <li>1. <b>Go to "Undetermined problem" section.</b></li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test.</li> </ol>
<b>014-2XX-XXX</b> <b>014-3XX-XXX</b> Parallel port failure	<ol style="list-style-type: none"> <li>1. <b>External parallel device</b></li> <li>2. System board</li> </ol>
<b>015-000-XXX</b> USB port Interface Test Passed	<ol style="list-style-type: none"> <li>1. <b>No action</b></li> </ol>
<b>015-001-XXX</b> USB port Presence	<ol style="list-style-type: none"> <li>1. <b>Remove USB Device(s) and re-test</b></li> <li>2. System board</li> </ol>
<b>015-002-XXX</b> USB port Timeout	<ol style="list-style-type: none"> <li>1. <b>Remove USB Device(s) and re-test</b></li> <li>2. System board</li> </ol>
<b>015-015-XXX</b> USB port External Loopback failure	<ol style="list-style-type: none"> <li>1. <b>Remove USB Device(s) and re-test</b></li> <li>2. System board</li> </ol>
<b>015-027-XXX</b> USB port Configuration/Setup error	<ol style="list-style-type: none"> <li>1. <b>Flash the system</b></li> <li>2. System board</li> </ol>
<b>015-032-XXX</b> USB port Device Controller failure	<ol style="list-style-type: none"> <li>1. <b>System board</b></li> </ol>
<b>015-034-XXX</b> USB port buffer allocation failure	<ol style="list-style-type: none"> <li>1. <b>Reboot the system</b></li> <li>2. Flash the system</li> <li>3. Run memory test</li> <li>4. System board</li> </ol>

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

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

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

Diagnostic Error Code	FRU/Action
<b>030-000-XXX</b> SCSI interface Test Passed	1. <b>No action</b>
<b>030-00X-XXX</b> <b>030-01X-XXX</b> SCSI interface failure	1. <b>SCSI signal cable</b> 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
<b>030-027-XXX</b> SCSI interface Configuration/Setup error	1. <b>SCSI signal cable</b> 2. Flash the system 3. SCSI device 4. SCSI adapter card, if installed 5. System board
<b>030-03X-XXX</b> <b>030-04X-XXX</b> SCSI interface error	1. <b>SCSI signal cable</b> 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
<b>030-195-XXX</b> SCSI interface Test aborted by user	1. <b>Information</b> 2. Re-start the test, if need to
<b>030-196-XXX</b> SCSI interface test halt, error threshold exceeded	1. <b>Depress F3 to review the log file.</b> 2. Re-start the test to reset the log file.
<b>030-197-XXX</b> SCSI interface test warning	1. <b>Make sure component that is called out is enabled and/or connected</b> 2. Re-run test 3. Component that is called out in warning statement 4. Component under test
<b>030-198-XXX</b> SCSI interface test aborted	1. <b>If a component is called out, make sure it is enabled and/or connected</b> 2. Flash the system and re-test 3. Go to "Undetermined problem" section.
<b>030-199-XXX</b> SCSI interface test failed, cause unknown	1. <b>Go to "Undetermined problem" section.</b> 2. Flash the system and re-test 3. Replace component under function test.
<b>035-000-XXX</b> RAID interface Test Passed	1. <b>No action</b>

Diagnostic Error Code	FRU/Action
<b>035-0XX-XXX</b> RAID interface Failure	<ol style="list-style-type: none"> <li>1. <b>RAID signal cable</b></li> <li>2. RAID device</li> <li>3. RAID adapter card, if installed</li> <li>4. System board</li> </ol>
<b>035-195-XXX</b> RAID interface Test aborted by user	<ol style="list-style-type: none"> <li>1. <b>Information</b></li> <li>2. Re-start the test, if need to</li> </ol>
<b>035-196-XXX</b> RAID interface test halt, error threshold exceeded	<ol style="list-style-type: none"> <li>1. <b>Depress F3 to review the log file.</b></li> <li>2. Re-start the test to reset the log file.</li> </ol>
<b>035-197-XXX</b> RAID interface test warning	<ol style="list-style-type: none"> <li>1. <b>Make sure component that is called out is enabled and/or connected</b></li> <li>2. Re-run test</li> <li>3. Component that is called out in warning statement</li> <li>4. Component under test</li> </ol>
<b>035-198-XXX</b> RAID interface test aborted	<ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is enabled and/or connected</b></li> <li>2. Flash the system and re-test</li> <li>3. Go to "Undetermined problem" section.</li> </ol>
<b>035-199-XXX</b> RAID interface test failed, cause unknown	<ol style="list-style-type: none"> <li>1. <b>Go to "Undetermined problem" section.</b></li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test.</li> </ol>
<b>071-000-XXX</b> Audio port Interface Test Passed	<ol style="list-style-type: none"> <li>1. <b>No action</b></li> </ol>
<b>071-00X-XXX</b> <b>071-01X-XXX</b> <b>071-02X-XXX</b> Audio port error	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Flash the system</li> <li>3. System board</li> </ol>
<b>071-03X-XXX</b> Audio port failure	<ol style="list-style-type: none"> <li>1. <b>Speakers</b></li> <li>2. Microphone</li> <li>3. Audio card, if installed</li> <li>4. System board</li> </ol>
<b>071-04X-XXX</b> Audio port failure	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Audio card, if installed</li> <li>3. System board</li> </ol>
<b>071-195-XXX</b> Audio port Test aborted by user	<ol style="list-style-type: none"> <li>1. <b>Information</b></li> <li>2. Re-start the test, if need to</li> </ol>

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

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

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

Diagnostic Error Code	FRU/Action
<b>170-197-XXX</b> Voltage Sensor(s) test warning	<ol style="list-style-type: none"> <li>1. <b>Make sure component that is called out is enabled and/or connected</b></li> <li>2. Re-run test</li> <li>3. Component that is called out in warning statement</li> <li>4. Component under test</li> </ol>
<b>170-198-XXX</b> Voltage Sensor(s) test aborted	<ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is enabled and/or connected</b></li> <li>2. Flash the system and re-test</li> <li>3. Go to "Undetermined problem" section.</li> </ol>
<b>170-199-XXX</b> Voltage Sensor(s) test failed, cause unknown	<ol style="list-style-type: none"> <li>1. <b>Go to "Undetermined problem" section.</b></li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test.</li> </ol>
<b>170-250-XXX</b> <b>170-251-XXX</b> Voltage Sensor(s) Voltage limit error	<ol style="list-style-type: none"> <li>1. <b>Power supply</b></li> <li>2. System board</li> </ol>
<b>170-254-XXX</b> Voltage Sensor(s) Voltage Regulator Module error	<ol style="list-style-type: none"> <li>1. <b>Voltage Regulator Module (VRM)</b></li> <li>2. Microprocessor</li> <li>3. System board</li> </ol>
<b>175-000-XXX</b> Thermal Sensor(s) Test Passed	<ol style="list-style-type: none"> <li>1. <b>No action</b></li> </ol>
<b>175-0XX-XXX</b> Thermal Sensor(s) failure	<ol style="list-style-type: none"> <li>1. <b>Flash system</b></li> <li>2. System board</li> </ol>
<b>175-195-XXX</b> Thermal Sensor(s) Test aborted by user	<ol style="list-style-type: none"> <li>1. <b>Information</b></li> <li>2. Re-start the test, if need to</li> </ol>
<b>175-196-XXX</b> Thermal Sensor(s) test halt, error threshold exceeded	<ol style="list-style-type: none"> <li>1. <b>Depress F3 to review the log file.</b></li> <li>2. Re-start the test to reset the log file.</li> </ol>
<b>175-197-XXX</b> Thermal Sensor(s) test warning	<ol style="list-style-type: none"> <li>1. <b>Make sure component that is called out is enabled and/or connected</b></li> <li>2. Re-run test</li> <li>3. Component that is called out in warning statement</li> <li>4. Component under test</li> </ol>

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>175-198-XXX</b> Thermal Sensor(s) test aborted	<ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is enabled and/or connected</b></li> <li>2. Flash the system and re-test</li> <li>3. Go to "Undetermined problem" section.</li> </ol>
<b>175-199-XXX</b> Thermal Sensor(s) test failed, cause unknown	<ol style="list-style-type: none"> <li>1. <b>Go to "Undetermined problem" section.</b></li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test.</li> </ol>
<b>175-250-XXX</b> <b>175-251-XXX</b> Thermal Sensor(s) limit error	<ol style="list-style-type: none"> <li>1. <b>Check fans</b></li> <li>2. Check Power supply</li> <li>3. Microprocessor</li> <li>4. System board</li> </ol>
<b>185-000-XXX</b> Asset Security Test Passed	<ol style="list-style-type: none"> <li>1. <b>No action</b></li> </ol>
<b>185-XXX-XXX</b> Asset Security failure	<ol style="list-style-type: none"> <li>1. <b>Assure Asset Security Enabled</b></li> <li>2. Flash system</li> <li>3. System board</li> </ol>
<b>185-278-XXX</b> Asset Security Chassis Intrusion	<ol style="list-style-type: none"> <li>1. <b>C2 Cover Switch</b></li> <li>2. System board</li> </ol>
<b>201-000-XXX</b> System Memory Test Passed	<ol style="list-style-type: none"> <li>1. <b>No action</b></li> </ol>
<b>201-XXX-XXX</b> System Memory error	<ol style="list-style-type: none"> <li>1. <b>Replace the memory module called out by the test</b></li> <li>2. System board</li> </ol>
<b>202-000-XXX</b> System Cache Test Passed	<ol style="list-style-type: none"> <li>1. <b>No action</b></li> </ol>
<b>202-XXX-XXX</b> System Cache error	<ol style="list-style-type: none"> <li>1. <b>Cache, if removable</b></li> <li>2. System board</li> <li>3. Microprocessor</li> </ol>
<b>206-000-XXX</b> Diskette Drive Test Passed	<ol style="list-style-type: none"> <li>1. <b>No action</b></li> </ol>
<b>206-XXX-XXX</b> Diskette Drive error	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive Cable</b></li> <li>2. Check power supply voltages</li> <li>3. Diskette drive</li> <li>4. System board</li> </ol>
<b>215-000-XXX</b> CD-ROM Drive Test Passed	<ol style="list-style-type: none"> <li>1. <b>No action</b></li> </ol>
<b>215-XXX-XXX</b> CD-ROM Drive error	<ol style="list-style-type: none"> <li>1. <b>CD-ROM Drive Cable</b></li> <li>2. Check power supply voltages</li> <li>3. CD-ROM drive</li> <li>4. System board</li> </ol>

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

---

## PC 300 - 6584/6594

This section contains the general checkout procedures, additional service information, computer exploded view, Symptom-to-FRU indexes, undetermined problem, model tables, and parts listings for the IBM PC 300, type 6584/6594 computer.

### Note

Service information is the same for types 6584/6594 computers, unless specifically identified as type 6584 which is the desktop computer.

### 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.

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## General checkout

This general checkout procedure is for Type 6584/6594 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 "IBM PC Enhanced Diagnostics" on page 34.

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 53.
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 82.
4. If the computer hangs and no error is displayed, go to "Undetermined problem" on page 104.
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 41) 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.
- Set all display controls to the middle position.

(Step **001** continues)

**001** (continued)

- 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 6584/6594 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

- Enable **Power on Status** in setup. See "Setup Utility program" on page 41.

**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 41)
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 "IBM PC Enhanced Diagnostics" on page 34.

**003**

Run the IBM PC Enhanced Diagnostics test. If necessary, refer to "Diagnostics and test information" on page 32.

- If you receive an error, replace the part that the diagnostic program calls out or go to "IBM PC Enhanced Diagnostics" on page 34.
- 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 28.

(Step **003** continues)

(CONTINUED)

**003** (continued)

- If the printer has incorrect responses, go to "Printer" on page 28.
  - If the display has problems such as jittering, rolling, shifting, or being out of focus, go to "Display" on page 31.
-

## 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 104 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 104.

## Keyboard

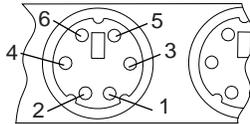
### Note

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  $\pm 5\%$ .

Pin	Voltage (Vdc)
1	+5.0
2	Reserved
3	Ground
4	+5.0
5	+5.0
6	Reserved



### 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.	<b>Correct the voltage-selector switch setting.</b>
2. Check the following for proper installation. <ul style="list-style-type: none"><li>• Power Cord</li><li>• On/Off Switch connector</li><li>• On/Off Switch Power Supply connector</li><li>• System Board Power Supply connectors</li><li>• microprocessor(s) connection</li></ul>	<b>Reseat</b>
3. Check the power cord for proper continuity.	<b>Power Cord</b>
4. Check the power-on switch for continuity.	<b>Power-on Switch</b>

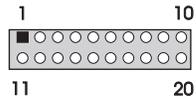
If the above are correct, check the following voltages.

## 20-pin main power supply connection

See "System board layout" on page 77 for connector location.

### Attention

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



Pin	Signal	Function
1	3.3 V	+3.3 V dc
2	3.3 V	+3.3 V dc
3	COM	Ground
4	5 V	+5 V dc
5	COM	Ground
6	5 V	+5 V dc
7	COM	Ground
8	POK	Power Good
9	5VSB	Standby Voltage
10	12 V	+12 V dc
11	3.3 V	+3.3 V dc
12	-12 V	-12 V dc
13	COM	Ground
14	PS-ON	DC Remote Enable
15	COM	Ground
16	COM	Ground
17	COM	Ground
18	-5 V	-5 V dc
19	5 V	+5 V dc
20	5 V	+5 V dc

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

## 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 104.

---

## 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
- IBM PC Enhanced Diagnostics

### 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 6584/6594 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

1. Enable **Power on Status** in setup. See "Setup Utility program" on page 41.

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 6584/6594 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

1. Enable **Power on Status** in setup. See "Setup Utility program" on page 41.

### Error code format

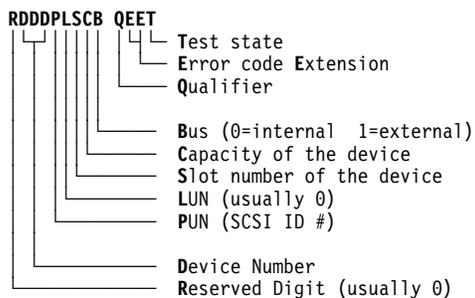
This section provides an explanation of the encoded non-SCSI and SCSI POST error codes.

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.



## 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 PC Enhanced Memory Diagnostics and the suite of diagnostic tests provided by PC-Doctor.

The IBM PC Enhanced Diagnostics are available on-line and can be downloaded from:

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

- Select **Support**
- Select **IBM IntelliStation Support**
- Select **Downloadable Files**
- Select **Diagnostics**

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 PC Enhanced Memory Diagnostics and the suite of diagnostic tests provided by PC-Doctor.
- IBM PC Enhanced Memory Diagnostics
  - The memory diagnostic tests determine which memory module (RIMM) 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 RIMM.

### Note

See "IBM PC Enhanced Diagnostics" for the IBM PC Enhanced Diagnostics error codes.

## 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 PC 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."
3. From within a test category, press **Ctrl-Enter** to automatically run only the selected tests in that category. See "Test selection."
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 39.

## 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 PC Enhanced Memory Diagnostics

The IBM PC Enhanced Memory Diagnostics provide the capability to identify a particular memory module (RIMM) which fails during testing. Use the System Board Layout section to reference the memory sockets, or select **F1 twice** to load the Online Manual and select Chapter 11 'DIMM/RIMM Locator'.

Follow the steps below to locate the IBM PC Enhanced 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 RIMM socket.

Only sockets containing a RIMM can be selected for testing. C-RIMM sockets are noted by ..... besides the test description.

**Alert On LAN test**

The Alert On LAN test does the following:

- Determines if Alert On LAN is supported on the system.
- Checks the revision ID register.
- Verifies the EEPROM checksum.
- Validates that a software alert can be sent.

**Asset ID test**

The Asset ID test does the following:

- Determines if Asset ID is supported on the system.
- Verifies the EEPROM areas.
- Performs an antenna detection test.

**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 RIMM, or a device on the PCI bus.

<b>Date:</b>	Contains the date on which the diagnostic test was run. Date is retrieved from CMOS and displayed using the YYYYMMDD format.
<b>ChkDigits:</b>	Contains a 2-digit check-digit value to ensure that: <ul style="list-style-type: none"> <li>• Diagnostics were run on the specified date</li> <li>• Diagnostics were run on the specified IBM computer</li> <li>• The diagnostic error code is recorded correctly</li> </ul>
<b>Text:</b>	Description of the error.

**Note**

See "IBM PC Enhanced Diagnostics error codes" on page 1 for error code listings.

## Hard File Smart Test

Use the Hard File Smart Test when the system management tool has detected a hard file SMART alert.

The Smart Test does the following:

- Interrogates IDE devices for support of the SMART instruction set.
- Issues a ENABLE SMART command to make sure SMART functionality is active.
- Checks the SMART RETURN STATUS command to determine if any thresholds have been exceeded.

If thresholds have been exceeded, an error message is shown, and the test fails. If no SMART is supported by the drive, the test returns with N/A.

## IBM Fixed Disk Optimized Test

The IBM Fixed Disk Optimized Test provide the capability to identify particular areas of a hard file which fails during testing. This test also provide a method of correcting certain types of errors.

To select the Fixed Disk Optimized Test:

1. Select the diagnostic option on the toolbar and press Enter.
2. Select the Fixed Disk Optimized Test
3. Select Hard Drives - NORMAL TEST to run a complete hard file test.
4. Select Hard Drives - PRESENCE TEST to run a test to check the drive controller and report any SMART information that the drive has detected.

## 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 copies 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.

## Iomega Zip Drive Test

Use the Iomega Zip Drive Test to test the zip drive and the drive interface. The test takes about 20 seconds to run.

The default tests the following:

- Controller
- Max Seek (50 times)
- Random Seek (300 sectors)

## Asset EEPROM backup

When replacing a system board, this utility allows the backup of all Asset information from the EEPROM to diskette. This utility also restores data to the EEPROM from diskette after replacement of the system board.

To run this utility:

- Select **Utility**
- Select **Asset EEPROM Backup**
- follow instructions on screen.

### 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.

**RIMM memory errors:** SIMM/DIMM/RIMM error messages issued by the IBM PC Enhanced Diagnostics:

Message	Failure Found	Recommended Actions
2xx-1y (for SIMMs)	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.
2xx-2y (for DIMMs/RIMMs)	A memory error was detected in DIMM/RIMM socket Y	Replace the DIMM/RIMM 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.

Message	Failure Found	Recommended Actions
Corrupt BIOS	<p>Information in BIOS is not as expected.</p> <p>Not able to find expected DMI information from BIOS.</p> <p>Memory controller chipset vendor ID does not match expected value.</p>	<p>Reflash the BIOS.</p> <p>Perform boot block recovery.</p> <p>Replace the system board.</p>
Test aborted by user	User stopped test.	Restart test.
<p><b>Note:</b></p> <p>"Y" is the SIMM/DIMM/RIMM socket number. Use the System Board Layouts section in the latest Hardware Maintenance Manual, HMM, to reference the memory sockets.</p>		

## 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:

- System Summary
- Product Data
- Devices and I/O Ports
- Start Options
- Date and Time
- System Security
- Advanced Setup
- ISA Legacy Resources
- Power Management

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.

## 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.

Cause	Actions
The boot sector on the start-up drive is corrupted.	The drive must be formatted, do the following: <ol style="list-style-type: none"> <li>1. Attempt to access and recover (back-up) the failing hard disk drive.</li> <li>2. Using the operating systems programs, format the hard disk drive.</li> <li>3. Go to "Preparing the hard disk drive for use" on page 42.</li> </ol>
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.

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## Product description

The PC 300 Type 6584/6594 computers are available in 4x5, (Four drive bays, Five I/O adapter slots which includes an AGP slot) as Type 6584 desktop and 6x7, (Six drive bays, Seven I/O adapter slots, which includes an AGP slot) as Type 6594 micro-tower models.

### Note

Service information is the same for types 6584 and 6594 computers, unless specifically identified as type 6584 or 6594.

- Type 6584 is the desktop
- Type 6594 is the micro-tower
  
- **Security**
  - Administrator password
  - Cover lock
  - Power-on password
  - Operating system password
  - U-bolt and cable (Optional for some models)
- **CMOS backup battery (lithium)**
- **Common parts**

(Varies with each model, see “Type/Model configuration tables (6584/6594)” on page 106.)

  - Diskette drive
  - 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 6584

Feature	Description
<b>Size</b>	Depth: 450 mm (17.7 inches) Height: 134 mm (5.3 inches) Width: 447 mm (17.6 inches)
<b>Weight</b>	Weight: 11.3 kg (25 lb) <sup>1</sup>
<b>Environment</b>	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 50°C (50° to 122°F)  Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 3048 m (10,000 ft)
<b>Heat Output</b>	Approximate heat output in BTUs per hour: - Minimum: 245 BTU (70 watts) - Maximum: 700 BTU (204 watts) <sup>2</sup>
<b>Electrical Input</b>	Sine-wave input (47 to 63 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): 0.08 kVA
<b>Airflow</b>	Approximately 0.56 cubic meters/minute (20 CFM)
<b>Acoustical Noise Emission Values</b>	Average sound pressure levels: At operator position: - 41 dB operating - 34 dB idle At bystander position (1 meter): - 34 dB operating - 29 dB idle Declared (upper limit) sound power levels: - 5.0 bels operating - 4.5 bels idle

- 1 Maximum configuration weight depends on options installed. Figures above are a system fully populated with options.
- 2 Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.
- 3 For additional information, see the *ISO Supplier's Declaration* available from IBM.

## Specifications Type 6594

Feature	Description
<b>Size</b>	Depth: 445 mm (17.5 inches) Height: 492 mm (19.4 inches) Width: 200 mm (7.9 inches)
<b>Weight</b>	Weight: 17.3 kg (38 lb) Fully configured <sup>4</sup>
<b>Environment</b>	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 50°C (50° to 122°F)  Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 3048 m (10,000 ft)
<b>Heat Output</b>	Approximate heat output in BTUs per hour: - Minimum: 245 BTU (70 watts) - Maximum: 969 BTU (285 watts) <sup>5</sup>
<b>Electrical Input</b>	Sine-wave input (47 to 63 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): 0.08 kVA
<b>Airflow</b>	Approximately 0.56 cubic meters/minute (20 CFM)
<b>Acoustical Noise Emission Values</b>	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 - 4.5 bels idle

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

<sup>5</sup> Maximum power and heat specifications are based on the 200-watt maximum capacity of the system power supply.

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

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## Additional service information

The following additional service information supports the PC 300 types 6584/6594 computer.

- “Replacing a processor”
- “Replacing a system board” on page 47
- “Security features” on page 47
- “Passwords” on page 47
- “Vital Product Data” on page 49
- “Management Information Format (MIF)” on page 49
- “Alert on LAN2” on page 50
- “Hard disk drive jumper settings” on page 51
- “CD-ROM drive jumper settings” on page 52
- “BIOS levels” on page 53
- “Flash (BIOS/VPD) update procedure” on page 54
- “Flash recovery boot block” on page 54
- “Power management” on page 55
- “Network settings” on page 57
- “Flash over LAN (update POST/BIOS over network)” on page 57
- “Wake on LAN” on page 58
- “System board memory” on page 59

## Replacing a processor

Make sure the processor is fully seated in its socket and that the goal post latches are engaged.

### Important

- Make sure the air baffle is installed to prevent processor overheating.
- If the processor is not installed correctly, the system board and the processor can be damaged.

## 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 53 “Vital Product Data” on page 49, and “Flash (BIOS/VPD) update procedure” on page 54.
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.
5. Remove any of the following installed options on the old system board, and install them on the new system board.
  - Memory modules (RIMM and C-RIMM)
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.

## Security features

Security features in this section include:

- Passwords
- Vital Product Data
- Management Information Format (MIF)
- Alert on LAN2

## 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 41 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 layout" on page 77 to find the recovery jumper.
3. Move the recovery jumper from 'normal' to 'clear'.
4. Power-on the computer. The system senses the change in the position and erases the password.
  - It is necessary to move the jumper back to the previous position.
5. Remind the user to enter a new password when service is complete.

**Administrator password:** The administrator password is used to restrict access to the 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 6584/6594 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.

**Administrator password control** The Administrator password is set in the Setup Configuration. Refer to "Setup Utility program" on page 41

**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 54.

## Management Information Format (MIF)

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

At the time of computer manufacture, the EPROM will be loaded with the serial numbers of the system and all major components. The customer will have access to the MIF file via the DMI MIF Browser that is installed with the preload and is also available on the SSCD 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 LAN2**

Alert on LAN2 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 LAN2 helps to manage and monitor the hardware and software features of the computer. Alert on LAN2 generates notifications to the server of these occurrences:

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

Alert on LAN2 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.

## Hard disk drive jumper settings

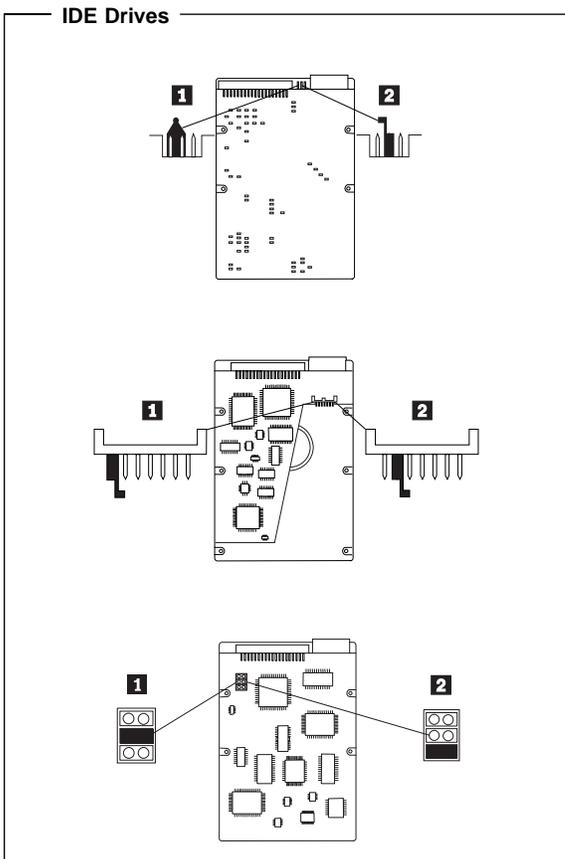
IDE hard disk drives for the PC 300 series computers use jumpers to set the drives as primary (master) or secondary (slave).

### Attention

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

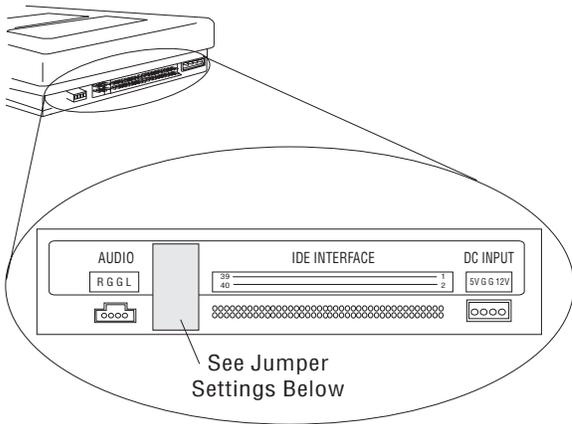
## IDE hard disk drive settings

- 1** Primary (Master) Hard Disk Drive
- 2** Secondary (Slave) Hard Disk Drive



## 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	: : ■	: ■ :
40X Max CD-ROM	: : ■	: ■ :
48X 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.ibm.com/pc/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.ibm.com/pc/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 54.

## 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

### Attention

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

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

1. Power-off the computer and remove the cover.
2. Move the system board recovery jumper to the **clear** position. Refer to "System board layout" on page 77 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 recovery jumper to the **normal** position. Then, replace the cover and power-on the computer.

## Power management

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

### Advanced Configuration and Power

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

**Advanced Power Management:** Energy-saving settings can be viewed and changed by using the Advanced Power Management menu in the 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.
- **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 41).
2. Select **Power Management** from the Configuration/Setup Utility program menu.
3. Select the **APM BIOS Mode** and be sure it is set to **Enabled**. If it is not, press Left Arrow (←) or Right Arrow (→) to change the setting.
4. Select **Automatic Hardware Power Management**.
5. Set **Automatic Hardware Power Management** to **Enabled**.
6. Select values for the two levels of power management (system power and display), as necessary.
7. Set **IDE Drives** to **Enabled** or **Disabled**.  
**Note:** This does not apply to SCSI drives.
8. Select **Low Power Entry Activity Monitor** and enable or disable the listed options.
9. Select **Low Power Exit Activity Monitor** and enable or disable the listed options.
10. Press **Esc** twice to return to the Configuration/Setup Utility program menu.
11. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
12. 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 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 serial port (COM1), 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.
- **PCI Wake Up:** PCI Wake Up uses PCI Power Management Enabled (PME) to wake up the computer when using token-ring, Ethernet LAN adapters, modems, or other PCI cards capable of waking up the computer. When you set PCI Wake Up to **Enabled**, the computer will turn on when it receives a specific signal from another computer on the local area network (LAN) or from a modem signal.

Wake on LAN features can be used on the 6584 and 6594 computers. For further information, see "Wake on LAN" on page 58.

## 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 54.

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 41.
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 41.
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.

## 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.

### Note

RAMBUS inline memory module (RIMM) is used in the type 6584/6594 computer. RIMM modules are not compatible with SIMM or DIMM memory modules. Refer to the information below regarding RIMM memory for type 6584, 6594.

Computer Name	RIMM Memory Module		
	Size	Memory	Type
PC 300	128 MB	PC700/	RDRAM
Type 6584/ 6594	256 MB	PC800	ECC/ Non-ECC
	512 MB Maximum	PC800 only	

### Note

For maximum 512 MB configuration, two 256 MB PC800 memory RIMMs must be installed. PC700 memory RIMMs can not be used.

## Supported RIMM memory configuration

Type 6584/6594 has two RIMM memory sockets. RIMM sockets must either have a RIMM memory module or a C-RIMM (RIMM Continuity module) installed. There can be no empty RIMM sockets. At least one socket must have a RIMM memory module installed.

- If new memory is to be added, remove a C-RIMM and install the new RIMM.
- If memory is to be removed, remove the RIMM and install a C-RIMM.

RIMM sizes of 128 MB and 256 MB are acceptable. RIMM sockets can be filled in any order. ECC or non-ECC, RAMBUS dynamic random access memory (RDRAM) are supported.

### Note

Mixed RIMM speeds will run at the lower speed.

## RIMM diagnostic approach

Identify any Beep or POST codes. See "Symptom-to-FRU index" on page 82.

Use the IBM PC Enhanced Diagnostics program to run memory tests. See "IBM PC Enhanced Diagnostics error codes" on page 1.

**Procedures to determine memory errors:**

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

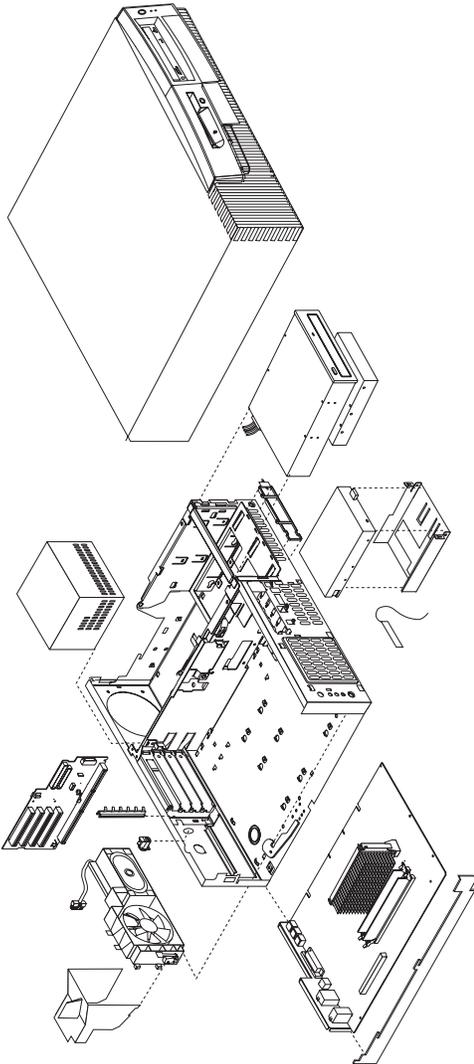
**Note**

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

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

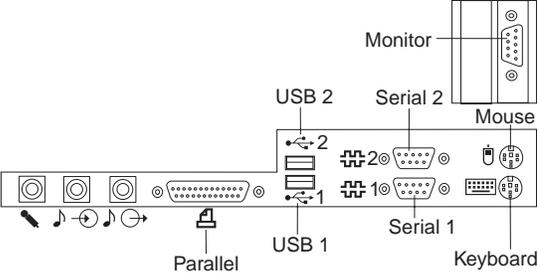
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## Computer exploded view (Type 6584)

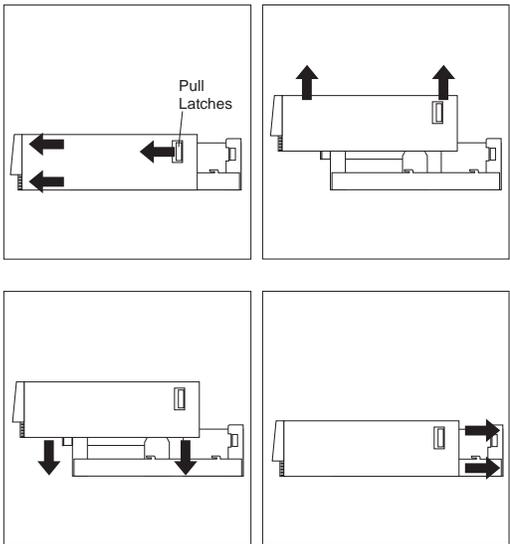


I/O connectors and removal procedures for the cover, CD-ROM/hard drive bracket, CD-ROM drive, hard drive, EIDE and SCSI cable routing, Diskette drive, system board, riser card, power supply, and fan/speaker bracket removal are on the following pages.

# Input/Output connectors



## Top and front cover removal



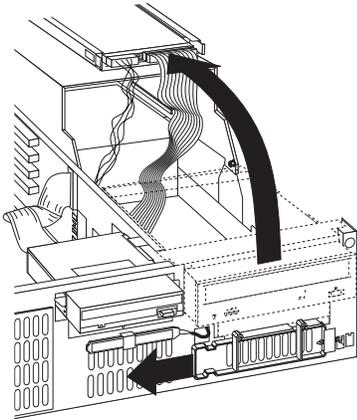
### To remove top and front cover:

1. Pull left and right pull latches forward then pull cover forward.
2. Lift cover up from the chassis.

### To install top and front cover:

1. Slide cover down onto the chassis about 4-inches (10.16 cm) from the rear of chassis.
2. Slide cover back to engage the left and right latches.

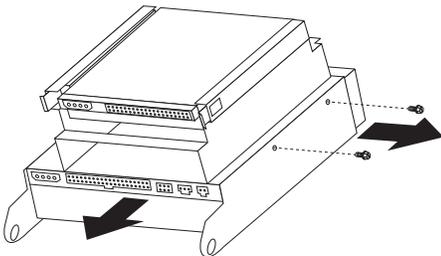
## CD-ROM/hard drive bracket



### To open the CD-ROM/hard drive bracket:

1. Remove the top cover.
2. Slide the plastic spring loaded cage retainer to the left.
3. Lift the cage up and swing it back to the service position.

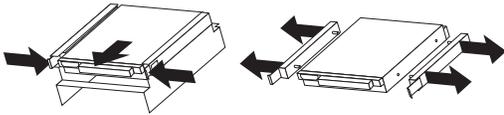
## CD-ROM drive removal



### To remove the CD-ROM drive:

1. Remove the top cover.
2. Put the CD-ROM/hard drive bracket in its service position.
3. Disconnect the CD-ROM signal and power cables.
4. Remove two screws securing the CD-ROM drive.
5. Pull the CD-ROM drive out of the bracket.

## Hard drive removal



### To remove the hard drive:

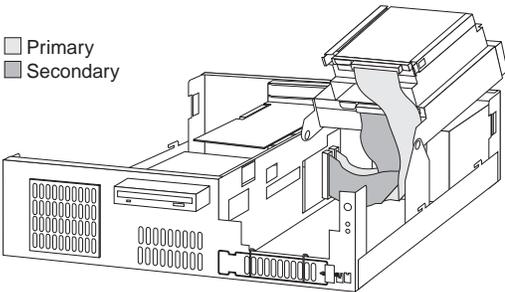
1. Remove the top cover.
2. Put the CD-ROM/hard drive bracket in its service position.
3. Disconnect the hard drive signal and power cables.
4. Push in on the left and right plastic tabs of the hard drive rails.
5. Pull the hard drive out of the bracket.

#### Note

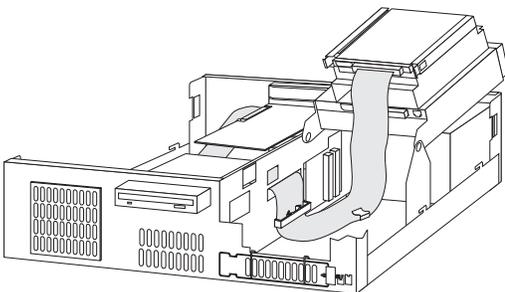
Remove the plastic rails from the old hard drive and install them on the new hard drive.

## EIDE cable routing

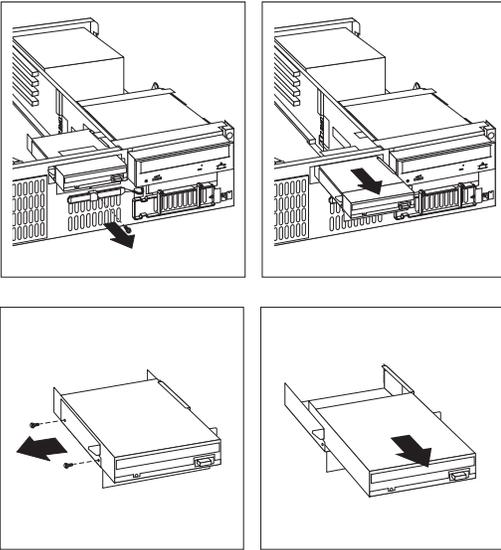
- Primary
- Secondary



## SCSI cable routing



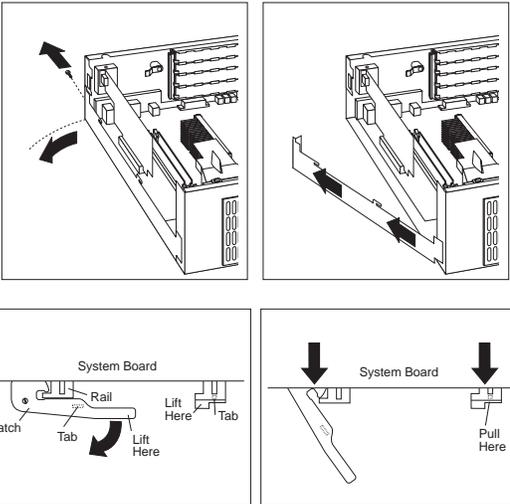
## Diskette drive removal



### To remove the diskette drive:

1. Remove the top cover.
2. Disconnect the diskette drive signal and power cables.
3. Remove the front screw of the diskette drive cage.
4. Pull the diskette drive out of the chassis.
5. Remove the two side screws from the diskette drive cage.
6. Remove the diskette drive from its cage.

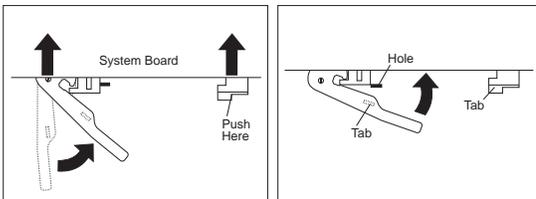
## System board removal



### To remove the system board:

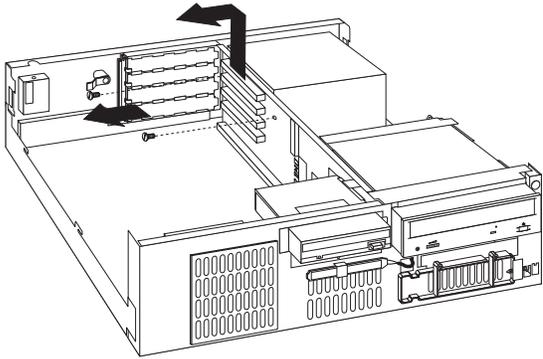
1. Remove the top cover.
2. Remove all cables connected to the system board.
3. Remove the AGP card, if installed.
4. Remove the retainer side bracket thumb screw.
5. Swing open the retainer side bracket and remove it from the chassis.
6. Lift up on the system board right-hand rail tab to disengage it from the bottom of the chassis.
7. Rotate the latch handle to disengage the system board.

## System board installation



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.

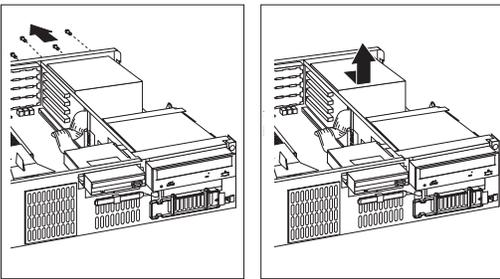
## Riser card removal



### To remove the riser card:

1. Remove the top cover.
2. Remove the system board.
3. Disconnect all cables from the front and back of the riser card.
4. Remove the two top screws securing the riser card.
5. Remove the riser card from the chassis.

