

IBM Personal Computer

S00N-4019-02

**PC 300 Series
IntelliStation
Aptiva (Type
2173/2178/2198)**

Volume 2:

**Hardware
Maintenance
Manual**

February 2000

**We Want Your Comments!
(Please see page 427)**

This Manual Supports:

300 Series, Type

6268
6278
6288
6338
6563
6564
6565
6574

IntelliStation, Type

6868
6878

Aptiva, Type

2173
2178
2198

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Note

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 436.

Third Edition (February 2000)

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About this manual

This (Volume 2) manual contains service and reference information for the IBM Personal Computer 300 Series, the IBM Profession Workstation IntelliStation, and the IBM Aptiva (2173/2178/2198) Type computers listed in front of this manual.

For other type PC300/700, IntelliStation computers, refer to the Personal Computer, Volume 1, Hardware Maintenance Manual, form number S83G-7789 and Volume 3, form number S09-8603.

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 396 and "Safety information" on page 420.

Important safety information

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

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

注意和危险声明(简体中文)

重要事项:

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

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

在按说明执行任何操作前, 请务必阅读所有注意和危险声明。

注意及危險聲明 (中文)

重要資訊：

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

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

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

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

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

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

주의 및 위험 경고문(한글)

중요:

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

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

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

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

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 - Volume 3 HMM	IBM Personal Computer Hardware Maintenance Manual Volume 3 (S09N-8603)
PS/2 Computers	IBM Personal System/2 Hardware Maintenance Manual (S52G-9971)
PS/ValuePoint Computers	IBM PS/ValuePoint Hardware Maintenance Service and Reference (S61G-1423)
Laptop, Notebook, Portable, and ThinkPad Computers (L40, CL57, N45, N51, P70/P75, ThinkPad 300, 350, 500, 510, 710T, Expansion Unit, Dock I, Dock II)	IBM Mobile Systems Hardware Maintenance Manual Volume 1 (S82G-1501)
ThinkPad Computers (ThinkPad 340, 355, 360, 370, 700, 701, 720, 750, 755)	IBM Mobile Systems Hardware Maintenance Manual Volume 2 (S82G-1502)
ThinkPad Computers (ThinkPad 365, 560, 760, SelectaDock)	IBM Mobile Systems Hardware Maintenance Manual Volume 3 (S82G-1503)
Monitors (Displays) (February 1993)	IBM PS/2 Display HMM Volume 1 (SA38-0053)
Monitors (December 1993)	IBM Color Monitor HMM Volume 2 (S71G-4197)
IBM Monitors (P/G Series) (June 1996)	IBM Monitor HMM Volume 3 (S52H-3679)
IBM 2248 Monitor (February 1996)	IBM Monitor HMM Volume 4 (S52H-3739)
Disk Array technology overview and using the IBM RAID Configuration Program	Configuring Your Disk Array booklet (S82G-1506)
Installation Planning for Personal System/2 computers	Personal System/2 Installation Planning and Beyond (G41G-2927)
Installation Planning for Advanced Personal System/2 Servers	Advanced PS/2 Servers Planning and Selection Guide (GG24-3927)

Contents

About this manual	iii
Important safety information	iii
Related publications	v

IBM PC Enhanced Diagnostics error codes 1

PC 300 - 6268/6278/6288/6338 Aptiva - 2173	21
General checkout	24
Diagnostics and test information	32
Product description	43
Additional service information	47
Computer exploded view (Type 6268/6278/2173)	61
Computer exploded view (Type 6288/6338)	70
System board layout	77
Symptom-to-FRU index	80
Undetermined problem	102
Model tables - Country/Region/Language	103
Parts (Type 6268/6278/2173)	111
Parts (Type 6288/6338)	114

PC 300 - 6563/6564/6574 Aptiva - 2178/2198	119
General checkout	122
Diagnostics and test information	130
Product description	141
Additional service information	144
Computer exploded view (Type 6563)	158
Computer exploded view (Type 6564/6574/2178/2198)	165
System board layout	174
Symptom-to-FRU index	177
Undetermined problem	199
Model tables - Country/Region/Language	200
Parts (Type 6563)	212
Parts (Type 6564/6574)	214
Parts (Type 2178/2198)	219

PC 300 - 6565	225
General checkout	228
Diagnostics and test information	236
Product description	247
Additional service information	249
Computer exploded view (Type 6565)	264
System board layout	271
Symptom-to-FRU index	274
Undetermined problem	296
Model tables - Country/Region/Language	297
Parts (Type 6565)	303

IntelliStation - 6868/6878	309
General checkout	312
Diagnostics and test information	320

Product description	331
Additional service information	333
Computer exploded view (Type 6868/6878)	350
System board layout	357
Symptom-to-FRU index	360
Undetermined problem	382
Model tables - Country/Region/Language	383
Parts (Type 6868/6878)	390
Related Service Information	395
Safety notices (multi-lingual translations)	396
Safety information	420
Miscellaneous information	425
Send us your comments!	427
Do you need technical references?	428
Problem determination tips	429
Notices	436

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

PC 300 - 6268/6278/6288/6338 Aptiva - 2173

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 6268/6278/6288/6338 and Aptiva, type 2173 computer.

Note

Service information is the same for types 6268, 6278, 6288/6338, and 2173 computers, unless specifically identified as type 6288/6338 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.

General checkout	24
Module test menu and hardware configuration	
report	27
Keyboard	28
Printer	28
Power supply	29
20-pin main power supply connection	30
Display	31
Diagnostics and test information	32
Power-on self-test (POST)	32
POST beep codes	32
Error code format	33
IBM PC Enhanced Diagnostics	34
Starting the IBM PC Enhanced Diagnostics	
Program	34
Navigating through the diagnostic programs	34
Running diagnostic tests	35
Test selection	35
IBM PC Enhanced Memory Diagnostics	35
Alert On LAN test	36
Asset ID test	36
Test results	36
Hard file Smart test	37
IBM Fixed Disk Optimized Test	37
Quick and Full erase - hard drive	38
Iomega Zip Drive Test	38
Asset EEPROM backup	38
Viewing the test log	39

SIMM/DIMM memory errors	39
Setup Utility program	41
Hard disk drive boot error	41
When to use the Low-Level Format program	42
Preparing the hard disk drive for use	42
Product description	43
Specifications Type 6268/6278/2173	45
Specifications Type 6288/6338	46
Additional service information	47
Replacing a processor	47
Replacing a system board	48
Security features	48
Passwords	48
Power-on password	49
Administrator password	50
Administrator password control	50
Operating system password	50
Vital product data	50
Management Information Format (MIF)	50
Alert on LAN	51
Hard disk drive jumper settings	52
IDE hard disk drive settings	52
CD-ROM drive jumper settings	53
BIOS levels	54
Flash (BIOS/VPD) update procedure	55
Flash recovery boot block jumper	55
Power management	56
Automatic configuration and power interface (ACPI) BIOS	56
Advanced Power Management	56
Automatic Hardware Power Management features	56
Setting Automatic Hardware Power Management features	57
Automatic Power-On features	57
Network settings	58
Flash over LAN (update POST/BIOS over network)	58
Wake on LAN	59
System board memory	60
Computer exploded view (Type 6268/6278/2173)	61
Input/Output connectors	62
Cover removal	63
Front bezel	64
EMC shield	64
CD-ROM drive removal	65
Front panel	66
ZIP drive removal	67
Hard drive removal	67
HD/fan/speaker bracket removal	68
Power supply removal	69
Computer exploded view (Type 6288/6338)	70
Input/Output connectors	71
Cover removal	72
Front panel	73

Front bezel	74
EMC shield	74
Diskette/hard drive bracket	74
CD-ROM drive removal	75
Power supply removal	76
System board layout	77
System board locations	78
System board jumper settings	79
Symptom-to-FRU index	80
Beep symptoms	81
No beep symptoms	82
POST error codes	84
Miscellaneous error messages	99
Undetermined problem	102
Model tables - Country/Region/Language	103
Type/Model configuration tables (6268/6278/6288/6338)	104
Parts (Type 6268/6278/2173)	111
Parts listing	112
Parts (Type 6288/6338)	114
Parts listing	115
Special tools	117

General checkout

This general checkout procedure is for Type 6268/6278/6288/6338/2173 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 54.
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 80.
4. If the computer hangs and no error is displayed, go to "Undetermined problem" on page 102.
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 6268/6278/6288/6338/2173 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 102 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 102.

Keyboard

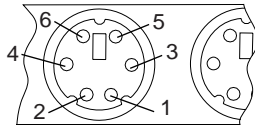
Note

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

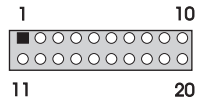
If the above are correct, check the following voltages.

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	not used	not used
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 102.

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 6268/6278/6288/6338/2173 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 6268/6278/6288/6338/2173 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

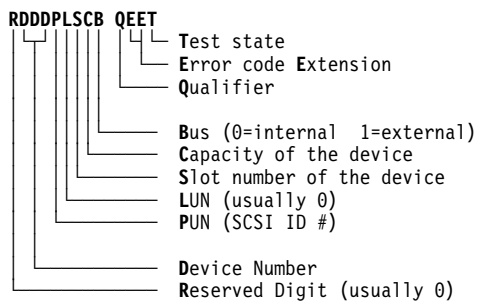
This section provides an explanation of the encoded non-SCSI and SCSI POST error codes.

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 (SIMM or DIMM) is defective and report the socket where the failing module is located. The Memory diagnostics can run a quick and full test of the system. Diagnostics can also be run on a single SIMM or DIMM.

Note

See "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 (SIMM/DIMM) 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 'SIMM/DIMM 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 SIMM/DIMM socket.

Only sockets containing a SIMM or DIMM can be selected for testing. Unpopulated 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 DIMM, or a device on the PCI bus.

Date:	Contains the date on which the diagnostic test was run. Date is retrieved from CMOS and displayed using the YYYYMMDD format.
ChkDigits:	Contains a 2-digit check-digit value to ensure that: <ul style="list-style-type: none"> • 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 copy of the FAT Table on all partitions (both the master and backup).
- Destroys the partition table.
- Provides messages that warn the user that this is a non-recoverable process.

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

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

Important

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

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

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

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.