## Power supply removal



### Note

1. Make sure the power supply voltage switch is set to the proper operating voltage; 115V or 230V.

### To remove the power supply:

1. Remove the top cover.
2. Disconnect the power supply connectors.
3. Remove the four screws securing the power supply to the chassis.
4. Move power supply inward, then lift out of the chassis.

## Fan and speaker bracket removal

### Note

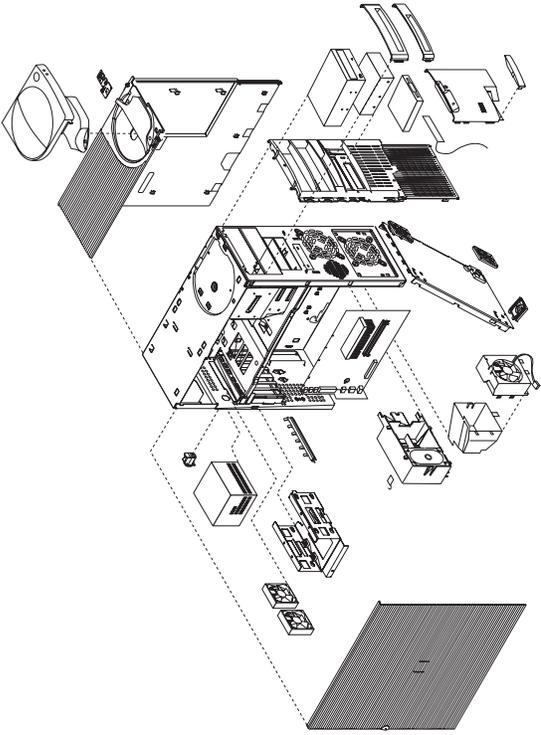
1. If you remove the LED/power cable or the RFID antenna cable, make sure it is routed the same way it was installed.
2. When removing the C2 switch assembly from the fan bracket, use care to pry the switch (alternating at both ends of the switch) from its mounting studs.
3. Make sure the RFID antenna cable is grounded to the chassis by its grounding lug.

### To remove the fan bracket:

1. Remove the top cover.
2. Remove the air duct.
3. Disconnect the fan and speaker connectors.
4. Push on the outside tab to release the bracket from the chassis.
5. Swing the bracket inward and then pull it from the chassis.

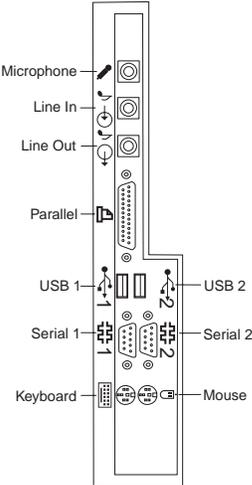
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**Computer exploded view (Type 6594)**

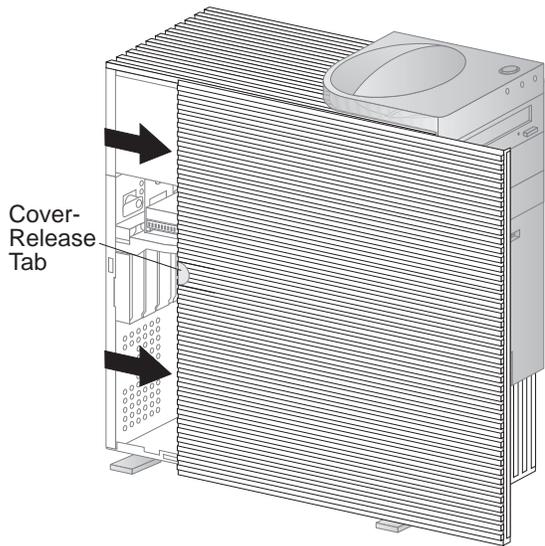


I/O connectors and removal procedures for the access cover, top handle cover, system board, hard disk drive, tab, and fan cage, air baffle, and card guide are on the following pages.

# Input/Output connectors

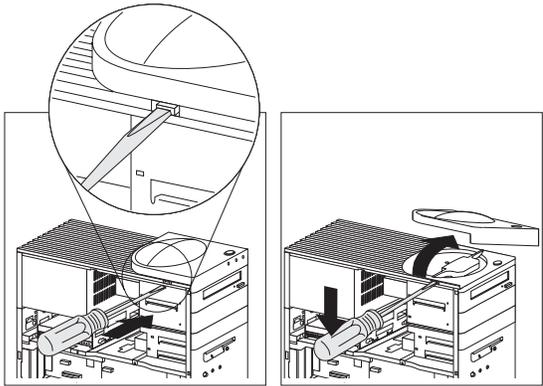


## Access cover removal



Unlock cover from back of the system unit before removing cover.

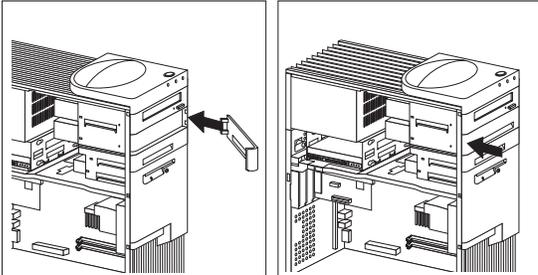
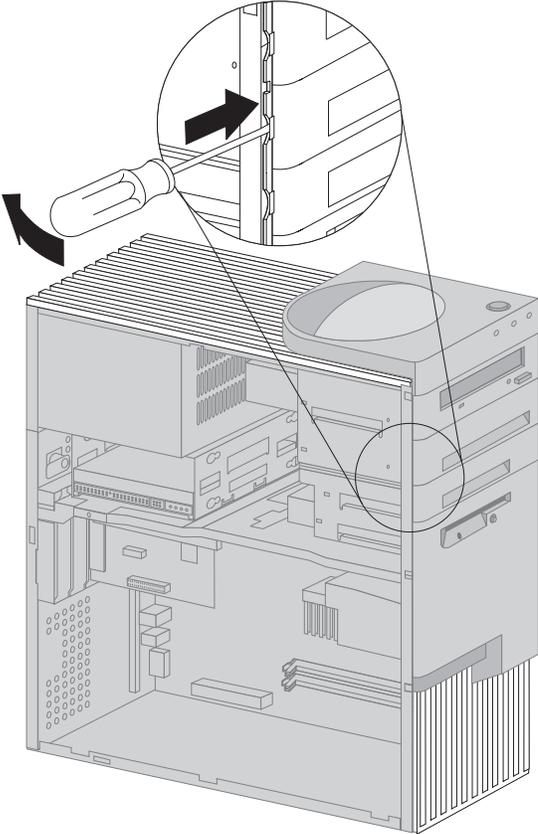
## Top handle cover removal



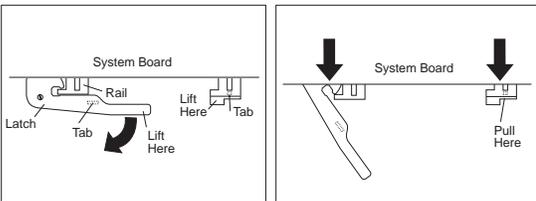
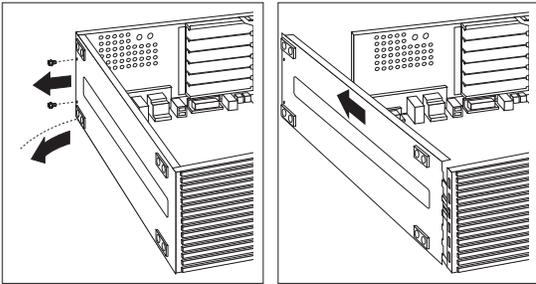
### Attention

Do not lift handle cover too high or the tabs will break.

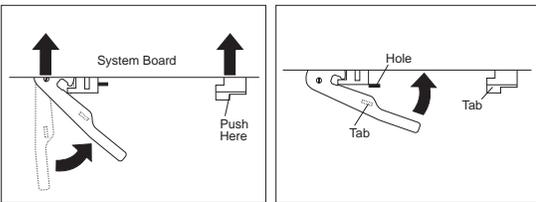
**Front bezel removal/replacement**



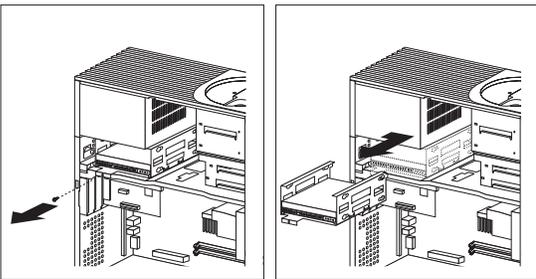
## System board removal



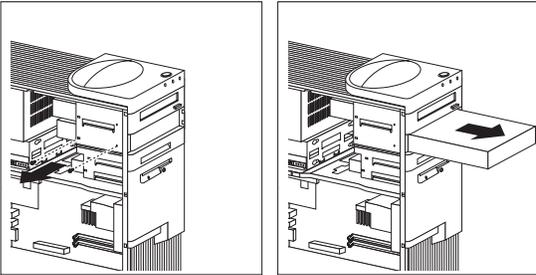
## System board installation



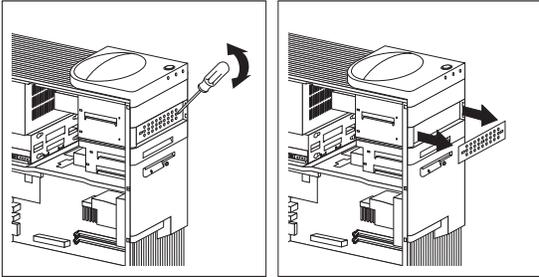
## Hard disk bracket removal



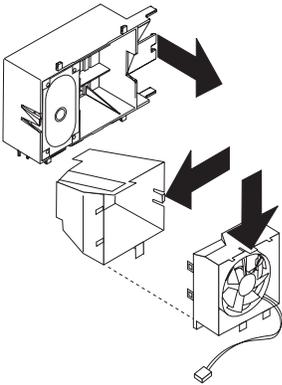
**Hard disk drive in non removable drive cage**



## Tab removal



## Fan cage, air baffle, speaker/card guide removal



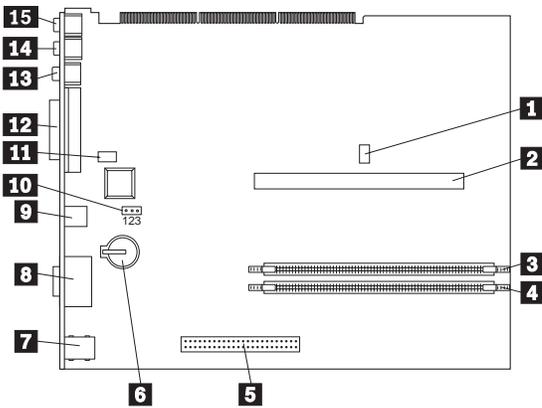
Push in on the latches as shown by arrows to release the fan cage, air baffle, or speaker/card guide.

### Note

After releasing the latch on the speaker/card guide, slide it away from the latch to disengage it from the chassis.

---

## System board layout



## System board locations

- 1** Processor fan connector (not used)
- 2** Processor socket
- 3** RIMM socket 1
- 4** RIMM socket 2
- 5** AGP connector
- 6** Battery
- 7** Keyboard/Mouse connectors
- 8** Serial 1,2 connectors
- 9** USB connectors
- 10** Recovery jumper
- 11** PC PCI connector (not used)
- 12** Parallel connector
- 13** Line Out connector
- 14** Line In connector
- 15** Microphone connector

## System board jumper settings

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

### Clear CMOS/Flash Boot Block Recovery

Use the recovery jumper setting to Clear CMOS or to Flash Boot Block Recover.

Jumper	Setting	Description
Recovery	2-3 (clear)	Clear CMOS/ Flash Recovery Mode
	1-2 (D) (normal)	Normal Mode

### Processor Speed Settings

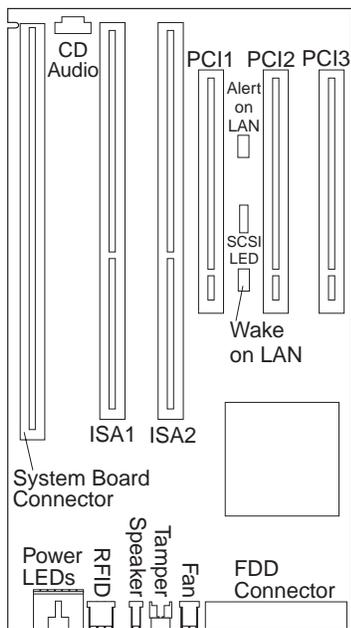
Processor speed for the PC 300 type 6584/6594 computers are fixed and are determined by the processor. There are no settings required.

### Diskette Write Access

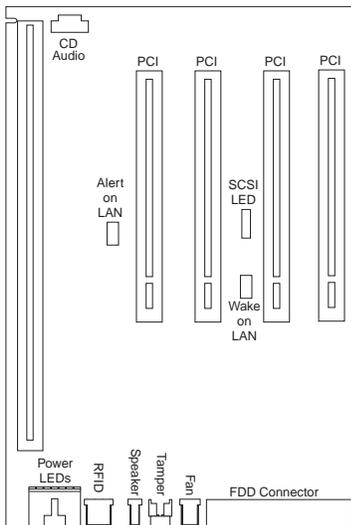
Diskette Write Enable and Write Protect options are changed in the Setup Configuration. See "Setup Utility program" on page 41.

## Riser cards (Type 6584)

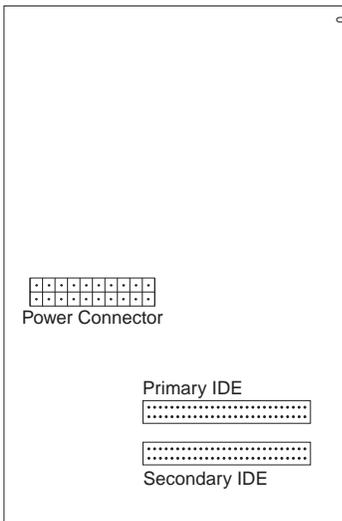
Riser card, ISA/PCI, front view



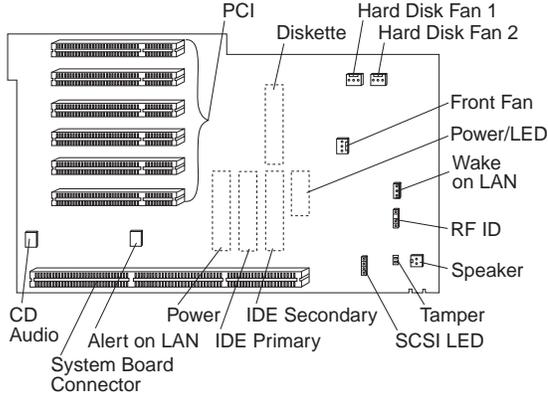
Riser card, PCI, front view



**Riser card, back view (both cards)**



**Riser card (Type 6594)**



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## 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" on page 24. See "IBM PC Enhanced Diagnostics error codes" on page 1 when running diagnostics. 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 104.

### 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 29.)
- Check the hard disk drive jumper settings before you replace a hard disk drive. (See "Hard disk drive jumper settings" on page 51.)

### Important

1. Some errors are indicated with a series of beep codes. (See "Beep symptoms" on page 83.)  
Type 6584/6594 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST. To enable Beep and memory count and checkpoint code display when a successful POST occurs:
  - Enable **Power on Status** in setup. See "Setup Utility program" on page 41.
2. The processor is a separate FRU from the system board; the processor is not included with the system board FRU.

## 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	<ul style="list-style-type: none"> <li>• One Beep</li> <li>• A pause (or break)</li> <li>• Two beeps</li> <li>• A pause (or break)</li> <li>• Any number of beeps</li> </ul>
4	Four continuous beeps

Beep Symptom	FRU/Action
1-1-3 CMOS read/write error	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. System Board</li> </ol>
1-1-4 ROM BIOS check error	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
1-2-X DMA error	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
1-3-X	<ol style="list-style-type: none"> <li>1. <b>RIMM Memory Module</b> see "System board memory" on page 59</li> <li>2. C-RIMM</li> <li>3. System Board</li> </ol>
1-4-4	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. System Board</li> </ol>
1-4-X Error detected in first 64 KB of RAM.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-1-1, 2-1-2	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. System Board</li> </ol>
2-1-X First 64 KB of RAM failed.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-2-2	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
2-2-X First 64 KB of RAM failed.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-3-X	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-4-X	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Memory Module</li> <li>3. System Board</li> </ol>
3-1-X DMA register failed.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
3-2-4 Keyboard controller failed.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Keyboard</li> </ol>

Beep Symptom	FRU/Action
<b>3-3-4</b> Screen initialization failed.	<ol style="list-style-type: none"> <li><b>Video Adapter</b> (if installed)</li> <li>System Board</li> <li>Display</li> </ol>
<b>3-4-1</b> Screen retrace test detected an error.	<ol style="list-style-type: none"> <li><b>Video Adapter</b> (if installed)</li> <li>System Board</li> <li>Display</li> </ol>
<b>3-4-2</b> POST is searching for video ROM.	<ol style="list-style-type: none"> <li><b>Video Adapter</b> (if installed)</li> <li>System Board</li> </ol>
<b>4</b>	<ol style="list-style-type: none"> <li><b>Video Adapter</b> (if installed)</li> <li>System Board</li> </ol>
All other beep code sequences.	<ol style="list-style-type: none"> <li><b>System Board</b></li> </ol>
One long and one short beep during POST. Base 640 KB memory error or shadow RAM error.	<ol style="list-style-type: none"> <li><b>Memory Module</b></li> <li>System Board</li> </ol>
One long beep and two or three short beeps during POST. (Video error)	<ol style="list-style-type: none"> <li><b>Video Adapter</b> (if installed)</li> <li>System Board</li> </ol>
Three short beeps during POST.	<ol style="list-style-type: none"> <li>See "<b>System board memory</b>" on page 59.</li> <li>System Board</li> </ol>
Continuous beep.	<ol style="list-style-type: none"> <li><b>System Board</b></li> </ol>
Repeating short beeps.	<ol style="list-style-type: none"> <li><b>Keyboard stuck key?</b></li> <li>Keyboard Cable</li> <li>System Board</li> </ol>

## No beep symptoms

### Note

Type 6584/6594 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

- Enable **Power on Status** in setup. See "Setup Utility program" on page 41.

Symptom/Error	FRU/Action
No beep during POST but computer works correctly.	<ol style="list-style-type: none"> <li><b>System Board</b></li> </ol>

Symptom/Error	FRU/Action
No beep during POST.	<ol style="list-style-type: none"><li>1. <b>See “Undetermined problem” on page 104.</b></li><li>2. System Board</li><li>3. Memory Module</li><li>4. Any Adapter or Device</li><li>5. Riser Card</li><li>6. Power Cord</li><li>7. Power Supply</li></ol>

## POST error codes

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

POST Error Code	FRU/Action
<b>000</b> SCSI Adapter not enabled.	1. <b>Verify adapter device and Bus Master fields are enabled in PCI configuration program. See documentation shipped with computer.</b>
<b>02X</b>	1. <b>SCSI Adapter</b>
<b>08X</b> Check SCSI terminator installation.	1. <b>SCSI Cable</b> 2. SCSI Terminator 3. SCSI Device 4. SCSI Adapter
<b>101</b> System board interrupt failure.	1. <b>System Board</b>
<b>102</b> System board timer error.	1. <b>System Board</b>
<b>106</b>	1. <b>System Board</b>
<b>110</b> System board memory parity error.	1. <b>Memory Module</b> 2. System Board
<b>111</b> I/O channel parity error.	1. <b>Reseat adapters</b> 2. Any Adapter 3. Riser card 4. System Board
<b>114</b> Adapter ROM error.	1. <b>Adapter Memory</b> 2. System Board 3. Riser card
<b>129</b> Internal cache test error.	1. <b>Processor</b> 2. L2 Cache Memory 3. System Board
<b>151</b> Real-time clock failure.	1. <b>System Board</b>
<b>161</b> Bad CMOS battery.	1. <b>Run Setup</b> 2. CMOS Backup Battery (See page "Safety information" on page 332.) 3. System Board

POST Error Code	FRU/Action
<p><b>162</b> Configuration mismatch.</p>	<ol style="list-style-type: none"> <li>1. <b>Run Setup and verify Configuration</b></li> <li>2. Had a device been added, removed, changed location? If not, suspect that device.</li> <li>3. Power-on external devices first, then power-on computer.</li> <li>4. CMOS Backup Battery (See page "Safety information" on page 332.)</li> <li>5. System Board</li> <li>6. Riser card</li> </ol>
<p><b>162</b> And unable to run diagnostics.</p>	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> <li>4. Riser card</li> </ol>
<p><b>163</b> Clock not updating or invalid time set.</p>	<ol style="list-style-type: none"> <li>1. <b>Time and Date Set?</b></li> <li>2. CMOS Backup Battery (See page "Safety information" on page 332.)</li> <li>3. System Board</li> </ol>
<p><b>164</b> POST detected a base memory or extended memory size mismatch error. or RIMM socket 3 is populated with a RIMM memory module.</p>	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check System Summary menu for memory size change. (See "Setup Utility program" on page 41.)</b></li> <li>2. Run the Extended Memory Diagnostic tests.</li> <li>3. Replace RIMM memory module in socket 3 with a C-RIMM</li> </ol>
<p><b>166</b> Boot Block Check Sum Error</p>	<ol style="list-style-type: none"> <li>1. <b>Run Flash Recovery using Boot Block. See "Flash recovery boot block" on page 54</b></li> <li>2. System Board</li> </ol>
<p><b>167</b> Microprocessor installed that is not supported by the current POST/BIOS.</p>	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check Stepping level for the BIOS level needed, then perform the flash update.</b></li> <li>2. Processor</li> </ol>

POST Error Code	FRU/Action
<b>168</b> Alert on LAN2 error	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check to see that Ethernet and Alert on LAN2 are enabled.</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
<b>17X, 18X</b>	1. <b>C2 Security</b>
<b>175</b>	<ol style="list-style-type: none"> <li>1. <b>Run Configuration (See "Setup Utility program" on page 41.)</b></li> <li>2. System Board</li> </ol>
<b>176</b>	1. <b>Covers were removed from the computer.</b>
<b>177</b> Corrupted Administrator Password.	1. <b>System Board</b>
<b>178</b>	1. <b>System Board</b>
<b>183</b>	1. <b>Enter the administrator password</b>
<b>184</b> No RFID Antenna	<ol style="list-style-type: none"> <li>1. <b>Make sure Asset Care and Asset ID™ are enabled in Configuration/Setup.</b></li> <li>2. RFID Antenna</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>185</b> Corrupted boot sequence.	1. <b>Set configuration and reinstall the boot sequence.</b>
<b>186</b>	1. <b>System Board</b>
<b>187</b>	<ol style="list-style-type: none"> <li>1. <b>Clear Administration password</b></li> <li>2. System Board</li> </ol>
<b>189</b>	1. <b>More than three password attempts were made to access the computer.</b>
<b>190</b> Chassis intrusion detector was cleared. This is information only, no action required. If this code does not clear:	1. <b>System Board</b>
<b>1XX</b> Not listed above.	1. <b>System Board</b>
<b>201, 20X</b> Memory data error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diag. Memory Test</b></li> <li>2. Memory Module</li> <li>3. System Board</li> </ol>
<b>225</b>	1. <b>Unsupported Memory</b>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>229</b> External cache test error.	<ol style="list-style-type: none"> <li>1. <b>L2 Cache Memory</b></li> <li>2. System Board</li> </ol>
<b>262</b> POST detected a base memory or extended memory type error.	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check System Summary menu for memory type change. (See "Setup Utility program" on page 41.)</b></li> <li>2. Run the Extended Memory Diagnostic tests.</li> </ol>
<b>301</b>	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>
<b>303</b> With an 8603 error.	<ol style="list-style-type: none"> <li>1. <b>Mouse</b></li> <li>2. Keyboard</li> <li>3. Keyboard Cable</li> <li>4. System Board</li> </ol>
<b>303</b> With no 8603 error.	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>
<b>3XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>
<b>5XX</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
<b>601</b>	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive A</b></li> <li>2. Diskette Drive Cable</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>602</b>	<ol style="list-style-type: none"> <li>1. <b>Bad Diskette ?</b></li> <li>2. Verify Diskette and retry.</li> </ol>
<b>604</b> And able to run diagnostics.	<ol style="list-style-type: none"> <li>1. <b>Run Setup and verify diskette configuration settings</b></li> <li>2. Diskette Drive A/B</li> <li>3. Diskette Drive Cable</li> <li>4. System Board</li> <li>5. Riser card</li> </ol>
<b>605</b> POST cannot unlock the diskette drive.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. Diskette Drive Cable</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>662</b>	<ol style="list-style-type: none"> <li>1. <b>Diskette drive configuration error or wrong diskette drive type, run Setup Configuration.</b></li> </ol>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>6XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Riser card</li> <li>4. External Drive Adapter</li> <li>5. Diskette Drive Cable</li> <li>6. Power Supply</li> </ol>
<b>762</b> Math coprocessor configuration error.	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Processor</li> <li>3. System Board</li> </ol>
<b>7XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Processor</b></li> <li>2. System Board</li> </ol>
<b>962</b> Parallel port configuration error.	<ol style="list-style-type: none"> <li>1. <b>Run Configuration</b></li> <li>2. Parallel Adapter (if installed)</li> <li>3. System Board</li> </ol>
<b>9XX</b>	<ol style="list-style-type: none"> <li>1. <b>Printer</b></li> <li>2. System Board</li> </ol>
<b>1047</b>	<ol style="list-style-type: none"> <li>1. <b>16-Bit AT Fast SCSI Adapter</b></li> </ol>
<b>107X</b> Check SCSI terminator installation.	<ol style="list-style-type: none"> <li>1. <b>Check SCSI terminator installation.</b></li> <li>2. SCSI Cable</li> <li>3. SCSI Terminator</li> <li>4. SCSI Device</li> <li>5. SCSI Adapter</li> </ol>
<b>1101</b> Serial connector error, possible system board failure.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>1101, 1102, 1106, 1108, 1109</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Any Serial Device</li> </ol>
<b>1107</b>	<ol style="list-style-type: none"> <li>1. <b>Communications Cable</b></li> <li>2. System Board</li> </ol>
<b>1102</b> Card selected feedback error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>1103</b> Port fails register check.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. System Board</li> </ol>
<b>1106</b> Serial option cannot be turned off.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. System Board</li> </ol>
<b>1107</b>	<ol style="list-style-type: none"> <li>1. <b>Serial Device Cable</b></li> <li>2. System Board</li> </ol>
<b>1110</b> Register test failed.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. System Board</li> </ol>
<b>1116</b> Interrupt error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>1117</b> Failed baud rate test.	1. <b>Run Enhanced Diagnostics</b>
<b>1162</b> Serial port configuration error.	1. <b>Run Configuration</b> 2. Serial Adapter (if installed) 3. System Board
<b>11XX</b> Not listed above.	1. <b>System Board</b>
<b>1201</b>	1. <b>System Board</b> 2. Any Serial Device
<b>1202, 1206, 1208, 1209, 12XX</b>	1. <b>Dual Async Adapter/A</b> 2. System Board 3. Any Serial Device
<b>1207</b>	1. <b>Communications Cable</b> 2. Dual Async Adapter/A
<b>13XX</b>	1. <b>Game Adapter</b>
<b>1402</b> Printer not ready.	Information only
<b>1403</b> No paper error, or interrupt failure.	Information only
<b>1404</b> System board timeout failure.	1. <b>Run Enhanced Diagnostics</b>
<b>1405</b> Parallel adapter error.	1. <b>Run Enhanced Diagnostics</b>
<b>1406</b> Presence test error.	1. <b>Run Enhanced Diagnostics</b>
<b>14XX</b> Not listed above. Check printer before replacing system board.	1. <b>Printer</b> 2. System Board
<b>15XX</b>	1. <b>SDLC Adapter</b>
<b>1692</b> Boot sequence error.	1. <b>Run FDISK to ensure at least one active partition is set active.</b>
<b>16XX</b>	1. <b>36/38 Workstation Adapter</b>
<b>1762</b> Hard disk drive configuration error.	1. <b>Run Configuration (See "Setup Utility program" on page 41.)</b>
<b>1780</b> (Disk Drive 0) <b>1781</b> (Disk Drive 1) <b>1782</b> (Disk Drive 2) <b>1783</b> (Disk Drive 3)	1. <b>See "Power supply" on page 29.</b> 2. Hard Disk Drive 3. System Board 4. Riser card 5. Hard Disk Cable 6. Power Supply

POST Error Code	FRU/Action
<b>180X, 188X</b> PCI configuration or resource error.	<ol style="list-style-type: none"> <li>1. <b>Run Setup and verify PCI/ISA configuration settings.</b></li> <li>2. If necessary, set ISA adapters to "Not available" to allow PCI adapters to properly configure.</li> <li>3. Remove any suspect ISA adapters.</li> <li>4. Rerun diagnostics.</li> <li>5. PCI Adapter</li> </ol>
<b>1962</b> Boot sequence error.	<ol style="list-style-type: none"> <li>1. <b>Possible hard disk drive problem, see "Hard disk drive boot error" on page 41.</b></li> </ol>
<b>209X</b>	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. Diskette Cable</li> <li>3. 16-bit AT Fast SCSI Adapter</li> </ol>
<b>20XX</b> Not listed above	<ol style="list-style-type: none"> <li>1. <b>BSC Adapter</b></li> </ol>
<b>21XX</b>	<ol style="list-style-type: none"> <li>1. <b>SCSI Device</b></li> <li>2. 16-bit AT Fast SCSI Adapter</li> <li>3. Alternate BSC Adapter</li> </ol>
<b>2401, 2402</b> If screen colors change.	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> </ol>
<b>2401, 2402</b> If screen colors are OK.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Display</li> </ol>
<b>2409</b>	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> </ol>
<b>2410</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Display</li> </ol>
<b>2462</b> Video memory configuration error.	<ol style="list-style-type: none"> <li>1. <b>Check cable connections.</b></li> <li>2. Run Setup and verify video configuration settings.</li> <li>3. Video Memory Modules</li> <li>4. Video Adapter (if installed)</li> <li>5. System Board</li> </ol>
<b>3015, 3040</b> Check for missing wrap or terminator plug on the adapter.	<ol style="list-style-type: none"> <li>1. <b>Network Attached?</b></li> <li>2. LF Translator</li> <li>3. Cable Problem</li> <li>4. PC Network Adapter</li> </ol>
<b>30XX</b>	<ol style="list-style-type: none"> <li>1. <b>PC Network Adapter</b></li> <li>2. LF Translator</li> <li>3. Cable Problem?</li> </ol>

POST Error Code	FRU/Action
3115, 3140	<ol style="list-style-type: none"> <li>1. <b>Network Attached?</b></li> <li>2. LF Translator</li> <li>3. Alternate PC Network-Adapter</li> <li>4. Cable Problem</li> </ol>
31XX	<ol style="list-style-type: none"> <li>1. <b>Alternate PC Network Adapter</b></li> <li>2. LF Translator</li> <li>3. Cable Problem</li> </ol>
36XX	<ol style="list-style-type: none"> <li>1. <b>GPIB Adapter</b></li> </ol>
38XX	<ol style="list-style-type: none"> <li>1. <b>DAC Adapter</b></li> </ol>
4611, 4630	<ol style="list-style-type: none"> <li>1. <b>Multiport/2 Interface Board</b></li> <li>2. Multiport/2 Adapter</li> </ol>
4612, 4613 4640, 4641	<ol style="list-style-type: none"> <li>1. <b>Memory Module Package</b></li> <li>2. Multiport/2 Adapter</li> </ol>
4650	<ol style="list-style-type: none"> <li>1. <b>Multiport/2 Interface Cable</b></li> </ol>
46XX Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Multiport/2 Adapter</b></li> <li>2. Multiport/2 Interface Board</li> <li>3. Memory Module</li> </ol>
5600	<ol style="list-style-type: none"> <li>1. <b>Financial System Controller Adapter</b></li> </ol>
5962 An IDE device (other than hard drive) configuration error.	<ol style="list-style-type: none"> <li>1. <b>Run Configuration</b></li> <li>2. CD-ROM Drive</li> <li>3. CD-ROM Adapter</li> <li>4. ZIP or other ATAPI device</li> <li>5. System Board</li> <li>6. Riser card</li> </ol>
62XX	<ol style="list-style-type: none"> <li>1. <b>1st Store Loop Adapter</b></li> <li>2. Adapter Cable</li> </ol>
63XX	<ol style="list-style-type: none"> <li>1. <b>2nd Store Loop Adapter</b></li> <li>2. Adapter Cable</li> </ol>
64XX	<ol style="list-style-type: none"> <li>1. <b>Network Adapter</b></li> </ol>
71XX	<ol style="list-style-type: none"> <li>1. <b>Voice Adapter</b></li> </ol>
74XX	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> </ol>
76XX	<ol style="list-style-type: none"> <li>1. <b>Page Printer Adapter</b></li> </ol>
78XX	<ol style="list-style-type: none"> <li>1. <b>High Speed Adapter</b></li> </ol>
79XX	<ol style="list-style-type: none"> <li>1. <b>3117 Adapter</b></li> </ol>
80XX	<ol style="list-style-type: none"> <li>1. <b>PCMCIA Adapter</b></li> </ol>
84XX	<ol style="list-style-type: none"> <li>1. <b>Speech Adapter</b></li> <li>2. Speech Control Assy.</li> </ol>

POST Error Code	FRU/Action
8601, 8602	<ol style="list-style-type: none"> <li>1. <b>Pointing Device</b> (Mouse)</li> <li>2. System Board</li> </ol>
8603, 8604	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Pointing Device (Mouse)</li> </ol>
86XX Not listed above	<ol style="list-style-type: none"> <li>1. <b>Mouse</b></li> <li>2. System Board</li> </ol>
89XX	<ol style="list-style-type: none"> <li>1. <b>PC Music Adapter</b></li> <li>2. MIDI Adapter Unit</li> </ol>
91XX	<ol style="list-style-type: none"> <li>1. <b>Optical Drive</b></li> <li>2. Adapter</li> </ol>
96XX	<ol style="list-style-type: none"> <li>1. <b>SCSI Adapter</b></li> <li>2. Any SCSI Device</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
10101, 10102, 10104 10105, 10106, 10107 10108, 10109, 10111 10112, 10113, 10114 10115, 10116	<ol style="list-style-type: none"> <li>1. <b>Have customer verify correct operating system device drivers are installed and operational.</b></li> <li>2. Modem</li> </ol>
10103, 10110, 101171	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Data/Fax Modem</li> <li>3. Riser card</li> </ol>
10117 Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Check system speaker</b></li> <li>2. Check PSTN cable</li> <li>3. External DAA (if installed)</li> <li>4. Modem</li> </ol>
10118	<ol style="list-style-type: none"> <li>1. <b>Run Diagnostics and verify the correct operation of the modem slot</b></li> <li>2. Modem</li> </ol>
10119	<ol style="list-style-type: none"> <li>1. <b>Diagnostics detected a non-IBM modem</b></li> <li>2. Modem</li> </ol>
10120	<ol style="list-style-type: none"> <li>1. <b>Check PSTN Cable</b></li> <li>2. External DAA (if installed)</li> <li>3. Modem</li> </ol>
10132, 10133, 10134 10135, 10136, 10137 10138, 10139, 10140 10141, 10142, 10143 10144, 10145, 10146 10147, 10148, 10149 10150, 10151, 10152	<ol style="list-style-type: none"> <li>1. <b>Modem</b></li> </ol>
10153	<ol style="list-style-type: none"> <li>1. <b>Data/Fax Modem</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>101XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Modem Adapter/A</b></li> <li>2. Data/Fax Modem</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>10450, 10451, 10490</b> <b>10491, 10492, 10499</b> Read/write error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. Hard Disk Drive</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>10452</b> Seek test error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10453</b> Wrong drive type?	Information only
<b>10454</b> Sector buffer test error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10455, 10456</b> Controller error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10459</b> Drive diagnostic command error.	Information only
<b>10461</b> Drive format error	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10462</b> Controller seek error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10464</b> Hard Drive read error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10467</b> Drive non fatal seek error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10468</b> Drive fatal seek error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10469</b> Drive soft error count exceeded.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10470, 10471, 10472</b> Controller wrap error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10473</b> Corrupt data. Low level format might be required.	Information only
<b>10480</b>	<ol style="list-style-type: none"> <li>1. <b>Hard Disk Drive (ESDI)</b></li> <li>2. Drive Cable</li> <li>3. System Board</li> </ol>
<b>10481</b> ESDI drive D seek error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10482</b> Drive select acknowledgement bad.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>106X1</b>	<ol style="list-style-type: none"> <li>1. <b>Check Configuration</b></li> <li>2. Ethernet Adapter</li> </ol>

POST Error Code	FRU/Action
<b>10635</b>	<ol style="list-style-type: none"> <li>1. <b>Power-off computer, wait ten seconds; then power-on the computer.</b></li> <li>2. Ethernet Adapter</li> </ol>
<b>10651, 10660</b>	<ol style="list-style-type: none"> <li>1. <b>Check Cables</b></li> <li>2. Ethernet Adapter</li> </ol>
<b>106XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Ethernet Adapter</b></li> </ol>
<b>107XX</b>	<ol style="list-style-type: none"> <li>1. <b>5.25-inch External Diskette Drive</b></li> <li>2. 5.25-inch Diskette Drive Adapter/A</li> </ol>
<b>109XX</b> Check the adapter cables.	<ol style="list-style-type: none"> <li>1. <b>ActionMedia Adapter/A</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
<b>112XX</b> This adapter does not have cache.	<ol style="list-style-type: none"> <li>1. <b>SCSI Adapter</b></li> <li>2. Any SCSI Device</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>119XX</b>	<ol style="list-style-type: none"> <li>1. <b>3119 Adapter</b></li> </ol>
<b>121XX</b>	<ol style="list-style-type: none"> <li>1. <b>Modem Adapter</b></li> <li>2. Any Serial Device</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>136XX</b>	<ol style="list-style-type: none"> <li>1. <b>ISDN Primary Rate Adapter</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
<b>137XX</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
<b>141XX</b>	<ol style="list-style-type: none"> <li>1. <b>Realtime Interface Coprocessor Portmaster™ Adapter/A</b></li> </ol>
<b>143XX</b>	<ol style="list-style-type: none"> <li>1. <b>Japanese Display Adapter</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
<b>14710, 14711</b>	<ol style="list-style-type: none"> <li>1. <b>System Board Video Adapter</b></li> <li>2. Adapter Video Memory</li> </ol>
<b>148XX</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b></li> </ol>
<b>14901, 14902</b> <b>1491X, 14922</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> <li>3. Riser card</li> <li>4. Display (any type)</li> </ol>
<b>14932</b>	<ol style="list-style-type: none"> <li>1. <b>External Display</b></li> <li>2. Video Adapter</li> </ol>

POST Error Code	FRU/Action
161XX	1. <b>FaxConcentrator™ Adapter</b>
164XX	1. <b>120 MB Internal Tape Drive</b> 2. Diskette Cable 3. System Board 4. Riser card
16500	1. <b>6157 Tape Attachment Adapter</b>
16520, 16540	1. <b>6157 Streaming Tape Drive</b> 2. 6157 Tape Attachment Adapter
166XX, 167XX	1. <b>Token Ring Adapter</b> 2. System Board 3. Riser card
18001 to 18029	1. <b>Wizard Adapter</b> 2. Wizard Adapter Memory
18031 to 18039	1. <b>Wizard Adapter Cable</b>
185XXX	1. <b>DBCS Japanese Display Adapter/A</b> 2. System Board 3. Riser card
20001 to 20003	1. <b>Image Adapter/A Image-I Adapter/A</b> 2. Memory Module DRAM, VRAM
20004	1. <b>Memory Module DRAM, VRAM</b> 2. Image Adapter/A Image-I Adapter/A
20005 to 20010	1. <b>Image Adapter/A Image-I Adapter/A</b> 2. Memory Module DRAM, VRAM
200XX Not listed above.	1. <b>Image Adapter/A Image-I Adapter/A</b> 2. Memory Module DRAM, VRAM 3. System Board 4. Riser card
20101 to 20103	1. <b>Printer/Scanner Option</b> 2. Image Adapter/A 3. Memory Module DRAM, VRAM
20104	1. <b>Memory Module DRAM, VRAM</b> 2. Printer/Scanner Option 3. Image Adapter/A