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

Message	Failure Found	Recommended Actions
2xx-1y	A memory error was detected in SIMM socket Y	Replace the SIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board.
2xx-2y	A memory error was detected in DIMM socket Y	Replace the DIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board or where memory is on the processor card, replace the processor card.
Corrupt BIOS	Information in BIOS is not as expected. Not able to find expected DMI information from BIOS. Memory controller chipset vendor ID does not match expected value.	Reflash the BIOS. Perform boot block recovery. Replace the system board.

Message	Failure Found	Recommended Actions
Test aborted by user	User stopped test.	Restart test.
Note: "Y" is the SIMM/DIMM socket number. Use the System Board Layouts section in the latest PC 300/700, IntelliStation Hardware Maintenance Manual, HMM, to reference the memory sockets.		

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"> 1. Attempt to access and recover (back-up) the failing hard disk drive. 2. Using the operating systems programs, format the hard disk drive. 3. Go to "Preparing the hard disk drive for use" on page 42.
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 PC 300 Type 6268/6278/6288/6338 computers are available in 4 x 4, (Four drive bays, four I/O adapter slots) as desktop and micro-tower models.

The IBM Aptiva Type 2173 computer is available in 4 x 4 micro-tower models only.

Note

Service information is the same for types 6268, 6278, 6288, 6338, and 2173 computers, unless specifically identified as type 6288/6338 which is the desktop computer.

- Type 6268 and 6278 are the micro-tower
- Type 6288/6338 is the desktop
- Type 2173 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 (6268/6278/6288/6338)” on page 104.)

 - 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 6268/6278/2173

Feature	Description
Size	Depth: 383 mm (15.08 inches) Height: 378 mm (14.88 inches) Width: 192 mm (7.56 inches)
Weight	Weight: 7.25 kg (16 lb) ¹
Environment	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)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 256 BTU (75 watts) - Maximum: 706 BTU (207 watts) ²
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Maximum (as shipped): 0.10 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 38 dB idle At bystander position (1 meter): - 37 dB operating - 33 dB idle Declared (upper limit) sound power levels: - 5.1 bels operating - 4.8 bels idle

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 6288/6338

Feature	Description
Size	Depth: 422.8 mm (16.64 inches) Height: 138.8 mm (5.46 inches) Width: 400 mm (15.75 inches)
Weight	Weight: 10.43 kg (23 lb) Fully configured ⁴
Environment	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)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 256 BTU (75 watts) - Maximum: 706 BTU (207 watts) ⁵
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Maximum (as shipped): 0.10 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 38 dB idle At bystander position (1 meter): - 37 dB operating - 33 dB idle Declared (upper limit) sound power levels: - 5.1 bels operating - 4.8 bels idle

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

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

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

Additional service information

The following additional service information supports the PC 300 types 6268, 6278, 6288, 6338, and the Aptiva type 2173 computer.

- “Replacing a processor”
- “Replacing a system board” on page 48
- “Security features” on page 48
- “Passwords” on page 48
- “Vital product data” on page 50
- “Management Information Format (MIF)” on page 50
- “Alert on LAN” on page 51
- “Hard disk drive jumper settings” on page 52
- “CD-ROM drive jumper settings” on page 53
- “BIOS levels” on page 54
- “Flash (BIOS/VPD) update procedure” on page 55
- “Flash recovery boot block jumper” on page 55
- “Power management” on page 56
- “Network settings” on page 58
- “Flash over LAN (update POST/BIOS over network)” on page 58
- “Wake on LAN” on page 59
- “System board memory” on page 60

Replacing a processor

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

Important

- Before removing the processor, remove all memory first. Install the processor, heat sink and clip, then re-install the memory.
- 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 54 "Vital product data" on page 50, and "Flash (BIOS/VPD) update procedure" on page 55.
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
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 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 password jumper.
3. Move the password jumper to connect the center pin and the pin on the opposite end of the connector.
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 6268, 6278, 6288/6338, 2173 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 55.

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 LAN

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

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

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

Hard disk drive jumper settings

IDE hard disk drives for the PC 300 series and the Aptiva 2173 computers use jumpers to set the drives as primary (master) or secondary (slave).

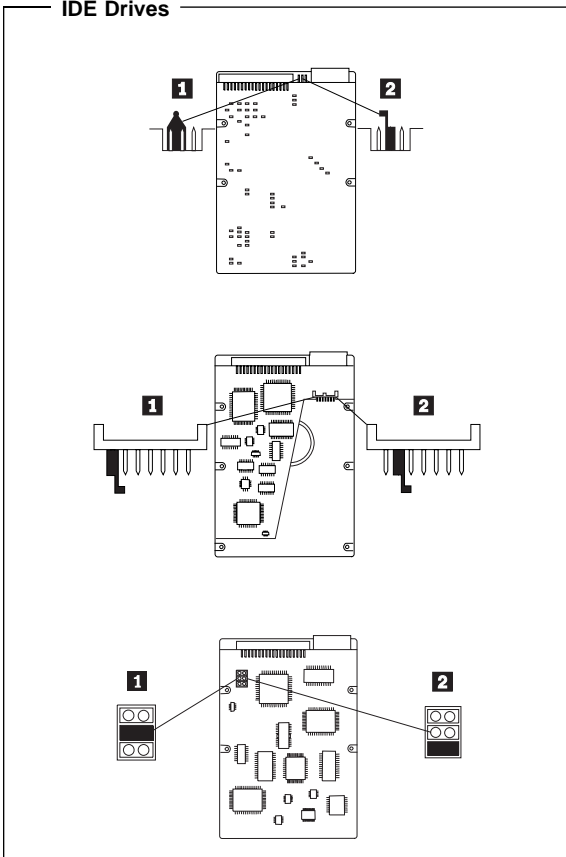
Attention

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

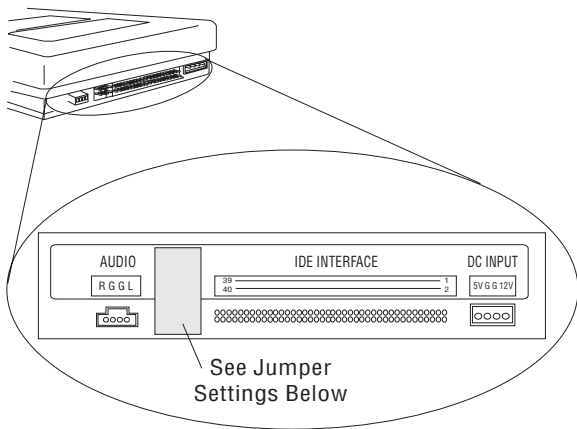
- 1 Primary (Master) Hard Disk Drive
- 2 Secondary (Slave) Hard Disk Drive

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. HelpCenter™
 4. Levels 1 and 2 Support
 5. RETAIN
- Sources for obtaining the latest level BIOS available.
 1. IBM PC Company Home Page
<http://www.ibm.com/pc/us/>
 2. PC PartnerInfo-Technical Database (CTSTIPS.NSF)
 3. HelpCenter
 4. Levels 1 and 2 Support

To update (flash) the BIOS, see “Flash (BIOS/VPD) update procedure” on page 55.

Flash (BIOS/VPD) update procedure

Attention

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

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

Flash recovery boot block jumper

Attention

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

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

1. Power-off the computer and remove the cover.
2. Move the system board Boot Block jumper or switch to the **recover** position. Refer to "System board 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 Boot Block jumper or switch to the **normal** position. Then, replace the cover and power-on the computer.

Power management

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

Automatic configuration and power

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

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

Attention

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

Automatic Hardware Power Management

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

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

Level 1 Set time from 5 minutes to 4 hours.

Level 2 Set time from 10 minutes to 5 hours.

Level 3 Set time from 15 minutes to 6 hours.

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

- **System Power:**
 - Select **On** for the computer to remain on.
 - Select **Off** for the computer to shut down.
- **Processor Speed:**

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

- **Display:**

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

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

Setting Automatic Hardware Power Management features

1. Start the Configuration/Setup Utility program (see “Setup Utility program” on page 41).
2. Select **Advanced Power Management** from the Configuration/Setup Utility program menu.
3. Be sure **APM BIOS Mode** is set to **Enabled**. If it is not, press Left Arrow (←) or Right Arrow (→) to change the setting.
4. Select **Automatic Hardware Power Management**.
5. Set **Automatic Hardware Power Management** to **Enabled**.
6. Select values for the three levels of power management (system power, processor speed, and display), as necessary.
7. Set **Hard Disk** to **Enabled** or **Disabled**.
Note: This does not apply to SCSI drives.
8. Press **Esc** twice to return to the Configuration/Setup Utility program menu.
9. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
10. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

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

- **Serial Port Ring Detect:** With this feature set to **Enabled** and an *external* modem connected to 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.
- **Wake on LAN:** If the computer has a properly configured token-ring or Ethernet LAN adapter card that is Wake on LAN-enabled and there is remote network management software, you can use the IBM-developed Wake on LAN feature. When you set Wake on LAN to **Enabled**, the computer will turn on when it receives a specific signal from another computer on the local area network (LAN). For further information, see "Wake on LAN" on page 59.

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 55.

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

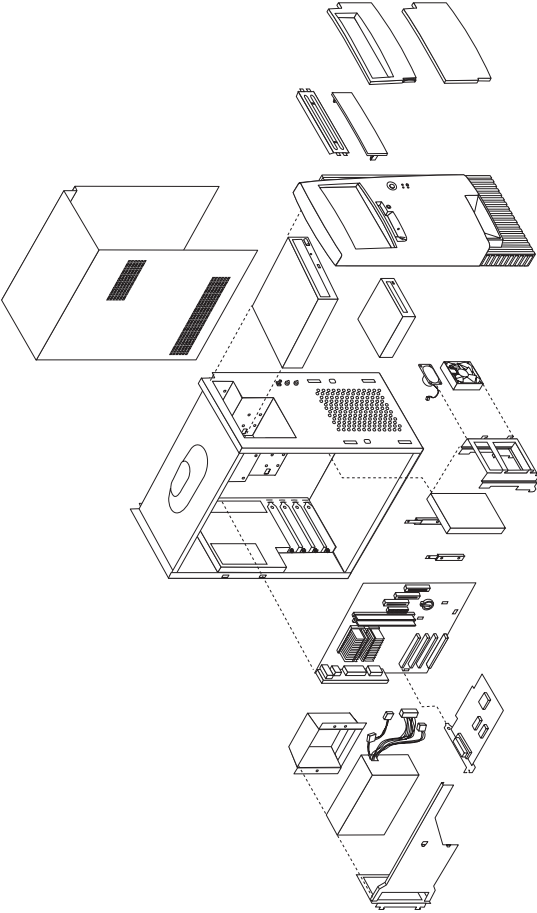
The following matrix cross-references the name of the computer (printed on the logo) and the size, speed, and type of memory modules supported in the computer.