POST Error Code	FRU/Action
20105 to 20110	<ol style="list-style-type: none"> <li>1. <b>Printer/Scanner Option</b></li> <li>2. Image Adapter/A</li> <li>3. Memory Module DRAM, VRAM</li> </ol>
Image Adapter/A Memory Test failure indicated by graphic of adapter.	<ol style="list-style-type: none"> <li>1. <b>Replace memory module (shown in graphic.)</b></li> </ol>
206XX	<ol style="list-style-type: none"> <li>1. <b>SCSI-2 Adapter</b></li> <li>2. Any SCSI Device</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
208XX Verify there are no duplicate SCSI ID settings on the same bus.	<ol style="list-style-type: none"> <li>1. <b>Any SCSI Device</b></li> </ol>
210XXX1 External bus, size unknown.	<ol style="list-style-type: none"> <li>1. <b>SCSI Hard Disk Drive</b></li> <li>2. SCSI Adapter</li> <li>3. SCSI Cable</li> <li>4. SCSI ID Switch (on some models)</li> </ol>
Tape Drive amber LED remains on.	<ol style="list-style-type: none"> <li>1. <b>Tape Drive</b></li> <li>2. SCSI Cable (internal)</li> <li>3. SCSI Adapter</li> </ol>
Tape Drive green "in use" LED fails to come on.	<ol style="list-style-type: none"> <li>1. <b>Tape Drive</b></li> <li>2. SCSI Adapter</li> <li>3. SCSI Cable (internal) SCSI Cable (external)</li> </ol>
Tape automatically ejected from drive.	<ol style="list-style-type: none"> <li>1. <b>Tape Cassette</b></li> <li>2. Drive</li> </ol>
SCSI ID on rotary switch does not match SCSI ID set in configuration. Verify drive switches inside cover are set to zero.	<ol style="list-style-type: none"> <li>1. <b>Rotary Switch Circuit Board</b></li> <li>2. Circuit Board Cable</li> <li>3. Tape Drive</li> </ol>
Tape sticks/breaks in drive. Verify that the tapes used meet ANSI standard X3B5.	<ol style="list-style-type: none"> <li>1. <b>Tape Cassette</b></li> </ol>
212XX	<ol style="list-style-type: none"> <li>1. <b>SCSI Printer</b></li> <li>2. Printer Cable</li> </ol>
213XX	<ol style="list-style-type: none"> <li>1. <b>SCSI Processor</b></li> </ol>
214XX	<ol style="list-style-type: none"> <li>1. <b>WORM Drive</b></li> </ol>
215XXXC 215XXXD 215XXXE 215XX XU If an external device, and power-on LED is off, check external voltages.	<ol style="list-style-type: none"> <li>1. <b>CD-ROM Drive I CD-ROM Drive II Enhanced CD-ROM Drive II Any CD-ROM Drive</b></li> <li>2. SCSI Cable</li> <li>3. SCSI Adapter</li> </ol>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>216XX</b>	1. <b>Scanner</b>
<b>217XX</b> If an external device, and power-on LED is off, check external voltages.	1. <b>Rewritable Optical Drive</b> 2. SCSI Adapter 3. SCSI Cable
<b>218XX</b> Check for multi CD tray, or juke box.	1. <b>Changer</b>
<b>219XX</b>	1. <b>SCSI Communications Device</b>
<b>24201Y0, 24210Y0</b> Be sure wrap plug is attached.	1. <b>ISDN/2 Adapter</b> 2. ISDN/2 Wrap Plug 3. ISDN/2 Communications Cable
<b>273XX</b>	1. <b>1 Mbps Micro Channel Infrared LAN Adapter</b>
<b>27501, 27503</b> <b>27506, 27507</b>	1. <b>ServerGuard Adapter</b> 2. System Board 3. Riser card
<b>27502, 27504, 27510</b> <b>27511, 27533, 27534</b> <b>27536, 27537</b>	1. <b>ServerGuard Adapter</b>
<b>27509</b>	1. <b>Remove redundant adapters, run Auto Configuration program, then retest.</b>
<b>27512</b>	1. <b>WMSELF.DGS diagnostics file missing.</b> 2. WMSELF.DGS diagnostics file incorrect.
<b>27535</b>	1. <b>3V Lithium Backup Battery</b> 2. ServerGuard Adapter
<b>27554</b>	1. <b>Internal Temperature out of range</b> 2. ServerGuard Adapter
<b>27555, 27556</b>	1. <b>ServerGuard Adapter</b> 2. Power Supply
<b>27557</b>	1. <b>7.2V NiCad Main Battery Pack</b> 2. ServerGuard Adapter
<b>27558, 27559</b> <b>27560, 27561</b>	1. <b>PCMCIA Type II Modem</b> 2. ServerGuard Adapter

POST Error Code	FRU/Action
27562	<ol style="list-style-type: none"> <li>1. <b>External Power Control not connected</b></li> <li>2. External Power Control</li> <li>3. ServerGuard Adapter</li> </ol>
27563, 27564	<ol style="list-style-type: none"> <li>1. <b>External Power Control</b></li> <li>2. ServerGuard Adapter</li> </ol>
275XX	<ol style="list-style-type: none"> <li>1. <b>Update Diagnostic Software</b></li> </ol>
27801 to 27879	<ol style="list-style-type: none"> <li>1. <b>Personal Dictation System Adapter</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
27880 to 27889	<ol style="list-style-type: none"> <li>1. <b>External FRU</b> (Speaker, Microphone)</li> </ol>
I999030X Hard disk reset failure.	<p><b>Possible hard disk drive problem, see “Hard disk drive boot error” on page 41.</b></p>

## Miscellaneous error messages

Message/Symptom	FRU/Action
CMOS Backup Battery inaccurate.	<ol style="list-style-type: none"> <li>1. <b>CMOS Backup Battery</b> See page "Safety information" on page 332.</li> <li>2. System Board</li> </ol>
Changing colors.	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> </ol>
Computer will <b>not</b> power-off. See "Power supply" on page 29.	<ol style="list-style-type: none"> <li>1. <b>Power Switch</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
Computer will <b>not</b> RPL from server	<ol style="list-style-type: none"> <li>1. <b>Ensure Network is in startup sequence as first device or first device after diskette.</b></li> <li>2. Ensure Network adapter is enabled for RPL.</li> <li>3. Network adapter (Advise network administrator of new MAC address)</li> </ol>
Computer will <b>not</b> Wake On LAN <sup>™</sup>	<ol style="list-style-type: none"> <li>1. <b>Check power supply and signal cable connections to network adapter.</b></li> <li>2. Ensure Wake On LAN feature is enabled in Setup/Configuration. See "Setup Utility program" on page 41.</li> <li>3. Ensure network administrator is using correct MAC address.</li> <li>4. Ensure no interrupt or I/O address conflicts.</li> <li>5. Network adapter (Advise network administrator of new MAC address)</li> </ol>
Dead computer. See "Power supply" on page 29.	<ol style="list-style-type: none"> <li>1. <b>Power Switch</b></li> <li>2. Power Supply</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
Diskette drive in-use light remains on or does not light when drive is active.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> <li>4. Riser card</li> </ol>
Flashing cursor with an otherwise blank display.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Primary Hard Disk Drive</li> <li>3. Hard Disk Drive Cable</li> <li>4. Riser card</li> </ol>

Message/Symptom	FRU/Action
Incorrect memory size during POST.	<ol style="list-style-type: none"> <li>1. <b>Run the Memory tests.</b></li> <li>2. Memory Module</li> <li>3. System Board</li> </ol>
"Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> <li>4. Riser card</li> <li>5. Network Adapter</li> </ol>
Intensity or color varies from left to right of characters and color bars.	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> <li>2. System Board</li> </ol>
No power, or fan not running.	<ol style="list-style-type: none"> <li>1. <b>See "Power supply" on page 29.</b></li> </ol>
Non-system disk or disk error-type message with a known-good diagnostic diskette.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> <li>4. Riser card</li> </ol>
Other display symptoms not listed above (including blank or illegible display).	<ol style="list-style-type: none"> <li>1. <b>See "Display" on page 31.</b></li> <li>2. System Board</li> <li>3. Display</li> </ol>
Power-on indicator or hard disk drive in-use light not on, but computer works correctly.	<ol style="list-style-type: none"> <li>1. <b>Power Supply</b></li> <li>2. System Board</li> <li>3. LED Cables</li> </ol>
Printer problems.	<ol style="list-style-type: none"> <li>1. <b>See "Printer" on page 28.</b></li> </ol>
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Diskette Drive</li> <li>3. Diskette Drive Cable</li> <li>4. System Board</li> <li>5. Riser card</li> <li>6. Power Supply</li> </ol>
RPL computer cannot access programs from its own hard disk.	<ol style="list-style-type: none"> <li>1. <b>If network admin. is using LCCM Hybrid RPL, check startup sequence: First device: network; Second device: hard disk</b></li> <li>2. Hard disk drive</li> </ol>
RPL computer does not RPL from server.	<ol style="list-style-type: none"> <li>1. <b>Check startup sequence</b></li> <li>2. Check the network adapter LED status</li> </ol>
Serial or parallel port device failure (system board port).	<ol style="list-style-type: none"> <li>1. <b>External Device Self-Test OK?</b></li> <li>2. External Device</li> <li>3. Cable</li> <li>4. System Board</li> </ol>

Message/Symptom	FRU/Action
Serial or parallel port device failure (adapter port).	<ol style="list-style-type: none"> <li>1. <b>External Device Self-Test OK?</b></li> <li>2. External Device</li> <li>3. Cable</li> <li>4. Alternate Adapter</li> <li>5. System Board</li> <li>6. Riser Card</li> </ol>
Some or all keys on the keyboard do not work.	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>

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## Undetermined problem

Check the power supply voltages. See "Power supply" on page 29. If the voltages are correct, return here and continue with the following steps.

1. Power-off the computer.
2. Remove or disconnect the following, if installed, 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 59.
  - 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 47.

## Model tables - Country/Region/Language

Use this table to identify the country/region/language of the specific Models that are listed in the Type/Model configuration tables section.

In most cases, country or language designation will be identified by the last digit of the model number. Some models might be listed twice, as X and (J), for Country/Language identification. (J) is for Japan only.

*Table 1. Country/Region/Language Model Definition.*

<b>EMEA</b>	<b>Model</b>
EMEA preload	xx <b>G</b>
<b>North America</b>	<b>Model</b>
US English	xx <b>U</b>
Canadian French	xx <b>F</b>
<b>Latin America (LA)</b>	<b>Model</b>
Portuguese (Brazil)	xx <b>P</b>
LA Spanish	xx <b>S</b>
LA English	xx <b>L</b>
<b>Asia Pacific (AP)</b>	<b>Model</b>
AP English w/Keyboard	xx <b>A</b>
AP English w/o Keyboard	xx <b>B</b>
Japan (Japanese)	xx <b>J</b>
Hong Kong (AP English)	xx <b>H</b>
China (Chinese)	xx <b>C</b>
China (AP English)	xx <b>D</b>
Thailand (Thai)	xx <b>T</b>
Taiwan (Chinese)	xx <b>V</b>
Taiwan (AP English)	xx <b>W</b>
Korea (Korean)	xx <b>K</b>
Korea (AP English)	xx <b>R</b>

## Type/Model configuration tables (6584/6594)

### 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 than 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 10X and 24X.
  - For 32X Max CD-ROM drives, the disk hub and disk edge speeds are 14X and 32X.
  - For 40X Max CD-ROM drives, the disk hub and disk edge speeds are 17X and 40X.
  - For 48X Max CD-ROM drives, the disk hub and disk edge speeds are 20X and 48X.

Table	Page
PC 300 Type 6584	107
PC 300 Type 6594	110

Table 2 (Page 1 of 3): PC 300 Type 6584 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
80X - Open Bay	600EB MHz	N/A	N/A	N/A	4X5	N/A	N/A
82X	600EB MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	4X5	48X Max	Windows 98
83X	600EB MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	4X5	48X Max	Windows NT
90X - Open Bay	667 MHz	N/A	N/A	N/A	4X5	N/A	N/A
94X	667 MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	4X5	48X Max	Windows 98
95X	667 MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	4X5	48X Max	Windows NT
A1X	733 MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	4X5	48X Max	Windows 98
A2X	733 MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	4X5	48X Max	Windows NT
A3X	800 MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	4X5 GM	48X Max	Windows NT
A4X	800 MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	4X5 GM	48X Max	Windows 98

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 105.
3. Processor = Pentium® III
4. Memory = RAMBUS RIMM
5. Audio = integrated on system board.
6. Models 82X, 83X, 94X, 95X, A1X, A2X come with Ethernet, Alert On LAN 2 card.
7. Open Bay = Authorized Assembler Program. See the note on page 106

Table 2 (Page 2 of 3): PC 300 Type 6584 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
A5X	800 MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	4X5	48X Max	Windows 2000
A6X	800 MHz	128 MB RIMM	10.1 GB EIDE	SR9 2X - 8 MB	4X5	N/A	Windows 98
A7X	800 MHz	128 MB RIMM	10.1 GB EIDE	SR9 2X - 8 MB	4X5	N/A	Windows NT
A8X	800 MHz	128 MB RIMM	10.1 GB EIDE	SR9 2X - 8 MB	4X5 ISA riser	N/A	Windows 98
A9X	800 MHz	128 MB RIMM	10.1 GB EIDE	SR9 2X - 8 MB	4X5 ISA riser	N/A	Windows NT
B2X	733 MHz	128 MB RIMM	10.1 GB EIDE	SR9 2X - 8 MB	4X5	N/A	Windows 2000
B3X	733 MHz	128 MB RIMM	10.1 GB EIDE	SR9 2X - 8 MB	4X5	N/A	Windows 98
B4X	733 MHz	128 MB RIMM	10.1 GB EIDE	SR9 2X - 8 MB	4X5 ISA riser	N/A	Windows 98
B5X	733 MHz	128 MB RIMM	10.1 GB EIDE	SR9 2X - 8 MB	4X5 ISA riser	N/A	Windows NT
B6X	733 MHz	128 MB RIMM	10.1 GB EIDE	SR9 2X - 8 MB	4X5	N/A	Windows NT

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 105.
3. Processor = Pentium® III
4. Memory = RAMBUS RIMM
5. Audio = integrated on system board.
6. Models 82X, 83X, 94X, 95X, A1X, A2X come with Ethernet, Alert On LAN 2 card.
7. Open Bay = Authorized Assembler Program. See the note on page 106

Table 2 (Page 3 of 3): PC 300 Type 6584 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
C1X	733 MHz	N/A	N/A	N/A	4X5	N/A	N/A
C2X	800 MHz	N/A	N/A	N/A	4X5	N/A	N/A
C3X	733 MHz	N/A	N/A	N/A	4X5 ISA riser	N/A	N/A
C4X	800 MHz	N/A	N/A	N/A	4X5 ISA riser	N/A	N/A

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 105.
3. Processor = Pentium® III
4. Memory = RAMBUS RIMM
5. Audio = integrated on system board.
6. Models 82X, 83X, 94X, 95X, A1X, A2X come with Ethernet, Alert On LAN 2 card.
7. Open Bay = Authorized Assembler Program. See the note on page 106

Table 3 (Page 1 of 2): PC 300 Type 6594 - Microtower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
80X - Open Bay	600EB MHz	N/A	N/A	N/A	6X7	N/A	N/A
82X	600EB MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	6X7	48X Max	Windows NT
90X - Open Bay	667 MHz	N/A	N/A	N/A	6X7	N/A	N/A
92X	667 MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	6X7	48X Max	Windows NT
A3X	800 MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	6X7	48X Max	Windows NT
B1X	733 MHz	128 MB RIMM	20.4 GB EIDE	SR9 4X - 16 MB	6X7	48X Max	Windows NT
C1X	733 MHz	N/A	N/A	N/A	6X7	N/A	N/A
C2X	800 MHz	N/A	N/A	N/A	6X7	N/A	N/A
E1(J)	667 MHz	128 MB RIMM	13.5 GB EIDE	S3 AGP2 - 8 MB	6X7	48X Max	Windows 98
E2(U)	667 MHz	128 MB RIMM	13.5 GB EIDE	S3 AGP2 - 8 MB	6X7	48X Max	Windows NT

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 105.
3. Processor = Pentium® III
4. Memory = RAMBUS RIMM
5. Audio = integrated on system board.
6. All models come with Ethernet, Alert On LAN 2 card except Open Bay Models.
7. Open Bay = Authorized Assembler Program. See the note on page 106

Table 3 (Page 2 of 2): PC 300 Type 6594 - Microtower

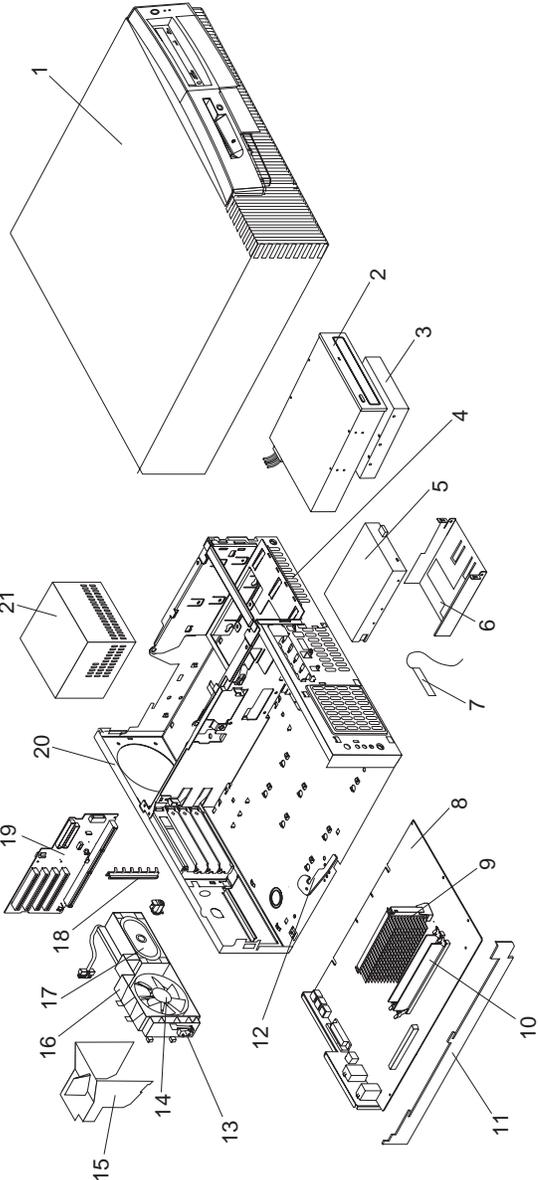
Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
E5X(J)	800 MHz	128 MB RIMM	20.4 GB EIDE	SR9 2X - 8 MB	6X7	48X Max	Windows 98
E6X(J)	800 MHz	128 MB RIMM	20.4 GB EIDE	SR9 2X - 8 MB	6X7	48X Max	Windows NT
E7X(J)	800 MHz	128 MB RIMM	20.4 GB EIDE	SR9 2X - 8 MB	6X7	48X Max	Windows 2000

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 105.
3. Processor = Pentium® III
4. Memory = RAMEBUS RIMM
5. Audio = integrated on system board.
6. All models come with Ethernet, Alert On LAN 2 card except Open Bay Models.
7. Open Bay = Authorized Assembler Program. See the note on page 106

**Notes:**

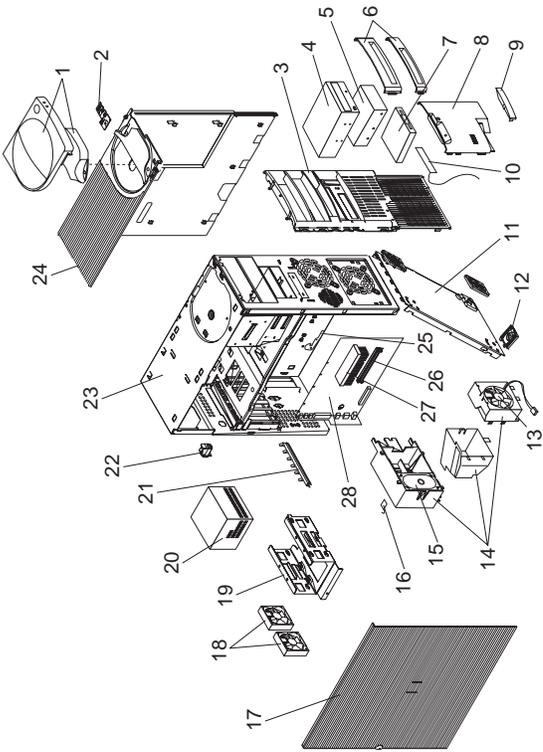
Parts (Type 6584)



## Parts listing

Index	System (Type 6584)	FRU No.
1	Top and Front Cover Assembly	01K6030
2	CD-ROM (48X Max)	09N0735
3	9.1 GB SCSI 7200RPM Hard Disk Drive	36L8648
3	10.1 GB EIDE Hard Disk Drive	37L5717
3	20.4 GB EIDE Hard Disk Drive	36L8628
4	Hard drive Cage Latch Kit	33L2606
5	1.44 MB, 3.5-Inch Diskette Drive	75H9550
5	1.44 MB, 3.5-Inch Diskette Drive (Japan)	75H9552
6	3.5" Diskette Bracket	33L2599
7	RFID Antenna	03K9654
8	System Board (no processor, no memory)	01K2119
9	Pentium III Processor 600/133 MHz.	37L6034
9	Pentium III Processor 677/133 MHz.	00N3622
9	Pentium III Processor 733/133 MHz.	00N7174
9	Pentium III Processor 800/133 MHz.	09N9097
10	Memory - 128 MB PC700 Memory RIMM, Non-ECC	33L3102
10	Memory Continuity Card (C-RIMM)	00N5223
11	Side Bracket	03K9662
12	Latch, system board	03K9665
13	C2 Switch Assembly	33L2603
14	Fan 92mm with grommets	33L2594
15	Air Baffle	33L2593
16	Fan Bracket	33L2601
17	Speaker/Cable Assembly	37L5554
18	I/O Bracket	03K9622
19	Riser Card (PCI only)	28L4926
19	Riser Card (PCI/ISA)	37L1531
20	Chassis Assembly with latch	33L2602
21	Power Supply-145W	36L8841
21	Power Supply-145W (China)	36L8836
21	Power Supply-145W (Japan)	36L8843
	Bezel Kit	03K9663
	Cable - CD-ROM, IDE (1 drop)	33L2597
	Cable - Diskette Drive	33L2596
	Cable - Hard Disk, IDE	19K7616
	Cable - Wake On Ring	76H7345
	DASD EMC Shield Kit	33L2600
	Ethernet Adapter - Lake Clark 2.4	34L1109
	Foot (4)	33L2592
	Hard Drive Rails (Qty 2)	01K1539
	Keylock Assembly	02K1428
	LED/Power Switch Cable Assembly	20L3021
	Lithium Battery	33F8354
	Miscellaneous Hardware Kit	33L2605
	Mouse - Scrollpoint 2	28L1865
	Name Plate (6584)	03K9664
	RM Retainer Kit	33L4321
	Savage 2 Video Card - 100 2xAGP	00N5237
	Savage 2 Video Card - 143 4xAGP	19K4812
	Savage 2 Video Card-4xAGP Dongle	37L5566
	SCSI Signal Cable Assembly	33L2735
	System Board Rails	03K9626

**Parts (Type 6594)**



## Parts listing

Index	System (Type 6594)	FRU No.
1	Handle Assembly	33L2555
2	Power Switch/LED Cable Assembly	12J4510
3	Front Bezel	12J4495
4	CD-ROM (48X Max)	09N0735
5	13.5 GB EIDE Hard Disk Drive	36L8689
5	20.4 GB EIDE Hard Disk Drive	36L8628
6	Louver Blank Bezels	01K1889
7	1.44 MB, 3.5-Inch Diskette Drive	75H9550
7	1.44 MB, 3.5-Inch Diskette Drive (Japan)	75H9552
8	3.5" Front Panel	01K1854
9	Model Plate	12J4499
10	RFID Antenna	03K9654
11	Bottom Cover Assembly	33L2560
12	Foot (4)	12J6294
13	92MM Fan Assembly with isolators	33L2594
14	Card Guide, Fan Holder, Air Duct	33L2557
15	Speaker with Cable Assembly	03K9607
16	C2 Switch Cable Assembly	01K1495
17	Access Cover Assembly	33L2556
18	60MM Fan Assembly	00N5194
19	Hard Disk Bracket	33L2558
20	Power Supply-200W	75H8991
20	Power Supply-200W (Japan)	76H4873
21	I/O Clamp	33L2562
22	Keylock Assembly	12J5102
23	Chassis Assembly	33L2559
24	Top Cover	12J4509
25	Latch and screw, system board	01K1612
26	Memory - 128 MB PC700 Memory RIMM, Non-ECC	33L3102
26	Memory - 128 MB PC700 Memory RIMM, ECC	33L3108
26	Memory Continuity Card (C-RIMM)	00N5223
27	Pentium III Processor 600/133 MHz.	37L6034
27	Pentium III Processor 667/133 MHz.	00N3622
27	Pentium III Processor 733/133 MHz.	00N7174
27	Pentium III Processor 800/133 MHz.	09N9097
28	System Board (no processor, no memory)	01K2119
28	System Board (no processor, no memory 256 Bit Lock)	09N5934
	AGP Card Blank Bracket	03K9623
	Cable - CD-ROM Audio	75H9219
	Cable - Secondary CD-ROM, IDE	12J4518
	Cable - Diskette Drive	76H7340
	Cable - Hard Disk, IDE	33L2564
	Cable - Wake On Ring	76H7345
	Cable - SCSI LVD 5 Drop	37L5558
	Cable - SCSI LED	76H7344
	Ethernet Adapter - Lake Clark 2.4	34L1109
	Lithium Battery	33F8354

Index	System (Type 6594)	FRU No.
	Miscellaneous Hardware Kit	33L2561
	includes:	
	(2)M4X12 Screw, carrying handle	
	(6)I/O blanks	
	(4)M3.5X0.6 screw, thread forming	
	(4)M3.0X0.5 screw, thread forming	
	(12)Rubber isolating grommets	
	(12)6-32 screw, hard drive shoulder	
	Misc. Optional Bezels	09N5871
	Mouse - Scrollpoint 2	28L1865
	Rail, system board	03K9626
	Riser Card PCI only	37L1522
	Riser Card PCI/ISA	37L1531
	Riser Supports, front and rear	02K2766
	RM Retainer Kit	33L4321
	Savage Video Card - 100 2xAGP	00N5237
	Savage Video Card - 143 4xAGP	19K4812
	Savage Video Card 4xAGP Dongle	37L5566
	SCSI Adapter	10L7122

**Keyboards - PCNext Lite (PC 300 Type 6584/6594)**

Arabic	37L2518
Belgian-French	37L2519
Belgian-UK	37L2520
Brazil/Portugal	28L1826
Bulgarian	37L2521
Chinese	37L2548
Czech	37L2522
Danish	37L2523
Dutch	37L2524
French	37L2525
French/Canadian-ID 058	37L0912
French/Canadian-ID 445	37L2515
German	37L2526
Greek	37L2527
Hebrew	37L2528
Hungarian	37L2529
Italian	37L2531
Korean	28L1860
Japanese	28L1858
Latin/Spanish	37L2516
Norwegian	37L2532
Polish	37L2533
Portuguese	37L2534
Romania	37L2535
Russian	37L2536
Serbian/Cyrillic	37L2537
Slovakian	37L2538
Spanish	37L2539
Swed/Finn	37L2540
Swiss French/German	37L2541
Thailand	37L2550
Turkish (ID 179)	37L2542
Turkish (ID 440)	37L2543
UK English	37L2544
US English	37L2514
UK English (ISO Compliant)	37L2546
Yugoslavian	37L2545

## Computer Power Cords

Arabic Countries	14F0033
Argentina	36L8880
Australia	93F2365
Belgium	1339520
Bulgaria	1339520
Canada	93F2364
Chile	14F0069
China (Aptiva 2173)	02K0545
Czechoslovakia	1339520
Denmark	13F9997
Finland	1339520
France	1339520
Germany	1339520
Hungary	1339520
Israel	14F0087
Italy	14F0069
Latin-America	6952301
Netherlands	1339520
New Zealand	93F2365
Norway	1339520
Paraguay	36L8880
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
Uruguay	36L8880
Yugoslavia	1339520

## Display and Monitor Information

Display and monitor information is separately available and is listed under "Related publications" on page vi.

## 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



---

## IntelliStation - 6866

This section contains the general checkout procedures, additional service information, computer exploded view, Symptom-to-FRU indexes, undetermined problem, model tables, and parts listings for the IBM IntelliStation, type 6866 computer.

### 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.

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## General checkout

This general checkout procedure is for Type 6866 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 "IBM PC Enhanced Diagnostics" on page 133.

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 151.
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 185.
4. If the computer hangs and no error is displayed, go to "Undetermined problem" on page 206.
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 140) then, enable **Enhanced POST**.

### 001

- Power-off the computer and all external devices.
- Check all cables and power cords.
- Make sure the system board is seated properly.
- Set all display controls to the middle position.

(Step **001** continues)

**001** (continued)

- Insert the IBM PC Enhanced Diagnostics diskette into drive A or CD into the CD drive.
- Power-on all external devices.
- Power-on the computer.
- Check for the following response:
  1. Readable instructions or the Main Menu.

**Note**

Type 6866 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

- Enable **Power on Status and Enhanced POST** in setup. See "Setup Utility program" on page 140.

**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 140)
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 "IBM PC Enhanced Diagnostics" on page 133.

**003**

Run the IBM PC Enhanced Diagnostics test. If necessary, refer to "Diagnostics and test information" on page 132.

- If you receive an error, replace the part that the diagnostic program calls out or go to "IBM PC Enhanced Diagnostics" on page 133.
- 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 128.

(Step **003** continues)

(CONTINUED)

**003** (continued)

- If the printer has incorrect responses, go to "Printer" on page 128.
  - If the display has problems such as jittering, rolling, shifting, or being out of focus, go to "Display" on page 131.
-

## 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 206 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 206.

## Keyboard

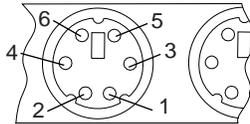
### Note

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  $\pm 5\%$ .

Pin	Voltage (Vdc)
1	+5.0
2	Reserved
3	Ground
4	+5.0
5	+5.0
6	Reserved



### 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. Check the following for proper installation. <ul style="list-style-type: none"><li>• Power Cord</li><li>• On/Off Switch connector</li><li>• System Board Power Supply connectors</li><li>• microprocessor(s) connection</li></ul>	<b>Reseat</b>
2. Check the power cord for proper continuity.	<b>Power Cord</b>
3. Check the power-on switch for continuity when pressed.	<b>Power-on Switch</b>

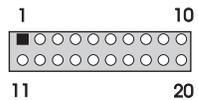
If the above are correct, check the following voltages.

## 20-pin main power supply connection

See "System board layout" on page 183 for connector location.

### Attention

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



Pin	Signal	Function
1	3.3 V	+3.3 V dc
2	3.3 V	+3.3 V dc
3	COM	Ground
4	5 V	+5 V dc
5	COM	Ground
6	5 V	+5 V dc
7	COM	Ground
8	POK	Power Good
9	5VSB	Standby Voltage
10	12 V	+12 V dc
11	3.3 V	+3.3 V dc
12	-12 V	-12 V dc
13	COM	Ground
14	PS-ON	DC Remote Enable
15	COM	Ground
16	COM	Ground
17	COM	Ground
18	-5 V	-5 V dc
19	5 V	+5 V dc
20	5 V	+5 V dc

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

## 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 206.

---

## 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
- IBM PC Enhanced Diagnostics

### 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.

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 6866 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

1. Enable **Power on Status** in setup. See "Setup Utility program" on page 140.

## 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 PC Enhanced Memory Diagnostics and the suite of diagnostic tests provided by PC-Doctor.

The IBM PC Enhanced Diagnostics are available on-line and can be downloaded from:

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

- Select **Support**
- Select **IntelliStation**
- Select **Brand/Product home page**
- Select **Downloadable Files**
- Select **Diagnostics**

This diagnostic diskette includes:

- A user interface (WaterGate Software's PC-Doctor)
  - This interface serves as the control program for running both the IBM PC Enhanced Memory Diagnostics and the suite of diagnostic tests provided by PC-Doctor.
- IBM PC Enhanced Memory Diagnostics
  - The memory diagnostic tests determine which RIMM pair is defective and report the sockets where the failing pair is located. The Memory diagnostics can run a quick and full test of the system.

### Note

Replace the RIMM pair one at a time to identify the failing RIMM in the pair.

### Note

See "IBM PC Enhanced Diagnostics" for the IBM PC Enhanced Diagnostics error codes.

## 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 PC 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."
3. From within a test category, press **Ctrl-Enter** to automatically run only the selected tests in that category. See "Test selection."
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 138.

## 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 PC Enhanced Memory Diagnostics

The IBM PC Enhanced Memory Diagnostics provide the capability to identify a particular RIMM pair that fails during testing. Use the System board memory section to reference the memory sockets, or select **F1 twice** to load

the Online Manual and select Chapter 11 'DIMM/RIMM Locator'.

**Note**

Replace the RIMM pair one at a time to identify the failing RIMM in the pair.

Follow the steps below to locate the IBM PC Enhanced 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 selected RIMM pair sockets.

Only pair sockets containing RIMMs can be selected for testing. C-RIMM sockets are noted by ..... besides the test description.

**Important**

If the failing RIMM pairs are not identified by the diagnostics, replace individual RIMM on the memory board one at a time until the diagnostics run with out error.

## Alert On LAN test

The Alert On LAN test does the following:

- Determines if Alert On LAN is supported on the system.
- Checks the revision ID register.
- Verifies the EEPROM checksum.
- Validates that a software alert can be sent.

## Asset ID test

The Asset ID test does the following:

- Determines if Asset ID is supported on the system.
- Verifies the EEPROM areas.
- Performs an antenna detection test.

## 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 RIMM, 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 "IBM PC Enhanced Diagnostics error codes" on page 1 for error code listings.

## Hard File SMART Test

Use the Hard File SMART Test when the system management tool has detected a hard file SMART alert.

The SMART Test does the following:

- Interrogates IDE devices for support of the SMART instruction set.
- Issues a ENABLE SMART command to make sure SMART functionality is active.
- Checks the SMART RETURN STATUS command to determine if any thresholds have been exceeded.

If thresholds have been exceeded, an error message is shown, and the test fails. If no SMART is supported by the drive, the test returns with N/A.

## IBM Fixed Disk Optimized Test

The IBM Fixed Disk Optimized Test provide the capability to identify particular areas of a hard file which fails during testing. This test also provide a method of correcting certain types of errors.

To select the Fixed Disk Optimized Test:

1. Select the diagnostic option on the toolbar and press Enter.
2. Select the Fixed Disk Optimized Test
3. Select Hard Drives - NORMAL TEST to run a complete hard file test.
4. Select Hard Drives - PRESENCE TEST to run a test to check the drive controller and report any SMART information that the drive has detected.

## 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 copies 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.

## Iomega Zip Drive Test

Use the Iomega Zip Drive Test to test the zip drive and the drive interface. The test takes about 20 seconds to run.

The default tests the following:

- Controller
- Max Seek (50 times)
- Random Seek (300 sectors)

## Asset EEPROM backup

When replacing a system board, this utility allows the backup of all Asset information from the EEPROM to diskette. This utility also restores data to the EEPROM from diskette after replacement of the system board.

To run this utility:

- Select **Utility**
- Select **Asset EEPROM Backup**
- follow instructions on screen.

## 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.

**RIMM memory errors:** SIMM/DIMM/RIMM error messages issued by the IBM PC Enhanced Diagnostics:

### Important

If the failing RIMM pairs are not identified by the diagnostics, replace individual RIMM on the memory board one at a time until the diagnostics run with out error.

Message	Failure Found	Recommended Actions
2xx-1y (for SIMMs)	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 (for DIMMs/RIMMs)	A memory error was detected in DIMM/RIMM pair socket Y	<p>Replace the DIMM/RIMM in the pair sockets identified by the last digit of the error code one at a time.</p> <p>Re-run the test.</p> <p>If the same error code occurs again, replace both of the RIMM pair.</p> <p>If the same error code occurs again, replace the memory board or where memory is on the processor card, replace the processor card.</p>
Corrupt BIOS	<p>Information in BIOS is not as expected.</p> <p>Not able to find expected DMI information from BIOS.</p> <p>Memory controller chipset vendor ID does not match expected value.</p>	<p>Reflash the BIOS.</p> <p>Perform boot block recovery.</p> <p>Replace the system board.</p>
Test aborted by user	User stopped test.	Restart test.
<p><b>Note:</b></p> <p>"Y" is the SIMM/DIMM/RIMM socket number. Use the System Board memory section to reference the memory sockets.</p>		

## 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:

- System Summary
- Product Data
- Devices and I/O Ports
- Start Options
- Date and Time
- System Security
- Advanced Setup
- ISA Legacy Resources
- Power Management

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.

## Hard disk drive boot error

A hard disk drive boot error (error code 1962 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.

Cause	Actions
The boot sector on the start-up drive is corrupted.	The drive must be formatted, do the following: <ol style="list-style-type: none"> <li>1. Attempt to access and recover (back-up) the failing hard disk drive.</li> <li>2. Using the operating systems programs, format the hard disk drive.</li> <li>3. Go to "Preparing the hard disk drive for use" on page 141.</li> </ol>
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 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.

---

## Product description

The IBM IntelliStation Type 6866 computer is available in 9x7, (nine drive bays, seven expansion slots) four 32-bit, two 64-bit PCI slots, and one AGP slot as a tower model only.

### Security features

- Cover lock and keys (located behind the CD-ROM cover door)
- Support for the addition of a U-bolt and lockable cable
- Power-on and administrator passwords
- Startup sequence control
- Startup without diskette drive, keyboard, or mouse
- Unattended start mode
- Diskette and hard disk I/O control
- Serial and parallel port I/O control
- Alert on LAN
- Security profile by device
- IBM Security Solutions

### 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 6866

Feature	Description
<b>Size</b>	Depth: 606 mm (23.9 inches) Height: 440 mm (17.3 inches) Width: 216 mm (8.5 inches)
<b>Weight</b>	Weight: 29.5 kg (65 lb) <sup>7</sup>
<b>Environment</b>	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 50°C (50° to 122°F)  Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 3048 m (10,000 ft)
<b>Heat Output</b>	Approximate heat output in BTUs per hour: - Minimum: 340 BTU (100 watts) - Maximum: 2385 BTU (700 watts) <sup>8</sup>
<b>Electrical Input</b>	Sine-wave input (47 to 63 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): 1.50 kVA
<b>Airflow</b>	Approximately 0.56 cubic meters/minute (20 CFM)
<b>Acoustical Noise Emission Values</b>	Average sound pressure levels: At operator position: - 41 dB operating - 34 dB idle At bystander position (1 meter): - 34 dB operating - 29 dB idle Declared (upper limit) sound power levels: - 5.3 bels operating - 4.7 bels idle

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

<sup>8</sup> Maximum power and heat specifications are based on the 490-watt maximum capacity of the system power supply.

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

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## Additional service information

The following additional service information supports the IBM IntelliStation type 6866 computer.

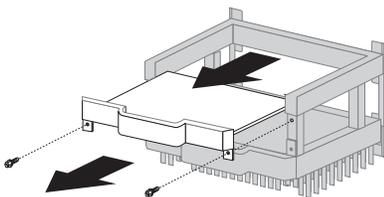
- “Replacing a processor/Installing a second microprocessor”
- “Replacing a system board” on page 146
- “Security features” on page 146
- “Passwords” on page 147
- “Vital Product Data” on page 148
- “Alert on LAN2” on page 148
- “Hard disk drive jumper settings” on page 149
- “CD-ROM drive jumper settings” on page 150
- “BIOS levels” on page 151
- “Flash (BIOS/VPD) update procedure” on page 152
- “Flash recovery boot block” on page 152
- “Power management” on page 153
- “Network settings” on page 155
- “Flash over LAN (update POST/BIOS over network)” on page 155
- “Wake on LAN” on page 156
- “System board memory” on page 157

## Replacing a processor/Installing a second microprocessor

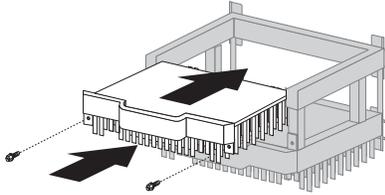
### Important

- Before installing a second microprocessor, run the Multiprocessor Upgrade Option program, provided on the *Software Selections CD*. For information about this utility, see addcpu.txt on the *Software Selections CD*.

1. Remove the cover and front bezel. See “Cover removal” on page 165
2. Loosen the two screws holding the terminator card or microprocessor. (see “System board layout” on page 183 ) and remove from the microprocessor socket.



3. Insert the new microprocessor into the guides. Push the microprocessor into the socket until it is properly seated.



4. Tighten the two screws.
5. To gain access to the second CPU voltage regulator module (VRM) socket on the system board, move aside all power supply cables as necessary.
6. Install the VRM supplied with the microprocessor.  
See "System board layout" on page 183 for the location of the second CPU VRM socket.

**Note**

If you add a second microprocessor that runs at a different speed than the primary microprocessor, both will run at the speed of the slower microprocessor.

## 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 151 "Vital Product Data" on page 148, and "Flash (BIOS/VPD) update procedure" on page 152.
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&:
  - a. Remove the processor from the old system board and install it on the new system board.
  - b. Refer to "System board layout" on page 183 to find the system board rocker switch.
  - c. Set switch 1 to the on position.
  - d. Power-on the computer. The system senses the change in the switch setting and resets to the default processor speed (266 MHz).
  - e. Power-off the computer and set switch 1 back to the off position.
  - f. Power-on the computer
    - 1) Select **Advanced Setup** from the Setup Utility Menu.
    - 2) Select **Processor Speed Control** from the Advanced Setup menu.
    - 3) Set the processor speed to match the speed of the installed processor.
4. If the new system board does not correct the problem, reinstall the old system board, then replace the processor.