Computer Name	Memory Module		
	Size	Speed	Type
PC 300	32 MB	100 MHz	SDRAM Non-Parity Industry Standard
Type	64 MB		
6268/6278/ 6288/6338/	128 MB		
	256 MB		
Aptiva	512 MB		
Type 2173	Maximum		

Supported memory configuration

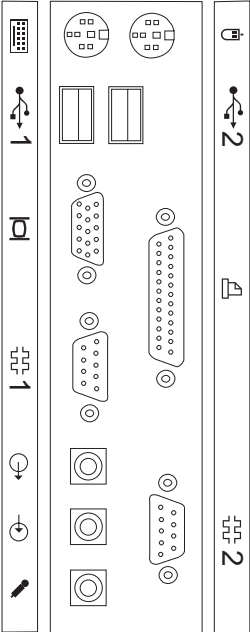
DIMM sizes of 32 MB, 64 MB, 128 MB, and 256 MB are acceptable. Start filling DIMM socket 0, then 1. Use 3.3 V unbuffered 100 MHz. SDRAM Non-Registered DIMMs only.

Computer exploded view (Type 6268/6278/2173)

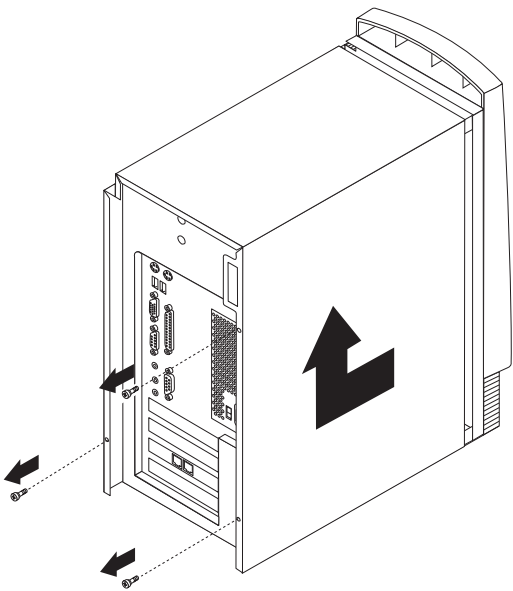


I/O connectors and removal procedures for the cover, front bezel, EMC shield, CD-ROM drive, front panel, ZIP drive, hard drive, HD/fan/speaker bracket, and power supply are on the following pages.

Input/Output connectors



Cover removal



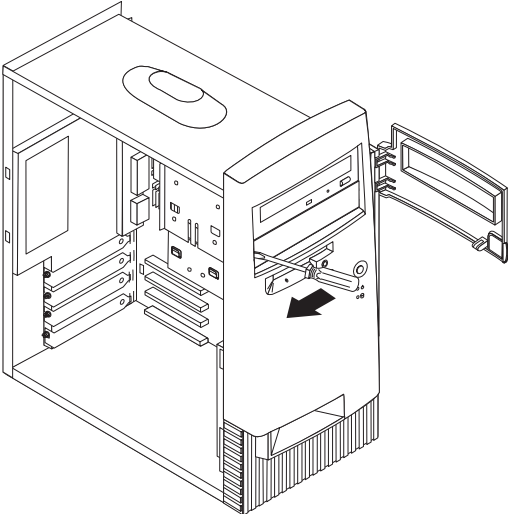
To remove top cover:

1. Remove the three cover thumb screws.
2. Slide cover toward the rear of the chassis about 1-Inch (2 cm) to clear the front panel.
3. Lift cover straight up.

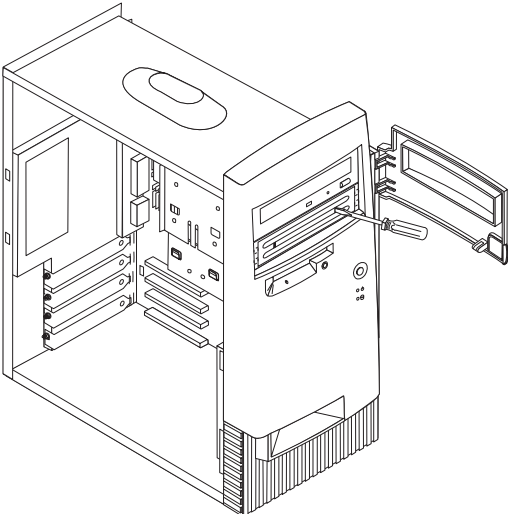
To install top cover:

1. Slide cover down onto the chassis about 1-inch (2 cm) from the front flange.
2. Make sure bottom cover slots are engaged on the chassis.
3. Slide cover forward to engage the front cover slots onto the chassis flange.
4. Install the three cover thumb screws.

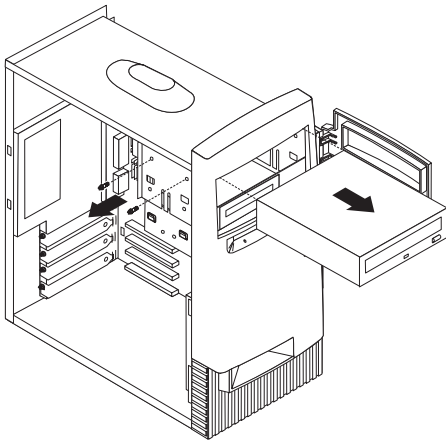
Front bezel



EMC shield



CD-ROM drive removal



To remove the CD-ROM drive:

1. Remove the top cover.
2. Disconnect the cables from the CD-ROM drive
3. Remove two screws securing the CD-ROM drive.
4. Pull the CD-ROM drive out of the chassis.

Note

When connecting the CD-ROM Audio Cable, make sure the cable is routed along the system board near the PCI adapter slots. Continue routing the cable along the system board between the power connector and primary IDE connector and then up to the CD-ROM drive. Do not route the CD-ROM cable near the system board I/O connectors.

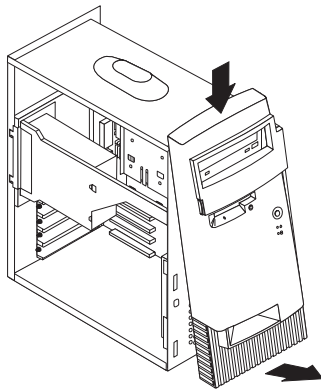
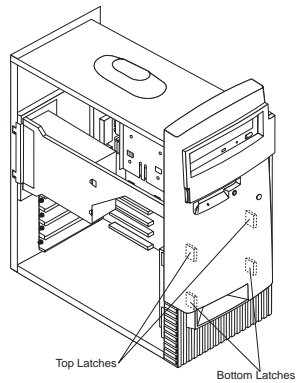
Note

When connecting the EIDE DASD Cable, connect the:

- Blue connector of cable to the system board
- Black connector to the master device
- Gray connector to the slave device

Route the signal cables next to the hard drive and toward the bottom of the diskette drive housing.

Front panel



To remove the front panel:

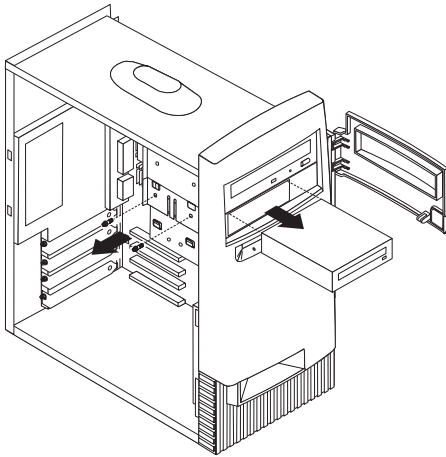
1. Remove the top cover.
2. Remove the top blank bezel and EMC shield or the CD-ROM drive.

Note

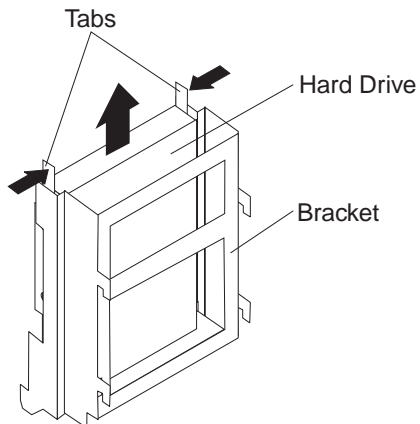
Depending on which one is installed, the blank bezel and EMC shield or the CD-ROM drive must be removed in order to remove the front panel.

3. Reach inside the chassis and pull apart the two bottom latches inside the front panel while pulling the panel out. The two bottom latches will unlatch from the chassis.
4. Next, pull apart the top two latches from inside the panel while pulling the panel out.
5. To remove the front panel, pivot the bottom of the panel out and down at the same time.

ZIP drive removal



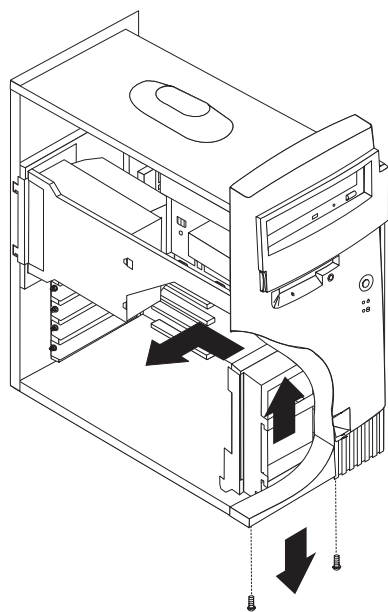
Hard drive removal



To remove the hard drive:

1. Press in on both rail tabs and lift the hard drive up then pull it back and out from the bracket.
2. Remove the signal and power cables from top of the hard drive.
3. When replacing the hard drive, remove the drive rails from the old drive and install them on the new drive.

HD/fan/speaker bracket removal



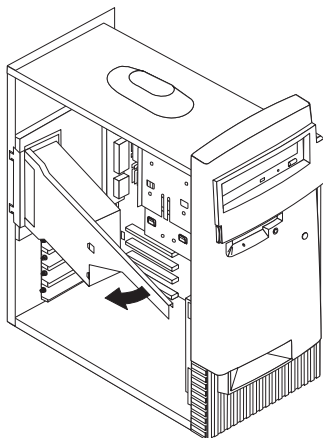
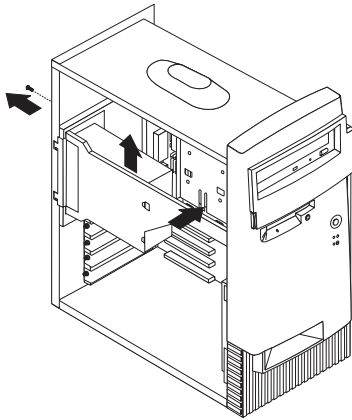
To remove the bracket:

1. Remove the hard drive so it will not be damaged from vibration. The hard drive can be removed from the bracket by depressing the hard drive rail tabs, lifting the hard drive up then pulling it back and away from the bracket. See "Hard drive removal" on page 67.
2. Disconnect the speaker and fan cables from the system board.
3. Remove the two bracket screws at bottom of chassis.
4. Lift the bracket up then pull the bracket out from front of chassis.

Power supply removal

Notes

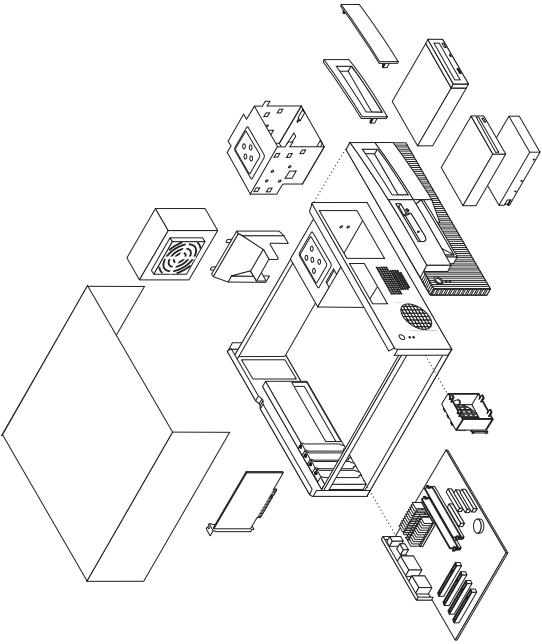
1. Remove the power supply bracket from the old power supply and install it on the new power supply.
2. Make sure the power supply voltage switch is set to the proper operating voltage; 115V or 230V.



To remove the power supply:

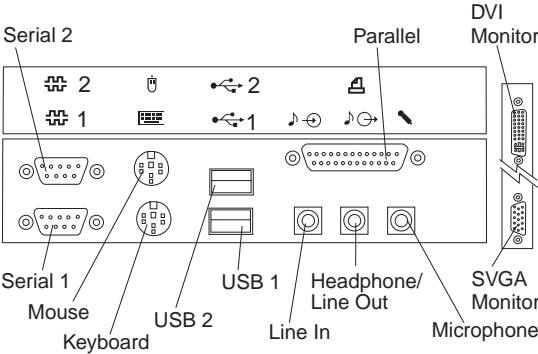
1. Remove the top cover
2. Remove the thumb screw from the rear of the power supply
3. Push in on the tab then, push up on the power supply bracket and swing it out to disengage the bracket from the chassis.

Computer exploded view (Type 6288/6338)

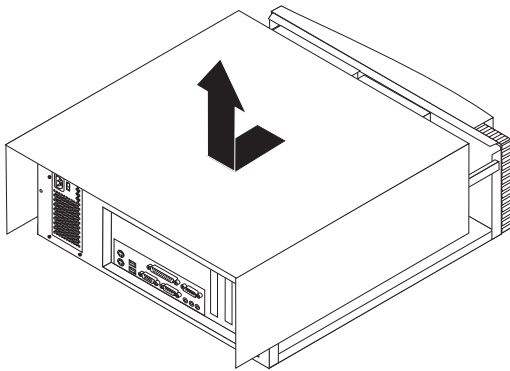
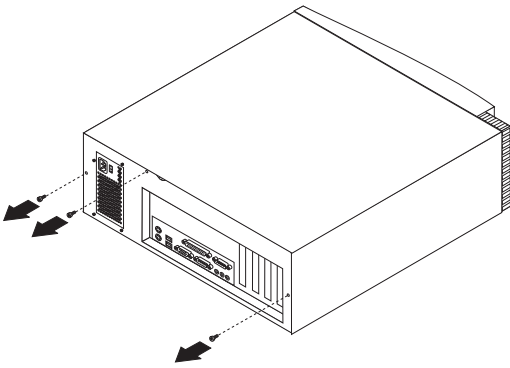


I/O connectors and removal procedures for the cover, front panel, front bezel, diskette/hard drive bracket, CD-ROM drive, and power supply are on the following pages.

Input/Output connectors



Cover removal



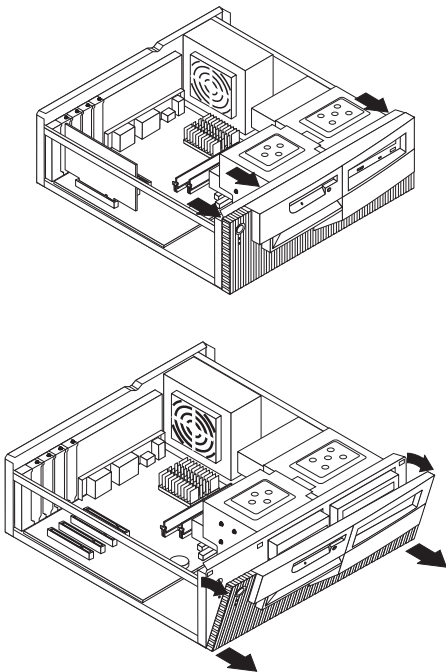
To remove top cover:

1. Remove the three cover thumb screws.
2. Slide cover toward the rear of the chassis about 1-inch (2 cm) to clear the front panel.
3. Lift cover up.

To install top cover:

1. Slide cover down onto the chassis about 1-inch (2 cm) from the front panel.
2. Make sure bottom cover slots are engaged on the chassis.
3. Slide cover forward to engage the front cover slots onto the chassis.
4. Install the three cover thumb screws.

Front panel



To remove the front panel:

1. Remove the top cover.
2. Release the three top latches while gently pulling the top of the panel outward.
3. Keeping the panel at the same angle, gently pull the panel out from the bottom of the chassis.

To install the front panel:

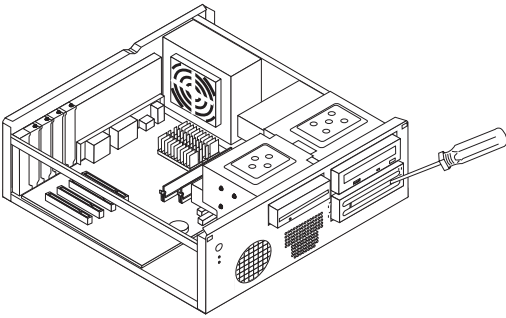
1. At the same angle that the panel was when removed, install the bottom tabs of the panel in the chassis. Push up on the left and right bottom tabs, if necessary, to get the tabs in the holes of the chassis.
2. Push the top of the panel toward the chassis until the three top latches lock in place.

Front bezel

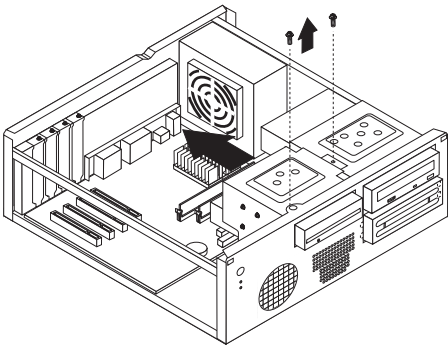
To remove the front blank bezel:

1. Remove the top cover.
2. Remove the front panel.
3. Unlatch the tabs of the bezel and remove it from the panel.

EMC shield



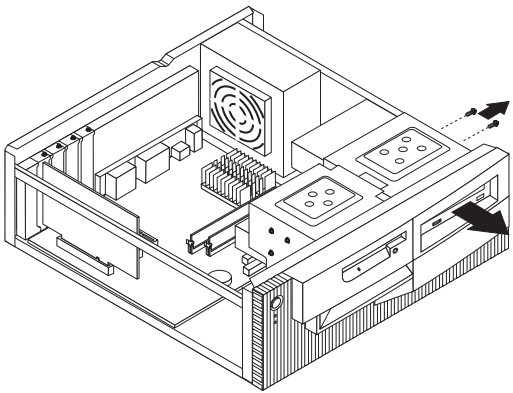
Diskette/hard drive bracket



To remove the diskette/hard drive bracket:

1. Remove the top cover.
2. Remove the diskette and hard drives or disconnect their cables.
3. Remove the two top screws securing the bracket.
4. Slide bracket toward the back of the chassis to unlatch it from the chassis.
5. Lift the bracket out of the chassis.

CD-ROM drive removal



To remove the CD-ROM drive:

1. Remove the top cover.
2. Remove the cables from the CD-ROM drive.
3. Remove two screws securing the CD-ROM drive.
4. Pull the CD-ROM drive out of the chassis.

Note

When connecting the CD-ROM Audio Cable, make sure the cable is routed along the system board near the PCI adapter slots. Continue routing the cable along the system board between the power connector and primary IDE connector and then up to the CD-ROM drive. Do not route the CD-ROM cable near the system board I/O connectors.