## Security features

Security features in this section include:

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

## 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 140 for information about running the Setup Utility.

**Power-on password:** 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:

1. Unplug the power cord and remove the top cover.
2. Refer to "System board layout" on page 183 to find the system board rocker switch.
3. Set switch 3 to the on position.
4. Power-on the computer. The system senses the change in the switch setting and erases the password.
5. Set switch 3 back to the off position.
6. 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 6866 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.

**Administrator password control** The Administrator password is set in the Setup Configuration. Refer to "Setup Utility program" on page 140

**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 152.

### **Alert on LAN2**

Alert on LAN2 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 LAN2 helps to manage and monitor the hardware and software features of the computer. Alert on LAN2 generates notifications to the server of these occurrences:

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

Alert on LAN2 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.

## Hard disk drive jumper settings

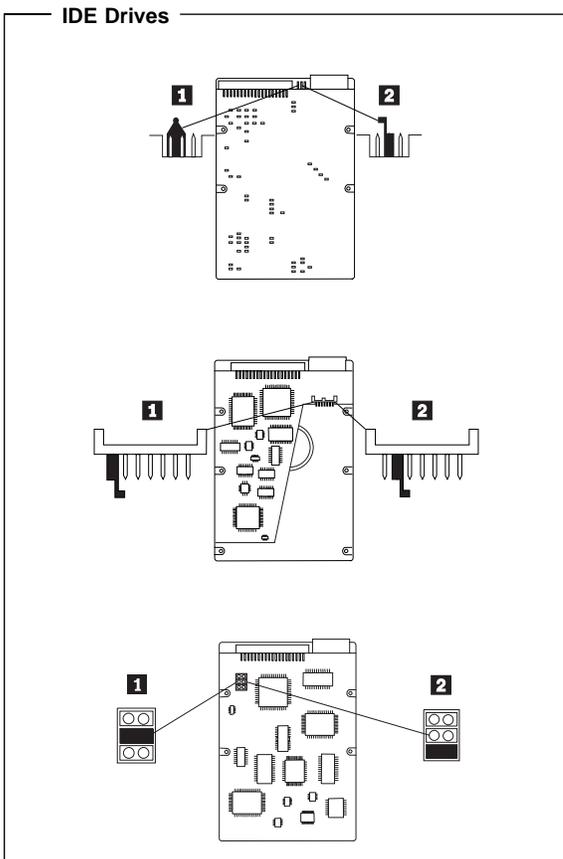
IDE hard disk drives for the IntelliStation computers use jumpers to set the drives as primary (master) or secondary (slave).

### Attention

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

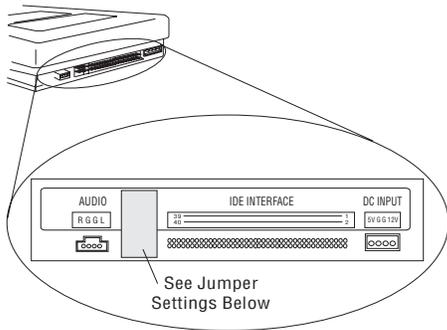
## IDE hard disk drive settings

- 1** Primary (Master) Hard Disk Drive
- 2** Secondary (Slave) Hard Disk Drive



## 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	: : ■	: ■ :
40X Max CD-ROM	: : ■	: ■ :
48X 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.ibm.com/pc/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.ibm.com/pc/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 152.

## 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

### Attention

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

To perform a Flash/BIOS recovery using the boot block switch:

1. Power-off the computer and remove the cover and front bezel.
2. Move the system board rocker switch 3 to the **on** position. Refer to "System board layout" on page 183 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.  
**Note:** Depending on the amount of memory installed, it may take up to a minute for the Logo to 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 rocker switch 3 to the **normal (off)** position. Then, replace the cover and power-on the computer.

## Power management

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

### Advanced Configuration and Power

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

**Advanced Power Management:** Energy-saving settings can be viewed and changed by using the Advanced Power Management menu in the 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.
- **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 140).
2. Select **Power Management** from the Configuration/Setup Utility program menu.
3. Select the **APM BIOS Mode** and be sure it is set to **Enabled**. If it is not, press Left Arrow (←) or Right Arrow (→) to change the setting.
4. Select **Automatic Hardware Power Management**.
5. Set **Automatic Hardware Power Management** to **Enabled**.
6. Select values for the two levels of power management (system power and display), as necessary.
7. Set **IDE Drives** to **Enabled** or **Disabled**.  
**Note:** This does not apply to SCSI drives.
8. Select **Low Power Entry Activity Monitor** and enable or disable the listed options.
9. Select **Low Power Exit Activity Monitor** and enable or disable the listed options.
10. Press **Esc** twice to return to the Configuration/Setup Utility program menu.
11. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
12. 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 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 serial port (COM1), 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.
- **PCI Wake Up:** PCI Wake Up uses PCI Power Management Enabled (PME) to wake up the computer when using token-ring, Ethernet LAN adapters, modems, or other PCI cards capable of waking up the computer. When you set PCI Wake Up to **Enabled**, the computer will turn on when it receives a specific signal from another computer on the local area network (LAN) or from a modem signal. Wake on LAN features can be used on the 6866 computer. For further information, see "Wake on LAN" on page 156.

## 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 152.

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 140.
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 140.
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.

## System board memory

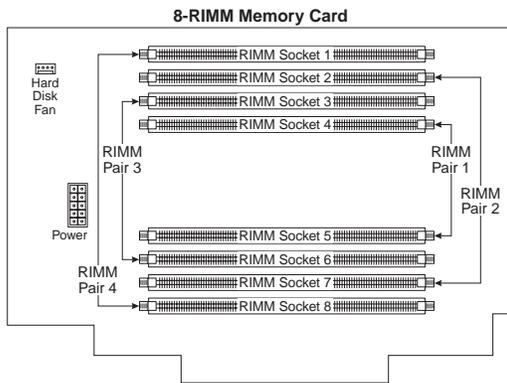
### Note

RAMBUS inline memory module (RIMM) is used in the type 6866 computer. RIMM modules are not compatible with SIMM or DIMM memory modules. Refer to the information below regarding RIMM memory for type 6866.

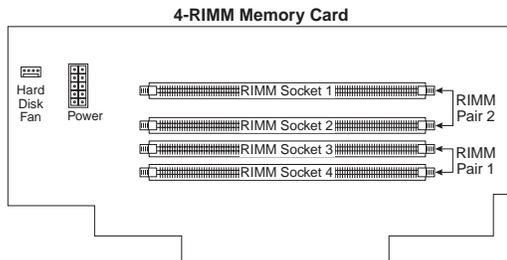
## Locating components on the memory card

The type 6866 uses a four or eight RIMM memory card for system memory. The memory card contains RIMM connectors, a power connector, and a hard disk fan connector.

### Eight RIMM memory card



### Four RIMM memory card



## Type 6866 memory

### Rambus inline memory modules (RIMMs).

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

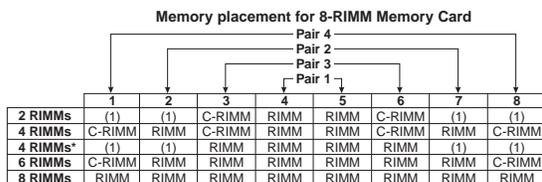
When installing or replacing RIMMs, take the following information into consideration:

- RIMM connectors do not support dual inline memory modules (DIMMs)
- Use only PC600 or PC800 RIMMs.
- There are four or eight RIMM memory cards. RIMMs must be installed in pairs. The RIMMs installed in a RIMM connector pair must be of the same speed, and size.
- For four RIMM cards, any connector that does not have a RIMM installed must have a *continuity RIMM* (C-RIMM).
- For eight RIMM cards, pairs 1 and 3 must have RIMMs or C-RIMMs installed in them. If RIMMs are installed in pair 2, RIMMs or C-RIMMs must be installed in pair 4. For the arrangement of the RIMM connector pairs on the computer memory card, see the illustration on page 157.
- Install only ECC RIMMs to enable ECC. If ECC and non-ECC memory are used together, the memory will function as non-ECC memory.

#### Note

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

### Eight RIMM Memory card configuration



Note: Memory must be installed in matched pairs.

\* Non-optimal performance configuration

(1) These connectors may either be left empty or used to store c-rimms.

### Four RIMM memory card configuration

**Memory placement for 4-RIMM Memory Card**

	Pair 1		Pair 2	
	3	4	1	2
2 RIMMs	RIMM	RIMM	C-RIMM	C-RIMM
4 RIMMs	RIMM	RIMM	RIMM	RIMM

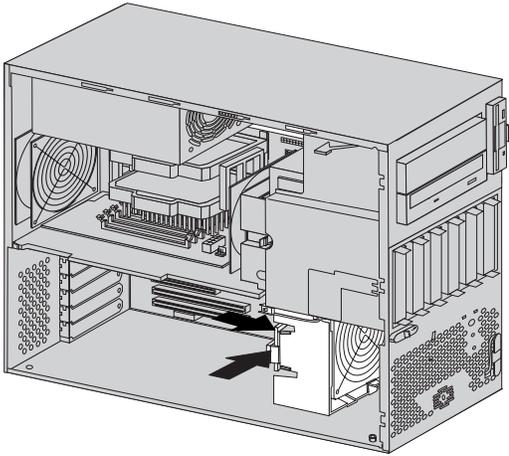
**Note:** Memory must be installed in matched pairs.

## Removing a RIMM or C-RIMM

### Attention:

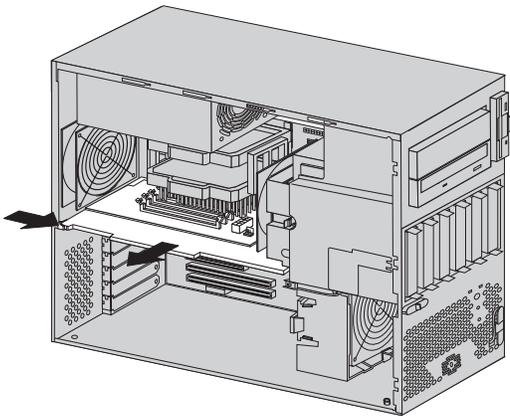
Standby power present, disconnect power cord before servicing computer.

1. To locate the RIMM connectors, see "System board layout" on page 183 and "Locating components on the memory card" on page 157.
2. Press the tab on the front fan and push the adapter guide latch toward the front of the chassis until it snaps into place.



3. Disconnect the power and hard disk drive fan cables on the memory card.

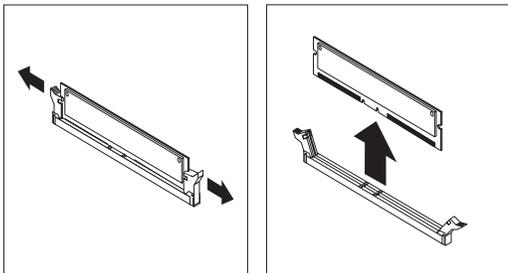
4. Push the tab on the back of the memory card inward and pull the memory card out of the chassis.



5. At both ends of the RIMM connector, push outward on the retaining clips until the module is loosened. Lift the RIMM or C-RIMM out of the connector.

**Note**

Be careful not to push too hard on the retaining clips, because the RIMM or C-RIMM might eject too quickly.



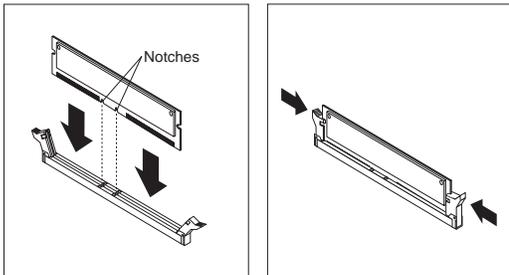
## Installing a RIMM or C-RIMM

1. Position the RIMM or C-RIMM above the connector so that the two notches on the bottom edge of the module align properly with the empty connector.

### Note

Pay attention to the orientation of the notches on the connectors and RIMMs. Adjacent connectors might not have the same orientation on the memory card.

2. Firmly push the module straight down into the connector until the retaining clips pop up and fit snugly around both ends of the module.



3. Place the memory card back in the slot on the system board and reattach the power and hard disk drive fan cables to the connectors on the memory card.
4. Release the adapter guide latch on the front fan.

### Procedures to determine memory errors:

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

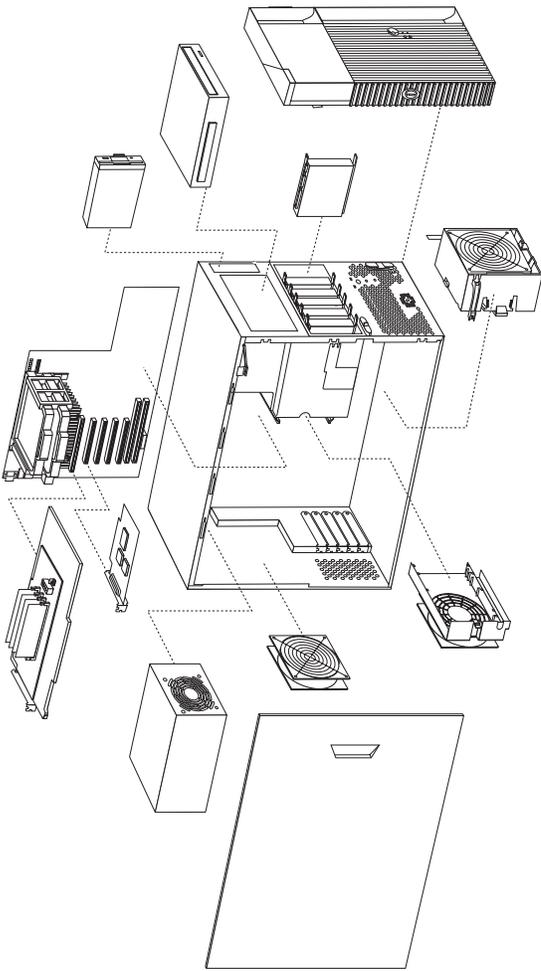
### Note

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

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

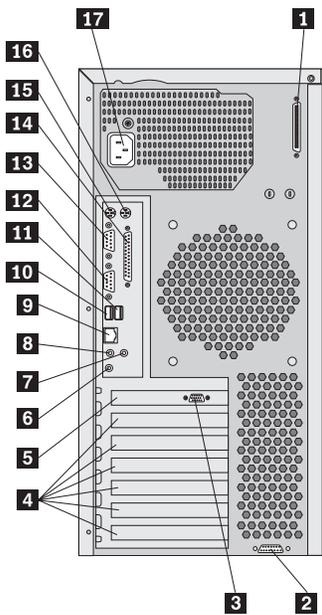
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## Computer exploded view (Type 6866)



I/O connectors and removal procedures for the cover and front bezel, Diskette drive, CD-ROM drive, hard drive, card guide/fan assembly, hard disk fan assembly, system board, long adapters, power supply, and battery removal are on the following pages.

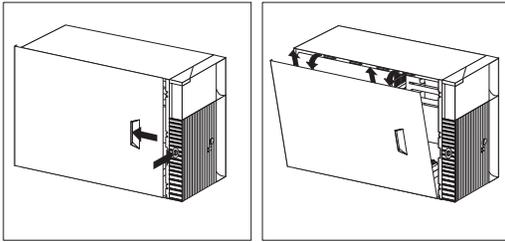
## Input/Output connectors



- 1** SCSI connector
- 2** MIDI/joystick connector
- 3** Monitor connector
- 4** Adaptor slots
- 5** AGP Adaptor
- 6** Line out/headphone connector
- 7** Microphone in connector
- 8** Audio line in connector
- 9** Ethernet connector
- 10** USB connector
- 11** USB connector
- 12** Serial connector 2
- 13** Serial connector 1
- 14** Parallel connector
- 15** Keyboard connector
- 16** Mouse connector
- 17** Power connector

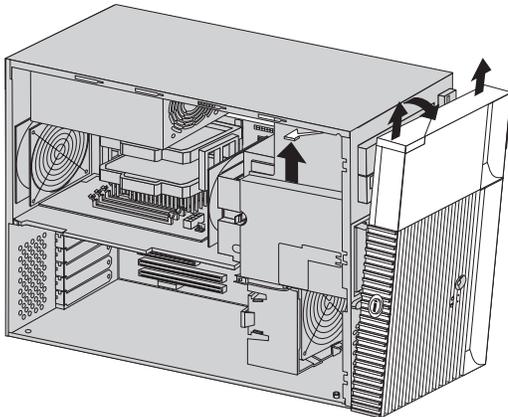
## Cover removal

1. If the key-lock button is locked, unlock it.
2. Press the key-lock button on the left side of the front bezel and slide the side cover toward the rear of the computer.
3. Lift the side cover from the computer.



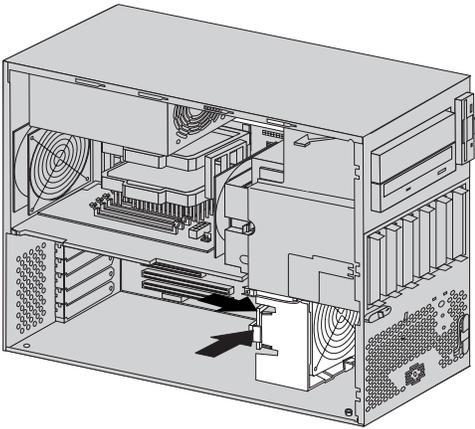
## Front bezel removal

1. Lift the lever at the top of the chassis and pull the front bezel from the front of the computer.



## Card guide/fan assembly removal

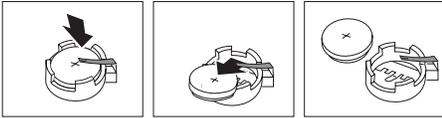
1. Remove the cover and front bezel.
2. Press the latch tab on the card guide/fan assembly and push the adapter guide latch toward the front of the chassis until it snaps into place.



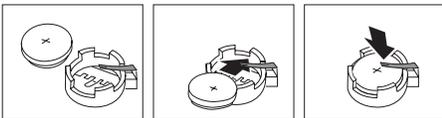
3. Disconnect the memory power cable and the hard disk drive fan cable on the memory card.
4. Push the tab on the back of the memory card inward and pull the memory card out of the chassis. see "Removing a RIMM or C-RIMM" on page 160
5. Remove any long adapters installed in the PCI slots.
6. Press the latch tabs on the card guide/fan assembly to release it, move the assembly towards the back and out of the chassis.

## Battery removal and installation

1. Turn off the computer and all attached devices.
2. Unplug the power cord.
3. Remove the cover.
4. Remove the memory card. see "Removing a RIMM or C-RIMM" on page 160
5. Remove any long adapters installed in the PCI slots. see "Installing long adapters" on page 168
6. Remove the card guide/fan assembly. see "Card guide/fan assembly removal" on page 166
7. Locate the battery. Refer to the system board label inside your computer or see "System board layout" on page 183.
8. Remove the old battery.

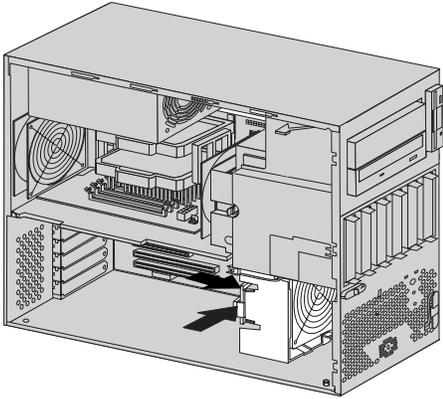


9. Install the new battery.

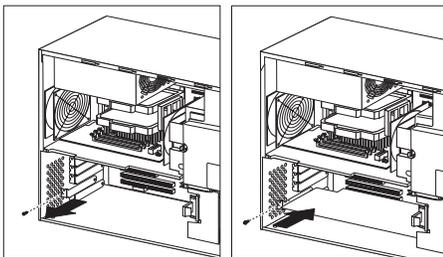


## Installing long adapters

1. Press the tab on the card guide/fan assembly and push the adapter guide latch back to allow room for a full size adapter to slide into the adapter guide on the assembly.

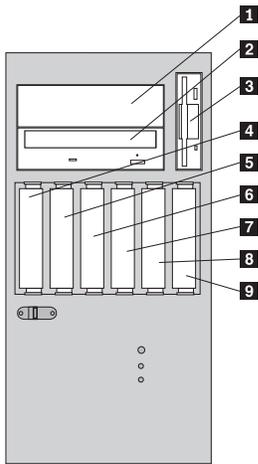


2. Remove the screw and the appropriate expansion slot cover.
3. Install the adapter and screw it into place.



4. Release the adapter guide latch.

## Installing internal drives

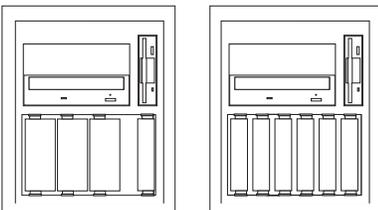


- 1** Drive bay 1
- 2** Drive bay 2 (CD-ROM drive)
- 3** Drive bay 3 (diskette drive)
- 4** Drive bay 4
- 5** Drive bay 5
- 6** Drive bay 6
- 7** Drive bay 7
- 8** Drive bay 8
- 9** Drive bay 9 (hard disk drive)

### Note

1. Install removable-media drives in bay 1.
2. Only one diskette drive is supported.
3. Bays 4, 5, and 6 support either three 25.4 mm (1.0 in.) drives or two 40.6 mm (1.6 in.) drives.
4. Bays 7, 8, and 9 support either three 25.4 mm (1.0 in.) drives or two 40.6 mm (1.6 in.) drives.

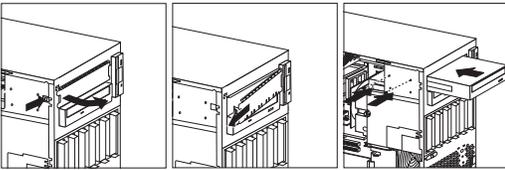
See the following illustration for possible drive arrangement.



## Installing a drive in bay 1

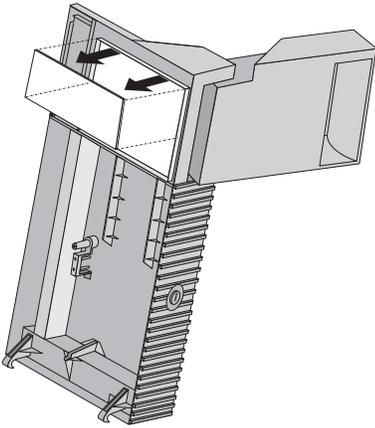
### Note

A 3.5-inch drive into bay 1 requires an industry standard bay adapter bracket.



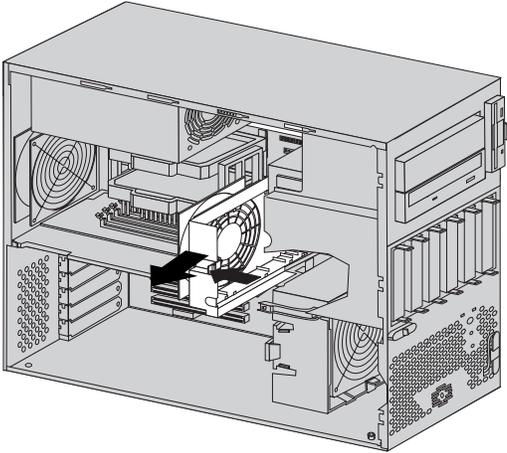
### Note

For removable media drives remove the front bay panel.

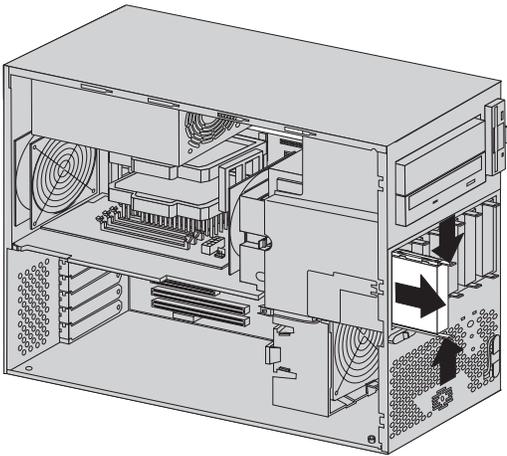


## Removing drives in bays 4, 5, 6, 7, 8, and 9

1. Unplug the hard disk drive fan power cable from the connector on the memory card.
2. Pull the tab release on the hard disk fan toward the rear of the chassis and slide the hard disk drive fan out of the chassis.



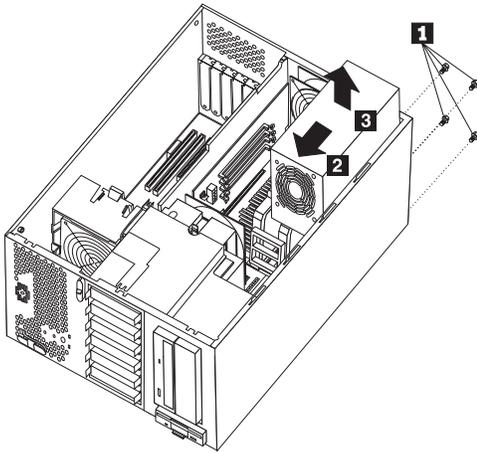
3. Remove all cables to the drive.
4. Press in the tabs on the sliding rails and remove the hard disk drive.



## Power supply removal

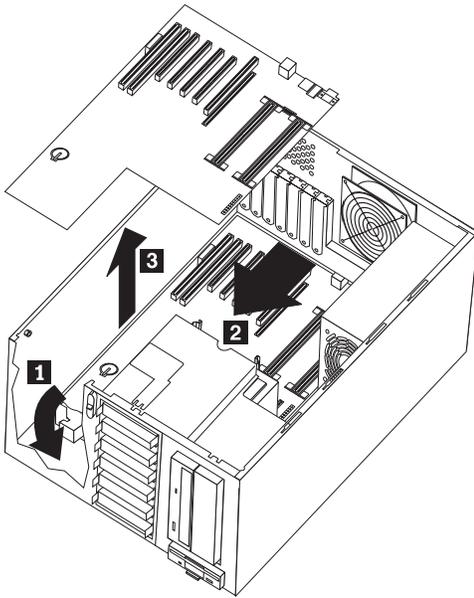
To remove the power supply, do the following:

1. Remove the side cover.



2. Disconnect the power supply cables.
3. Remove the power supply screws **1**.
4. Slide the power supply toward the front of the system **2** and lift the power supply out of the system **3**.

## System board removal



1. Remove the side cover.
2. Remove the memory board.
3. Remove the hard disk fan assembly
4. Remove adapter cards.
5. Remove the card guide/fan assembly.
6. Disconnect all cables attached to the system board.
7. Release the system board back-plate release latch **1**.
8. Slide the system board and back plate toward the front of the system **2** and lift the system board and back-plate **3** out of the chassis.

## Rack mount configuration

To configure the Type 6866 in a rack mount there are three major steps.

1. Preparing the computer for installation in a rack enclosure.
2. Preparing the rack enclosure.
3. Installing the computer into the rack enclosure.

## Preparing the computer for installation

Parts needed:

- Part number 10L7006, Netfinity® Tower-Rack Conversion Kit
- Two 3.5 mm flange nuts which are provided in a plastic bag taped inside the CD-ROM drive cover
- The inner slide from two slide bracket assemblies
- 6 pan-head short screws

### Attention

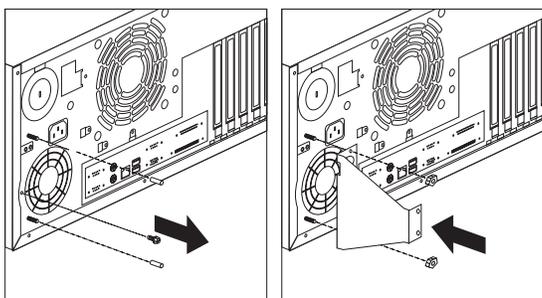
To avoid damage to internal components, use only the pan-head short screws included with the rack mount kit.

To prepare the Type 6866 for installation in a rack enclosure:

1. Remove the left side cover.
2. Remove the top and right cover (secured by four slotted screws).
3. Place the computer on its right side to gain access to the inside.
4. Reach in and remove the four feet at the bottom of the computer.
5. Move the computer back to the tower position.
6. Install the new right side cover using three slotted screws.
7. Place the computer on its right side.
8. Install the new left side cover (the left cover has a thumbscrew attached). Tighten the thumbscrew.
9. Install L-bracket part number 20L1419 on the left and L-bracket part number 20L1418 on the right, using two slotted screws per L-bracket.
10. Remove the rubber thread protectors on the two bolt studs near the power supply (as shown in the following illustration).
11. Remove the screw between the two bolt studs (as shown in the following illustration).
12. Install the cable-arm bracket onto the two bolt studs on the rear of the computer. This cable-arm bracket

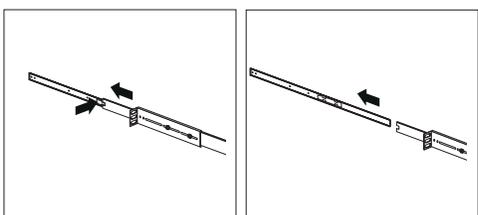
is secured using two 3.5 mm flange nuts which are provided in a plastic bag taped inside the CD-ROM drive cover.

**Note:** This cable-arm bracket will not attach to the computer unless you have first removed the screw near the power supply.

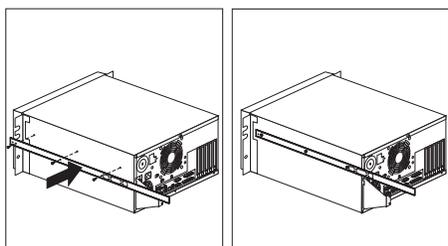


13. Attach the inner slide section of each slide rail to the side of the computer.

- a. Pull the inner slide until the safety latch locks.
- b. Press the safety latch; then, pull the inner slide firmly until it detaches from the outer slide rail.



- c. Align the holes on the inner slide with the holes on sides of the computer; then, attach the slide with three pan-head short screws.



## Preparing the rack enclosure

Parts needed:

- Two slide bracket assemblies
- Two slide rails (fitted to system unit)
- One cable-management arm
- Ten long screws
- Ten cage nuts
- Installation template

### Attention

To ensure cabinet stability, install computers in the rack enclosure starting from the bottom.

### Attention

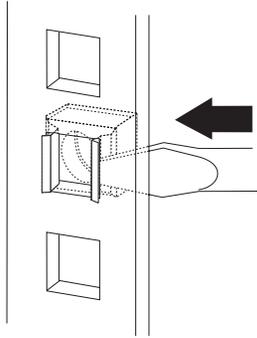
This procedure requires two people.

To attach the mounting hardware to the rack enclosure:

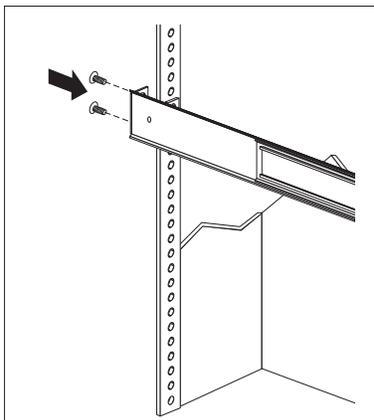
1. Mark the positions of the slide brackets on the mounting rails on the rack enclosure:
  - a. Position the template on the front mounting rail on the rack enclosure, aligning the holes. Secure the template in place with tape.
  - b. Mark the holes for the slide brackets and cage nuts.
  - c. Remove the tape from the mounting rails, and attach the template to the rear mounting rails. Mark the locations for the slide brackets and cage nuts.

### Notes

1. Align the slide brackets correctly, or the installation cannot be completed.
  2. The slide rails have four screws each to allow for length adjustment.
2. Install the cage nuts in the marked positions as shown.

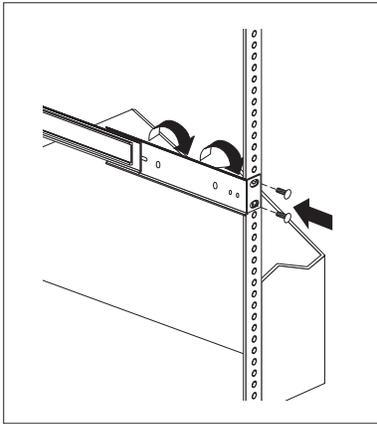


3. Attach the slide rail to the left side of the rack enclosure.
  - a. Extend the outer slide rail until the slide bracket is flush against the outside of the left front mounting rail. Align the slide rail with the cage nuts on the mounting rail.
  - b. From the front of the rack enclosure, insert two long screws through the slide bracket and mounting rail. Press the slide bracket until it is flush with the outer edge of the mounting rail; then, tighten the screws.

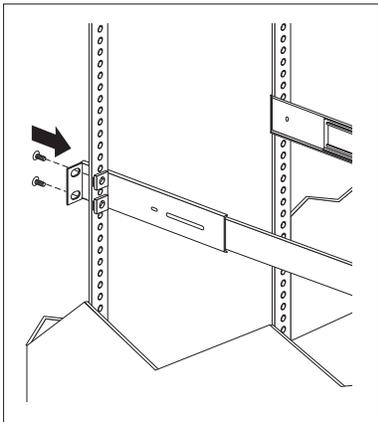


- c. Attach the slide bracket to the left rear side of the rack enclosure.
  - 1) Align the holes on the slide bracket with the cage nuts on the rear mounting rail.
  - 2) From the rear of the rack enclosure, insert two long screws through the slide bracket and mounting rail; then, tighten the screws.

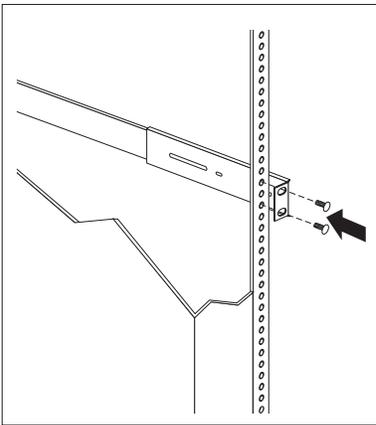
- 3) If it was necessary to adjust the length of the slide rails, tighten the nuts on the slide rail, using pliers, a socket wrench, or an adjustable wrench.



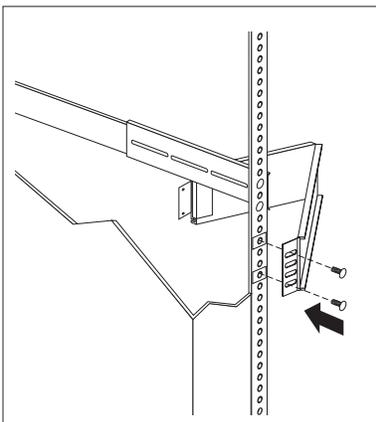
4. Attach the slide rail to the right side of the rack enclosure.
- Extend the outer slide rail until the slide bracket is flush against the outside of the right front mounting rail. Align the slide bracket with the cage nuts on the mounting rail.
  - From the front of the rack enclosure, insert two long screws through the slide bracket and mounting rail. Press the slide rail so that it is flush with the outer edge of the mounting rail and tighten the screws.



- c. Attach the slide bracket to the right rear of the rack enclosure.
  - 1) Align the holes on the bracket with the cage nuts on the rear mounting rail.



- 2) From the rear of the rack enclosure, insert a long screw through holes in the slide bracket and mounting rail; then, tighten the screws.
- 5. Attach the cable-management arm to the right rear of the rack enclosure.
  - a. Align the holes on the cable-management arm mounting panel with the cage nuts on the rear mounting rail.



- b. From the rear of the rack enclosure, insert a long screw through the holes in the

cable-management arm mounting panel and cage nut; then, tighten the screws.

**Note**

1. You can choose to wait to attach the cable-management arm to the rack until after you have attached the other end of the cable-management arm to the computer.
2. To facilitate alignment of the cable-management arm, be sure to insert the screws through the first and fourth holes, as shown.

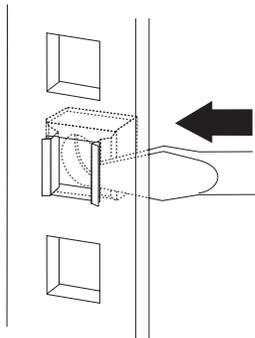
## Installing the computer in the rack enclosure

Parts needed:

- Four long screws
- Two cage nuts
- One cable-management arm
- Cable ties

To install the computer into the rack enclosure:

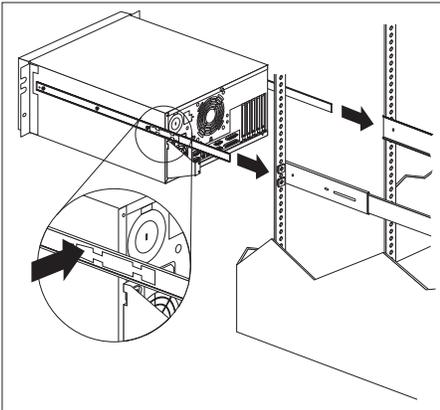
1. Install a cage nut in each front mounting rail in the marked positions, as shown.



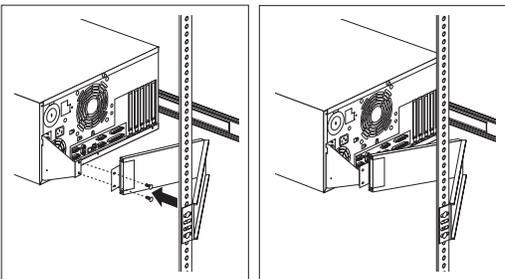
2. Position the computer horizontally, with the 3.5-inch drive bays on the top.
3. Align the inner slides of the computer with the slide rails; then, slide the computer onto the outer slide, until the slide rails click into place.

**Note**

When the computer is fully extended, safety latches on the slide rails lock into place. This prevents the computer from being accidentally pulled out too far and dropped. To release the safety latch, press in.



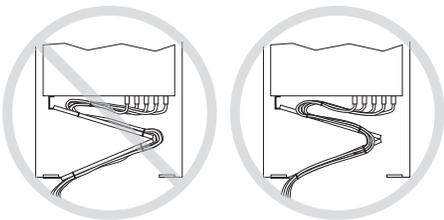
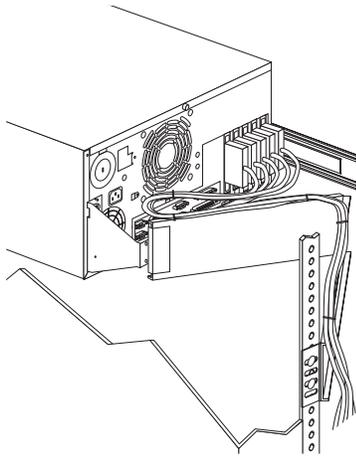
4. Press the safety latches and slide the computer about halfway into the rack enclosure.
5. Attach the cable-management arm to the cable-arm bracket, using two long screws.



6. Attach the cable-management arm to the rack.
7. Attach the monitor, keyboard, and power cables.
8. Attach the cables to the cable-management arm using the cable ties provided.

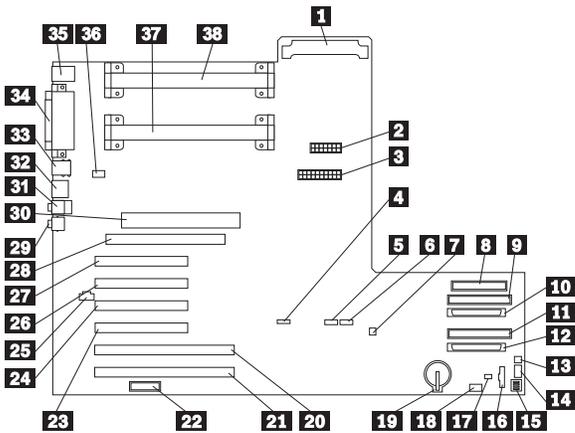
**Note**

Be sure to route the cables above the top edge or below the bottom edge of the cable-management arm to avoid overstressing the cables.



9. Secure the computer in the rack enclosure.
  - a. Slide the computer into the rack enclosure.
  - b. Secure the computer to both sides of the rack enclosure by inserting a long screw through the chassis bracket, mounting rail, and cage nut.

## System board layout



- 1** Second CPU voltage regulator module (VRM)
- 2** Power 2
- 3** Power 1
- 4** Hard disk LED
- 5** Wake on LAN connector
- 6** Alert on LAN connector
- 7** Wake on Modem connector
- 8** Diskette drive connector
- 9** Secondary IDE connector
- 10** SCSI channel B
- 11** Primary IDE connector
- 12** SCSI channel A
- 13** Internal speaker connector
- 14** Front fan connector
- 15** Rocker switch
- 16** Front panel connector
- 17** Tamper detection switch connector
- 18** Radio Frequency antenna connector
- 19** Battery
- 20** Slot 6 (64-bit PCI adapter)
- 21** Slot 7 (64-bit PCI adapter)
- 22** MIDI/joystick connector
- 23** Slot 5 (32-bit PCI adapter)
- 24** Slot 4 (32-bit PCI adapter)
- 25** CD audio connector
- 26** Slot 3 (32-bit PCI adapter)
- 27** Slot 2 (32-bit PCI adapter)
- 28** Slot 1 (AGP adapter)
- 29** Line out/head phone connector
- 30** Memory card connector
- 31** Microphone and audio line connectors
- 32** Ethernet connector

- 33** USB connectors
- 34** Parallel and serial connectors
- 35** Mouse and Keyboard connectors
- 36** Rear fan connector
- 37** Microprocessor 1
- 38** Microprocessor 2

## System board switch settings

The following table contains the rocker switch setting information.