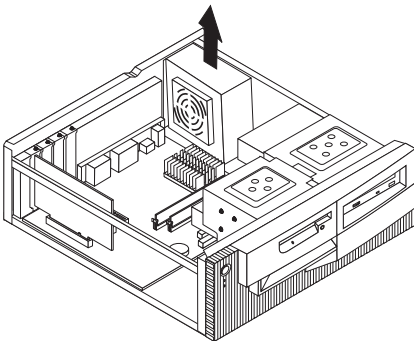
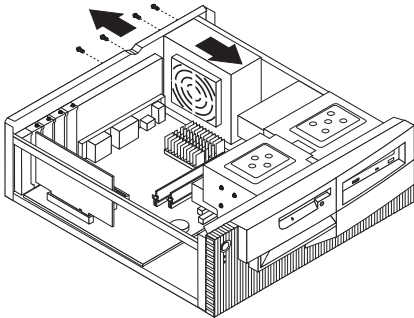
Power supply removal

Note

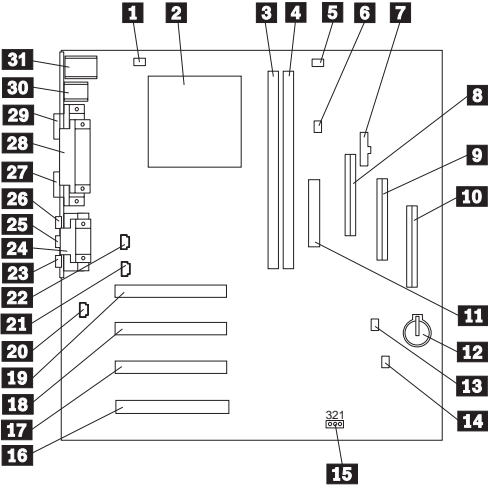
1. Make sure the power supply voltage switch is set to the proper operating voltage; 115V or 230V.

To remove the power supply:

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



System board layout



System board locations

1	Fan 3 connector
2	Processor socket
3	DIMM socket 0
4	DIMM socket 1
5	Reserved connector (Must be jumpered if present)
6	Alert on LAN
7	Power Switch/LED connector
8	Secondary IDE connector
9	Diskette Drive connector
10	Primary IDE connector
11	Power connector
12	Battery
13	Fan 1
14	Wake on LAN connector
15	CMOS Clear jumper
16	PCI 4 slot
17	PCI 3 slot
18	PCI 2 slot
19	PCI 1 slot
20	Internal Speaker connector
21	CD Audio connector
22	Telephony connector
23	Microphone connector
24	Serial 2 connector (COM B)
25	Line In connector
26	Line Out connector
27	Serial 1 connector (COM A)
28	Parallel connector
29	Display connector
30	USB connectors
31	Mouse/Keyboard connectors

System board jumper settings

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

CMOS Reset/Flash Boot Block Recovery

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

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

Processor Speed Settings

Processor speed for the PC 300 type 6268, 6278, 6288/6338, and Aptiva type 2173 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.

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 102.

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 52.)

Important

1. Some errors are indicated with a series of beep codes. (See "Beep symptoms" on page 81.)
Type 6268/6278/6288/6338/2173 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"> • One Beep • A pause (or break) • Two beeps • A pause (or break) • Any number of beeps
4	Four continuous beeps

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

Beep Symptom	FRU/Action
3-4-1 Screen retrace test detected an error.	<ol style="list-style-type: none"> 1. Video Adapter (if installed) 2. System Board 3. Display
3-4-2 POST is searching for video ROM.	<ol style="list-style-type: none"> 1. Video Adapter (if installed) 2. System Board
4	<ol style="list-style-type: none"> 1. Video Adapter (if installed) 2. System Board
All other beep code sequences.	1. System Board
One long and one short beep during POST. Base 640 KB memory error or shadow RAM error.	<ol style="list-style-type: none"> 1. Memory Module 2. System Board
One long beep and two or three short beeps during POST. (Video error)	<ol style="list-style-type: none"> 1. Video Adapter (if installed) 2. System Board
Three short beeps during POST.	<ol style="list-style-type: none"> 1. See "System board memory" on page 60. 2. System Board
Continuous beep.	1. System Board
Repeating short beeps.	<ol style="list-style-type: none"> 1. Keyboard stuck key? 2. Keyboard Cable 3. System Board

No beep symptoms

Note

Type 6268/6278/6288/6338/2173 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.	1. System Board

Symptom/Error	FRU/Action
No beep during POST.	<ol style="list-style-type: none">1. See “Undetermined problem” on page 102.2. System Board3. Memory Module4. Any Adapter or Device5. Riser Card6. Power Cord7. Power Supply

POST error codes

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

POST Error Code	FRU/Action
000 SCSI Adapter not enabled.	1. Verify adapter device and Bus Master fields are enabled in PCI configuration program. See documentation shipped with computer.
02X	1. SCSI Adapter
08X Check SCSI terminator installation.	1. SCSI Cable 2. SCSI Terminator 3. SCSI Device 4. SCSI Adapter
101 System board interrupt failure.	1. System Board
102 System board timer error.	1. System Board
106	1. System Board
110 System board memory parity error.	1. Memory Module 2. System Board
111 I/O channel parity error.	1. Reseat adapters 2. Any Adapter 3. System Board
114 Adapter ROM error.	1. Adapter Memory 2. System Board
129 Internal cache test error.	1. Processor 2. L2 Cache Memory 3. System Board
151 Real-time clock failure.	1. System Board
161 Bad CMOS battery.	1. Run Setup 2. CMOS Backup Battery (See page "Safety information" on page 420.) 3. System Board

POST Error Code	FRU/Action
162 Configuration mismatch.	<ol style="list-style-type: none"> 1. Run Setup and verify Configuration 2. Had a device been added, removed, changed location? If not, suspect that device. 3. Power-on external devices first, then power-on computer. 4. CMOS Backup Battery (See page "Safety information" on page 420.) 5. System Board
162 And unable to run diagnostics.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
163 Clock not updating or invalid time set.	<ol style="list-style-type: none"> 1. Time and Date Set? 2. CMOS Backup Battery (See page "Safety information" on page 420.) 3. System Board
164 POST detected a base memory or extended memory size mismatch error.	<ol style="list-style-type: none"> 1. Run Setup. Check System Summary menu for memory size change. (See "Setup Utility program" on page 41.) 2. Run the Extended Memory Diagnostic tests.
166 Boot Block Check Sum Error	<ol style="list-style-type: none"> 1. Run Flash Recovery using Boot Block. See "Flash recovery boot block jumper" on page 55 2. System Board
167 Microprocessor installed that is not supported by the current POST/BIOS.	<ol style="list-style-type: none"> 1. Run Setup. Check Stepping level for the BIOS level needed, then perform the flash update. 2. Processor
168 Alert on LAN error	<ol style="list-style-type: none"> 1. Run Setup. Check to see that Ethernet and Alert on LAN are enabled. 2. System Board
17X, 18X	<ol style="list-style-type: none"> 1. C2 Security

POST Error Code	FRU/Action
175	<ol style="list-style-type: none"> 1. Run Configuration (See "Setup Utility program" on page 41.) 2. System Board
176	<ol style="list-style-type: none"> 1. Covers were removed from the computer.
177 Corrupted Administrator Password.	<ol style="list-style-type: none"> 1. System Board
178	<ol style="list-style-type: none"> 1. System Board
183	<ol style="list-style-type: none"> 1. Enter the administrator password
184 Password removed due to check-sum error.	<ol style="list-style-type: none"> 1. Enter new password
185 Corrupted boot sequence.	<ol style="list-style-type: none"> 1. Set configuration and reinstall the boot sequence.
186	<ol style="list-style-type: none"> 1. System Board
187	<ol style="list-style-type: none"> 1. Clear Administration password 2. System Board
189	<ol style="list-style-type: none"> 1. More than three password attempts were made to access the computer.
190 Chassis intrusion detector was cleared. This is information only, no action required. If this code does not clear:	<ol style="list-style-type: none"> 1. System Board
1XX Not listed above.	<ol style="list-style-type: none"> 1. System Board
201, 20X Memory data error.	<ol style="list-style-type: none"> 1. Run Enhanced Diag. Memory Test 2. Memory Module 3. System Board
225	<ol style="list-style-type: none"> 1. Unsupported Memory
229 External cache test error.	<ol style="list-style-type: none"> 1. L2 Cache Memory 2. System Board

POST Error Code	FRU/Action
262 POST detected a base memory or extended memory type error.	<ol style="list-style-type: none"> 1. Run Setup. Check System Summary menu for memory type change. (See "Setup Utility program" on page 41.) 2. Run the Extended Memory Diagnostic tests.
301	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
303 With an 8603 error.	<ol style="list-style-type: none"> 1. Mouse 2. Keyboard 3. Keyboard Cable 4. System Board
303 With no 8603 error.	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
3XX Not listed above.	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
5XX	<ol style="list-style-type: none"> 1. Video Adapter (if installed) 2. System Board
601	<ol style="list-style-type: none"> 1. Diskette Drive A 2. Diskette Drive Cable 3. System Board
602	<ol style="list-style-type: none"> 1. Bad Diskette ? 2. Verify Diskette and retry.
604 And able to run diagnostics.	<ol style="list-style-type: none"> 1. Run Setup and verify diskette configuration settings 2. Diskette Drive A/B 3. Diskette Drive Cable 4. System Board
605 POST cannot unlock the diskette drive.	<ol style="list-style-type: none"> 1. Diskette Drive 2. Diskette Drive Cable 3. System Board
662	<ol style="list-style-type: none"> 1. Diskette drive configuration error or wrong diskette drive type, run Setup Configuration.
6XX Not listed above.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. External Drive Adapter 4. Diskette Drive Cable 5. Power Supply

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

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

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

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

POST Error Code	FRU/Action
8603, 8604	<ol style="list-style-type: none"> 1. System Board 2. Pointing Device (Mouse)
86XX Not listed above	<ol style="list-style-type: none"> 1. Mouse 2. System Board
89XX	<ol style="list-style-type: none"> 1. PC Music Adapter 2. MIDI Adapter Unit
91XX	<ol style="list-style-type: none"> 1. Optical Drive 2. Adapter
96XX	<ol style="list-style-type: none"> 1. SCSI Adapter 2. Any SCSI Device 3. System Board
10101, 10102, 10104 10105, 10106, 10107 10108, 10109, 10111 10112, 10113, 10114 10115, 10116	<ol style="list-style-type: none"> 1. Have customer verify correct operating system device drivers are installed and operational. 2. Modem
10103, 10110, 101171	<ol style="list-style-type: none"> 1. System Board 2. Data/Fax Modem
10117 Not listed above.	<ol style="list-style-type: none"> 1. Check system speaker 2. Check PSTN cable 3. External DAA (if installed) 4. Modem
10118	<ol style="list-style-type: none"> 1. Run Diagnostics and verify the correct operation of the modem slot 2. Modem
10119	<ol style="list-style-type: none"> 1. Diagnostics detected a non-IBM modem 2. Modem
10120	<ol style="list-style-type: none"> 1. Check PSTN Cable 2. External DAA (if installed) 3. Modem
10132, 10133, 10134 10135, 10136, 10137 10138, 10139, 10140 10141, 10142, 10143 10144, 10145, 10146 10147, 10148, 10149 10150, 10151, 10152	<ol style="list-style-type: none"> 1. Modem
10153	<ol style="list-style-type: none"> 1. Data/Fax Modem 2. System Board
101XX Not listed above.	<ol style="list-style-type: none"> 1. Modem Adapter/A 2. Data/Fax Modem 3. System Board

POST Error Code	FRU/Action
10450, 10451, 10490 10491, 10492, 10499 Read/write error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics 2. Hard Disk Drive 3. System Board
10452 Seek test error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10453 Wrong drive type?	Information only
10454 Sector buffer test error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10455, 10456 Controller error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10459 Drive diagnostic command error.	Information only
10461 Drive format error	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10462 Controller seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10464 Hard Drive read error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10467 Drive non fatal seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10468 Drive fatal seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10469 Drive soft error count exceeded.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10470, 10471, 10472 Controller wrap error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10473 Corrupt data. Low level format might be required.	Information only
10480	<ol style="list-style-type: none"> 1. Hard Disk Drive (ESDI) 2. Drive Cable 3. System Board
10481 ESDI drive D seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10482 Drive select acknowledgement bad.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
106X1	<ol style="list-style-type: none"> 1. Check Configuration 2. Ethernet Adapter
10635	<ol style="list-style-type: none"> 1. Power-off computer, wait ten seconds; then power-on the computer. 2. Ethernet Adapter

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

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

POST Error Code	FRU/Action
<p>210XXXX Internal bus, size unknown.</p> <p>210XXX1 External bus, size unknown.</p>	<ol style="list-style-type: none"> 1. SCSI Hard Disk Drive 2. SCSI Adapter or System Board 3. SCSI Cable 4. SCSI ID Switch (on some models)
<p>Tape Drive amber LED remains on.</p>	<ol style="list-style-type: none"> 1. Tape Drive 2. SCSI Cable (internal) 3. SCSI Adapter or System Board
<p>Tape Drive green "in use" LED fails to come on.</p>	<ol style="list-style-type: none"> 1. Tape Drive 2. SCSI Adapter or System Board 3. SCSI Cable (internal) SCSI Cable (external)
<p>Tape automatically ejected from drive.</p>	<ol style="list-style-type: none"> 1. Tape Cassette 2. Drive
<p>SCSI ID on rotary switch does not match SCSI ID set in configuration. Verify drive switches inside cover are set to zero.</p>	<ol style="list-style-type: none"> 1. Rotary Switch Circuit Board 2. Circuit Board Cable 3. Tape Drive
<p>Tape sticks/breaks in drive. Verify that the tapes used meet ANSI standard X3B5.</p>	<ol style="list-style-type: none"> 1. Tape Cassette
<p>212XX</p>	<ol style="list-style-type: none"> 1. SCSI Printer 2. Printer Cable
<p>213XX</p>	<ol style="list-style-type: none"> 1. SCSI Processor
<p>214XX</p>	<ol style="list-style-type: none"> 1. WORM Drive
<p>215XXXC 215XXXD 215XXXE 215XXXU If an external device, and power-on LED is off, check external voltages.</p>	<ol style="list-style-type: none"> 1. CD-ROM Drive I CD-ROM Drive II Enhanced CD-ROM Drive II Any CD-ROM Drive 2. SCSI Cable 3. SCSI Adapter or System Board
<p>216XX</p>	<ol style="list-style-type: none"> 1. Scanner
<p>217XX If an external device, and power-on LED is off, check external voltages.</p>	<ol style="list-style-type: none"> 1. Rewritable Optical Drive 2. SCSI Adapter or System Board 3. SCSI Cable
<p>218XX Check for multi CD tray, or juke box.</p>	<ol style="list-style-type: none"> 1. Changer
<p>219XX</p>	<ol style="list-style-type: none"> 1. SCSI Communications Device

POST Error Code	FRU/Action
24201Y0, 24210Y0 Be sure wrap plug is attached.	<ol style="list-style-type: none"> 1. ISDN/2 Adapter 2. ISDN/2 Wrap Plug 3. ISDN/2 Communications Cable
273XX	<ol style="list-style-type: none"> 1. 1 Mbps Micro Channel Infrared LAN Adapter
27501, 27503 27506, 27507	<ol style="list-style-type: none"> 1. ServerGuard Adapter 2. System Board
27502, 27504, 27510 27511, 27533, 27534 27536, 27537	<ol style="list-style-type: none"> 1. ServerGuard Adapter
27509	<ol style="list-style-type: none"> 1. Remove redundant adapters, run Auto Configuration program, then retest.
27512	<ol style="list-style-type: none"> 1. WMSELF.DGS diagnostics file missing. 2. WMSELF.DGS diagnostics file incorrect.
27535	<ol style="list-style-type: none"> 1. 3V Lithium Backup Battery 2. ServerGuard Adapter
27554	<ol style="list-style-type: none"> 1. Internal Temperature out of range 2. ServerGuard Adapter
27555, 27556	<ol style="list-style-type: none"> 1. ServerGuard Adapter 2. Power Supply
27557	<ol style="list-style-type: none"> 1. 7.2V NiCad Main Battery Pack 2. ServerGuard Adapter
27558, 27559 27560, 27561	<ol style="list-style-type: none"> 1. PCMCIA Type II Modem 2. ServerGuard Adapter
27562	<ol style="list-style-type: none"> 1. External Power Control not connected 2. External Power Control 3. ServerGuard Adapter
27563, 27564	<ol style="list-style-type: none"> 1. External Power Control 2. ServerGuard Adapter
275XX	<ol style="list-style-type: none"> 1. Update Diagnostic Software
27801 to 27879	<ol style="list-style-type: none"> 1. Personal Dictation System Adapter 2. System Board
27880 to 27889	<ol style="list-style-type: none"> 1. External FRU (Speaker, Microphone)

POST Error Code	FRU/Action
I999030X Hard disk reset failure.	Possible hard disk drive problem, see “Hard disk drive boot error” on page 41.

Miscellaneous error messages

Message/Symptom	FRU/Action
CMOS Backup Battery inaccurate.	<ol style="list-style-type: none"> 1. CMOS Backup Battery See page "Safety information" on page 420. 2. System Board
Changing colors.	<ol style="list-style-type: none"> 1. Display
Computer will not power-off. See "Power supply" on page 29.	<ol style="list-style-type: none"> 1. Power Switch 2. System Board
Computer will not RPL from server	<ol style="list-style-type: none"> 1. Ensure Network is in startup sequence as first device or first device after diskette. 2. Ensure Network adapter is enabled for RPL. 3. Network adapter (Advise network administrator of new MAC address)
Computer will not Wake On LAN [™]	<ol style="list-style-type: none"> 1. Check power supply and signal cable connections to network adapter. 2. Ensure Wake On LAN feature is enabled in Setup/Configuration. See "Setup Utility program" on page 41. 3. Ensure network administrator is using correct MAC address. 4. Ensure no interrupt or I/O address conflicts. 5. Network adapter (Advise network administrator of new MAC address)
Dead computer. See "Power supply" on page 29.	<ol style="list-style-type: none"> 1. Power Switch 2. Power Supply 3. System Board
Diskette drive in-use light remains on or does not light when drive is active.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
Flashing cursor with an otherwise blank display.	<ol style="list-style-type: none"> 1. System Board 2. Primary Hard Disk Drive 3. Hard Disk Drive Cable
Incorrect memory size during POST.	<ol style="list-style-type: none"> 1. Run the Memory tests. 2. Memory Module 3. System Board

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

Message/Symptom	FRU/Action
Some or all keys on the keyboard do not work.	<ol style="list-style-type: none">1. Keyboard2. Keyboard Cable3. System Board

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 60.
 - 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 48.

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.

Note

These model tables are for the PC 300 models only. For Aptiva type 2173 models, please refer to the IBM on-line site, www.ibm.com/pc/

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.

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

Type/Model configuration tables (6268/6278/6288/6338)

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

Note

These model tables are for the PC 300 models only. For Aptiva type 2173 models, please refer to the IBM on-line site, www.ibm.com/pc/

Table	Page
PC 300 Type 6268	105
PC 300 Type 6278	106
PC 300 Type 6288/6338	107

Table 2. PC 300 Type 6268 - Microtower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
16X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	N/A	Windows 98
43X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	N/A	Windows NT
44X	500 MHz Celeron	64 MB NP	13.5 GB EIDE	810 Graphics	4X4	N/A	Windows 98
56X - Open Bay	433 MHz Celeron	N/A	N/A	810 Graphics	4X4	N/A	N/A
57X - Open Bay	466 MHz Celeron	N/A	N/A	810 Graphics	4X4	N/A	N/A
58X - Open Bay	500 MHz Celeron	N/A	N/A	810 Graphics	4X4	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 103.
3. Intel Celeron™ processor comes with 128K Cache.
4. Graphics = 810 Graphics with 4 MB SDRAM display Cache integrated on system board.
5. Audio = integrated on system board.
6. Models 56X, 57X, 58X come with a PCI Audio adapter.
7. Open Bay = Authorized Assembler Program. See the note on page 104