**Note**

The default switch settings for the rocker switch is off.

Switch	Description
1	Reset Frequency
2	Reserved
3	Clear CMOS & Force Bootblock
4	Reserved

## Processor Speed Settings

Processor speed for the PC 300 type 6866 computer is set in the Setup Utility (configuration) program.

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## 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" on page 124. See "IBM PC Enhanced Diagnostics error codes" on page 1 when running diagnostics. 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 206.

### 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 129.)
- Check the hard disk drive jumper settings before you replace a hard disk drive. (See "Hard disk drive jumper settings" on page 149.)

### Important

1. Some errors are indicated with a series of beep codes. (See "Beep symptoms" on page 186.)  
Type 6866 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST. To enable Beep and memory count and checkpoint code display when a successful POST occurs:
  - Enable **Power on Status** in setup. See "Setup Utility program" on page 140.
2. The processor is a separate FRU from the system board; the processor is not included with the system board FRU.

## 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	<ul style="list-style-type: none"> <li>• One Beep</li> <li>• A pause (or break)</li> <li>• Two beeps</li> <li>• A pause (or break)</li> <li>• Any number of beeps</li> </ul>
4	Four continuous beeps

Beep Symptom	FRU/Action
1-1-3 CMOS read/write error	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. System Board</li> </ol>
1-1-4 ROM BIOS check error	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
1-2-X DMA error	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
1-3-X	<ol style="list-style-type: none"> <li>1. <b>RIMM Memory Module</b> see "System board memory" on page 157</li> <li>2. C-RIMM</li> <li>3. System Board</li> </ol>
1-4-4	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. System Board</li> </ol>
1-4-X Error detected in first 64 KB of RAM.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-1-1, 2-1-2	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. System Board</li> </ol>
2-1-X First 64 KB of RAM failed.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-2-2	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
2-2-X First 64 KB of RAM failed.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-3-X	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-4-X	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Memory Module</li> <li>3. System Board</li> </ol>
3-1-X DMA register failed.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
3-2-4 Keyboard controller failed.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Keyboard</li> </ol>

Beep Symptom	FRU/Action
<b>3-3-4</b> Screen initialization failed.	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> <li>3. Display</li> </ol>
<b>3-4-1</b> Screen retrace test detected an error.	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> <li>3. Display</li> </ol>
<b>3-4-2</b> POST is searching for video ROM.	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
<b>4</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
All other beep code sequences.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
One long and one short beep during POST. Base 640 KB memory error or shadow RAM error.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
One long beep and two or three short beeps during POST. (Video error)	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
Three short beeps during POST.	<ol style="list-style-type: none"> <li>1. <b>See "System board memory" on page 157.</b></li> <li>2. System Board</li> </ol>
Continuous beep.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
Repeating short beeps.	<ol style="list-style-type: none"> <li>1. <b>Keyboard stuck key?</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>

## No beep symptoms

### Note

Type 6866 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

- Enable **Power on Status** in setup. See "Setup Utility program" on page 140.

Symptom/Error	FRU/Action
No beep during POST but computer works correctly.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>

Symptom/Error	FRU/Action
No beep during POST.	<ol style="list-style-type: none"><li>1. <b>See “Undetermined problem” on page 206.</b></li><li>2. System Board</li><li>3. Memory Module</li><li>4. Any Adapter or Device</li><li>5. Power Cord</li><li>6. Power Supply</li></ol>

## POST error codes

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

POST Error Code	FRU/Action
<b>000</b> SCSI Adapter not enabled.	1. <b>Verify adapter device and Bus Master fields are enabled in PCI configuration program. See documentation shipped with computer.</b>
<b>02X</b>	1. <b>SCSI Adapter</b>
<b>08X</b> Check SCSI terminator installation.	1. <b>SCSI Cable</b> 2. SCSI Terminator 3. SCSI Device 4. SCSI Adapter
<b>101</b> System board interrupt failure.	1. <b>System Board</b>
<b>102</b> System board timer error.	1. <b>System Board</b>
<b>106</b>	1. <b>System Board</b>
<b>110</b> System board memory parity error.	1. <b>Memory Module</b> 2. System Board
<b>111</b> I/O channel parity error.	1. <b>Reseat adapters</b> 2. Any Adapter 3. System Board
<b>114</b> Adapter ROM error.	1. <b>Adapter Memory</b> 2. System Board
<b>129</b> Internal cache test error.	1. <b>Processor</b> 2. L2 Cache Memory 3. System Board
<b>151</b> Real-time clock failure.	1. <b>System Board</b>
<b>161</b> Bad CMOS battery.	1. <b>Run Setup</b> 2. CMOS Backup Battery (See page "Safety information" on page 332.) 3. System Board

POST Error Code	FRU/Action
<b>162</b> Configuration mismatch.	<ol style="list-style-type: none"> <li>1. <b>Run Setup and verify Configuration</b></li> <li>2. Had a device been added, removed, changed location? If not, suspect that device.</li> <li>3. Power-on external devices first, then power-on computer.</li> <li>4. CMOS Backup Battery (See page "Safety information" on page 332.)</li> <li>5. System Board</li> </ol>
<b>162</b> And unable to run diagnostics.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> </ol>
<b>163</b> Clock not updating or invalid time set.	<ol style="list-style-type: none"> <li>1. <b>Time and Date Set?</b></li> <li>2. CMOS Backup Battery (See page "Safety information" on page 332.)</li> <li>3. System Board</li> </ol>
<b>164</b> POST detected a base memory or extended memory size mismatch.	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check System Summary menu for memory size change. (See "Setup Utility program" on page 140.)</b></li> <li>2. Run the Extended Memory Diagnostic tests.</li> </ol>
<b>166</b> Boot Block Check Sum Error	<ol style="list-style-type: none"> <li>1. <b>Run Flash Recovery using Boot Block. See "Flash recovery boot block" on page 152</b></li> <li>2. System Board</li> </ol>
<b>167</b> Microprocessor installed that is not supported by the current POST/BIOS.	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check Stepping level for the BIOS level needed, then perform the flash update.</b></li> <li>2. Processor</li> </ol>
<b>168</b> Alert on LAN2 error	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check to see that Ethernet and Alert on LAN2 are enabled.</b></li> <li>2. System Board</li> </ol>
<b>17X, 18X</b>	<ol style="list-style-type: none"> <li>1. <b>C2 Security</b></li> </ol>

POST Error Code	FRU/Action
<b>175</b>	<ol style="list-style-type: none"> <li>1. <b>Run Configuration (See "Setup Utility program" on page 140.)</b></li> <li>2. System Board</li> </ol>
<b>176</b>	<ol style="list-style-type: none"> <li>1. <b>Covers were removed from the computer.</b></li> </ol>
<b>177</b> Corrupted Administrator Password.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
<b>178</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
<b>183</b>	<ol style="list-style-type: none"> <li>1. <b>Enter the administrator password</b></li> </ol>
<b>184</b> No RFID Antenna	<ol style="list-style-type: none"> <li>1. <b>Make sure Asset Care and Asset ID™ are enabled in Configuration/Setup.</b></li> <li>2. RFID Antenna</li> <li>3. System Board</li> </ol>
<b>185</b> Corrupted boot sequence.	<ol style="list-style-type: none"> <li>1. <b>Set configuration and reinstall the boot sequence.</b></li> </ol>
<b>186</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
<b>187</b>	<ol style="list-style-type: none"> <li>1. <b>Clear Administration password</b></li> <li>2. System Board</li> </ol>
<b>189</b>	<ol style="list-style-type: none"> <li>1. <b>More than three password attempts were made to access the computer.</b></li> </ol>
<b>190</b> Chassis intrusion detector was cleared. This is information only, no action required. If this code does not clear:	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
<b>1XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
<b>201, 20X</b> Memory data error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diag. Memory Test</b></li> <li>2. Memory Module</li> <li>3. System Board</li> </ol>
<b>225</b>	<ol style="list-style-type: none"> <li>1. <b>Unsupported Memory</b></li> </ol>
<b>229</b> External cache test error.	<ol style="list-style-type: none"> <li>1. <b>L2 Cache Memory</b></li> <li>2. System Board</li> </ol>

POST Error Code	FRU/Action
<b>262</b> POST detected a base memory or extended memory type error.	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check System Summary menu for memory type change. (See "Setup Utility program" on page 140.)</b></li> <li>2. Run the Extended Memory Diagnostic tests.</li> </ol>
<b>301</b>	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>
<b>303</b> With an 8603 error.	<ol style="list-style-type: none"> <li>1. <b>Mouse</b></li> <li>2. Keyboard</li> <li>3. Keyboard Cable</li> <li>4. System Board</li> </ol>
<b>303</b> With no 8603 error.	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>
<b>3XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>
<b>5XX</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
<b>601</b>	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive A</b></li> <li>2. Diskette Drive Cable</li> <li>3. System Board</li> </ol>
<b>602</b>	<ol style="list-style-type: none"> <li>1. <b>Bad Diskette ?</b></li> <li>2. Verify Diskette and retry.</li> </ol>
<b>604</b> And able to run diagnostics.	<ol style="list-style-type: none"> <li>1. <b>Run Setup and verify diskette configuration settings</b></li> <li>2. Diskette Drive A/B</li> <li>3. Diskette Drive Cable</li> <li>4. System Board</li> </ol>
<b>605</b> POST cannot unlock the diskette drive.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. Diskette Drive Cable</li> <li>3. System Board</li> </ol>
<b>662</b>	<ol style="list-style-type: none"> <li>1. <b>Diskette drive configuration error or wrong diskette drive type, run Setup Configuration.</b></li> </ol>
<b>6XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. External Drive Adapter</li> <li>4. Diskette Drive Cable</li> <li>5. Power Supply</li> </ol>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>762</b> Math coprocessor configuration error.	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Processor</li> <li>3. System Board</li> </ol>
<b>7XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Processor</b></li> <li>2. System Board</li> </ol>
<b>962</b> Parallel port configuration error.	<ol style="list-style-type: none"> <li>1. <b>Run Configuration</b></li> <li>2. Parallel Adapter (if installed)</li> <li>3. System Board</li> </ol>
<b>9XX</b>	<ol style="list-style-type: none"> <li>1. <b>Printer</b></li> <li>2. System Board</li> </ol>
<b>1047</b>	<ol style="list-style-type: none"> <li>1. <b>16-Bit AT Fast SCSI Adapter</b></li> </ol>
<b>107X</b> Check SCSI terminator installation.	<ol style="list-style-type: none"> <li>1. <b>Check SCSI terminator installation.</b></li> <li>2. SCSI Cable</li> <li>3. SCSI Terminator</li> <li>4. SCSI Device</li> <li>5. SCSI Adapter</li> </ol>
<b>1101</b> Serial connector error, possible system board failure.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>1101, 1102, 1106, 1108, 1109</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Any Serial Device</li> </ol>
<b>1107</b>	<ol style="list-style-type: none"> <li>1. <b>Communications Cable</b></li> <li>2. System Board</li> </ol>
<b>1102</b> Card selected feedback error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>1103</b> Port fails register check.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. System Board</li> </ol>
<b>1106</b> Serial option cannot be turned off.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. System Board</li> </ol>
<b>1107</b>	<ol style="list-style-type: none"> <li>1. <b>Serial Device Cable</b></li> <li>2. System Board</li> </ol>
<b>1110</b> Register test failed.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. System Board</li> </ol>
<b>1116</b> Interrupt error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>1117</b> Failed baud rate test.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>1162</b> Serial port configuration error.	<ol style="list-style-type: none"> <li>1. <b>Run Configuration</b></li> <li>2. Serial Adapter (if installed)</li> <li>3. System Board</li> </ol>

POST Error Code	FRU/Action
<b>11XX</b> Not listed above.	1. <b>System Board</b>
<b>1201</b>	1. <b>System Board</b> 2. Any Serial Device
<b>1202, 1206, 1208, 1209, 12XX</b>	1. <b>Dual Async Adapter/A</b> 2. System Board 3. Any Serial Device
<b>1207</b>	1. <b>Communications Cable</b> 2. Dual Async Adapter/A
<b>13XX</b>	1. <b>Game Adapter</b>
<b>1402</b> Printer not ready.	Information only
<b>1403</b> No paper error, or interrupt failure.	Information only
<b>1404</b> System board timeout failure.	1. <b>Run Enhanced Diagnostics</b>
<b>1405</b> Parallel adapter error.	1. <b>Run Enhanced Diagnostics</b>
<b>1406</b> Presence test error.	1. <b>Run Enhanced Diagnostics</b>
<b>14XX</b> Not listed above. Check printer before replacing system board.	1. <b>Printer</b> 2. System Board
<b>15XX</b>	1. <b>SDLC Adapter</b>
<b>1692</b> Boot sequence error.	1. <b>Run FDISK to ensure at least one active partition is set active.</b>
<b>16XX</b>	1. <b>36/38 Workstation Adapter</b>
<b>1762</b> Hard disk drive configuration error.	1. <b>Run Configuration (See "Setup Utility program" on page 140.)</b>
<b>1780</b> (Disk Drive 0) <b>1781</b> (Disk Drive 1) <b>1782</b> (Disk Drive 2) <b>1783</b> (Disk Drive 3)	1. <b>See "Power supply" on page 129.</b> 2. Hard Disk Drive 3. System Board 4. Hard Disk Cable 5. Power Supply

POST Error Code	FRU/Action
<b>180X, 188X</b> PCI configuration or resource error.	<ol style="list-style-type: none"> <li>1. <b>Run Setup and verify PCI/ISA configuration settings.</b></li> <li>2. If necessary, set ISA adapters to "Not available" to allow PCI adapters to properly configure.</li> <li>3. Remove any suspect ISA adapters.</li> <li>4. Rerun diagnostics.</li> <li>5. PCI Adapter</li> </ol>
<b>1962</b> Boot sequence error.	<ol style="list-style-type: none"> <li>1. <b>Possible hard disk drive problem, see "Hard disk drive boot error" on page 140.</b></li> </ol>
<b>209X</b>	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. Diskette Cable</li> <li>3. 16-bit AT Fast SCSI Adapter</li> </ol>
<b>20XX</b> Not listed above	<ol style="list-style-type: none"> <li>1. <b>BSC Adapter</b></li> </ol>
<b>21XX</b>	<ol style="list-style-type: none"> <li>1. <b>SCSI Device</b></li> <li>2. 16-bit AT Fast SCSI Adapter</li> <li>3. Alternate BSC Adapter</li> </ol>
<b>2401, 2402</b> If screen colors change.	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> </ol>
<b>2401, 2402</b> If screen colors are OK.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Display</li> </ol>
<b>2409</b>	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> </ol>
<b>2410</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Display</li> </ol>
<b>2462</b> Video memory configuration error.	<ol style="list-style-type: none"> <li>1. <b>Check cable connections.</b></li> <li>2. Run Setup and verify video configuration settings.</li> <li>3. Video Memory Modules</li> <li>4. Video Adapter (if installed)</li> <li>5. System Board</li> </ol>
<b>3015, 3040</b> Check for missing wrap or terminator plug on the adapter.	<ol style="list-style-type: none"> <li>1. <b>Network Attached?</b></li> <li>2. LF Translator</li> <li>3. Cable Problem</li> <li>4. PC Network Adapter</li> </ol>
<b>30XX</b>	<ol style="list-style-type: none"> <li>1. <b>PC Network Adapter</b></li> <li>2. LF Translator</li> <li>3. Cable Problem?</li> </ol>

POST Error Code	FRU/Action
3115, 3140	<ol style="list-style-type: none"> <li>1. <b>Network Attached?</b></li> <li>2. LF Translator</li> <li>3. Alternate PC Network-Adapter</li> <li>4. Cable Problem</li> </ol>
31XX	<ol style="list-style-type: none"> <li>1. <b>Alternate PC Network Adapter</b></li> <li>2. LF Translator</li> <li>3. Cable Problem</li> </ol>
36XX	<ol style="list-style-type: none"> <li>1. <b>GPIB Adapter</b></li> </ol>
38XX	<ol style="list-style-type: none"> <li>1. <b>DAC Adapter</b></li> </ol>
4611, 4630	<ol style="list-style-type: none"> <li>1. <b>Multiport/2 Interface Board</b></li> <li>2. Multiport/2 Adapter</li> </ol>
4612, 4613 4640, 4641	<ol style="list-style-type: none"> <li>1. <b>Memory Module Package</b></li> <li>2. Multiport/2 Adapter</li> </ol>
4650	<ol style="list-style-type: none"> <li>1. <b>Multiport Interface Cable</b></li> </ol>
46XX Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Multiport/2 Adapter</b></li> <li>2. Multiport/2 Interface Board</li> <li>3. Memory Module</li> </ol>
5600	<ol style="list-style-type: none"> <li>1. <b>Financial System Controller Adapter</b></li> </ol>
5962 An IDE device (other than hard drive) configuration error.	<ol style="list-style-type: none"> <li>1. <b>Run Configuration</b></li> <li>2. CD-ROM Drive</li> <li>3. CD-ROM Adapter</li> <li>4. ZIP or other ATAPI device</li> <li>5. System Board</li> </ol>
62XX	<ol style="list-style-type: none"> <li>1. <b>1st Store Loop Adapter</b></li> <li>2. Adapter Cable</li> </ol>
63XX	<ol style="list-style-type: none"> <li>1. <b>2nd Store Loop Adapter</b></li> <li>2. Adapter Cable</li> </ol>
64XX	<ol style="list-style-type: none"> <li>1. <b>Network Adapter</b></li> </ol>
71XX	<ol style="list-style-type: none"> <li>1. <b>Voice Adapter</b></li> </ol>
74XX	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> </ol>
76XX	<ol style="list-style-type: none"> <li>1. <b>Page Printer Adapter</b></li> </ol>
78XX	<ol style="list-style-type: none"> <li>1. <b>High Speed Adapter</b></li> </ol>
79XX	<ol style="list-style-type: none"> <li>1. <b>3117 Adapter</b></li> </ol>
80XX	<ol style="list-style-type: none"> <li>1. <b>PCMCIA Adapter</b></li> </ol>
84XX	<ol style="list-style-type: none"> <li>1. <b>Speech Adapter</b></li> <li>2. Speech Control Assy.</li> </ol>
8601, 8602	<ol style="list-style-type: none"> <li>1. <b>Pointing Device</b> (Mouse)</li> <li>2. System Board</li> </ol>

POST Error Code	FRU/Action
<b>8603, 8604</b>	<ol style="list-style-type: none"> <li><b>System Board</b></li> <li>Pointing Device (Mouse)</li> </ol>
<b>86XX</b> Not listed above	<ol style="list-style-type: none"> <li><b>Mouse</b></li> <li>System Board</li> </ol>
<b>89XX</b>	<ol style="list-style-type: none"> <li><b>PC Music Adapter</b></li> <li>MIDI Adapter Unit</li> </ol>
<b>91XX</b>	<ol style="list-style-type: none"> <li><b>Optical Drive</b></li> <li>Adapter</li> </ol>
<b>96XX</b>	<ol style="list-style-type: none"> <li><b>SCSI Adapter</b></li> <li>Any SCSI Device</li> <li>System Board</li> </ol>
<b>10101, 10102, 10104 10105, 10106, 10107 10108, 10109, 10111 10112, 10113, 10114 10115, 10116</b>	<ol style="list-style-type: none"> <li><b>Have customer verify correct operating system device drivers are installed and operational.</b></li> <li>Modem</li> </ol>
<b>10103, 10110, 101171</b>	<ol style="list-style-type: none"> <li><b>System Board</b></li> <li>Data/Fax Modem</li> </ol>
<b>10117</b> Not listed above.	<ol style="list-style-type: none"> <li><b>Check system speaker</b></li> <li>Check PSTN cable</li> <li>External DAA (if installed)</li> <li>Modem</li> </ol>
<b>10118</b>	<ol style="list-style-type: none"> <li><b>Run Diagnostics and verify the correct operation of the modem slot</b></li> <li>Modem</li> </ol>
<b>10119</b>	<ol style="list-style-type: none"> <li><b>Diagnostics detected a non-IBM modem</b></li> <li>Modem</li> </ol>
<b>10120</b>	<ol style="list-style-type: none"> <li><b>Check PSTN Cable</b></li> <li>External DAA (if installed)</li> <li>Modem</li> </ol>
<b>10132, 10133, 10134 10135, 10136, 10137 10138, 10139, 10140 10141, 10142, 10143 10144, 10145, 10146 10147, 10148, 10149 10150, 10151, 10152</b>	<ol style="list-style-type: none"> <li><b>Modem</b></li> </ol>
<b>10153</b>	<ol style="list-style-type: none"> <li><b>Data/Fax Modem</b></li> <li>System Board</li> </ol>
<b>101XX</b> Not listed above.	<ol style="list-style-type: none"> <li><b>Modem Adapter/A</b></li> <li>Data/Fax Modem</li> <li>System Board</li> </ol>

POST Error Code	FRU/Action
<b>10450, 10451, 10490</b> <b>10491, 10492, 10499</b> Read/write error.	1. <b>Run Enhanced Diagnostics</b> 2. Hard Disk Drive 3. System Board
<b>10452</b> Seek test error.	1. <b>Run Enhanced Diagnostics</b>
<b>10453</b> Wrong drive type?	Information only
<b>10454</b> Sector buffer test error.	1. <b>Run Enhanced Diagnostics</b>
<b>10455, 10456</b> Controller error.	1. <b>Run Enhanced Diagnostics</b>
<b>10459</b> Drive diagnostic command error.	Information only
<b>10461</b> Drive format error	1. <b>Run Enhanced Diagnostics</b>
<b>10462</b> Controller seek error.	1. <b>Run Enhanced Diagnostics</b>
<b>10464</b> Hard Drive read error.	1. <b>Run Enhanced Diagnostics</b>
<b>10467</b> Drive non fatal seek error.	1. <b>Run Enhanced Diagnostics</b>
<b>10468</b> Drive fatal seek error.	1. <b>Run Enhanced Diagnostics</b>
<b>10469</b> Drive soft error count exceeded.	1. <b>Run Enhanced Diagnostics</b>
<b>10470, 10471, 10472</b> Controller wrap error.	1. <b>Run Enhanced Diagnostics</b>
<b>10473</b> Corrupt data. Low level format might be required.	Information only
<b>10480</b>	1. <b>Hard Disk Drive (ESDI)</b> 2. Drive Cable 3. System Board
<b>10481</b> ESDI drive D seek error.	1. <b>Run Enhanced Diagnostics</b>
<b>10482</b> Drive select acknowledgement bad.	1. <b>Run Enhanced Diagnostics</b>
<b>106X1</b>	1. <b>Check Configuration</b> 2. Ethernet Adapter
<b>10635</b>	1. <b>Power-off computer, wait ten seconds; then power-on the computer.</b> 2. Ethernet Adapter

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>10651, 10660</b>	<ol style="list-style-type: none"> <li>1. <b>Check Cables</b></li> <li>2. Ethernet Adapter</li> </ol>
<b>106XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Ethernet Adapter</b></li> </ol>
<b>107XX</b>	<ol style="list-style-type: none"> <li>1. <b>5.25-inch External Diskette Drive</b></li> <li>2. 5.25-inch Diskette Drive Adapter/A</li> </ol>
<b>109XX</b> Check the adapter cables.	<ol style="list-style-type: none"> <li>1. <b>ActionMedia Adapter/A</b></li> <li>2. System Board</li> </ol>
<b>112XX</b> This adapter does not have cache.	<ol style="list-style-type: none"> <li>1. <b>SCSI Adapter</b></li> <li>2. Any SCSI Device</li> <li>3. System Board</li> </ol>
<b>119XX</b>	<ol style="list-style-type: none"> <li>1. <b>3119 Adapter</b></li> </ol>
<b>121XX</b>	<ol style="list-style-type: none"> <li>1. <b>Modem Adapter</b></li> <li>2. Any Serial Device</li> <li>3. System Board</li> </ol>
<b>136XX</b>	<ol style="list-style-type: none"> <li>1. <b>ISDN Primary Rate Adapter</b></li> <li>2. System Board</li> </ol>
<b>137XX</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
<b>141XX</b>	<ol style="list-style-type: none"> <li>1. <b>Realtime Interface Coprocessor Portmaster™ Adapter/A</b></li> </ol>
<b>143XX</b>	<ol style="list-style-type: none"> <li>1. <b>Japanese Display Adapter</b></li> <li>2. System Board</li> </ol>
<b>14710, 14711</b>	<ol style="list-style-type: none"> <li>1. <b>System Board Video Adapter</b></li> <li>2. Adapter Video Memory</li> </ol>
<b>148XX</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b></li> </ol>
<b>14901, 14902</b> <b>1491X, 14922</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> <li>3. Display (any type)</li> </ol>
<b>14932</b>	<ol style="list-style-type: none"> <li>1. <b>External Display</b></li> <li>2. Video Adapter</li> </ol>
<b>161XX</b>	<ol style="list-style-type: none"> <li>1. <b>FaxConcentrator™ Adapter</b></li> </ol>
<b>164XX</b>	<ol style="list-style-type: none"> <li>1. <b>120 MB Internal Tape Drive</b></li> <li>2. Diskette Cable</li> <li>3. System Board</li> </ol>
<b>16500</b>	<ol style="list-style-type: none"> <li>1. <b>6157 Tape Attachment Adapter</b></li> </ol>
<b>16520, 16540</b>	<ol style="list-style-type: none"> <li>1. <b>6157 Streaming Tape Drive</b></li> <li>2. 6157 Tape Attachment Adapter</li> </ol>

POST Error Code	FRU/Action
166XX, 167XX	<ol style="list-style-type: none"> <li>1. <b>Token Ring Adapter</b></li> <li>2. System Board</li> </ol>
18001 to 18029	<ol style="list-style-type: none"> <li>1. <b>Wizard Adapter</b></li> <li>2. Wizard Adapter Memory</li> </ol>
18031 to 18039	<ol style="list-style-type: none"> <li>1. <b>Wizard Adapter Cable</b></li> </ol>
185XXXX	<ol style="list-style-type: none"> <li>1. <b>DBCS Japanese Display Adapter/A</b></li> <li>2. System Board</li> </ol>
20001 to 20003	<ol style="list-style-type: none"> <li>1. <b>Image Adapter/A Image-I Adapter/A</b></li> <li>2. Memory Module DRAM, VRAM</li> </ol>
20004	<ol style="list-style-type: none"> <li>1. <b>Memory Module DRAM, VRAM</b></li> <li>2. Image Adapter/A Image-I Adapter/A</li> </ol>
20005 to 20010	<ol style="list-style-type: none"> <li>1. <b>Image Adapter/A Image-I Adapter/A</b></li> <li>2. Memory Module DRAM, VRAM</li> </ol>
200XX Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Image Adapter/A Image-I Adapter/A</b></li> <li>2. Memory Module DRAM, VRAM</li> <li>3. System Board</li> </ol>
20101 to 20103	<ol style="list-style-type: none"> <li>1. <b>Printer/Scanner Option</b></li> <li>2. Image Adapter/A</li> <li>3. Memory Module DRAM, VRAM</li> </ol>
20104	<ol style="list-style-type: none"> <li>1. <b>Memory Module DRAM, VRAM</b></li> <li>2. Printer/Scanner Option</li> <li>3. Image Adapter/A</li> </ol>
20105 to 20110	<ol style="list-style-type: none"> <li>1. <b>Printer/Scanner Option</b></li> <li>2. Image Adapter/A</li> <li>3. Memory Module DRAM, VRAM</li> </ol>
<b>Image Adapter/A Memory Test failure indicated by graphic of adapter.</b>	<ol style="list-style-type: none"> <li>1. <b>Replace memory module (shown in graphic.)</b></li> </ol>
206XX	<ol style="list-style-type: none"> <li>1. <b>SCSI-2 Adapter</b></li> <li>2. Any SCSI Device</li> <li>3. System Board</li> </ol>
208XX Verify there are no duplicate SCSI ID settings on the same bus.	<ol style="list-style-type: none"> <li>1. <b>Any SCSI Device</b></li> </ol>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>210XX1</b> External bus, size unknown.	<ol style="list-style-type: none"> <li>1. <b>SCSI Hard Disk Drive</b></li> <li>2. SCSI Adapter</li> <li>3. SCSI Cable</li> <li>4. SCSI ID Switch (on some models)</li> </ol>
<b>Tape Drive amber LED remains on.</b>	<ol style="list-style-type: none"> <li>1. <b>Tape Drive</b></li> <li>2. SCSI Cable (internal)</li> <li>3. SCSI Adapter</li> </ol>
<b>Tape Drive green "in use" LED fails to come on.</b>	<ol style="list-style-type: none"> <li>1. <b>Tape Drive</b></li> <li>2. SCSI Adapter</li> <li>3. SCSI Cable (internal) SCSI Cable (external)</li> </ol>
<b>Tape automatically ejected from drive.</b>	<ol style="list-style-type: none"> <li>1. <b>Tape Cassette</b></li> <li>2. Drive</li> </ol>
<b>SCSI ID on rotary switch does not match SCSI ID set in configuration. Verify drive switches inside cover are set to zero.</b>	<ol style="list-style-type: none"> <li>1. <b>Rotary Switch Circuit Board</b></li> <li>2. Circuit Board Cable</li> <li>3. Tape Drive</li> </ol>
<b>Tape sticks/breaks in drive.</b> Verify that the tapes used meet ANSI standard X3B5.	<ol style="list-style-type: none"> <li>1. <b>Tape Cassette</b></li> </ol>
<b>212XX</b>	<ol style="list-style-type: none"> <li>1. <b>SCSI Printer</b></li> <li>2. Printer Cable</li> </ol>
<b>213XX</b>	<ol style="list-style-type: none"> <li>1. <b>SCSI Processor</b></li> </ol>
<b>214XX</b>	<ol style="list-style-type: none"> <li>1. <b>WORM Drive</b></li> </ol>
<b>215XXXC</b> <b>215XXXD</b> <b>215XXXE</b> <b>215XXXU</b> If an external device, and power-on LED is off, check external voltages.	<ol style="list-style-type: none"> <li>1. <b>CD-ROM Drive I</b> <b>CD-ROM Drive II</b> <b>Enhanced CD-ROM Drive II</b> <b>Any CD-ROM Drive</b></li> <li>2. SCSI Cable</li> <li>3. SCSI Adapter</li> </ol>
<b>216XX</b>	<ol style="list-style-type: none"> <li>1. <b>Scanner</b></li> </ol>
<b>217XX</b> If an external device, and power-on LED is off, check external voltages.	<ol style="list-style-type: none"> <li>1. <b>Rewritable Optical Drive</b></li> <li>2. SCSI Adapter</li> <li>3. SCSI Cable</li> </ol>
<b>218XX</b> Check for multi CD tray, or juke box.	<ol style="list-style-type: none"> <li>1. <b>Changer</b></li> </ol>
<b>219XX</b>	<ol style="list-style-type: none"> <li>1. <b>SCSI Communications Device</b></li> </ol>
<b>24201Y0, 24210Y0</b> Be sure wrap plug is attached.	<ol style="list-style-type: none"> <li>1. <b>ISDN/2 Adapter</b></li> <li>2. ISDN/2 Wrap Plug</li> <li>3. ISDN/2 Communications Cable</li> </ol>

POST Error Code	FRU/Action
273XX	1. <b>1 Mbps Micro Channel Infrared LAN Adapter</b>
27501, 27503 27506, 27507	1. <b>ServerGuard Adapter</b> 2. System Board
27502, 27504, 27510 27511, 27533, 27534 27536, 27537	1. <b>ServerGuard Adapter</b>
27509	1. <b>Remove redundant adapters, run Auto Configuration program, then retest.</b>
27512	1. <b>WMSELF.DGS diagnostics file missing.</b> 2. WMSELF.DGS diagnostics file incorrect.
27535	1. <b>3V Lithium Backup Battery</b> 2. ServerGuard Adapter
27554	1. <b>Internal Temperature out of range</b> 2. ServerGuard Adapter
27555, 27556	1. <b>ServerGuard Adapter</b> 2. Power Supply
27557	1. <b>7.2V NiCad Main Battery Pack</b> 2. ServerGuard Adapter
27558, 27559 27560, 27561	1. <b>PCMCIA Type II Modem</b> 2. ServerGuard Adapter
27562	1. <b>External Power Control not connected</b> 2. External Power Control 3. ServerGuard Adapter
27563, 27564	1. <b>External Power Control</b> 2. ServerGuard Adapter
275XX	1. <b>Update Diagnostic Software</b>
27801 to 27879	1. <b>Personal Dictation System Adapter</b> 2. System Board
27880 to 27889	1. <b>External FRU (Speaker, Microphone)</b>
I999030X Hard disk reset failure.	<b>Possible hard disk drive problem, see "Hard disk drive boot error" on page 140.</b>

## Miscellaneous error messages

Message/Symptom	FRU/Action
CMOS Backup Battery inaccurate.	<ol style="list-style-type: none"> <li>1. <b>CMOS Backup Battery</b> See page "Safety information" on page 332.</li> <li>2. System Board</li> </ol>
Changing colors.	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> </ol>
Computer will <b>not</b> power-off. See "Power supply" on page 129.	<ol style="list-style-type: none"> <li>1. <b>Press and hold power switch for 10 seconds</b></li> <li>2. Power Switch</li> <li>3. System Board</li> </ol>
Computer will <b>not</b> RPL from server	<ol style="list-style-type: none"> <li>1. <b>Ensure Network is in startup sequence as first device or first device after diskette.</b></li> <li>2. Ensure Network adapter is enabled for RPL.</li> <li>3. Network adapter (Advise network administrator of new MAC address)</li> </ol>
Computer will <b>not</b> Wake On LAN™	<ol style="list-style-type: none"> <li>1. <b>Check power supply and signal cable connections to network adapter.</b></li> <li>2. Ensure Wake On LAN feature is enabled in Setup/Configuration. See "Setup Utility program" on page 140.</li> <li>3. Ensure network administrator is using correct MAC address.</li> <li>4. Ensure no interrupt or I/O address conflicts.</li> <li>5. Network adapter (Advise network administrator of new MAC address)</li> </ol>
Dead computer. See "Power supply" on page 129.	<ol style="list-style-type: none"> <li>1. <b>Power Switch</b></li> <li>2. Power Supply</li> <li>3. System Board</li> </ol>
Diskette drive in-use light remains on or does not light when drive is active.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> </ol>
Flashing cursor with an otherwise blank display.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Primary Hard Disk Drive</li> <li>3. Hard Disk Drive Cable</li> </ol>

Message/Symptom	FRU/Action
Incorrect memory size during POST.	<ol style="list-style-type: none"> <li>1. <b>Run the Memory tests.</b></li> <li>2. Memory Module</li> <li>3. System Board</li> </ol>
"Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> <li>4. Network Adapter</li> </ol>
Intensity or color varies from left to right of characters and color bars.	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> <li>2. System Board</li> </ol>
No power, or fan not running.	<ol style="list-style-type: none"> <li>1. <b>See "Power supply" on page 129.</b></li> </ol>
Nonsystem disk or disk error-type message with a known-good diagnostic diskette.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> </ol>
Other display symptoms not listed above (including blank or illegible display).	<ol style="list-style-type: none"> <li>1. <b>See "Display" on page 131.</b></li> <li>2. System Board</li> <li>3. Display</li> </ol>
Power-on indicator or hard disk drive in-use light not on, but computer works correctly.	<ol style="list-style-type: none"> <li>1. <b>Power Supply</b></li> <li>2. System Board</li> <li>3. LED Cables</li> </ol>
Printer problems.	<ol style="list-style-type: none"> <li>1. <b>See "Printer" on page 128.</b></li> </ol>
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Diskette Drive</li> <li>3. Diskette Drive Cable</li> <li>4. System Board</li> <li>5. Power Supply</li> </ol>
RPL computer cannot access programs from its own hard disk.	<ol style="list-style-type: none"> <li>1. <b>If network admin. is using LCCM Hybrid RPL, check startup sequence: First device: network; Second device: hard disk</b></li> <li>2. Hard disk drive</li> </ol>
RPL computer does not RPL from server.	<ol style="list-style-type: none"> <li>1. <b>Check startup sequence</b></li> <li>2. Check the network adapter LED status</li> </ol>
Serial or parallel port device failure (system board port).	<ol style="list-style-type: none"> <li>1. <b>External Device Self-Test OK?</b></li> <li>2. External Device</li> <li>3. Cable</li> <li>4. System Board</li> </ol>

Message/Symptom	FRU/Action
Serial or parallel port device failure (adapter port).	<ol style="list-style-type: none"> <li>1. <b>External Device Self-Test OK?</b></li> <li>2. External Device</li> <li>3. Cable</li> <li>4. Alternate Adapter</li> <li>5. System Board</li> </ol>
Some or all keys on the keyboard do not work.	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>

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## Undetermined problem

Check the power supply voltages. See "Power supply" on page 129. If the voltages are correct, return here and continue with the following steps.

1. Power-off the computer.
2. Remove or disconnect the following, if installed, one at a time:
  - a. Non-IBM devices
  - b. External devices (modem, printer, or mouse)
  - c. Any adapters
  - d. Hard disk drive
  - e. Diskette drive
  - f. Memory modulesBefore removing or replacing memory modules, see "System board memory" on page 157.
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 146.

## Model tables - Country/Region/Language

Use this table to identify the country/region/language of the specific Models that are listed in the Type/Model configuration tables section.

In most cases, country or language designation will be identified by the last digit of the model number. Some models might be listed twice, as X and (J), for Country/Language identification. (J) is for Japan only.

*Table 4. Country/Region/Language Model Definition.*

<b>EMEA</b>	<b>Model</b>
EMEA preload	xx <b>G</b>
<b>North America</b>	<b>Model</b>
US English	xx <b>U</b>
Canadian French	xx <b>F</b>
<b>Latin America (LA)</b>	<b>Model</b>
Portuguese (Brazil)	xx <b>P</b>
LA Spanish	xx <b>S</b>
LA English	xx <b>L</b>
<b>Asia Pacific (AP)</b>	<b>Model</b>
AP English w/Keyboard	xx <b>A</b>
AP English w/o Keyboard	xx <b>B</b>
Japan (Japanese)	xx <b>J</b>
Hong Kong (AP English)	xx <b>H</b>
China (Chinese)	xx <b>C</b>
China (AP English)	xx <b>D</b>
Thailand (Thai)	xx <b>T</b>
Taiwan (Chinese)	xx <b>V</b>
Taiwan (AP English)	xx <b>W</b>
Korea (Korean)	xx <b>K</b>
Korea (AP English)	xx <b>R</b>

## Type/Model configuration tables (6866)

### 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 than 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 10X and 24X.
  - For 32X Max CD-ROM drives, the disk hub and disk edge speeds are 14X and 32X.
  - For 40X Max CD-ROM drives, the disk hub and disk edge speeds are 17X and 40X.
  - For 48X Max CD-ROM drives, the disk hub and disk edge speeds are 20X and 48X.