Table 3. PC 300 Type 6278 - Microtower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
S1X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	40X Max	Windows 98
S2X	500 MHz Celeron	64 MB NP	13.5 GB EIDE	810 Graphics	4X4	40X Max	Windows NT
S3X	500 MHz Celeron	64 MB NP	13.5 GB EIDE	810 Graphics	4X4	40X Max	Windows 98
S5X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	40X Max	Windows 98
S6X	500 MHz Celeron	128 MB NP	13.5 GB EIDE	810 Graphics	4X4	40X Max	Windows NT
S8X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	40X Max	Windows 98
S9X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	40X Max	Windows 98
SAX	466 MHz Celeron	64 MB NP	10.1 GB EIDE	810 Graphics	4X4	40X Max	Windows 98
SBX	500 MHz Celeron	128 MB NP	10.1 GB EIDE	810 Graphics	4X4	40X 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 103.
3. Intel Celeron™ processor comes with 128K Cache.
4. Graphics = 810 Graphics with 4 MB SDRAM display Cache integrated on system board.
5. Audio = integrated on system board.
6. Models S5X, S6X, S7X come with Ethernet card
7. Models S1X, S2X, S3X, S8X come with a modem.
8. Open Bay = Authorized Assembler Program. See the note on page 104

Table 4 (Page 1 of 3): PC 300 Type 6288/6338 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X	400 MHz Celeron	32 MB NP	8.4 GB EIDE	810 Graphics	4X4	N/A	Windows 98
11X	433 MHz Celeron	32 MB NP	8.4 GB EIDE	810 Graphics	4X4	N/A	Windows 98
15X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	N/A	Windows 95
16X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	N/A	Windows 98
17X	500 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	N/A	Windows 98
30X	433 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	N/A	Windows 95
31X	433 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	N/A	Windows 98
35X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	40X Max	Windows 95
36X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	40X 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 103.
3. Intel Celeron™ processor comes with 128K Cache.
4. Graphics = 810 Graphics with 4 MB SDRAM display Cache integrated on system board.
5. Audio = integrated on system board.
6. Models 39X, 40X come with Ethernet card
7. Models 56X, 57X, 58X come with a PCI Audio adapter.
8. Open Bay = Authorized Assembler Program. See the note on page 104

Table 4 (Page 2 of 3): PC 300 Type 6288/6338 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
37X	466 MHz Celeron	64 MB NP	13.5 GB EIDE	810 Graphics	4X4	40X Max	Windows 98
39X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	40X Max	Windows 98
40X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	40X Max	Windows 95
41X	466 MHz Celeron	64 MB NP	8.4 GB EIDE	810 Graphics	4X4	40X Max	Windows NT
42X	466 MHz Celeron	64 MB NP	13.5 GB EIDE	810 Graphics	4X4	40X Max	Windows NT
44X	500 MHz Celeron	64 MB NP	13.5 GB EIDE	810 Graphics	4X4	N/A	Windows 98
45X	500 MHz Celeron	64 MB NP	13.5 GB EIDE	810 Graphics	4X4	N/A	Windows NT
46X	500 MHz Celeron	64 MB NP	13.5 GB EIDE	810 Graphics	4X4	40X Max	Windows 98
47X	500 MHz Celeron	64 MB NP	13.5 GB EIDE	810 Graphics	4X4	40X 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 103.
3. Intel Celeron™ processor comes with 128K Cache.
4. Graphics = 810 Graphics with 4 MB SDRAM display Cache integrated on system board.
5. Audio = integrated on system board.
6. Models 39X, 40X come with Ethernet card
7. Models 56X, 57X, 58X come with a PCI Audio adapter.
8. Open Bay = Authorized Assembler Program. See the note on page 104

Table 4 (Page 3 of 3): PC 300 Type 6288/6338 - Desktop

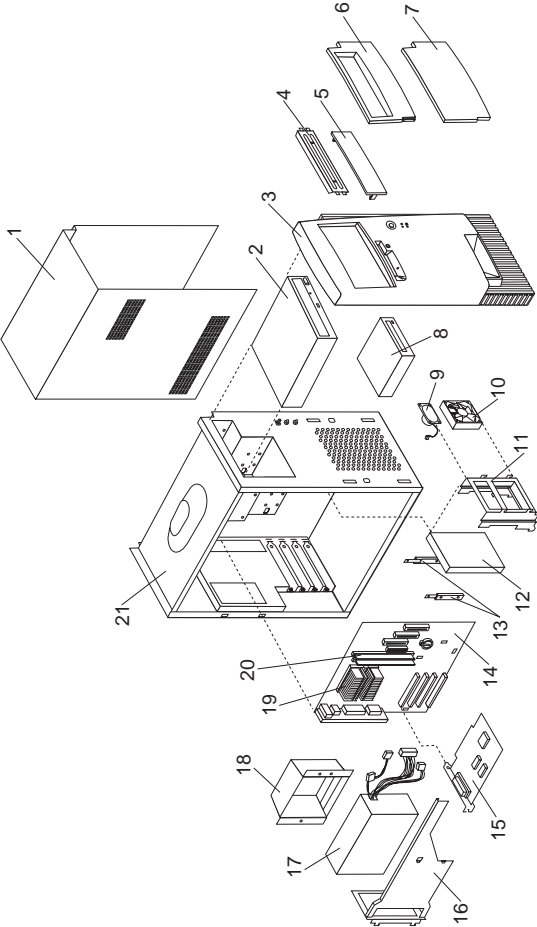
Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
48X	466 MHz Celeron	64 MB NP	10.1 GB EIDE	810 Graphics	4X4	N/A	Windows 98
49X	500 MHz Celeron	64 MB NP	10.1 GB EIDE	810 Graphics	4X4	N/A	Windows 98
50X	433 MHz Celeron	64 MB NP	10.1 GB EIDE	810 Graphics	4X4	N/A	Windows 98
51X	466 MHz Celeron	64 MB NP	10.1 GB EIDE	810 Graphics	4X4	40X Max	Windows 98
53X	466 MHz Celeron	64 MB NP	10.1 GB EIDE	810 Graphics	4X4	40X Max	Windows NT
56X - Open Bay	433 MHz Celeron	N/A	N/A	810 Graphics	4X4	N/A	N/A
57X - Open Bay	466 MHz Celeron	N/A	N/A	810 Graphics	4X4	N/A	N/A
58X - Open Bay	500 MHz Celeron	N/A	N/A	810 Graphics	4X4	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 103.
3. Intel Celeron processor comes with 128K Cache.
4. Graphics = 810 Graphics with 4 MB SDRAM display Cache integrated on system board.
5. Audio = integrated on system board.
6. Models 38X, 40X come with Ethernet card
7. Models 56X, 57X, 58X come with a PCI Audio adapter.
8. Open Bay = Authorized Assembler Program. See the note on page 104

Notes:

Parts (Type 6268/6278/2173)



Parts listing

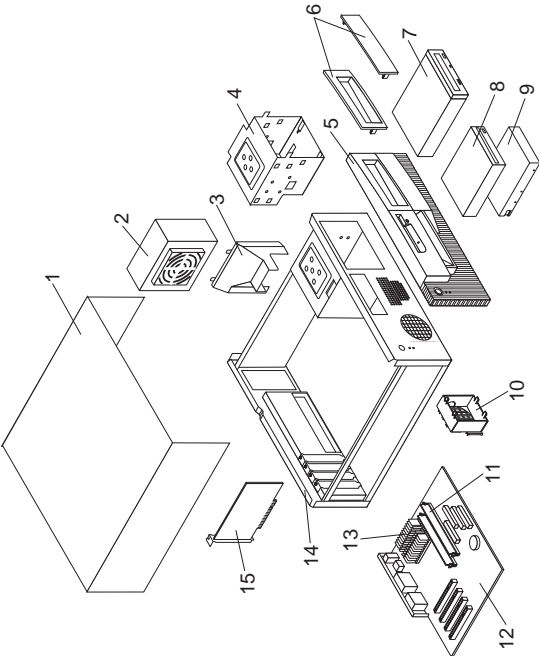
Index	System (Type 6268/6278/2173)	FRU No.
1	Top Cover	37L2499
2	CD-ROM (40X Max)	36L8713
3	Front Bezel (Panel) assembly	37L2505
4	EMC Shield for 5.25-inch Bay	20L3073
5	Blank Bezel 5.25-inch	37L2508
6	Door Assembly	37L2506
7	Blank Door Bezel	37L2507
8	1.44 MB, 3.5-Inch Diskette Drive	75H9550
8	1.44 MB, 3.5-Inch Diskette Drive (Japan)	75H9552
9	Speaker/Cable Assembly	01K4909
10	Fan with mounting supports	37L4526
11	Hard Disk Mounting Bracket	37L2501
12	8.4 GB ⁷ EIDE Hard Disk Drive	36L8679
12	10.1 GB EIDE Hard Disk Drive	36L8681
12	13.5 GB EIDE Hard Disk Drive	36L8689
13	Hard Drive Rails (Qty 2)	01K1539
14	System Board (no processor, no memory)	09N4316
15	Ethernet Adapter - Lake Clark 2.3	30L5929
16	Power Supply Bracket	37L2502
17	Power Supply-145W	01K9870
17	Power Supply-145W (China)	36L8815
17	Power Supply-145W (Japan)	20L2314
18	Fan Duct	37L2512
19	Intel Celeron Processor 433 MHz, 128 KB cache	37L2476
19	Intel Celeron Processor 466 MHz, 128 KB cache	37L2494
19	Intel Celeron Processor 500 MHz, 128 KB cache	00N6101
20	Memory - 64 MB DIMM, Non-Parity	01K1147
20	Memory - 128 MB DIMM, Non-Parity	01K1148
21	Base Frame Assembly	37L2500
	Audio Adapter - PCI	37L4457
	Cable - CD-ROM Audio	75H9219
	Cable - CD-ROM, IDE (2 drop)	37L5098
	Cable - Diskette Drive	01K1513
	Cable - Hard Disk Cable, ATA	37L4525
	Cable - Hard Disk Cable, ATA (2-drop)	37L5098
	Cable - Wake On Ring	76H7345
	EMC Shield Kit for System Board	37L2503
	Foot (4)	03K9655
	Heatsink/Clip for Celeron processor	09N4375
	LED/Power Switch Assembly	37L2511
	Lithium Battery	33F8354
	Miscellaneous Hardware Kit	20L3094
	Modem - Domestic (2173 only)	01N2833

⁷ When referring to hard-disk-drive capacity, GB means 1 000 000 000 bytes; total user-accessible capacity may vary depending on operating environment.

⁸ MHz measures internal clock speed of the microprocessor only; not application performance. Many factors affect application performance.