Table	Page
IntelliStation Type 6866	209

Table 5 (Page 1 of 5). IntelliStation Type 6866 - Tower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	Preload	Operating System
11X	667 MHz	2 x 128 MB 4 x RIMM	9.1 GB SCSI - 10K RPM	Matrox G400-E	9X7	48X Max	Windows NT
14X	667 MHz	2 x 128 MB 8 x RIMM	9.1 GB SCSI - 10K RPM	Eisa Gloria II	9X7	48X Max	Windows NT
15X	667 MHz	2 x 128 MB 4 x RIMM	9.1 GB SCSI - 10K RPM	IBM Fire GL 1	9X7	48X Max	Windows NT
16X	667 MHz	2 x 128 MB 8 x RIMM	18.2 GB SCSI - 10K RPM	I3D 4110	9X7	48X Max	Windows NT
19X - Open Bay	667 MHz	N/A	N/A	N/A	9X7	48X Max	N/A

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 207.
3. Models starting with C, D, or E have DOS license instead of Windows NT. Customer may install any operating system.
4. Processor = Pentium® III with 256 KB full speed Advanced Transfer Cache
5. Bus = 133 MHz frontside.
6. Memory = PC 600MHz ECC RAMBUS 4 or 8 RIMM socket cards.
7. Graphics = 2D Matrox G400 (AGP) - 16 MB, 3D IBM Fire GL1 (AGP) - 32 MB, Intense 3D 4110 (AGP) - 80 MB, Eisa Gloria II (AGP) - 64 MB.
8. Audio = AC 97, high quality internal speaker.
9. All models come with Ethernet 10/100 integrated on system board.
10. Open Bay = Authorized Assembler Program. See the note on page 208

Table 5 (Page 2 of 5). IntelliStation Type 6866 - Tower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	Preload	Operating System
21X	733 MHz	2 x 128 MB 4 x RIMM	9.1 GB SCSI - 10K RPM	Matrox G400-E	9X7	48X Max	Windows NT
24X	733 MHz	2 x 128 MB 8 x RIMM	9.1 GB SCSI - 10K RPM	Eisa Gloria II	9X7	48X Max	Windows NT
25X	733 MHz	2 x 128 MB 4 x RIMM	9.1 GB SCSI - 10K RPM	IBM Fire GL 1	9X7	48X Max	Windows NT
26X	733 MHz	2 x 256 MB 8 x RIMM	18.2 GB SCSI - 10K RPM	I3D 4110	9X7	48X Max	Windows NT
27X	2 x 733 MHz	2 x 256 MB 8 x RIMM	18.2 GB SCSI - 10K RPM	I3D 4110	9X7	48X Max	Windows NT

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 207.
3. Models starting with C, D, or E have DOS license instead of Windows NT. Customer may install any operating system.
4. Processor = Pentium® III with 256 KB full speed Advanced Transfer Cache
5. Bus = 133 MHz frontside.
6. Memory = PC 600MHz ECC RAMBUS 4 or 8 RIMM socket cards.
7. Graphics = 2D Matrox G400 (AGP) - 16 MB, 3D IBM Fire GL1 (AGP) - 32 MB, Intense 3D 4110 (AGP) - 80 MB, Eisa Gloria II (AGP) - 64 MB.
8. Audio = AC 97, high quality internal speaker.
9. All models come with Ethernet 10/100 integrated on system board.
10. Open Bay = Authorized Assembler Program. See the note on page 208

Table 5 (Page 3 of 5). IntelliStation Type 6866 - Tower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	Preload	
29X - Open Bay	733 MHz	N/A	N/A	N/A	9X7	48X Max	N/A
30X	800 MHz	2 x 128 MB 4 x RIMM	9.1 GB SCSI - 10K RPM	Matrox G400	9X7	48X Max	Windows NT
31X	800 MHz	2 x 256 MB 8 x RIMM	18.2 GB EIDE	I3D 4110	9X7	48X Max	Windows NT
34X, C4X	800 MHz	2 x 256 MB 8 x RIMM	9.1 GB SCSI - 10K RPM	Elsa Gloria II	9X7	48X Max	Windows NT
38X - Open Bay	800 MHz	N/A	N/A	N/A	9X7	48X Max	N/A

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 207.
3. Models starting with C, D, or E have DOS license instead of Windows NT. Customer may install any operating system.
4. Processor = Pentium® III with 256 KB full speed Advanced Transfer Cache
5. Bus = 133 MHz frontside.
6. Memory = PC 600MHz ECC RAMBUS 4 or 8 RIMM socket cards.
7. Graphics = 2D Matrox G400 (AGP) - 16 MB, 3D IBM Fire GL1 (AGP) - 32 MB, Intense 3D 4110 (AGP) - 80 MB, Elsa Gloria II (AGP) - 64 MB.
8. Audio = AC 97, high quality internal speaker.
9. All models come with Ethernet 10/100 integrated on system board.
10. Open Bay = Authorized Assembler Program. See the note on page 208

Table 5 (Page 4 of 5). IntelliStation Type 6866 - Tower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	Preload	Operating System
40X	866 MHz	2 x 128 MB 4 x RIMM	9.1 GB SCSI - 10K RPM	Matrox G400	9X7	48X Max	Windows NT
41X	866 MHz	2 x 256 MB 8 x RIMM	18.2 GB EIDE	I3D 4110	9X7	48X Max	Windows NT
44X, D4X	866 MHz	2 x 256 MB 8 x RIMM	9.1 GB SCSI - 10K RPM	Elsa Gloria II	9X7	48X Max	Windows NT
48X - Open Bay	866 MHz	N/A	N/A	N/A	9X7	48X Max	N/A
50X, E0X	933 MHz	2 x 128 MB 4 x RIMM	9.1 GB SCSI - 10K RPM	Matrox G400	9X7	48X Max	Windows NT

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 207.
3. Models starting with C, D, or E have DOS license instead of Windows NT. Customer may install any operating system.
4. Processor = Pentium® III with 256 KB full speed Advanced Transfer Cache
5. Bus = 133 MHz frontside.
6. Memory = PC 600MHz ECC RAMBUS 4 or 8 RIMM socket cards.
7. Graphics = 2D Matrox G400 (AGP) - 16 MB, 3D IBM Fire GL1 (AGP) - 32 MB, Intense 3D 4110 (AGP) - 80 MB, Elsa Gloria II (AGP) - 64 MB.
8. Audio = AC 97, high quality internal speaker.
9. All models come with Ethernet 10/100 integrated on system board.
10. Open Bay = Authorized Assembler Program. See the note on page 208

Table 5 (Page 5 of 5). IntelliStation Type 6866 - Tower

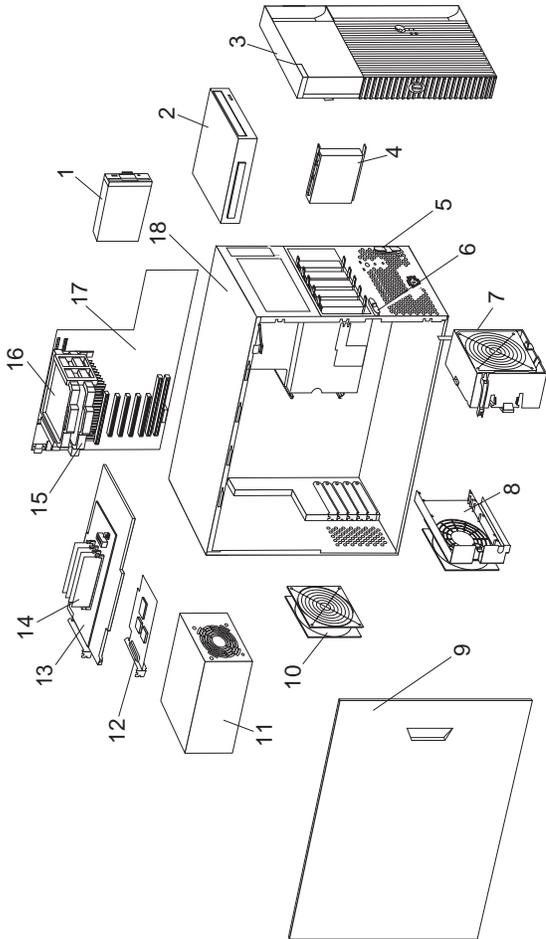
Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	Preload	Operating System
54X, E4X	933 MHz	2 x 256 MB 8 x RIMM	9.1 GB SCSI - 10K RPM	Elsa Gloria II	9X7	48X Max	Windows NT
56X, E6X	933 MHz	2 x 256 MB 8 x RIMM	18.2 GB SCSI - 10K RPM	I3D 4110	9X7	48X Max	Windows NT
58X, E8X	933 MHz	2 x 256 MB 8 x RIMM	18.2 GB SCSI - 10K RPM	I3D 4110	9X7	48X Max	Windows NT

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 207.
3. Models starting with C, D, or E have DOS license instead of Windows NT. Customer may install any operating system.
4. Processor = Pentium® III with 256 KB full speed Advanced Transfer Cache
5. Bus = 133 MHz frontside.
6. Memory = PC 600MHz ECC RAMBUS 4 or 8 RIMM socket cards.
7. Graphics = 2D Matrox G400 (AGP) - 16 MB, 3D IBM Fire GL1 (AGP) - 32 MB, Intense 3D 4110 (AGP) - 80 MB, Elsa Gloria II (AGP) - 64 MB.
8. Audio = AC 97, high quality internal speaker.
9. All models come with Ethernet 10/100 integrated on system board.
10. Open Bay = Authorized Assembler Program. See the note on page 208

**Notes:**

Parts (Type 6866)



## Parts listing

Index	System (Type 6866)	FRU No.
1	1.44 MB, 3.5-Inch Diskette Drive	75H9550
2	CD-ROM (48X Max)	09N0737
3	Front Bezel w/Keylock Assembly	00N3505
	Keylock Assembly	00N3508
	Bezel Latch & Handle Assembly	01N2017
4	9.1 GB SCSI 10K RPM Hard Disk Drive	36L8767
4	18.2 GB SCSI 10K RPM Hard Disk Drive	36L8769
	Hard Disk Filler	00N3511
5	RFID Antenna & Cable Assembly	03K9654
6	"I" Cover Latch Assembly	01N2262
7	Card Guide w/Fan Assembly/C2 Switch Assembly	00N3509
	C2 Switch Assembly	00N3514
	Fan Assembly, 120mm	00N3494
8	Hard Disk Fan Assembly, 120mm	00N3513
9	"I" Cover Assembly (side cover)	00N3507
10	Fan Assembly Rear, 120x38mm	00N3512
11	Power Supply-490W	20L2312
12	Video card - 3D Pro 4110	37L2406
12	Video card - 3D Pro 4210	00N3439
12	Video card - IBM FIRE GL1 (AGP) 32 MB	37L2375
12	Video Card - Matrox G400 Rev E	01N2197
12	Video Card - ELSA Gloria II	01N2256
13	Memory Card (4-Slot) - includes memory card holder	00N3496
13	Memory Card (8-Slot) - includes memory card holder	00N3498
	Memory Card Holder Kit	00N3504
14	Memory - 128 MB PC600 Memory RIMM, ECC	33L3096
14	Memory - 256 MB PC600 Memory RIMM, ECC	33L3098
14	Memory Continuity Card	00N5223
15	Pentium III Xeon Processor 667 MHz/ 256 KB cache	00N3422
15	Pentium III Xeon Processor 733 MHz/ 256 KB cache	01N2259
15	Pentium III Xeon Processor 800 MHz/ 256 KB cache	01N2379
15	Pentium III Xeon Processor 866 MHz/ 256 KB cache	09N9202
15	Pentium III Xeon Processor 933 MHz/ 256 KB cache	09N9257
16	Terminator Card w/Housing	00N3434
	Processor Retainer Kit	10L5599
17	System Board w/Backing Plate (no processor, no memory, no VRM)	00N3499
	System Board Backing Plate	00N3501
18	"L" Cover Assembly	00N3506
	Air duct (for 933 MHz. processor models)	06P1974
	LED/Power Switch Cable Assembly	20L3021
	Speaker	01K4909
	VRM Processor Power Supply	20L2318
	Cable - SCSI - 6 Drop LVD	00N3502

<b>Index</b>	<b>System (Type 6866)</b>	<b>FRU No.</b>
	Cable - CD-ROM, IDE	61H0314
	Cable - Diskette Drive	61H0308
	Cable - CD-ROM Audio	75H9219
	Cable - MIDI External	00N3510
	Cable - SCSI External	00N3521
	Cable - IDE ATA 66 Hard Disk	00N3503
	Cable Duct Moulding	61H0353
	Foot (4)	01N2196
	Chassis Assembly	00N3515
	5.25" Blank Bezel	00N3259
	Door Assembly	00N3520
	Label Kit	00N3519
	Mouse - Scrollpoint II	28L1868
	Hard Disk Rails	01K1539
	EMC Shield Kit	00N3500
	includes:	
	EMC Shield, Planar (1)	
	Shield, EMC Hardfile(1)	
	Shield, 5.25" Blank (1)	
	7 position I/O shield (1)	
	Miscellaneous Hardware Kit	00N3517
	includes:	
	Screw, M3.5 x 7 (13)	
	Screwlock, Female 4-40/4-40 (2)	
	I/O Blank Brackets (Tabs) (6)	
	Screwlock, Female 4-40/2-56 (2)	
	Clip, RFID (1)	
	Isolation Grommets (20)	
	Guide, Card Memory (1)	
	Clamp, Cable (1)	
	Clamp, Cable (1)	
	Clamp, Cable (1)	
	Screws, 6-32 shoulder (20)	
	Screw, S/T M5 - Fan (4)	

### **Keyboards - PCNext Lite**

Arabic	37L2555
Belgian-French	37L2556
Belgian-UK	37L2557
Brazil/Portugal	37L2554
Bulgarian	37L2558
Chinese	37L2585
Czech	37L2559
Danish	37L2560
Dutch	37L2561
French	37L2562
French/Canadian-ID 058	37L0913
French/Canadian-ID 445	37L2552
German	37L2563
Greek	37L2564
Hebrew	37L2565
Hungarian	37L2566
Icelandic	37L2567
Italian	37L2568
Korean	28L1905
Japanese	37L2584
Latin/Spanish	37L2553
Norwegian	37L2569
Polish	37L2570
Portuguese	37L2571
Romania	37L2572
Russian	37L2573
Serbian/Cyrillic	37L2574
Slovakian	37L2575
Spanish	37L2576
Swed/Finn	37L2577
Swiss French/German	37L2578
Thailand	37L2587
Turkish (ID 179)	37L2579
Turkish (ID 440)	37L2580
UK English	37L2581
US English	37L2551
UK English (ISO Compliant)	37L2583
Yugoslavian	37L2582

## Computer Power Cords

Arabic Countries	14F0033
Argentina	36L8880
Australia	93F2365
Belgium	1339520
Bulgaria	1339520
Canada	93F2364
Chile	14F0069
Czechoslovakia	1339520
Denmark	13F9997
Finland	1339520
France	1339520
Germany	1339520
Hungary	1339520
Israel	14F0087
Italy	14F0069
Latin-America	6952301
Netherlands	1339520
New Zealand	93F2365
Norway	1339520
Paraguay	36L8880
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
Uruguay	36L8880
Yugoslavia	1339520

## Display and Monitor Information

Display and monitor information is separately available and is listed under "Related publications" on page vi.

## 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
- T10 Torx bit from Torx bit set, IBM P/N 93F2830



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## IntelliStation - 6867

This section contains the general checkout procedures, additional service information, computer exploded view, Symptom-to-FRU indexes, undetermined problem, model tables, and parts listings for the IBM IntelliStation, type 6867 computer.

### 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.

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## General checkout

This general checkout procedure is for Type 6867 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 "IBM PC Enhanced Diagnostics" on page 234.

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 252.
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 272.
4. If the computer hangs and no error is displayed, go to "Undetermined problem" on page 294.
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 241) 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.
- Set all display controls to the middle position.

(Step 001 continues)

**001** (continued)

- 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 6867 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

- Enable **Power on Status** in setup. See "Setup Utility program" on page 241.

**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 241)
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 "IBM PC Enhanced Diagnostics" on page 234.

**003**

Run the IBM PC Enhanced Diagnostics test. If necessary, refer to "Diagnostics and test information" on page 232.

- If you receive an error, replace the part that the diagnostic program calls out or go to "IBM PC Enhanced Diagnostics" on page 234.
- 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 228.
- If the printer has incorrect responses, go to "Printer" on page 228.

(Step **003** continues)

(CONTINUED)

**003** (continued)

- If the display has problems such as jittering, rolling, shifting, or being out of focus, go to "Display" on page 231.
-

## 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 294 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 294.

## Keyboard

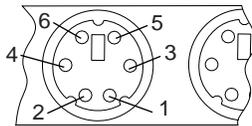
### Note

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  $\pm 5\%$ .

Pin	Voltage (Vdc)
1	+5.0
2	Reserved
3	Ground
4	+5.0
5	+5.0
6	Reserved



### 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.	<b>Correct the voltage-selector switch setting.</b>
2. Check the following for proper installation. <ul style="list-style-type: none"><li>• Power Cord</li><li>• On/Off Switch connector</li><li>• On/Off Switch Power Supply connector</li><li>• System Board Power Supply connectors</li><li>• microprocessor(s) connection</li></ul>	<b>Reseat</b>
3. Check the power cord for proper continuity.	<b>Power Cord</b>
4. Check the power-on switch for continuity.	<b>Power-on Switch</b>

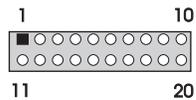
If the above are correct, check the following voltages.

## 20-pin main power supply connection

See "System board layout" on page 269 for connector location.

### Attention

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



Pin	Signal	Function
1	3.3 V	+3.3 V dc
2	3.3 V	+3.3 V dc
3	COM	Ground
4	5 V	+5 V dc
5	COM	Ground
6	5 V	+5 V dc
7	COM	Ground
8	POK	Power Good
9	5VSB	Standby Voltage
10	12 V	+12 V dc
11	3.3 V	+3.3 V dc
12	-12 V	-12 V dc
13	COM	Ground
14	PS-ON	DC Remote Enable
15	COM	Ground
16	COM	Ground
17	COM	Ground
18	-5 V	-5 V dc
19	5 V	+5 V dc
20	5 V	+5 V dc

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

## 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 294.

---

## 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
- IBM PC Enhanced Diagnostics

### 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 6867 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

1. Enable **Power on Status** in setup. See "Setup Utility program" on page 241.

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 6867 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

1. Enable **Power on Status** in setup. See "Setup Utility program" on page 241.

**Error code format**

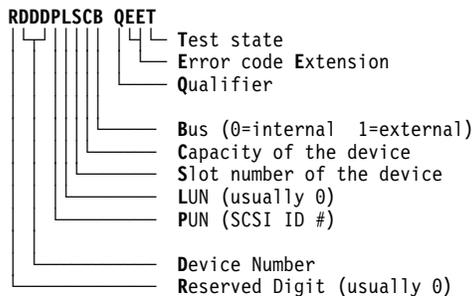
This section provides an explanation of the encoded non-SCSI and SCSI POST error codes.

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.



## 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 PC Enhanced Memory Diagnostics and the suite of diagnostic tests provided by PC-Doctor.

The IBM PC Enhanced Diagnostics are available on-line and can be downloaded from:

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

- Select **Support**
- Select **IBM IntelliStation Support**
- Select **Downloadable Files**
- Select **Diagnostics**

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 PC Enhanced Memory Diagnostics and the suite of diagnostic tests provided by PC-Doctor.
- IBM PC Enhanced Memory Diagnostics
  - The memory diagnostic tests determine which memory module (RIMM) 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 RIMM.

### Note

See "IBM PC Enhanced Diagnostics" for the IBM PC Enhanced Diagnostics error codes.

## 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 PC 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."
3. From within a test category, press **Ctrl-Enter** to automatically run only the selected tests in that category. See "Test selection."
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 239.

## 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 PC Enhanced Memory Diagnostics

The IBM PC Enhanced Memory Diagnostics provide the capability to identify a particular memory module (RIMM) which fails during testing. Use the System Board Layout section to reference the memory sockets, or select **F1 twice** to load the Online Manual and select Chapter 11 'DIMM/RIMM Locator'.

Follow the steps below to locate the IBM PC Enhanced 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 RIMM socket.

Only sockets containing a RIMM can be selected for testing. C-RIMM sockets are noted by ..... besides the test description.

**Alert On LAN test**

The Alert On LAN test does the following:

- Determines if Alert On LAN is supported on the system.
- Checks the revision ID register.
- Verifies the EEPROM checksum.
- Validates that a software alert can be sent.

**Asset ID test**

The Asset ID test does the following:

- Determines if Asset ID is supported on the system.
- Verifies the EEPROM areas.
- Performs an antenna detection test.

**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 RIMM, or a device on the PCI bus.

<b>Date:</b>	Contains the date on which the diagnostic test was run. Date is retrieved from CMOS and displayed using the YYYYMMDD format.
<b>ChkDigits:</b>	Contains a 2-digit check-digit value to ensure that: <ul style="list-style-type: none"> <li>• Diagnostics were run on the specified date</li> <li>• Diagnostics were run on the specified IBM computer</li> <li>• The diagnostic error code is recorded correctly</li> </ul>
<b>Text:</b>	Description of the error.

**Note**

See "IBM PC Enhanced Diagnostics error codes" on page 1 for error code listings.

## Hard File Smart Test

Use the Hard File Smart Test when the system management tool has detected a hard file SMART alert.

The Smart Test does the following:

- Interrogates IDE devices for support of the SMART instruction set.
- Issues a ENABLE SMART command to make sure SMART functionality is active.
- Checks the SMART RETURN STATUS command to determine if any thresholds have been exceeded.

If thresholds have been exceeded, an error message is shown, and the test fails. If no SMART is supported by the drive, the test returns with N/A.

## IBM Fixed Disk Optimized Test

The IBM Fixed Disk Optimized Test provide the capability to identify particular areas of a hard file which fails during testing. This test also provide a method of correcting certain types of errors.

To select the Fixed Disk Optimized Test:

1. Select the diagnostic option on the toolbar and press Enter.
2. Select the Fixed Disk Optimized Test
3. Select Hard Drives - NORMAL TEST to run a complete hard file test.
4. Select Hard Drives - PRESENCE TEST to run a test to check the drive controller and report any SMART information that the drive has detected.

## 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 copies 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.

## Iomega Zip Drive Test

Use the Iomega Zip Drive Test to test the zip drive and the drive interface. The test takes about 20 seconds to run.

The default tests the following:

- Controller
- Max Seek (50 times)
- Random Seek (300 sectors)

## Asset EEPROM backup

When replacing a system board, this utility allows the backup of all Asset information from the EEPROM to diskette. This utility also restores data to the EEPROM from diskette after replacement of the system board.

To run this utility:

- Select **Utility**
- Select **Asset EEPROM Backup**
- follow instructions on screen.

### 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.

**RIMM memory errors:** SIMM/DIMM/RIMM error messages issued by the IBM PC Enhanced Diagnostics:

Message	Failure Found	Recommended Actions
2xx-1y (for SIMMs)	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.
2xx-2y (for DIMMs/RIMMs)	A memory error was detected in DIMM/RIMM socket Y	Replace the DIMM/RIMM 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.

Message	Failure Found	Recommended Actions
Corrupt BIOS	<p>Information in BIOS is not as expected.</p> <p>Not able to find expected DMI information from BIOS.</p> <p>Memory controller chipset vendor ID does not match expected value.</p>	<p>Reflash the BIOS.</p> <p>Perform boot block recovery.</p> <p>Replace the system board.</p>
Test aborted by user	User stopped test.	Restart test.
<p><b>Note:</b></p> <p>"Y" is the SIMM/DIMM/RIMM socket number. Use the System Board Layouts section in the latest Hardware Maintenance Manual, HMM, to reference the memory sockets.</p>		

## 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:

- System Summary
- Product Data
- Devices and I/O Ports
- Start Options
- Date and Time
- System Security
- Advanced Setup
- ISA Legacy Resources
- Power Management

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.

## 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.

Cause	Actions
The boot sector on the start-up drive is corrupted.	The drive must be formatted, do the following: <ol style="list-style-type: none"> <li>1. Attempt to access and recover (back-up) the failing hard disk drive.</li> <li>2. Using the operating systems programs, format the hard disk drive.</li> <li>3. Go to "Preparing the hard disk drive for use" on page 242.</li> </ol>
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.

---

## Product description

The IBM IntelliStation Type 6867 computer is available in 4x5, (Four drive bays, Five I/O adapter slots which includes an AGP slot) as a desktop model only.

- **Security**
  - Administrator password
  - Cover lock
  - Power-on password
  - Operating system password
  - U-bolt and cable (Optional for some models)
  - C2 security on some models
- **CMOS backup battery (lithium)**

### 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 6867

Feature	Description
<b>Size</b>	Depth: 450 mm (17.7 inches) Height: 134 mm (5.3 inches) Width: 447 mm (17.6 inches)
<b>Weight</b>	Weight: 11.3 kg (25 lb) <sup>10</sup>
<b>Environment</b>	Air temperature: - System on: 10° to 35°C (50° to 95°F) - System off: 10° to 50°C (50° to 122°F)  Humidity: - System on: 8% to 80% - System off: 8% to 80% Maximum altitude: 3048 m (10,000 ft)
<b>Heat Output</b>	Approximate heat output in BTUs per hour: - Minimum: 245 BTU (70 watts) - Maximum: 700 BTU (204 watts) <sup>11</sup>
<b>Electrical Input</b>	Sine-wave input (47 to 63 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): 0.08 kVA
<b>Airflow</b>	Approximately 0.56 cubic meters/minute (20 CFM)
<b>Acoustical Noise Emission Values</b>	Average sound pressure levels: At operator position: - 41 dB operating - 34 dB idle At bystander position (1 meter): - 34 dB operating - 29 dB idle Declared (upper limit) sound power levels: - 5.0 bels operating - 4.5 bels idle

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

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

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

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## Additional service information

The following additional service information supports the IBM IntelliStation type 6867 computer.

- “Replacing a processor”
- “Replacing a system board” on page 246
- “Security features” on page 246
- “Passwords” on page 246
- “Vital Product Data” on page 248
- “Management Information Format (MIF)” on page 248
- “Alert on LAN2” on page 249
- “Hard disk drive jumper settings” on page 250
- “CD-ROM drive jumper settings” on page 251
- “BIOS levels” on page 252
- “Flash (BIOS/VPD) update procedure” on page 253
- “Flash recovery boot block” on page 253
- “Power management” on page 254
- “Network settings” on page 256
- “Flash over LAN (update POST/BIOS over network)” on page 256
- “Wake on LAN” on page 257
- “System board memory” on page 258

## Replacing a processor

Make sure the processor is fully seated in its socket and that the goal post latches are engaged.

### Important

- Make sure the air baffle is installed to prevent processor overheating.
- If the processor is not installed correctly, the system board and the processor can be damaged.

## 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 252 "Vital Product Data" on page 248, and "Flash (BIOS/VPD) update procedure" on page 253.
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.
5. Remove any of the following installed options on the old system board, and install them on the new system board.
  - Memory modules (RIMM and C-RIMM)
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.

## Security features

Security features in this section include:

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

## 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 241 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 layout" on page 269 to find the recovery jumper.
3. Move the recovery jumper from 'normal' to 'clear'.
4. Power-on the computer. The system senses the change in the position and erases the password.
  - It is necessary to move the jumper back to the previous position.
5. Remind the user to enter a new password when service is complete.

**Administrator password:** The administrator password is used to restrict access to the 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 6867 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.

**Administrator password control** The Administrator password is set in the Setup Configuration. Refer to "Setup Utility program" on page 241

**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 253.

## Management Information Format (MIF)

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

At the time of computer manufacture, the EPROM will be loaded with the serial numbers of the system and all major components. The customer will have access to the MIF file via the DMI MIF Browser that is installed with the preload and is also available on the SSCD 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 LAN2**

Alert on LAN2 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 LAN2 helps to manage and monitor the hardware and software features of the computer. Alert on LAN2 generates notifications to the server of these occurrences:

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

Alert on LAN2 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.

## Hard disk drive jumper settings

IDE hard disk drives for the IntelliStation computers use jumpers to set the drives as primary (master) or secondary (slave).

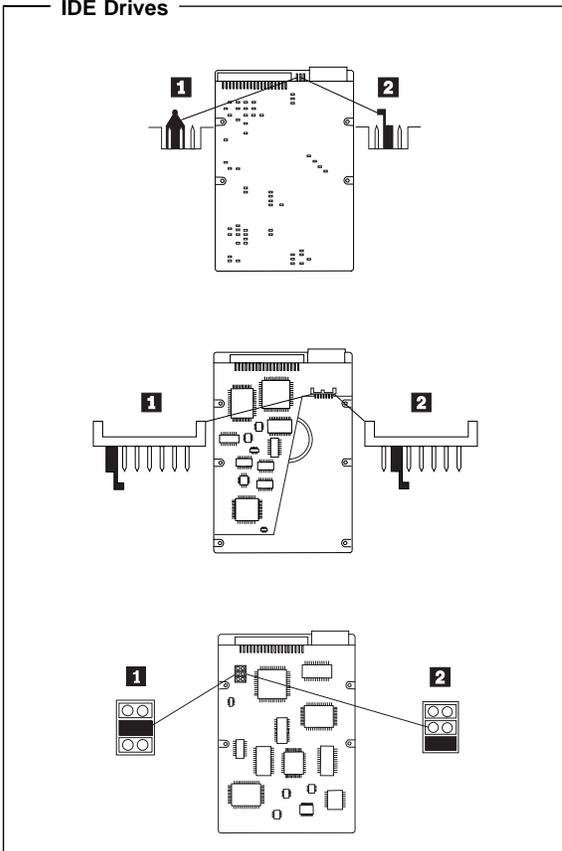
### Attention

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

## IDE hard disk drive settings

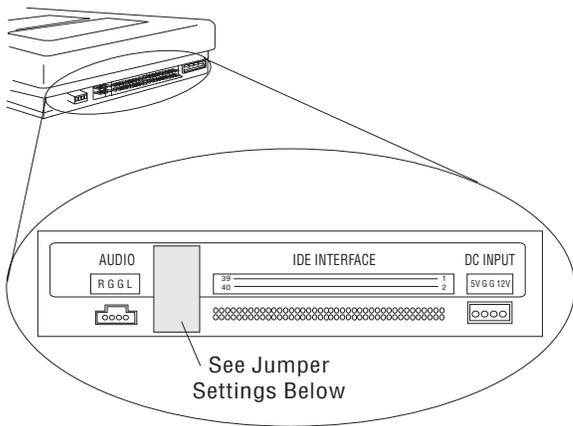
- 1** Primary (Master) Hard Disk Drive
- 2** Secondary (Slave) Hard Disk Drive

### IDE Drives



## 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	: : ■ :	: ■ :
40X Max CD-ROM	: : ■ :	: ■ :
48X 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.ibm.com/pc/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.ibm.com/pc/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 253.

## 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

### 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 recovery jumper:

1. Power-off the computer and remove the cover.
2. Move the system board recovery jumper or switch to the **clear** position. Refer to "System board layout" on page 269 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 recovery jumper to the **normal** position. Then, replace the cover and power-on the computer.

## Power management

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

### Advanced Configuration and Power

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

**Advanced Power Management:** Energy-saving settings can be viewed and changed by using the Advanced Power Management menu in the 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.
- **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 241).
2. Select **Power Management** from the Configuration/Setup Utility program menu.
3. Select the **APM BIOS Mode** and be sure it is set to **Enabled**. If it is not, press Left Arrow (←) or Right Arrow (→) to change the setting.
4. Select **Automatic Hardware Power Management**.
5. Set **Automatic Hardware Power Management** to **Enabled**.
6. Select values for the two levels of power management (system power and display), as necessary.
7. Set **IDE Drives** to **Enabled** or **Disabled**.  
**Note:** This does not apply to SCSI drives.
8. Select **Low Power Entry Activity Monitor** and enable or disable the listed options.
9. Select **Low Power Exit Activity Monitor** and enable or disable the listed options.
10. Press **Esc** twice to return to the Configuration/Setup Utility program menu.
11. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
12. 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 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 serial port (COM1), 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.
- **PCI Wake Up:** PCI Wake Up uses PCI Power Management Enabled (PME) to wake up the computer when using token-ring, Ethernet LAN adapters, modems, or other PCI cards capable of waking up the computer. When you set PCI Wake Up to **Enabled**, the computer will turn on when it receives a specific signal from another computer on the local area network (LAN) or from a modem signal. Wake on LAN features can be used on the 6867 computer. For further information, see "Wake on LAN" on page 257.

## 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 253.

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 241.
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 241.
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.

## 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.

### Note

RAMBUS inline memory module (RIMM) is used in the type 6867 computer. RIMM modules are not compatible with SIMM or DIMM memory modules. Refer to the information below regarding RIMM memory for type 6867.

Computer Name	RIMM Memory Module		
	Size	Memory	Type
IntelliStation Type 6867	128 MB	PC700/	RDRAM
	256 MB	PC800	ECC/ Non-ECC
	512 MB Maximum	PC800 only	

### Note

For maximum 512 MB configuration, two 256 MB PC800 memory RIMMs must be installed. PC700 memory RIMMs can not be used.

## Supported RIMM memory configuration

Type 6867 has two RIMM memory sockets. RIMM sockets must either have a RIMM memory module or a C-RIMM (RIMM Continuity module) installed. There can be no empty RIMM sockets. At least one socket must have a RIMM memory module installed.

- If new memory is to be added, remove a C-RIMM and install the new RIMM.
- If memory is to be removed, remove the RIMM and install a C-RIMM.

RIMM sizes of 128 MB and 256 MB are acceptable. RIMM sockets can be filled in any order. ECC or non-ECC, RAMBUS dynamic random access memory (RDRAM) are supported.

### Note

Mixed RIMM speeds will run at the lower speed.

## RIMM diagnostic approach

Identify any Beep or POST codes. See "Symptom-to-FRU index" on page 272.

Use the IBM PC Enhanced Diagnostics program to run memory tests. See "IBM PC Enhanced Diagnostics error codes" on page 1.

**Procedures to determine memory errors:**

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

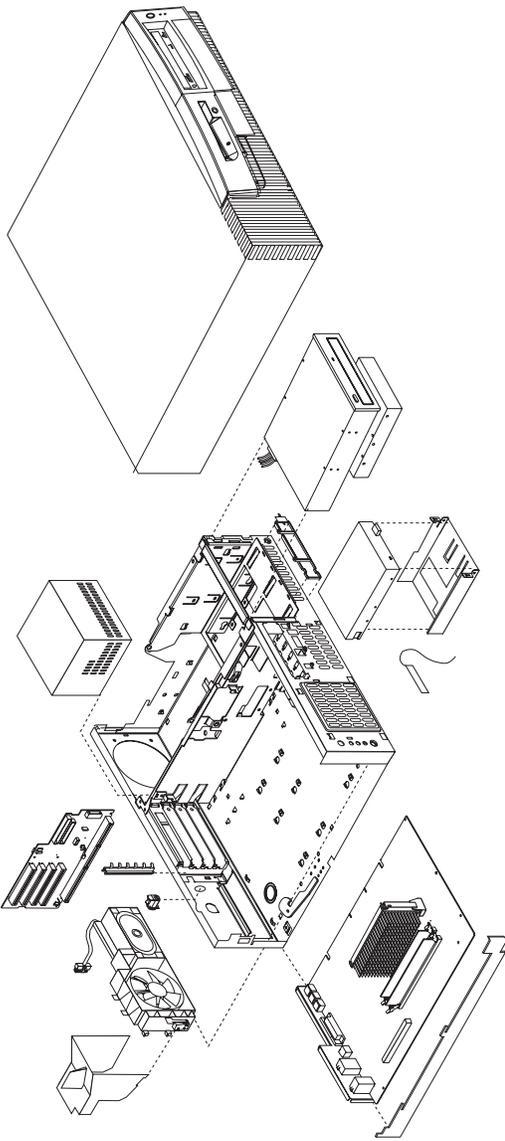
**Note**

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

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

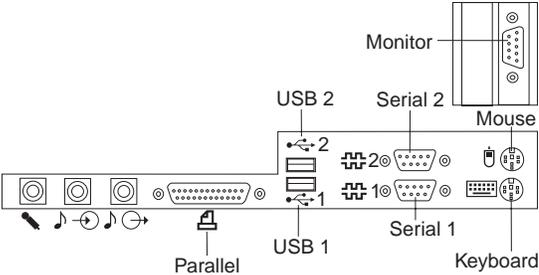
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## Computer exploded view (Type 6867)

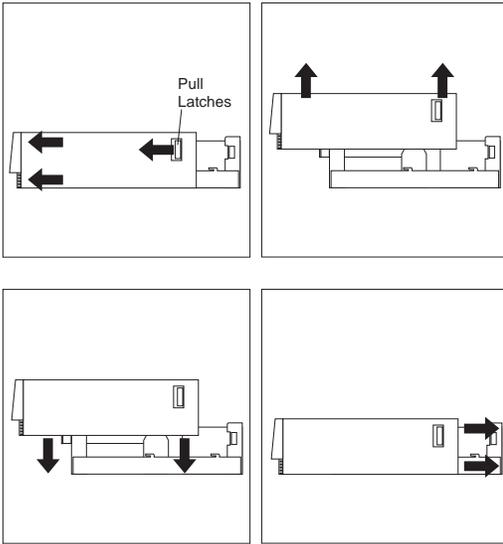


I/O connectors and removal procedures for the cover, CD-ROM/hard drive bracket, CD-ROM drive, hard drive, EIDE and SCSI cable routing, Diskette drive, system board, riser card, power supply, and fan/speaker bracket removal are on the following pages.

**Input/Output connectors**



## Top and front cover removal



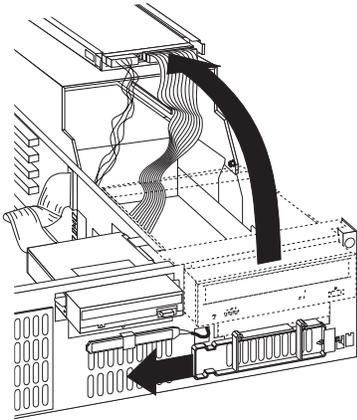
### To remove top and front cover:

1. Pull left and right pull latches forward then pull cover forward.
2. Lift cover up from the chassis.

### To install top and front cover:

1. Slide cover down onto the chassis about 4-inches (10.16 cm) from the rear of chassis.
2. Slide cover back to engage the left and right latches.

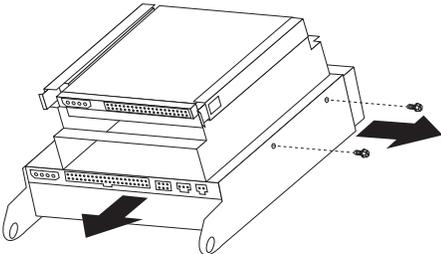
## CD-ROM/hard drive bracket



### To open the CD-ROM/hard drive bracket:

1. Remove the top cover.
2. Slide the plastic spring loaded cage retainer to the left.
3. Lift the cage up and swing it back to the service position.

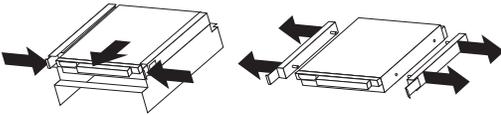
## CD-ROM drive removal



### To remove the CD-ROM drive:

1. Remove the top cover.
2. Put the CD-ROM/hard drive bracket in its service position.
3. Disconnect the CD-ROM signal and power cables.
4. Remove two screws securing the CD-ROM drive.
5. Pull the CD-ROM drive out of the bracket.

## Hard drive removal



### To remove the hard drive:

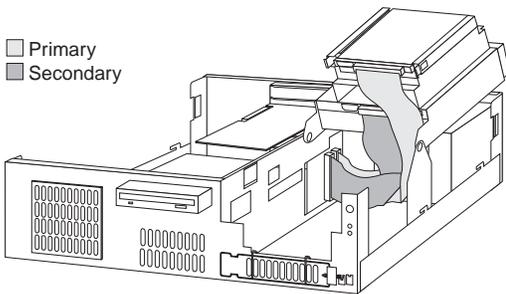
1. Remove the top cover.
2. Put the CD-ROM/hard drive bracket in its service position.
3. Disconnect the hard drive signal and power cables.
4. Push in on the left and right plastic tabs of the hard drive rails.
5. Pull the hard drive out of the bracket.

#### Note

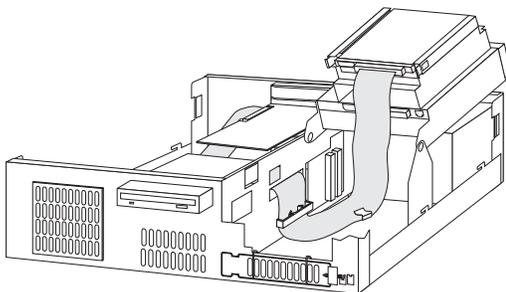
Remove the plastic rails from the old hard drive and install them on the new hard drive.

## EIDE cable routing

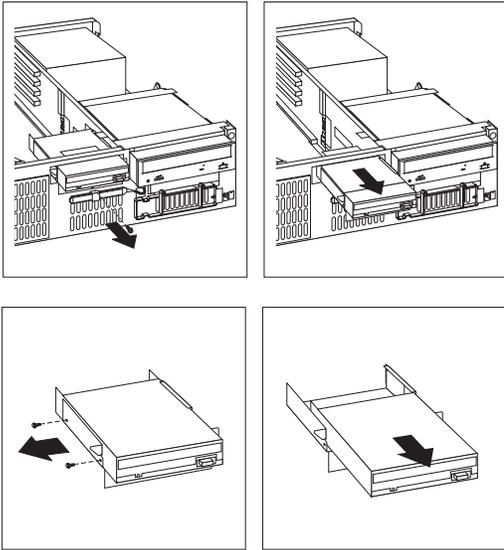
- Primary
- Secondary



## SCSI cable routing



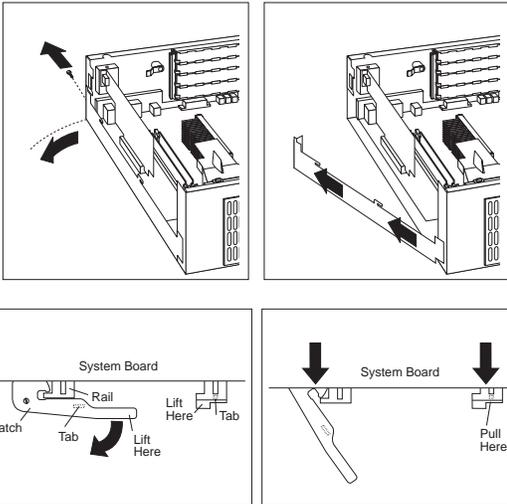
## Diskette drive removal



### To remove the diskette drive:

1. Remove the top cover.
2. Disconnect the diskette drive signal and power cables.
3. Remove the front screw of the diskette drive cage.
4. Pull the diskette drive out of the chassis.
5. Remove the two side screws from the diskette drive cage.
6. Remove the diskette drive from its cage.

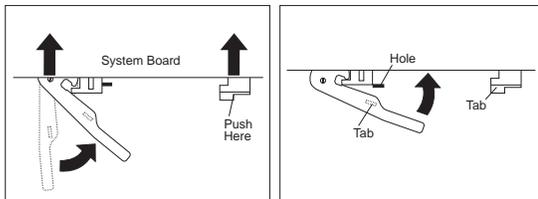
## System board removal



### To remove the system board:

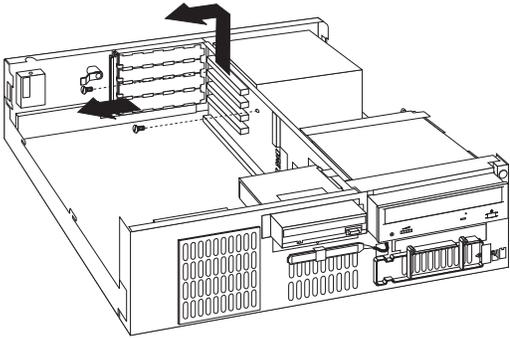
1. Remove the top cover.
2. Remove all cables connected to the system board.
3. Remove the AGP card, if installed.
4. Remove the retainer side bracket thumb screw.
5. Swing open the retainer side bracket and remove it from the chassis.
6. Lift up on the system board right-hand rail tab to disengage it from the bottom of the chassis.
7. Rotate the latch handle to disengage the system board.

## System board installation



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.

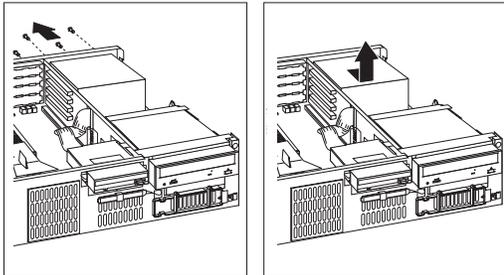
## Riser card removal



### To remove the riser card:

1. Remove the top cover.
2. Remove the system board.
3. Disconnect all cables from the front and back of the riser card.
4. Remove the two top screws securing the riser card.
5. Remove the riser card from the chassis.

## Power supply removal



### Note

1. Make sure the power supply voltage switch is set to the proper operating voltage; 115V or 230V.

### To remove the power supply:

1. Remove the top cover.
2. Disconnect the power supply connectors.
3. Remove the four screws securing the power supply to the chassis.
4. Move power supply inward, then lift out of the chassis.

## Fan bracket removal

### Note

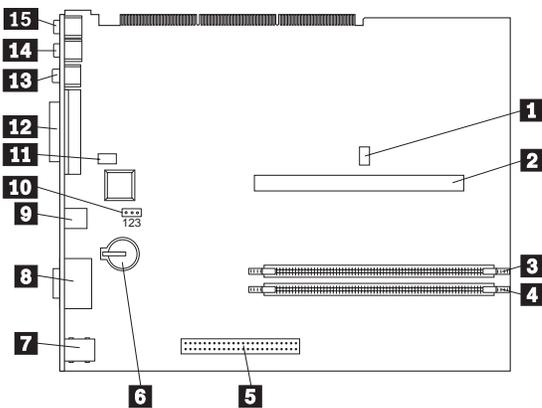
1. If you remove the LED/power cable or the RFID antenna cable, make sure it is routed the same way it was installed.
2. When removing the C2 switch assembly from the fan bracket, use care to pry the switch (alternating at both ends of the switch) from its mounting studs.
3. Make sure the RFID antenna cable is grounded to the chassis by its grounding lug.

### To remove the fan bracket:

1. Remove the top cover.
2. Remove the air duct.
3. Disconnect the fan and speaker connectors.
4. Push on the outside tab to release the bracket from the chassis.
5. Swing the bracket inward and then pull it from the chassis.

---

## System board layout



## System board locations

- 1** Processor fan connector (not used)
- 2** Processor socket
- 3** RIMM socket 1
- 4** RIMM socket 2
- 5** AGP connector
- 6** Battery
- 7** Keyboard/Mouse connectors
- 8** Serial 1,2 connectors
- 9** USB connectors
- 10** Recovery jumper
- 11** PC PCI connector (not used)
- 12** Parallel connector
- 13** Line Out connector
- 14** Line In connector
- 15** Microphone connector

## System board jumper settings

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

### Clear CMOS/Flash Boot Block Recovery

Use this jumper setting to Clear CMOS or to Flash Boot Block Recover.

Jumper	Setting	Description
Clear CMOS	2-3	Clear CMOS/ Flash Recovery Mode
	1-2 (D)	Normal Mode

### Processor Speed Settings

Processor speed for the IBM IntelliStation 6867 computers are fixed and are determined by the processor. There are no settings required.

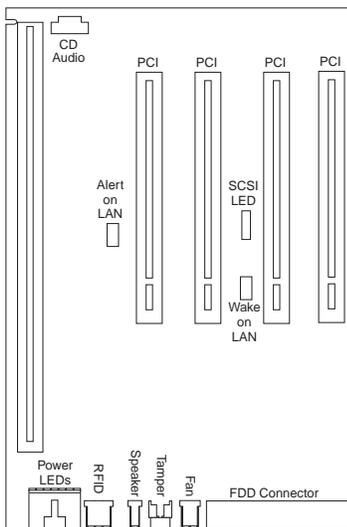
### Diskette Write Access

Diskette Write Enable and Write Protect options are changed in the Setup Configuration. See "Setup Utility program" on page 241.

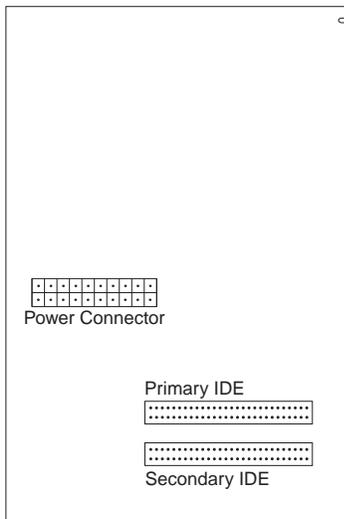
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## Riser card (Type 6867)

Riser card, PCI, front view



Riser card, back view



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## 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" on page 224. See "IBM PC Enhanced Diagnostics error codes" on page 1 when running diagnostics. 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 294.

### 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 229.)
- Check the hard disk drive jumper settings before you replace a hard disk drive. (See "Hard disk drive jumper settings" on page 250.)

### Important

1. Some errors are indicated with a series of beep codes. (See "Beep symptoms" on page 273.)  
Type 6867 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST. To enable Beep and memory count and checkpoint code display when a successful POST occurs:
  - Enable **Power on Status** in setup. See "Setup Utility program" on page 241.
2. The processor is a separate FRU from the system board; the processor is not included with the system board FRU.

## 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	<ul style="list-style-type: none"> <li>• One Beep</li> <li>• A pause (or break)</li> <li>• Two beeps</li> <li>• A pause (or break)</li> <li>• Any number of beeps</li> </ul>
4	Four continuous beeps

Beep Symptom	FRU/Action
1-1-3 CMOS read/write error	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. System Board</li> </ol>
1-1-4 ROM BIOS check error	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
1-2-X DMA error	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
1-3-X	<ol style="list-style-type: none"> <li>1. <b>RIMM Memory Module</b> see "System board memory" on page 258</li> <li>2. C-RIMM</li> <li>3. System Board</li> </ol>
1-4-4	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. System Board</li> </ol>
1-4-X Error detected in first 64 KB of RAM.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-1-1, 2-1-2	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. System Board</li> </ol>
2-1-X First 64 KB of RAM failed.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-2-2	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
2-2-X First 64 KB of RAM failed.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-3-X	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
2-4-X	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Memory Module</li> <li>3. System Board</li> </ol>
3-1-X DMA register failed.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
3-2-4 Keyboard controller failed.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Keyboard</li> </ol>

Beep Symptom	FRU/Action
<b>3-3-4</b> Screen initialization failed.	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> <li>3. Display</li> </ol>
<b>3-4-1</b> Screen retrace test detected an error.	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> <li>3. Display</li> </ol>
<b>3-4-2</b> POST is searching for video ROM.	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
<b>4</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
All other beep code sequences.	1. <b>System Board</b>
One long and one short beep during POST. Base 640 KB memory error or shadow RAM error.	<ol style="list-style-type: none"> <li>1. <b>Memory Module</b></li> <li>2. System Board</li> </ol>
One long beep and two or three short beeps during POST. (Video error)	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
Three short beeps during POST.	<ol style="list-style-type: none"> <li>1. <b>See "System board memory" on page 258.</b></li> <li>2. System Board</li> </ol>
Continuous beep.	1. <b>System Board</b>
Repeating short beeps.	<ol style="list-style-type: none"> <li>1. <b>Keyboard stuck key?</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>

## No beep symptoms

### Note

Type 6867 computers default to come up quiet (No beep and no memory count and checkpoint code display) when no errors are detected by POST.

To enable Beep and memory count and checkpoint code display when a successful POST occurs:

- Enable **Power on Status** in setup. See "Setup Utility program" on page 241.

Symptom/Error	FRU/Action
No beep during POST but computer works correctly.	1. <b>System Board</b>

Symptom/Error	FRU/Action
No beep during POST.	<ol style="list-style-type: none"><li>1. <b>See “Undetermined problem” on page 294.</b></li><li>2. System Board</li><li>3. Memory Module</li><li>4. Any Adapter or Device</li><li>5. Riser Card</li><li>6. Power Cord</li><li>7. Power Supply</li></ol>

## POST error codes

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

POST Error Code	FRU/Action
<b>000</b> SCSI Adapter not enabled.	1. <b>Verify adapter device and Bus Master fields are enabled in PCI configuration program. See documentation shipped with computer.</b>
<b>02X</b>	1. <b>SCSI Adapter</b>
<b>08X</b> Check SCSI terminator installation.	1. <b>SCSI Cable</b> 2. SCSI Terminator 3. SCSI Device 4. SCSI Adapter
<b>101</b> System board interrupt failure.	1. <b>System Board</b>
<b>102</b> System board timer error.	1. <b>System Board</b>
<b>106</b>	1. <b>System Board</b>
<b>110</b> System board memory parity error.	1. <b>Memory Module</b> 2. System Board
<b>111</b> I/O channel parity error.	1. <b>Reseat adapters</b> 2. Any Adapter 3. Riser card 4. System Board
<b>114</b> Adapter ROM error.	1. <b>Adapter Memory</b> 2. System Board 3. Riser card
<b>129</b> Internal cache test error.	1. <b>Processor</b> 2. L2 Cache Memory 3. System Board
<b>151</b> Real-time clock failure.	1. <b>System Board</b>
<b>161</b> Bad CMOS battery.	1. <b>Run Setup</b> 2. CMOS Backup Battery (See page "Safety information" on page 332.) 3. System Board

POST Error Code	FRU/Action
<p><b>162</b> Configuration mismatch.</p>	<ol style="list-style-type: none"> <li>1. <b>Run Setup and verify Configuration</b></li> <li>2. Had a device been added, removed, changed location? If not, suspect that device.</li> <li>3. Power-on external devices first, then power-on computer.</li> <li>4. CMOS Backup Battery (See page "Safety information" on page 332.)</li> <li>5. System Board</li> <li>6. Riser card</li> </ol>
<p><b>162</b> And unable to run diagnostics.</p>	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> <li>4. Riser card</li> </ol>
<p><b>163</b> Clock not updating or invalid time set.</p>	<ol style="list-style-type: none"> <li>1. <b>Time and Date Set?</b></li> <li>2. CMOS Backup Battery (See page "Safety information" on page 332.)</li> <li>3. System Board</li> </ol>
<p><b>164</b> POST detected a base memory or extended memory size mismatch error. or RIMM socket 3 is populated with a RIMM memory module.</p>	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check System Summary menu for memory size change. (See "Setup Utility program" on page 241.)</b></li> <li>2. Run the Extended Memory Diagnostic tests.</li> <li>3. Replace RIMM memory module in socket 3 with a C-RIMM</li> </ol>
<p><b>166</b> Boot Block Check Sum Error</p>	<ol style="list-style-type: none"> <li>1. <b>Run Flash Recovery using Boot Block. See "Flash recovery boot block" on page 253</b></li> <li>2. System Board</li> </ol>
<p><b>167</b> Microprocessor installed that is not supported by the current POST/BIOS.</p>	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check Stepping level for the BIOS level needed, then perform the flash update.</b></li> <li>2. Processor</li> </ol>

POST Error Code	FRU/Action
<b>168</b> Alert on LAN2 error	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check to see that Ethernet and Alert on LAN2 are enabled.</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
<b>17X, 18X</b>	1. <b>C2 Security</b>
<b>175</b>	<ol style="list-style-type: none"> <li>1. <b>Run Configuration (See "Setup Utility program" on page 241.)</b></li> <li>2. System Board</li> </ol>
<b>176</b>	1. <b>Covers were removed from the computer.</b>
<b>177</b> Corrupted Administrator Password.	1. <b>System Board</b>
<b>178</b>	1. <b>System Board</b>
<b>183</b>	1. <b>Enter the administrator password</b>
<b>184</b> No RFID Antenna	<ol style="list-style-type: none"> <li>1. <b>Make sure Asset Care and Asset ID™ are enabled in Configuration/Setup.</b></li> <li>2. RFID Antenna</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>185</b> Corrupted boot sequence.	1. <b>Set configuration and reinstall the boot sequence.</b>
<b>186</b>	1. <b>System Board</b>
<b>187</b>	<ol style="list-style-type: none"> <li>1. <b>Clear Administration password</b></li> <li>2. System Board</li> </ol>
<b>189</b>	1. <b>More than three password attempts were made to access the computer.</b>
<b>190</b> Chassis intrusion detector was cleared. This is information only, no action required. If this code does not clear:	1. <b>System Board</b>
<b>1XX</b> Not listed above.	1. <b>System Board</b>
<b>201, 20X</b> Memory data error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diag. Memory Test</b></li> <li>2. Memory Module</li> <li>3. System Board</li> </ol>
<b>225</b>	1. <b>Unsupported Memory</b>

POST Error Code	FRU/Action
<b>229</b> External cache test error.	<ol style="list-style-type: none"> <li>1. <b>L2 Cache Memory</b></li> <li>2. System Board</li> </ol>
<b>262</b> POST detected a base memory or extended memory type error.	<ol style="list-style-type: none"> <li>1. <b>Run Setup. Check System Summary menu for memory type change. (See "Setup Utility program" on page 241.)</b></li> <li>2. Run the Extended Memory Diagnostic tests.</li> </ol>
<b>301</b>	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>
<b>303</b> With an 8603 error.	<ol style="list-style-type: none"> <li>1. <b>Mouse</b></li> <li>2. Keyboard</li> <li>3. Keyboard Cable</li> <li>4. System Board</li> </ol>
<b>303</b> With no 8603 error.	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>
<b>3XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>
<b>5XX</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> </ol>
<b>601</b>	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive A</b></li> <li>2. Diskette Drive Cable</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>602</b>	<ol style="list-style-type: none"> <li>1. <b>Bad Diskette ?</b></li> <li>2. Verify Diskette and retry.</li> </ol>
<b>604</b> And able to run diagnostics.	<ol style="list-style-type: none"> <li>1. <b>Run Setup and verify diskette configuration settings</b></li> <li>2. Diskette Drive A/B</li> <li>3. Diskette Drive Cable</li> <li>4. System Board</li> <li>5. Riser card</li> </ol>
<b>605</b> POST cannot unlock the diskette drive.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. Diskette Drive Cable</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>662</b>	<ol style="list-style-type: none"> <li>1. <b>Diskette drive configuration error or wrong diskette drive type, run Setup Configuration.</b></li> </ol>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>6XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Riser card</li> <li>4. External Drive Adapter</li> <li>5. Diskette Drive Cable</li> <li>6. Power Supply</li> </ol>
<b>762</b> Math coprocessor configuration error.	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Processor</li> <li>3. System Board</li> </ol>
<b>7XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Processor</b></li> <li>2. System Board</li> </ol>
<b>962</b> Parallel port configuration error.	<ol style="list-style-type: none"> <li>1. <b>Run Configuration</b></li> <li>2. Parallel Adapter (if installed)</li> <li>3. System Board</li> </ol>
<b>9XX</b>	<ol style="list-style-type: none"> <li>1. <b>Printer</b></li> <li>2. System Board</li> </ol>
<b>1047</b>	<ol style="list-style-type: none"> <li>1. <b>16-Bit AT Fast SCSI Adapter</b></li> </ol>
<b>107X</b> Check SCSI terminator installation.	<ol style="list-style-type: none"> <li>1. <b>Check SCSI terminator installation.</b></li> <li>2. SCSI Cable</li> <li>3. SCSI Terminator</li> <li>4. SCSI Device</li> <li>5. SCSI Adapter</li> </ol>
<b>1101</b> Serial connector error, possible system board failure.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>1101, 1102, 1106, 1108, 1109</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Any Serial Device</li> </ol>
<b>1107</b>	<ol style="list-style-type: none"> <li>1. <b>Communications Cable</b></li> <li>2. System Board</li> </ol>
<b>1102</b> Card selected feedback error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>1103</b> Port fails register check.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. System Board</li> </ol>
<b>1106</b> Serial option cannot be turned off.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. System Board</li> </ol>
<b>1107</b>	<ol style="list-style-type: none"> <li>1. <b>Serial Device Cable</b></li> <li>2. System Board</li> </ol>
<b>1110</b> Register test failed.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. System Board</li> </ol>
<b>1116</b> Interrupt error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>1117</b> Failed baud rate test.	1. <b>Run Enhanced Diagnostics</b>
<b>1162</b> Serial port configuration error.	1. <b>Run Configuration</b> 2. Serial Adapter (if installed) 3. System Board
<b>11XX</b> Not listed above.	1. <b>System Board</b>
<b>1201</b>	1. <b>System Board</b> 2. Any Serial Device
<b>1202, 1206, 1208, 1209, 12XX</b>	1. <b>Dual Async Adapter/A</b> 2. System Board 3. Any Serial Device
<b>1207</b>	1. <b>Communications Cable</b> 2. Dual Async Adapter/A
<b>13XX</b>	1. <b>Game Adapter</b>
<b>1402</b> Printer not ready.	Information only
<b>1403</b> No paper error, or interrupt failure.	Information only
<b>1404</b> System board timeout failure.	1. <b>Run Enhanced Diagnostics</b>
<b>1405</b> Parallel adapter error.	1. <b>Run Enhanced Diagnostics</b>
<b>1406</b> Presence test error.	1. <b>Run Enhanced Diagnostics</b>
<b>14XX</b> Not listed above. Check printer before replacing system board.	1. <b>Printer</b> 2. System Board
<b>15XX</b>	1. <b>SDLC Adapter</b>
<b>1692</b> Boot sequence error.	1. <b>Run FDISK to ensure at least one active partition is set active.</b>
<b>16XX</b>	1. <b>36/38 Workstation Adapter</b>
<b>1762</b> Hard disk drive configuration error.	1. <b>Run Configuration (See "Setup Utility program" on page 241.)</b>
<b>1780</b> (Disk Drive 0) <b>1781</b> (Disk Drive 1) <b>1782</b> (Disk Drive 2) <b>1783</b> (Disk Drive 3)	1. <b>See "Power supply" on page 229.</b> 2. Hard Disk Drive 3. System Board 4. Riser card 5. Hard Disk Cable 6. Power Supply

POST Error Code	FRU/Action
<b>180X, 188X</b> PCI configuration or resource error.	<ol style="list-style-type: none"> <li>1. <b>Run Setup and verify PCI/ISA configuration settings.</b></li> <li>2. If necessary, set ISA adapters to "Not available" to allow PCI adapters to properly configure.</li> <li>3. Remove any suspect ISA adapters.</li> <li>4. Rerun diagnostics.</li> <li>5. PCI Adapter</li> </ol>
<b>1962</b> Boot sequence error.	<ol style="list-style-type: none"> <li>1. <b>Possible hard disk drive problem, see "Hard disk drive boot error" on page 41.</b></li> </ol>
<b>209X</b>	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. Diskette Cable</li> <li>3. 16-bit AT Fast SCSI Adapter</li> </ol>
<b>20XX</b> Not listed above	<ol style="list-style-type: none"> <li>1. <b>BSC Adapter</b></li> </ol>
<b>21XX</b>	<ol style="list-style-type: none"> <li>1. <b>SCSI Device</b></li> <li>2. 16-bit AT Fast SCSI Adapter</li> <li>3. Alternate BSC Adapter</li> </ol>
<b>2401, 2402</b> If screen colors change.	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> </ol>
<b>2401, 2402</b> If screen colors are OK.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Display</li> </ol>
<b>2409</b>	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> </ol>
<b>2410</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Display</li> </ol>
<b>2462</b> Video memory configuration error.	<ol style="list-style-type: none"> <li>1. <b>Check cable connections.</b></li> <li>2. Run Setup and verify video configuration settings.</li> <li>3. Video Memory Modules</li> <li>4. Video Adapter (if installed)</li> <li>5. System Board</li> </ol>
<b>3015, 3040</b> Check for missing wrap or terminator plug on the adapter.	<ol style="list-style-type: none"> <li>1. <b>Network Attached?</b></li> <li>2. LF Translator</li> <li>3. Cable Problem</li> <li>4. PC Network Adapter</li> </ol>
<b>30XX</b>	<ol style="list-style-type: none"> <li>1. <b>PC Network Adapter</b></li> <li>2. LF Translator</li> <li>3. Cable Problem?</li> </ol>

POST Error Code	FRU/Action
3115, 3140	<ol style="list-style-type: none"> <li>1. <b>Network Attached?</b></li> <li>2. LF Translator</li> <li>3. Alternate PC Network-Adapter</li> <li>4. Cable Problem</li> </ol>
31XX	<ol style="list-style-type: none"> <li>1. <b>Alternate PC Network Adapter</b></li> <li>2. LF Translator</li> <li>3. Cable Problem</li> </ol>
36XX	<ol style="list-style-type: none"> <li>1. <b>GPIB Adapter</b></li> </ol>
38XX	<ol style="list-style-type: none"> <li>1. <b>DAC Adapter</b></li> </ol>
4611, 4630	<ol style="list-style-type: none"> <li>1. <b>Multiport/2 Interface Board</b></li> <li>2. Multiport/2 Adapter</li> </ol>
4612, 4613 4640, 4641	<ol style="list-style-type: none"> <li>1. <b>Memory Module Package</b></li> <li>2. Multiport/2 Adapter</li> </ol>
4650	<ol style="list-style-type: none"> <li>1. <b>Multiport Interface Cable</b></li> </ol>
46XX Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Multiport/2 Adapter</b></li> <li>2. Multiport/2 Interface Board</li> <li>3. Memory Module</li> </ol>
5600	<ol style="list-style-type: none"> <li>1. <b>Financial System Controller Adapter</b></li> </ol>
5962 An IDE device (other than hard drive) configuration error.	<ol style="list-style-type: none"> <li>1. <b>Run Configuration</b></li> <li>2. CD-ROM Drive</li> <li>3. CD-ROM Adapter</li> <li>4. ZIP or other ATAPI device</li> <li>5. System Board</li> <li>6. Riser card</li> </ol>
62XX	<ol style="list-style-type: none"> <li>1. <b>1st Store Loop Adapter</b></li> <li>2. Adapter Cable</li> </ol>
63XX	<ol style="list-style-type: none"> <li>1. <b>2nd Store Loop Adapter</b></li> <li>2. Adapter Cable</li> </ol>
64XX	<ol style="list-style-type: none"> <li>1. <b>Network Adapter</b></li> </ol>
71XX	<ol style="list-style-type: none"> <li>1. <b>Voice Adapter</b></li> </ol>
74XX	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> </ol>
76XX	<ol style="list-style-type: none"> <li>1. <b>Page Printer Adapter</b></li> </ol>
78XX	<ol style="list-style-type: none"> <li>1. <b>High Speed Adapter</b></li> </ol>
79XX	<ol style="list-style-type: none"> <li>1. <b>3117 Adapter</b></li> </ol>
80XX	<ol style="list-style-type: none"> <li>1. <b>PCMCIA Adapter</b></li> </ol>
84XX	<ol style="list-style-type: none"> <li>1. <b>Speech Adapter</b></li> <li>2. Speech Control Assy.</li> </ol>

POST Error Code	FRU/Action
<b>8601, 8602</b>	<ol style="list-style-type: none"> <li>1. <b>Pointing Device</b> (Mouse)</li> <li>2. System Board</li> </ol>
<b>8603, 8604</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Pointing Device (Mouse)</li> </ol>
<b>86XX</b> Not listed above	<ol style="list-style-type: none"> <li>1. <b>Mouse</b></li> <li>2. System Board</li> </ol>
<b>89XX</b>	<ol style="list-style-type: none"> <li>1. <b>PC Music Adapter</b></li> <li>2. MIDI Adapter Unit</li> </ol>
<b>91XX</b>	<ol style="list-style-type: none"> <li>1. <b>Optical Drive</b></li> <li>2. Adapter</li> </ol>
<b>96XX</b>	<ol style="list-style-type: none"> <li>1. <b>SCSI Adapter</b></li> <li>2. Any SCSI Device</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>10101, 10102, 10104 10105, 10106, 10107 10108, 10109, 10111 10112, 10113, 10114 10115, 10116</b>	<ol style="list-style-type: none"> <li>1. <b>Have customer verify correct operating system device drivers are installed and operational.</b></li> <li>2. Modem</li> </ol>
<b>10103, 10110, 101171</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Data/Fax Modem</li> <li>3. Riser card</li> </ol>
<b>10117</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Check system speaker</b></li> <li>2. Check PSTN cable</li> <li>3. External DAA (if installed)</li> <li>4. Modem</li> </ol>
<b>10118</b>	<ol style="list-style-type: none"> <li>1. <b>Run Diagnostics and verify the correct operation of the modem slot</b></li> <li>2. Modem</li> </ol>
<b>10119</b>	<ol style="list-style-type: none"> <li>1. <b>Diagnostics detected a non-IBM modem</b></li> <li>2. Modem</li> </ol>
<b>10120</b>	<ol style="list-style-type: none"> <li>1. <b>Check PSTN Cable</b></li> <li>2. External DAA (if installed)</li> <li>3. Modem</li> </ol>
<b>10132, 10133, 10134 10135, 10136, 10137 10138, 10139, 10140 10141, 10142, 10143 10144, 10145, 10146 10147, 10148, 10149 10150, 10151, 10152</b>	<ol style="list-style-type: none"> <li>1. <b>Modem</b></li> </ol>
<b>10153</b>	<ol style="list-style-type: none"> <li>1. <b>Data/Fax Modem</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>101XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Modem Adapter/A</b></li> <li>2. Data/Fax Modem</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>10450, 10451, 10490</b> <b>10491, 10492, 10499</b> Read/write error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> <li>2. Hard Disk Drive</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>10452</b> Seek test error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10453</b> Wrong drive type?	Information only
<b>10454</b> Sector buffer test error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10455, 10456</b> Controller error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10459</b> Drive diagnostic command error.	Information only
<b>10461</b> Drive format error	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10462</b> Controller seek error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10464</b> Hard Drive read error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10467</b> Drive non fatal seek error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10468</b> Drive fatal seek error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10469</b> Drive soft error count exceeded.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10470, 10471, 10472</b> Controller wrap error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10473</b> Corrupt data. Low level format might be required.	Information only
<b>10480</b>	<ol style="list-style-type: none"> <li>1. <b>Hard Disk Drive (ESDI)</b></li> <li>2. Drive Cable</li> <li>3. System Board</li> </ol>
<b>10481</b> ESDI drive D seek error.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>10482</b> Drive select acknowledgement bad.	<ol style="list-style-type: none"> <li>1. <b>Run Enhanced Diagnostics</b></li> </ol>
<b>106X1</b>	<ol style="list-style-type: none"> <li>1. <b>Check Configuration</b></li> <li>2. Ethernet Adapter</li> </ol>

POST Error Code	FRU/Action
<b>10635</b>	<ol style="list-style-type: none"> <li>1. <b>Power-off computer, wait ten seconds; then power-on the computer.</b></li> <li>2. Ethernet Adapter</li> </ol>
<b>10651, 10660</b>	<ol style="list-style-type: none"> <li>1. <b>Check Cables</b></li> <li>2. Ethernet Adapter</li> </ol>
<b>106XX</b> Not listed above.	<ol style="list-style-type: none"> <li>1. <b>Ethernet Adapter</b></li> </ol>
<b>107XX</b>	<ol style="list-style-type: none"> <li>1. <b>5.25-inch External Diskette Drive</b></li> <li>2. 5.25-inch Diskette Drive Adapter/A</li> </ol>
<b>109XX</b> Check the adapter cables.	<ol style="list-style-type: none"> <li>1. <b>ActionMedia Adapter/A</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
<b>112XX</b> This adapter does not have cache.	<ol style="list-style-type: none"> <li>1. <b>SCSI Adapter</b></li> <li>2. Any SCSI Device</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>119XX</b>	<ol style="list-style-type: none"> <li>1. <b>3119 Adapter</b></li> </ol>
<b>121XX</b>	<ol style="list-style-type: none"> <li>1. <b>Modem Adapter</b></li> <li>2. Any Serial Device</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
<b>136XX</b>	<ol style="list-style-type: none"> <li>1. <b>ISDN Primary Rate Adapter</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
<b>137XX</b>	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> </ol>
<b>141XX</b>	<ol style="list-style-type: none"> <li>1. <b>Realtime Interface Coprocessor Portmaster™ Adapter/A</b></li> </ol>
<b>143XX</b>	<ol style="list-style-type: none"> <li>1. <b>Japanese Display Adapter</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
<b>14710, 14711</b>	<ol style="list-style-type: none"> <li>1. <b>System Board Video Adapter</b></li> <li>2. Adapter Video Memory</li> </ol>
<b>148XX</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b></li> </ol>
<b>14901, 14902</b> <b>1491X, 14922</b>	<ol style="list-style-type: none"> <li>1. <b>Video Adapter</b> (if installed)</li> <li>2. System Board</li> <li>3. Riser card</li> <li>4. Display (any type)</li> </ol>
<b>14932</b>	<ol style="list-style-type: none"> <li>1. <b>External Display</b></li> <li>2. Video Adapter</li> </ol>

POST Error Code	FRU/Action
161XX	1. <b>FaxConcentrator™ Adapter</b>
164XX	1. <b>120 MB Internal Tape Drive</b> 2. Diskette Cable 3. System Board 4. Riser card
16500	1. <b>6157 Tape Attachment Adapter</b>
16520, 16540	1. <b>6157 Streaming Tape Drive</b> 2. 6157 Tape Attachment Adapter
166XX, 167XX	1. <b>Token Ring Adapter</b> 2. System Board 3. Riser card
18001 to 18029	1. <b>Wizard Adapter</b> 2. Wizard Adapter Memory
18031 to 18039	1. <b>Wizard Adapter Cable</b>
185XXXX	1. <b>DBCS Japanese Display Adapter/A</b> 2. System Board 3. Riser card
20001 to 20003	1. <b>Image Adapter/A Image-I Adapter/A</b> 2. Memory Module DRAM, VRAM
20004	1. <b>Memory Module DRAM, VRAM</b> 2. Image Adapter/A Image-I Adapter/A
20005 to 20010	1. <b>Image Adapter/A Image-I Adapter/A</b> 2. Memory Module DRAM, VRAM
200XX Not listed above.	1. <b>Image Adapter/A Image-I Adapter/A</b> 2. Memory Module DRAM, VRAM 3. System Board 4. Riser card
20101 to 20103	1. <b>Printer/Scanner Option</b> 2. Image Adapter/A 3. Memory Module DRAM, VRAM
20104	1. <b>Memory Module DRAM, VRAM</b> 2. Printer/Scanner Option 3. Image Adapter/A

POST Error Code	FRU/Action
20105 to 20110	<ol style="list-style-type: none"> <li>1. <b>Printer/Scanner Option</b></li> <li>2. Image Adapter/A</li> <li>3. Memory Module DRAM, VRAM</li> </ol>
Image Adapter/A Memory Test failure indicated by graphic of adapter.	<ol style="list-style-type: none"> <li>1. <b>Replace memory module (shown in graphic.)</b></li> </ol>
206XX	<ol style="list-style-type: none"> <li>1. <b>SCSI-2 Adapter</b></li> <li>2. Any SCSI Device</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
208XX Verify there are no duplicate SCSI ID settings on the same bus.	<ol style="list-style-type: none"> <li>1. <b>Any SCSI Device</b></li> </ol>
210XXX1 External bus, size unknown.	<ol style="list-style-type: none"> <li>1. <b>SCSI Hard Disk Drive</b></li> <li>2. SCSI Adapter</li> <li>3. SCSI Cable</li> <li>4. SCSI ID Switch (on some models)</li> </ol>
Tape Drive amber LED remains on.	<ol style="list-style-type: none"> <li>1. <b>Tape Drive</b></li> <li>2. SCSI Cable (internal)</li> <li>3. SCSI Adapter</li> </ol>
Tape Drive green "in use" LED fails to come on.	<ol style="list-style-type: none"> <li>1. <b>Tape Drive</b></li> <li>2. SCSI Adapter</li> <li>3. SCSI Cable (internal) SCSI Cable (external)</li> </ol>
Tape automatically ejected from drive.	<ol style="list-style-type: none"> <li>1. <b>Tape Cassette</b></li> <li>2. Drive</li> </ol>
SCSI ID on rotary switch does not match SCSI ID set in configuration. Verify drive switches inside cover are set to zero.	<ol style="list-style-type: none"> <li>1. <b>Rotary Switch Circuit Board</b></li> <li>2. Circuit Board Cable</li> <li>3. Tape Drive</li> </ol>
Tape sticks/breaks in drive. Verify that the tapes used meet ANSI standard X3B5.	<ol style="list-style-type: none"> <li>1. <b>Tape Cassette</b></li> </ol>
212XX	<ol style="list-style-type: none"> <li>1. <b>SCSI Printer</b></li> <li>2. Printer Cable</li> </ol>
213XX	<ol style="list-style-type: none"> <li>1. <b>SCSI Processor</b></li> </ol>
214XX	<ol style="list-style-type: none"> <li>1. <b>WORM Drive</b></li> </ol>
215XXXC 215XXXD 215XXXE 215XX XU If an external device, and power-on LED is off, check external voltages.	<ol style="list-style-type: none"> <li>1. <b>CD-ROM Drive I CD-ROM Drive II Enhanced CD-ROM Drive II Any CD-ROM Drive</b></li> <li>2. SCSI Cable</li> <li>3. SCSI Adapter</li> </ol>

<b>POST Error Code</b>	<b>FRU/Action</b>
<b>216XX</b>	1. <b>Scanner</b>
<b>217XX</b> If an external device, and power-on LED is off, check external voltages.	1. <b>Rewritable Optical Drive</b> 2. SCSI Adapter 3. SCSI Cable
<b>218XX</b> Check for multi CD tray, or juke box.	1. <b>Changer</b>
<b>219XX</b>	1. <b>SCSI Communications Device</b>
<b>24201Y0, 24210Y0</b> Be sure wrap plug is attached.	1. <b>ISDN/2 Adapter</b> 2. ISDN/2 Wrap Plug 3. ISDN/2 Communications Cable
<b>273XX</b>	1. <b>1 Mbps Micro Channel Infrared LAN Adapter</b>
<b>27501, 27503</b> <b>27506, 27507</b>	1. <b>ServerGuard Adapter</b> 2. System Board 3. Riser card
<b>27502, 27504, 27510</b> <b>27511, 27533, 27534</b> <b>27536, 27537</b>	1. <b>ServerGuard Adapter</b>
<b>27509</b>	1. <b>Remove redundant adapters, run Auto Configuration program, then retest.</b>
<b>27512</b>	1. <b>WMSELF.DGS diagnostics file missing.</b> 2. WMSELF.DGS diagnostics file incorrect.
<b>27535</b>	1. <b>3V Lithium Backup Battery</b> 2. ServerGuard Adapter
<b>27554</b>	1. <b>Internal Temperature out of range</b> 2. ServerGuard Adapter
<b>27555, 27556</b>	1. <b>ServerGuard Adapter</b> 2. Power Supply
<b>27557</b>	1. <b>7.2V NiCad Main Battery Pack</b> 2. ServerGuard Adapter
<b>27558, 27559</b> <b>27560, 27561</b>	1. <b>PCMCIA Type II Modem</b> 2. ServerGuard Adapter

POST Error Code	FRU/Action
27562	<ol style="list-style-type: none"> <li>1. <b>External Power Control not connected</b></li> <li>2. External Power Control</li> <li>3. ServerGuard Adapter</li> </ol>
27563, 27564	<ol style="list-style-type: none"> <li>1. <b>External Power Control</b></li> <li>2. ServerGuard Adapter</li> </ol>
275XX	<ol style="list-style-type: none"> <li>1. <b>Update Diagnostic Software</b></li> </ol>
27801 to 27879	<ol style="list-style-type: none"> <li>1. <b>Personal Dictation System Adapter</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
27880 to 27889	<ol style="list-style-type: none"> <li>1. <b>External FRU</b> (Speaker, Microphone)</li> </ol>
I999030X Hard disk reset failure.	<p><b>Possible hard disk drive problem, see “Hard disk drive boot error” on page 41.</b></p>

## Miscellaneous error messages

Message/Symptom	FRU/Action
CMOS Backup Battery inaccurate.	<ol style="list-style-type: none"> <li>1. <b>CMOS Backup Battery</b> See page "Safety information" on page 332.</li> <li>2. System Board</li> </ol>
Changing colors.	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> </ol>
Computer will <b>not</b> power-off. See "Power supply" on page 229.	<ol style="list-style-type: none"> <li>1. <b>Power Switch</b></li> <li>2. System Board</li> <li>3. Riser card</li> </ol>
Computer will <b>not</b> RPL from server	<ol style="list-style-type: none"> <li>1. <b>Ensure Network is in startup sequence as first device or first device after diskette.</b></li> <li>2. Ensure Network adapter is enabled for RPL.</li> <li>3. Network adapter (Advise network administrator of new MAC address)</li> </ol>
Computer will <b>not</b> Wake On LAN <sup>™</sup>	<ol style="list-style-type: none"> <li>1. <b>Check power supply and signal cable connections to network adapter.</b></li> <li>2. Ensure Wake On LAN feature is enabled in Setup/Configuration. See "Setup Utility program" on page 241.</li> <li>3. Ensure network administrator is using correct MAC address.</li> <li>4. Ensure no interrupt or I/O address conflicts.</li> <li>5. Network adapter (Advise network administrator of new MAC address)</li> </ol>
Dead computer. See "Power supply" on page 229.	<ol style="list-style-type: none"> <li>1. <b>Power Switch</b></li> <li>2. Power Supply</li> <li>3. System Board</li> <li>4. Riser card</li> </ol>
Diskette drive in-use light remains on or does not light when drive is active.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> <li>4. Riser card</li> </ol>
Flashing cursor with an otherwise blank display.	<ol style="list-style-type: none"> <li>1. <b>System Board</b></li> <li>2. Primary Hard Disk Drive</li> <li>3. Hard Disk Drive Cable</li> <li>4. Riser card</li> </ol>

Message/Symptom	FRU/Action
Incorrect memory size during POST.	<ol style="list-style-type: none"> <li>1. <b>Run the Memory tests.</b></li> <li>2. Memory Module</li> <li>3. System Board</li> </ol>
"Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> <li>4. Riser card</li> <li>5. Network Adapter</li> </ol>
Intensity or color varies from left to right of characters and color bars.	<ol style="list-style-type: none"> <li>1. <b>Display</b></li> <li>2. System Board</li> </ol>
No power, or fan not running.	<ol style="list-style-type: none"> <li>1. <b>See "Power supply" on page 229.</b></li> </ol>
Nonsystem disk or disk error-type message with a known-good diagnostic diskette.	<ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> <li>4. Riser card</li> </ol>
Other display symptoms not listed above (including blank or illegible display).	<ol style="list-style-type: none"> <li>1. <b>See "Display" on page 231.</b></li> <li>2. System Board</li> <li>3. Display</li> </ol>
Power-on indicator or hard disk drive in-use light not on, but computer works correctly.	<ol style="list-style-type: none"> <li>1. <b>Power Supply</b></li> <li>2. System Board</li> <li>3. LED Cables</li> </ol>
Printer problems.	<ol style="list-style-type: none"> <li>1. <b>See "Printer" on page 228.</b></li> </ol>
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Diskette Drive</li> <li>3. Diskette Drive Cable</li> <li>4. System Board</li> <li>5. Riser card</li> <li>6. Power Supply</li> </ol>
RPL computer cannot access programs from its own hard disk.	<ol style="list-style-type: none"> <li>1. <b>If network admin. is using LCCM Hybrid RPL, check startup sequence: First device: network; Second device: hard disk</b></li> <li>2. Hard disk drive</li> </ol>
RPL computer does not RPL from server.	<ol style="list-style-type: none"> <li>1. <b>Check startup sequence</b></li> <li>2. Check the network adapter LED status</li> </ol>
Serial or parallel port device failure (system board port).	<ol style="list-style-type: none"> <li>1. <b>External Device Self-Test OK?</b></li> <li>2. External Device</li> <li>3. Cable</li> <li>4. System Board</li> </ol>

Message/Symptom	FRU/Action
Serial or parallel port device failure (adapter port).	<ol style="list-style-type: none"> <li>1. <b>External Device Self-Test OK?</b></li> <li>2. External Device</li> <li>3. Cable</li> <li>4. Alternate Adapter</li> <li>5. System Board</li> <li>6. Riser Card</li> </ol>
Some or all keys on the keyboard do not work.	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>

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## Undetermined problem

Check the power supply voltages. See "Power supply" on page 229. If the voltages are correct, return here and continue with the following steps.

1. Power-off the computer.
2. Remove or disconnect the following, if installed, 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 258.
  - 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 246.

## Model tables - Country/Region/Language

Use this table to identify the country/region/language of the specific Models that are listed in the Type/Model configuration tables section.

In most cases, country or language designation will be identified by the last digit of the model number. Some models might be listed twice, as X and (J), for Country/Language identification. (J) is for Japan only.

*Table 6. Country/Region/Language Model Definition.*

<b>EMEA</b>	<b>Model</b>
EMEA preload	xx <b>G</b>
<b>North America</b>	<b>Model</b>
US English	xx <b>U</b>
Canadian French	xx <b>F</b>
<b>Latin America (LA)</b>	<b>Model</b>
Portuguese (Brazil)	xx <b>P</b>
LA Spanish	xx <b>S</b>
LA English	xx <b>L</b>
<b>Asia Pacific (AP)</b>	<b>Model</b>
AP English w/Keyboard	xx <b>A</b>
AP English w/o Keyboard	xx <b>B</b>
Japan (Japanese)	xx <b>J</b>
Hong Kong (AP English)	xx <b>H</b>
China (Chinese)	xx <b>C</b>
China (AP English)	xx <b>D</b>
Thailand (Thai)	xx <b>T</b>
Taiwan (Chinese)	xx <b>V</b>
Taiwan (AP English)	xx <b>W</b>
Korea (Korean)	xx <b>K</b>
Korea (AP English)	xx <b>R</b>

## Type/Model configuration tables (6867)

### 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 than 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 10X and 24X.
  - For 32X Max CD-ROM drives, the disk hub and disk edge speeds are 14X and 32X.
  - For 40X Max CD-ROM drives, the disk hub and disk edge speeds are 17X and 40X.
  - For 48X Max CD-ROM drives, the disk hub and disk edge speeds are 20X and 48X.

Table	Page
IntelliStation Type 6867	297

Table 7 (Page 1 of 3): IntelliStation Type 6867 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
12X	600 MHz	128 MB RIMM	13.5 GB EIDE	Matrox G400	4X5	48X Max	Windows NT
13X	600 MHz	128 MB RIMM	9.1 GB SCSI	Matrox G400	4X5	48X Max	Windows NT
15X	600 MHz	128 MB RIMM	9.1 GB SCSI	IBM Fire GL 1	4X5	48X Max	Windows NT
17X	600 MHz	128 MB RIMM	13.5 GB EIDE	Appian Gemini	4X5	48X Max	Windows NT
19X - Open Bay	600 MHz	N/A	N/A	N/A	4X5	48X Max	N/A
30X	667 MHz	128 MB RIMM	13.5 GB EIDE	Matrox G400	4X5	48X Max	Windows NT
32X	667 MHz	128 MB RIMM	9.1 GB SCSI	Matrox G400	4X5	48X Max	Windows NT
34X	667 MHz	128 MB RIMM	13.5 GB EIDE	IBM Fire GL 1	4X5	48X Max	Windows NT
35X	667 MHz	128 MB RIMM	9.1 GB SCSI	IBM Fire GL 1	4X5	48X Max	Windows NT

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 295.
3. Models Exx and Fxx come with DOS license. Customer may install operating system of their choice.
4. Processor = Pentium® III with 512 KB L2 Cache
5. Memory = ECC RAMBUS RIMM
6. Graphics = 2D Matrox G400 (AGP) - 16 MB, 3D IBM Fire GL1 (AGP) - 32 MB.
7. Audio = integrated on system board.
8. All models come with Ethernet adapter card with RJ-45 connector.
9. Open Bay = Authorized Assembler Program. See the note on page 296

Table 7 (Page 2 of 3): IntelliStation Type 6867 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
37X	667 MHz	128 MB RIMM	9.1 GB SCSI	Applan Gemini	4X5	48X Max	Windows NT
39X - Open Bay	667 MHz	N/A	N/A	N/A	4X5	48X Max	N/A
40X	733 MHz	128 MB RIMM	13.5 GB EIDE	Matrox G400	4X5	48X Max	Windows NT
41X	733 MHz	128 MB RIMM	13.5 GB EIDE	Matrox G400	4X5	48X Max	Windows 2000
45X	733 MHz	128 MB RIMM	9.1 GB SCSI	IBM Fire GL 1	4X5	48X Max	Windows NT
49X - Open Bay	733 MHz	N/A	N/A	N/A	4X5	48X Max	N/A
52X, E2X	800 MHz	128 MHz RIMM	15.0 GB EIDE	Matrox G400	4X5	48X Max	Windows NT
53X, E3X	800 MHz	128 MHz RIMM	9.1 GB SCSI	Matrox G400	4X5	48X Max	Windows NT
55X, E5X	800 MHz	128 MHz RIMM	9.1 GB SCSI	Eisa GL II (xxMB)	4X5	48X Max	Windows NT

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 295.
3. Models Exx and Fxx come with DOS license. Customer may install operating system of their choice.
4. Processor = Pentium® III with 512 KB L2 Cache
5. Memory = ECC RAMBUS RIMM
6. Graphics = 2D Matrox G400 (AGP) - 16 MB, 3D IBM Fire GL1 (AGP) - 32 MB.
7. Audio = integrated on system board.
8. All models come with Ethernet adapter card with RJ-45 connector.
9. Open Bay = Authorized Assembler Program. See the note on page 296

Table 7 (Page 3 of 3): IntelliStation Type 6867 - Desktop

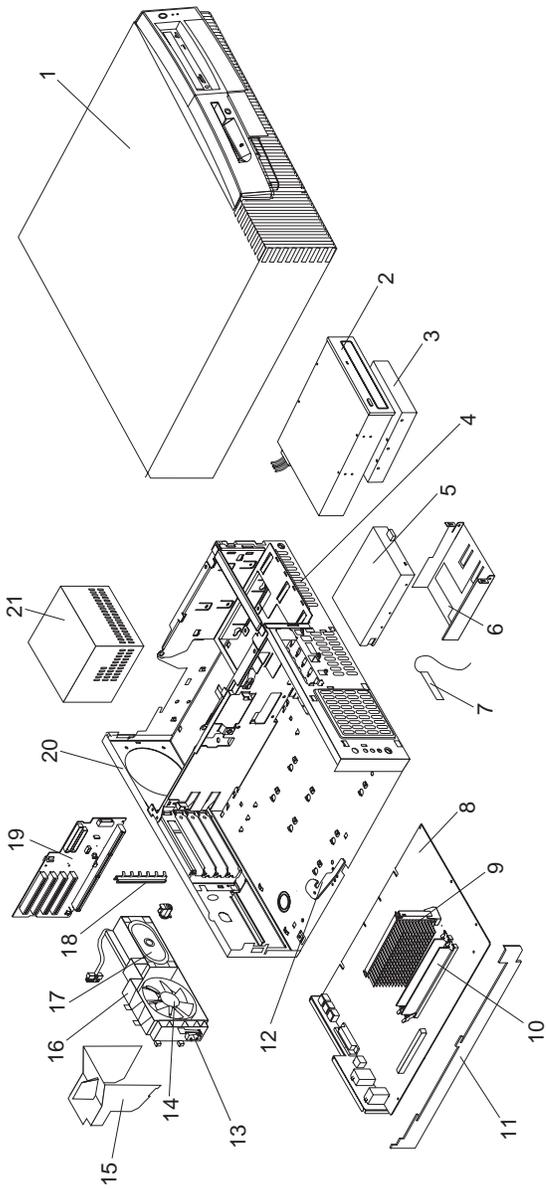
Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
59X	800 MHz	N/A	N/A	N/A	4X5	48X Max	Windows NT
62X, F2X	866 MHz	128 MHz RIMM	15.0 GB EIDE	Matrox G400	4X5	48X Max	Windows NT
63X, F3X	866 MHz	128 MHz RIMM	9.1 GB SCSI	Matrox G400	4X5	48X Max	Windows NT
65X, F5X	866 MHz	128 MHz RIMM	9.1 GB SCSI	Eisa GL II (xxMB)	4X5	48X Max	Windows NT
69X	866 MHz	N/A	N/A	N/A	4X5	48X Max	N/A
72X, G2X	933 MHz	128 MHz RIMM	15.0 GB EIDE	Matrox G400	4X5	48X Max	Windows NT

**Notes:**

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 295.
3. Models Exx and Fxx come with DOS license. Customer may install operating system of their choice.
4. Processor = Pentium® III with 512 KB L2 Cache
5. Memory = ECC RAMBUS RIMM
6. Graphics = 2D Matrox G400 (AGP) - 16 MB, 3D IBM Fire GL1 (AGP) - 32 MB.
7. Audio = integrated on system board.
8. All models come with Ethernet adapter card with RJ-45 connector.
9. Open Bay = Authorized Assembler Program. See the note on page 296

**Notes:**

Parts (Type 6867)



## Parts listing

Index	System (Type 6867)	FRU No.
1	Top and Front Cover Assembly	33L2747
2	CD-ROM (48X Max)	09N0737
3	9.1 GB SCSI 7200RPM Hard Disk Drive	36L8648
3	15.0 GB EIDE Hard Disk Drive	09N0921
3	13.5 GB EIDE Hard Disk Drive	36L8689
4	Hard drive Cage Latch Kit	33L2606
5	1.44 MB, 3.5-Inch Diskette Drive	75H9550
5	1.44 MB, 3.5-Inch Diskette Drive (Japan)	75H9552
6	3.5" Diskette Bracket	33L2599
7	RFID Antenna	03K9654
8	System Board (no processor, no memory)	01K2119
9	Pentium III Processor 600/133 MHz.	37L6034
9	Pentium III Processor 667/133 MHz.	00N3622
9	Pentium III Processor 733/133 MHz.	00N7174
9	Pentium III Processor 800/133 MHz.	09N9097
9	Pentium III Processor 866/133 MHz.	09N4877
9	Pentium III Processor 933/133 MHz.	19K8124
10	Memory - 128 MB PC700 Memory RIMM, ECC	33L3108
10	Memory Continuity Card (C-RIMM)	00N5223
11	Side Bracket	03K9662
12	Latch, system board	03K9665
13	C2 Switch Assembly	33L2603
14	Fan 92mm with grommets	33L2594
15	Air Baffle	33L2593
16	Fan Bracket	33L2601
17	Speaker/Cable Assembly	37L5554
18	I/O Bracket	03K9622
19	Riser Card (PCI only)	28L4926
20	Chassis Assembly with latch	33L2602
21	Power Supply-145W	36L8841
21	Power Supply-145W (China)	36L8836
21	Power Supply-145W (Japan)	36L8843
	Bezel Kit	33L2746
	Cable - CD-ROM, IDE (1 drop)	33L2597
	Cable - Diskette Drive	33L2596
	Cable - Hard Disk, IDE	19K7616
	Cable - Wake On Ring	76H7345
	DASD EMC Shield Kit	33L2600
	Ethernet Adapter - Lake Clark 2.4	34L1109
	Foot (4)	33L2592
	Hard Drive Rails (Qty 2)	01K1539
	Keylock Assembly	02K1428
	LED/Power Switch Cable Assembly	20L3021
	Lithium Battery	33F8354
	Miscellaneous Hardware Kit	33L2605
	Mouse	28L1868
	Name Plate (6867)	33L2745
	RM Retainer Kit	33L4321
	Video card - Appian Gemini	19K7287
	Appian Gemini video cable assembly	01N2333
	Video card - IBM FIRE GL1 (AGP) 32 MB	37L2375
	Video Card - Matrox G400 (AGP) 16 MB	01N2197

<b>Index</b>	<b>System (Type 6867)</b>	<b>FRU No.</b>
	Video Card - Elsa Gloria II (AGP) 16 MB	01N2256
	SCSI Adapter	10L7122
	SCSI Signal Cable (3-drop)	33L2598
	SCSI LED Cable Assembly	76H7344
	System Board Rails	03K9626

### **Keyboards - PCNext Lite**

Arabic	37L2555
Belgian-French	37L2556
Belgian-UK	37L2557
Brazil/Portugal	37L2554
Bulgarian	37L2558
Chinese	37L2585
Czech	37L2559
Danish	37L2560
Dutch	37L2561
French	37L2562
French/Canadian-ID 058	37L0913
French/Canadian-ID 445	37L2552
German	37L2563
Greek	37L2564
Hebrew	37L2565
Hungarian	37L2566
Icelandic	37L2567
Italian	37L2568
Korean	28L1905
Japanese	37L2584
Latin/Spanish	37L2553
Norwegian	37L2569
Polish	37L2570
Portuguese	37L2571
Romania	37L2572
Russian	37L2573
Serbian/Cyrillic	37L2574
Slovakian	37L2575
Spanish	37L2576
Swed/Finn	37L2577
Swiss French/German	37L2578
Thailand	37L2587
Turkish (ID 179)	37L2579
Turkish (ID 440)	37L2580
UK English	37L2581
US English	37L2551
UK English (ISO Compliant)	37L2583
Yugoslavian	37L2582

## Computer Power Cords

Arabic Countries	14F0033
Argentina	36L8880
Australia	93F2365
Belgium	1339520
Bulgaria	1339520
Canada	93F2364
Chile	14F0069
Czechoslovakia	1339520
Denmark	13F9997
Finland	1339520
France	1339520
Germany	1339520
Hungary	1339520
Israel	14F0087
Italy	14F0069
Latin-America	6952301
Netherlands	1339520
New Zealand	93F2365
Norway	1339520
Paraguay	36L8880
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
Uruguay	36L8880
Yugoslavia	1339520

## Display and Monitor Information

Display and monitor information is separately available and is listed under "Related publications" on page vi.

## 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



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## Related Service Information

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## **Safety notices (multi-lingual translations)**

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

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



**DANGER**

To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.

To avoid shock hazard:

- The power cord must be connected to a properly wired and earthed receptacle.
- Any equipment to which this product will be attached must also be connected to properly wired receptacles.

When possible, use one hand to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

Electrical current from power, telephone, and communications cables is hazardous. To avoid shock hazard, connect and disconnect cables as described following when installing, moving, or opening covers of this product or attached devices.

**To Connect**

1. Turn Everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to receptacles.
4. Attach power cord(s) to outlet.
5. Turn device ON.

**To Disconnect**

1. Turn Everything OFF.
2. First, remove power cord(s) from outlet.
3. Remove signal cables from receptacles.
4. Remove all cables from devices.

NOTE: In the UK, by law, the telephone cable must be connected after the power cord.

NOTE: In the UK, the power cord must be disconnected after the telephone cable.



**Caution:**

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

**Do not:**

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

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



**Caution:**

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

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

Removing the covers of the CD-ROM drive could result in exposure to hazardous laser radiation. There are no serviceable parts inside the CD-ROM drive. Do not remove the CD-ROM drive covers.

**DANGER**

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

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



≥32 kg  
(70.5 lbs)



≥55 kg  
(121.2 lbs)

**Caution:**  
Use safe lifting practices when lifting your machine.



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



## PERIGO

**Para evitar choques elétricos, não conecte ou desconecte nenhum cabo, nem efetue instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.**

**Para evitar choques elétricos:**

- **O cabo de alimentação deve ser conectado a um receptáculo corretamente instalado e aterrado.**
- **Todos os equipamentos aos quais este produto será conectado devem também ser conectados a receptáculos corretamente instalados.**

**Quando possível, utilize uma das mãos para conectar ou desconectar cabos de sinal, para evitar um possível choque ao tocar duas superfícies com potenciais elétricos diferentes.**

**A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicação é perigosa. Para evitar choques elétricos, conecte e desconecte os cabos conforme descrito a seguir, ao instalar, movimentar ou abrir tampas deste produto ou de dispositivos conectados.**

### Para Conectar

1. DESLIGUE tudo.
2. Conecte primeiro todos os cabos nos dispositivos.
3. Conecte os cabos de sinal nos receptáculos.
4. Conecte o(s) cabo(s) de alimentação nas tomadas.
5. LIGUE o dispositivo.

### Para Desconectar

1. DESLIGUE tudo.
2. Remova primeiro o(s) cabo(s) de alimentação das tomadas.
3. Remova os cabos de sinal dos receptáculos.
4. Remova todos os cabos dos dispositivos.



**cuidado:**

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

**Não:**

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

Descarte a bateria conforme requerido pelas disposições e regulamentações locais.



**cuidado:**

Quando uma unidade de CD-ROM estiver instalada, observe o seguinte.

A utilização de controles ou ajustes ou a execução de procedimentos diferentes daqueles especificados nesta publicação pode resultar em exposição perigosa à radiação.

A remoção das tampas da unidade de CD-ROM pode resultar em exposição a radiação perigosa de laser. Não existem peças que possam ser consertadas no interior da unidade de CD-ROM. Não remova as tampas da unidade de CD-ROM.

**PERIGO**

Algumas unidades de CD-ROM contém um diodo de laser da Classe 3A ou da Classe 3B. Observe o seguinte.

Radiação de laser quando aberto. Não olhe diretamente para o feixe de laser, não olhe diretamente com instrumentos óticos, e evite exposição direta ao raio.



≥32 kg  
(70,5 lbs)



≥55 kg  
(121,2 lbs)

**cuidado:**

Utilize práticas seguras para levantamento de peso ao levantar sua máquina.



**cuidado:**

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicação é perigosa. Para evitar ferimentos pessoais ou danos aos equipamentos, desconecte os cabos de alimentação, sistemas de telecomunicação, redes e modems antes de abrir as tampas do servidor, a menos que receba outras instruções nos procedimentos de instalação e configuração.

## 声明 1



### 危险!

为避免电击危险，请不要在暴风雨期间连接或断开任何电缆，或是进行此产品的安装、维护或重新配置操作。

为避免电击危险：

- 电源线必须连接到适当的电线及接地插座。
- 此产品将要连接的所有设备也必须连接到正确接线的插座上。

如果可能，请使用一只手连接或断开连接信号电缆，以避免在接触两个具有不同电势的表面时遭到电击。

电源线、电话线以及通信电缆中的电流非常危险。为避免电击，请在安装、移动或打开本产品或连接设备的外盖时，按照下述步骤连接或断开电缆。

#### 要连接电缆

1. 关闭所有设备。
2. 首先将所有电缆与设备连接。
3. 将信号线连接到插座。
4. 将电源线连接到电源插座。
5. 打开设备。

#### 要断开电缆

1. 关闭所有设备。
2. 首先从电源插座拔下电源线。
3. 从插座拔下信号电缆。
4. 从设备上拔下所有电缆。

## 声明 2



### 注意!

当更换电池时，仅可使用 IBM 部件号为 33F8354 的产品或由制造商推荐的同等电池。如果系统中有包含锂电池的模块，则只能使用由相同制造商制造的相同类型模块更换。该电池含有锂，如果使用、操作或处理不当会发生爆炸。

#### 不要：

- 将其投入或浸于水中
- 加热超过100°C (212°F)
- 修理或拆卸

应按照当地法规和条例对此电池进行处理。

## 声明 3



### 注意!

在已安装 CD-ROM 驱动器的情况下，请注意下面的内容。

不遵循此处指定的控制、调整、或操作过程的操作将可能导致危险的辐射泄漏。

取下 CD-ROM 驱动器的外盖会导致危险的激光辐射泄漏。CD-ROM 驱动器内没有可以使用的部件。请不要取下 CD-ROM 驱动器的外盖。

#### 声明 4

#### 危险！

一些 CD-ROM 驱动器中包含内置的 3A 类或 3B 类激光二极管。  
请注意下述内容。

打开驱动器会产生激光辐射。请不要凝视激光束，请不要使用光学仪器直接观看激光束，同时也要避免人体直接暴露在激光束下。

#### 声明 5



32 kg (70.5 磅)



55 kg (121.2 磅)

#### 注意！

搬运机器时，请进行安全搬运操作。

#### 声明 10



#### 注意！

电源线、电话线以及通信电缆中的电流非常危险。为避免人身伤害或设备损坏，除非在安装和配置过程中特别指明，请在打开服务器外盖前断开已连接的全部电源线、电信系统、网络及调制解调器。

#### • 声明 1



#### 危险

為了避免雷擊，在閃電期間，請勿連接或拔掉本裝置上的任何電纜線，或請勿安裝、維修或重新架構本產品。

為了避免雷擊：

- 電源線必須連接到接線及接地正確的插座。
- 本產品所連接的設備也必須連接到接線正確的插座。

儘可能使用單手來連接或拔掉信號電纜，以避免因接觸兩不同電位的平面，而受到電擊。

電源、電話及通信電纜上均有電流通過。為了避免電擊，在安裝、移動本產品，或開啓本產品的蓋子或與本產品連接之裝置的蓋子時，請依照下列「連接」及「拔掉」電纜線的步驟操作。

#### 連接

1. 關掉所有開關。
2. 首先，將所有電纜線連接到裝置。
3. 將信號電纜連接到信號插座。
4. 將電源線連接到電源插座。
5. 開啓裝置電源。

#### 拔掉

1. 關掉所有開關。
2. 首先，自電源插座拔掉電源線。
3. 拔掉信號插座上的所有信號電纜。
4. 拔掉裝置上的所有電纜線。

• 聲明 2



注意：  
更換電池時，只可使用 IBM 零件編號 33F8354 的電池，或廠商建議的相當類型的電池。如您系統中的模組含有鋰電池，更換時，請使用相同廠商製造的相同模組類型。如未正常使用、處理或捨棄含有鋰的電池時，可能會造成爆炸。

嚴禁：

- 丟入或浸入水中
- 加熱超過攝氏100度（華氏 212 度）
- 修補或拆解

處理廢棄電池時，請遵照當地法令規章處理。

• 聲明 3



注意：  
安裝光碟機時，請注意下列事項：

不依此處所指示的控制、調整或處理步驟，恐有導致輻射之虞。

移開光碟機蓋子，恐有導致雷射輻射之虞。光碟機中沒有需要維修的部分。請勿移開光碟機的蓋子。

• 聲明 4



危險

光碟機含有內嵌式 Class 3A 或 Class 3B 雷射二極體時，請注意下列事項：

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

• 聲明 5



≥ 32 公斤 (70.5 磅)



≥ 55 公斤 (121.2 磅)

注意：  
提昇機器時，請使用安全提昇措施。

• 聲明 10



注意：  
電源、電話及通信電纜上均有電流通過。在安裝及架構之時，若非專家指導，為了避免人員受傷、設備受損，在開啓伺服器蓋子之前，請切斷電源線、電信系統、網路及數據機。



**PERIGO**

**Pour éviter tout risque de choc électrique, ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.**

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

- **Les cordons d'alimentation du présent produit et de tous les appareils qui lui sont connectés doivent être branchés sur des socles de prise de courant correctement câblés et mis à la terre.**

**Afin d'éviter tout risque de choc électrique provenant d'une différence de potentiel de terre, n'utilisez qu'une main, lorsque cela est possible, pour connecter ou déconnecter les cordons d'interface.**

**Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux. Pour éviter tout risque de choc électrique, lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.**

**Connexion**

1. Mettez les unités hors tension.
2. Commencez par brancher tous les cordons sur les unités.
3. Branchez les câbles d'interface sur les prises.
4. Branchez les cordons d'alimentation sur un socle de prise de courant.
5. Mettez les unités sous tension.

**Déconnexion**

1. Mettez les unités hors tension.
2. Commencez par débrancher les cordons alimentation des socles de prise de courant.
3. Débranchez les câbles d'interface des prises.
4. Débranchez tous les câbles des unités.



**attention:**

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

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

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



**attention:**

Si une unité de CD-ROM est installée, prenez connaissance des informations suivantes :

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

Pour éviter une exposition directe au rayon laser, n'ouvrez pas l'unité de CD-ROM. Vous ne pouvez effectuer aucune opération de maintenance à l'intérieur.

**PERIGO**

Certaines unités de CD-ROM contiennent une diode laser de classe 3A ou 3B. Prenez connaissance des informations suivantes :

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



≥32 kg



≥55 kg

**attention:**

**Ce produit pèse un poids considérable. Faites-vous aider pour le soulever.**



**attention:**

**Le courant électrique circulant dans les câbles de communication et les cordons téléphoniques et d'alimentation peut être dangereux. Pour votre sécurité et celle de l'équipement, avant de retirer les carters du serveur, mettez celui-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui le relient aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).**



## VORSICHT

**Aus Sicherheitsgründen bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.**

**Aus Sicherheitsgründen:**

- **Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.**
- **Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.**

**Signalkabel möglichst einhändig anschließen oder lösen, um einen Stromschlag durch Berühren von Oberflächen mit unterschiedlichem elektrischem Potential zu vermeiden.**

**Elektrische Spannungen von Netz-, Telefon- und Datenübertragungsleitungen sind gefährlich. Um einen Stromschlag zu vermeiden, nur nach den Anweisungen arbeiten, die für Installation, Transport oder Öffnen von Gehäusen dieses Produkts oder angeschlossenen Einheiten gelten.**

### **Kabel anschließen**

1. Alle Geräte ausschalten und Netzstecker ziehen.
2. Zuerst alle Kabel an Einheiten anschließen.
3. Signalkabel an Anschlußbuchsen anschließen.
4. Netzstecker an Steckdose anschließen.
5. Gerät einschalten.

### **Kabel lösen**

1. Alle Geräte ausschalten.
2. Zuerst Netzstecker von Steckdose lösen.
3. Signalkabel von Anschlußbuchsen lösen.
4. Alle Kabel von Einheiten lösen.



**achtung:**

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

**Die Batterie nicht**

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

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.



**achtung:**

Wenn ein CD-ROM-Laufwerk installiert ist, beachten Sie folgendes. Steuer- und Einstellelemente sowie Verfahren nur entsprechend den Anweisungen im vorliegenden Handbuch einsetzen. Andernfalls kann gefährliche Laserstrahlung auftreten.

Das Entfernen der Abdeckungen des CD-ROM-Laufwerks kann zu gefährlicher Laserstrahlung führen. Es befinden sich keine Teile innerhalb des CD-ROM-Laufwerks, die vom Benutzer gewartet werden müssen. Die Verkleidung des CD-ROM-Laufwerks nicht öffnen.

**VORSICHT**

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

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



≥32 kg



≥55 kg

**achtung:**

Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.



**achtung:**

An Netz-, Telefon- und Datenleitungen können gefährliche elektrische Spannungen anliegen. Um eine Gefährdung des Benutzers oder Beschädigung des Geräts zu vermeiden, ist der Server auszuschalten. Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem Öffnen des Servergehäuses zu unterbrechen (sofern in Installations- und Konfigurationsanweisungen nicht anders angegeben).



## PERICOLO

**Per evitare il pericolo di scosse elettriche durante i temporali, non collegare o scollegare cavi, non effettuare l'installazione, la manutenzione o la riconfigurazione di questo prodotto.**

**Per evitare il pericolo di scosse elettriche:**

- **collegare il cavo di alimentazione ad una presa elettrica correttamente cablata e munita di terra di sicurezza;**
- **collegare qualsiasi apparecchiatura collegata a questo prodotto ad una presa elettrica correttamente cablata e munita di terra di sicurezza.**

**Quando possibile, collegare o scollegare i cavi di segnale con una sola mano per evitare il rischio di scosse derivanti dal contatto con due superfici a diverso potenziale elettrico.**

**La corrente elettrica circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa. Per evitare scosse elettriche, collegare e scollegare i cavi come descritto quando si effettuano l'installazione, la rimozione o l'apertura dei coperchi di questo prodotto o durante il collegamento delle unità.**

### Per collegare

1. **SPEGNERE** tutti i dispositivi.
2. **Collegare** prima tutti i cavi alle unità.
3. **Collegare** i cavi di segnale alle prese.
4. **Collegare** il(i) cavo(i) di alimentazione alla presa elettrica.
5. **ACCENDERE** le unità.

### Per scollegare

1. **SPEGNERE** tutti i dispositivi.
2. **Rimuovere** prima il(i) cavo(i) di alimentazione dalla presa elettrica.
3. **Rimuovere** i cavi di segnale dalle prese.
4. **Rimuovere** tutti i cavi dalle unità.

**ATTENZIONE:**

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

**Evitare di:**

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

Smaltire secondo la normativa in vigore (D.Lgs 22 del 5/2/97) e successive disposizioni nazionali e locali.

**ATTENZIONE:**

Quando è installata un'unità CD-ROM, notare quanto segue:

L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.

L'apertura di un'unità CD-ROM può determinare l'esposizione a radiazioni laser pericolose. All'interno dell'unità CD-ROM non vi sono parti su cui effettuare l'assistenza tecnica. Non rimuovere i coperchi dell'unità CD-ROM.

**PERICOLO**

Alcune unità CD-ROM contengono all'interno un diodo laser di Classe 3A o Classe 3B. Prestare attenzione a quanto segue:

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



≥32 kg



≥55 kg

**ATTENZIONE:**

Durante il sollevamento della macchina seguire delle norme di sicurezza.



**ATTENZIONE:**

La corrente circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa. Per evitare situazioni pericolose per le persone o danneggiamenti all'apparecchiatura, scollegare i cavi di alimentazione, i sistemi di telecomunicazioni, le reti e ed i modem prima di aprire i coperchi del server se non diversamente indicato nelle procedure di installazione e configurazione.

경고문 1



위험

전기 충격을 피하려면 날씨가 나쁠 때(예: 눈 또는 비가 오거나 천둥 번개가 칠 때)는 케이블을 연결하거나 끊지 않도록 하고 이 제품의 설치, 유지보수 또는 재구성 등의 작업을 수행하지 않도록 하십시오.

전기 충격을 피하려면 다음과 같아야 합니다.

- 고압선은 적절한 배선 및 접지 상태의 콘센트로 연결되어야 합니다.
- 이 제품이 접속될 모든 장비도 적절한 배서 상태의 콘센트로 연결되어야 합니다.

다른 전위를 가진 두 표면을 만졌을 때 발생할 수 있는 전기 충격을 피하려면 한 손으로 신호선을 연결하거나 끊으십시오.

전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다. 전기 충격을 피하려면 이 제품이나 접속 장치를 설치, 이동 및 덮개를 열 때 다음 설명에 따라 케이블을 연결하고 끊도록 하십시오.

연결하려면	연결해제하려면
1. 모든 스위치를 켜다.	1. 모든 스위치를 끈다.
2. 먼저 모든 케이블을 장치에 연결한다.	2. 먼저 모든 케이블을 장치에 제거한다.
3. 신호선을 콘센트에 연결한다.	3. 신호선을 콘센트에서 제거한다.
4. 전원을 콘센트에 연결한다.	4. 장치에서 모든 케이블을 제거한다.
5. 장치 스위치를 켜다.	

경고문 2



**주의:**  
 배터리를 교체할 때는 IBM 부품 번호 &PN. 또는 제조업체에서 추천하는 동등한 유형의 배터리를 사용하십시오. 시스템에 리튬 배터리를 포함하는 모듈이 있으면 이것은 동일한 제조업체에서 생산된 동일한 모듈 유형으로만 교체하십시오. 배터리에는 리튬이 포함되어 있으므로 제대로 사용, 처리 또는 처분하지 않으면 폭발할 수 있습니다.

다음은 주의하십시오.

- 먼지거나 물에 닿지 않도록 하십시오.
- 100°C(212°F) 이상으로 가열하지 않도록 하십시오.
- 수리하거나 분해하지 않도록 하십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3



**주의:**  
 CD-ROM 드라이브가 설치되어 있으면 다음 사항을 명심하십시오.

여기에서 지정하지 않은 방식으로 CD-ROM 드라이브를 제어 또는 조절하거나 다른 절차로 사용하면 위험한 방사능 노출이 발생할 수 있습니다.

CD-ROM 드라이브의 덮개를 제거하면 위험한 레이저 방사능이 노출될 수 있습니다. CD-ROM 드라이브 내에는 정비할 수 있는 부품이 없습니다. CD-ROM 드라이브 덮개를 제거하지 않도록 하십시오.

경고문 4

**위험**

일부 CD-ROM 드라이브에는 클래스 3A 또는 3B 레이저 2급 진공관(다이오드)이 들어 있습니다. 다음 사항을 명심하십시오.

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

경고문 5



32kg(70.5 파운드)



55kg(121.2 파운드)

**주의:**

기계를 들 때는 안전하게 들어 올리십시오.

경고문 10



**주의:**

전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다. 설치 및 구성 절차에 다른 지시가 없으면, 다치거나 장비 손상이 생기지 않게 하기 위해 서버 덮개를 열기 전에 접속된 전원, 원격 통신 시스템, 네트워크 및 모뎀의 연결을 끊으십시오.



**PELIGRO**

Para evitar una posible descarga eléctrica, no conecte ni desconecte los cables ni lleve a cabo ninguna operación de instalación, de mantenimiento o de reconfiguración de este producto durante una tormenta eléctrica.

Para evitar una posible descarga:

- El cable de alimentación debe conectarse a un receptáculo con una instalación eléctrica correcta y con toma de tierra.
- Los aparatos a los que se conecte este producto también deben estar conectados a receptáculos con la debida instalación eléctrica.

Cuando sea posible, utilice una sola mano para conectar o desconectar los cables de señal a fin de evitar una posible descarga al tocar dos superficies con distinto potencial eléctrico.

La corriente eléctrica de los cables de comunicaciones, teléfono y alimentación puede resultar peligrosa. Para evitar una posible descarga, siga las indicaciones de conexión y desconexión de los cables siempre que tenga que instalar, mover o abrir las cubiertas de este producto o de los dispositivos acoplados.

**Instrucciones de conexión**

1. Apague todos los componentes (OFF).
2. En primer lugar, conecte todos los cables a los dispositivos.
3. Conecte los cables de señal a los receptáculos.
4. Conecte los cables de alimentación a las tomas.
5. Encienda el dispositivo (ON).

**Instrucciones de desconexión**

1. Encienda todos los componentes (ON).
2. En primer lugar, retire los cables de alimentación de las tomas.
3. Retire los cables de señal de los receptáculos.
4. Retire todos los cables de los dispositivos.



**precaución:**

Al cambiar la batería, utilice únicamente la batería IBM Número de pieza 33F8354 o un tipo de batería equivalente recomendado por el fabricante. Si el sistema tiene un módulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de módulo del mismo fabricante. La batería contiene litio y puede explotar si no se utiliza, manipula o desecha correctamente.

*Lo que no debe hacer*

- Tirar o sumergir el producto en agua.
- Exponer el producto a una temperatura superior a 100°C.
- Reparar o desmontar el producto.

Cuando quiera desechar la batería, siga las disposiciones y reglamentaciones locales.



**precaución:**

Cuando instale una unidad de CD-ROM, tenga en cuenta la siguiente información.

Si se llevan a cabo controles o ajustes o se utilizan métodos que no se atengan a lo aquí especificado, se puede producir una exposición peligrosa a las radiaciones.

Si se retiran las cubiertas de la unidad de CD-ROM, se puede producir una peligrosa exposición a radiaciones de láser. Dentro de la unidad de CD-ROM no existen piezas reparables. No retire las cubiertas de la unidad de CD-ROM.

**PELIGRO**

Algunas unidades de CD-ROM tienen incorporado un diodo de láser de Clase 3A o de Clase 3B. Tenga en cuenta la siguiente información.

Cuando la unidad está abierta se generan emisiones de rayos láser. No dirija la mirada al haz, no lo observe directamente con instrumentos ópticos y evite la exposición directa.



≥32 kg



≥55 kg

**percaución:**

Alce la máquina con cuidado; el sobrepeso podría causar alguna lesión.



**percaución:**

La corriente eléctrica de los cables de comunicaciones, de teléfono y de alimentación puede resultar peligrosa. Para evitar posibles lesiones o daños del aparato, desconecte los cables de alimentación, los sistemas de telecomunicaciones, las redes y los módems antes de abrir las cubiertas del servidor, salvo que se indique lo contrario en las instrucciones de las operaciones de instalación y configuración.

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## 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.
- Use the ESD ground cord, FRU 25F9727, to protect the computer against ESD.
- 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.

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## Miscellaneous information

### Acronyms, Abbreviations and Terms

Term	Information
<b>ACPA/A</b>	Audio Capture and Playback Adapter
<b>ADP</b>	Automatic Data Processing
<b>AGP</b>	Advanced Graphics Port
<b>Alt</b>	Alternate
<b>ANSI</b>	American National Standards Institute
<b>ARTIC</b>	A Real Time Interface Coprocessor
<b>ASCII</b>	American National Standard Code for Interface Interchange
<b>AT</b>	Advanced Technology (as in AT Bus)
<b>AVC</b>	Audio Video Connection
<b>BIOS</b>	Basic Input/Output System (Controls System Resources)
<b>bps</b>	Bits Per Second
<b>BPS</b>	Bytes Per Second
<b>CCITT</b>	The International Telephone and Telegraph Consultative Committee
<b>CCS</b>	Common Command Set
<b>CCSB</b>	Common Complete Status Block
<b>CCSB</b>	Configuration Control Sub Board
<b>CD</b>	Compact Disc
<b>CDPD</b>	Cellular Digital Packet Data
<b>CD-ROM</b>	CD Read Only Memory (stores data/audio)
<b>CGA</b>	Color Graphics Adapter (See EGA, VGA, XGA)
<b>CRC</b>	Cyclic Redundancy Check
<b>CRT</b>	Cathode Ray Tube
<b>CSA</b>	Canadian Standards Association
<b>CSD</b>	Corrective Service Diskette
<b>DASD</b>	Direct Access Storage Device (hard disk, diskette)
<b>DMA</b>	Direct Memory Access
<b>DRAM</b>	Dynamic Random Access Memory
<b>ECA</b>	Engineering Change Announcement
<b>ECC</b>	Error Correction Code
<b>EGA</b>	Enhanced Graphics Adapter
<b>ESD</b>	Electrostatic Discharge
<b>ESDI</b>	Enhanced Small Device Interface
<b>EEPROM</b>	Electrically Erasable Programmable Read Only Memory
<b>EWS</b>	Energy Work Station
<b>FRU</b>	Field Replaceable Unit (replaceable part)
<b>GPIB</b>	General Purpose Interface Bus (IEEE 348)
<b>GSA</b>	General Services Administration
<b>Ht</b>	Height
<b>IDE</b>	Integrated Drive Electronics
<b>IC</b>	Integrated Circuit
<b>IEEE</b>	Institute of Electrical and Electronics Engineers
<b>IEC</b>	International Electrotechnical Commission
<b>IML</b>	Initial Machine Load
<b>IPL</b>	Initial Program Load
<b>ISA</b>	Industry Standard Architecture
<b>ISO</b>	International Organization for Standardization
<b>ISDN</b>	Integrated-Services Digital Network
<b>LAN</b>	Local Area Network
<b>LBA</b>	Local Block Address
<b>LTB</b>	Local Transfer Bus
<b>LUN</b>	Logical Unit Number (as in SCSI)
<b>MAP</b>	Maintenance Analysis Procedure

<b>Term</b>	<b>Information</b>
<b>MCGA</b>	Modified Color Graphics Adapter (320 x 200 x 256)
<b>MCA</b>	Micro Channel Architecture (bus structure)
<b>MHz</b>	Mega Hertz (million cycles per second)
<b>MIDI</b>	Musical Instrument Digital Interface
<b>MM</b>	Multimedia
<b>N/A</b>	Not Available or Not Applicable
<b>NDD</b>	National Distribution Division
<b>NDIS</b>	Network Driver Interface Specification
<b>NMI</b>	Non-Maskable Interrupt
<b>NSC</b>	National Support Center
<b>NVRAM</b>	Non Volatile Random Access Memory
<b>OEM</b>	Original Equipment Manufacturer
<b>PCI</b>	Peripheral component interconnect
<b>PCMCIA</b>	Personal Computer Memory Card International Association
<b>POS</b>	Programmable Option Select
<b>PUN</b>	Physical Unit Number (as in SCSI)
<b>RAID</b>	Redundant Array of Inexpensive Disks (disk array models)
<b>RAM</b>	Random Access Memory (read/write)
<b>RGB</b>	Red Green Blue (as in monitors)
<b>RIPL</b>	Remote Initial Program Load
<b>ROM</b>	Read Only Memory
<b>SASD</b>	Sequential Access Storage Device (Tape)
<b>SCB</b>	Subsystem Control Block
<b>SCSI</b>	Small Computer Systems Interface
<b>SCSI ID</b>	SCSI Identification Number (assigned device number)
<b>SPD</b>	Software Product Description
<b>SR</b>	Service Representative
<b>SRAM</b>	Static Random Access Memory
<b>SVGA</b>	Super Video Graphics Array
<b>STN</b>	Super Twisted Nematic
<b>T/A</b>	NDD Technical Advisor (See your Marketing Representative)
<b>TDD</b>	Telecommunications Device for the Deaf
<b>TFT</b>	Thin-Film Transistor
<b>TPF</b>	ThinkPad File
<b>TSR</b>	Terminate and Stay Resident
<b>UL</b>	Underwriters Laboratory
<b>VCA</b>	Video Capture Adapter
<b>VESA</b>	Video Electronics Standards Association
<b>VGA</b>	Video Graphics Array (640x480x16)
<b>VPD</b>	Vital Product Data
<b>VRAM</b>	Video Random Access Memory
<b>WORM</b>	Write Once, Read Many Media
<b>XGA</b>	Extended Graphics Array (1024 x 768 x 256)
<b>Y/C</b>	Luminance/Chrominance Signal (Video)

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## Send us your comments!

We want to know your opinion about this manual (part number 09N8605). 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!**

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## 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.ibm.com/support>**

These publications can be viewed online in PDF format.

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## 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 342.
- Verify any recent software changes. See "Software considerations" on page 343.
- Verify the BIOS is at the latest level. See "BIOS" on page 343.
- Verify the drivers are at latest levels. See "Drivers" on page 343.
- Verify the Configuration matches hardware. See "System resource conflicts" on page 344.
- Verify the Diagnostic diskette is at latest level. See "File updates" on page 342.

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) 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/>

## 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 than 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.**

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