Index	System (Type 6268/6278/2173)	FRU No.
	Modem - Universal - EMEA and Asia Pacific South (2173 only)	01N2834
	Modem - Domestic (6278 only)	37L3058
	Modem - Universal - EMEA and Asia Pacific South (6278 only)	37L3059
	Mouse - 2 button (6268, 2173)	10L6145
	Mouse - Scrollpoint (6278)	28L1865
	URM retainer Kit	33L4521
	Microphone (Aptiva 2173 only)	01N1961
	Speakers - Set (Aptiva 2173 only)	01N1845
	Speaker Brick-Power module (China) (Aptiva 2173 only)	20L2174
	Speaker Brick-Power module (HongKong) (Aptiva 2173 only)	20L2172
	Name Plate-Aptiva (Aptiva 2173 only)	01N3057
	Name Plate (6268, 6278)	37L2509

Parts (Type 6288/6338)



Parts listing

Index	System (Type 6288/6338)	FRU No.
1	Top Cover	09K9825
2	Power Supply-145W	01K9870
2	Power Supply-145W (China)	36L8815
2	Power Supply-145W (Japan)	20L2314
3	Air Duct	09N4512
4	Hard Disk/Floppy Bracket	37L5094
5	Front Bezel (Panel) Assembly	37L5096
6	Bezel Kit	37L5097
7	CD-ROM (40X Max)	36L8713
8	1.44 MB, 3.5-Inch Diskette Drive	75H9550
8	1.44 MB, 3.5-Inch Diskette Drive (Japan)	75H9552
9	8.4 GB EIDE Hard Disk Drive	36L8679
9	10.1 GB EIDE Hard Disk Drive	36L8681
9	13.5 GB EIDE Hard Disk Drive	36L8689
10	Fan/Card Guide Assembly	37L5093
11	Memory - 32 MB DIMM, Non-Parity	01K1146
11	Memory - 64 MB DIMM, Non-Parity	01K1147
12	System Board (no processor, no memory)	09N4316
13	Intel Celeron Processor 400 MHz, 128 KB cache	37L2474
13	Intel Celeron Processor 433 MHz, 128 KB cache	37L2476
13	Intel Celeron Processor 466 MHz, 128 KB cache	37L2494
13	Intel Celeron Processor 500 MHz, 128 KB cache	00N6101
14	Base Frame Assembly	09N4508
15	Ethernet Adapter - Lake Clark 2.3	30L5929
15	Audio adapter - PCI	37L4457
	Cable - CD-ROM Audio	75H9219
	Cable - ATA-66 2 Drop	37L5098
	Cable - Diskette Drive	33L2596
	Cable - Hard Disk Cable, ATA	37L4525
	Cable - Wake On Ring	76H7345
	EMC Shield for 5.25-inch bay	20L3073
	EMC Shield Kit for System Board	37L5095
	Foot (4)	03K9655
	Heatsink/Clip for Celeron processor	09N4375
	LED/Power Switch Assembly	37L5092
	Lithium Battery	33F8354
	Miscellaneous Hardware Kit	20L3094
	Modem - domestic	01N2833
	Mouse - 2 button	10L6145
	Speaker	20L2168
	Speaker with Cable Assembly	01K4909
	URM retainer Kit	33L4521

Keyboards - Rapid Access II (Aptiva Type 2173)

China	37L2590
Hong Kong	37L2611

Keyboards - PCNext Lite (PC 300 Type 6268/6278/6288/6338)

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 044	37L2515
German	37L2526
Greek	37L2527
Hebrew	37L2528
Hungarian	37L2529
Icelandic	37L2530
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 v.

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

PC 300 - 6563/6564/6574 Aptiva - 2178/2198

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 6563/6564/6574 computer and the IBM Aptiva type 2178/2198 computer.

Note

Service information is the same for PC 300 types 6563/6564/6574 and Aptiva 2178/2198 computers, unless specifically identified as type 6563 which is the desktop computer or type 2178/2198 which are the Aptiva micro-tower computers.

Note

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

General checkout	122
Module test menu and hardware configuration	
report	125
Keyboard	126
Printer	126
Power supply	127
20-pin main power supply connection	128
Display	129
Diagnostics and test information	130
Power-on self-test (POST)	130
POST beep codes	130
Error code format	131
IBM PC Enhanced Diagnostics	132
Starting the IBM PC Enhanced Diagnostics	
Program	132
Navigating through the diagnostic programs	132
Running diagnostic tests	133
Test selection	133
IBM PC Enhanced Memory Diagnostics	133
Alert On LAN test	134
Asset ID test	134
Test results	134
Hard file Smart test	135
IBM Fixed Disk Optimized Test	135
Quick and Full erase - hard drive	136
Iomega Zip Drive Test	136

Asset EEPROM backup	136
Viewing the test log	137
SIMM/DIMM memory errors	137
Setup Utility program	139
Hard disk drive boot error	139
When to use the Low-Level Format program	140
Preparing the hard disk drive for use	140
Product description	141
Specifications Type 6563	142
Specifications Type 6564/6574 Aptiva 2178/2198	143
Additional service information	144
Replacing a processor	144
Replacing a system board	145
Security features	145
Passwords	145
Power-on password	146
Administrator password	147
Administrator password control	147
Operating system password	147
Vital product data	147
Management Information Format (MIF)	147
Alert on LAN	148
Hard disk drive jumper settings	149
IDE hard disk drive settings	149
CD-ROM drive jumper settings	150
BIOS levels	151
Flash (BIOS/VPD) update procedure	152
Flash recovery boot block	152
Power management	153
Advanced Configuration and Power Interface (ACPI) BIOS	153
Advanced Power Management	153
Automatic Hardware Power Management features	153
Setting Automatic Hardware Power Management features	154
Automatic Power-On features	154
Network settings	155
Flash over LAN (update POST/BIOS over network)	155
Wake on LAN	156
System board memory	157
Computer exploded view (Type 6563)	158
Input/Output connectors	159
Cover removal	160
Front panel	161
Front bezel	162
EMC shield	162
Diskette/hard drive bracket	162
CD-ROM drive removal	163
Power supply removal	164
Computer exploded view (Type 6564/6574/2178/2198)	165
Input/Output connectors	166

Cover removal	167
Front bezel	168
EMC shield	168
CD-ROM drive removal	169
Front panel	170
ZIP drive removal	171
Hard drive removal	171
HD/fan/speaker bracket removal	172
Power supply removal	173
System board layout	174
System board locations	175
System board switch settings	176
Symptom-to-FRU index	177
Beep symptoms	178
No beep symptoms	179
POST error codes	181
Miscellaneous error messages	196
Undetermined problem	199
Model tables - Country/Region/Language	200
Type/Model configuration tables (6563/6564/6574)	201
Parts (Type 6563)	212
Parts listing	213
Parts (Type 6564/6574)	214
Parts listing	215
Parts (Type 2178/2198)	219
Parts listing	220
Special tools	223

General checkout

This general checkout procedure is for Type 6563/6564/6574 and 2178/2198 computers.

Attention

The drives in the computer you are servicing might have been re-arranged 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 132.

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 177.
4. If the computer hangs and no error is displayed, go to "Undetermined problem" on page 199.
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 139) 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 6563/6564/6574 and 2178/2198 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 139.

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 139)
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 132.

003

Run the IBM PC Enhanced Diagnostics test. If necessary, refer to "Diagnostics and test information" on page 130.

- If you receive an error, replace the part that the diagnostic program calls out or go to "IBM PC Enhanced Diagnostics" on page 132.
- 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 126.

(Step **003** continues)

(CONTINUED)

003 (continued)

- If the printer has incorrect responses, go to "Printer" on page 126.
 - If the display has problems such as jittering, rolling, shifting, or being out of focus, go to "Display" on page 129.
-

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 199 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 199.

Keyboard

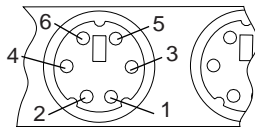
Note

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

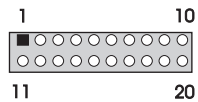
If the above are correct, check the following voltages.

20-pin main power supply connection

See "System board layout" on page 174 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	not used	not used
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 199.

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 6563/6564/6574 and 2178/2198 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 139.

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 6563/6564/6574 and 2178/2198 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 139.

Error code format

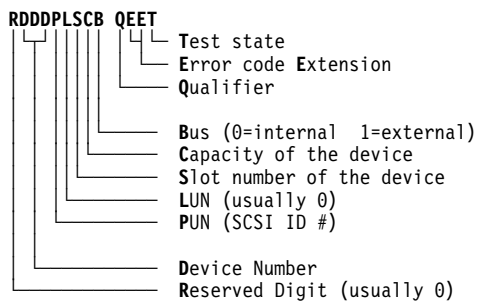
This section provides an explanation of the encoded non-SCSI and SCSI POST error codes.

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 PC Enhanced Memory Diagnostics
 - The memory diagnostic tests determine which memory module (SIMM or DIMM) is defective and report the socket where the failing module is located. The Memory diagnostics can run a quick and full test of the system. Diagnostics can also be run on a single SIMM or DIMM.

Note

See "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 137.

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 (SIMM/DIMM) 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 'SIMM/DIMM 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 SIMM/DIMM socket.

Only sockets containing a SIMM or DIMM can be selected for testing. Unpopulated 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 DIMM, or a device on the PCI bus.

Date:	Contains the date on which the diagnostic test was run. Date is retrieved from CMOS and displayed using the YYYYMMDD format.
ChkDigits:	Contains a 2-digit check-digit value to ensure that: <ul style="list-style-type: none"> • 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 copy of the FAT Table on all partitions (both the master and backup).
- Destroys the partition table.
- Provides messages that warn the user that this is a non-recoverable process.

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

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

Important

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

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

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

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.

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

Message	Failure Found	Recommended Actions
2xx-1y	A memory error was detected in SIMM socket Y	Replace the SIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board.
2xx-2y	A memory error was detected in DIMM socket Y	Replace the DIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board or where memory is on the processor card, replace the processor card.
Corrupt BIOS	Information in BIOS is not as expected. Not able to find expected DMI information from BIOS. Memory controller chipset vendor ID does not match expected value.	Reflash the BIOS. Perform boot block recovery. Replace the system board.

Message	Failure Found	Recommended Actions
Test aborted by user	User stopped test.	Restart test.
Note: "Y" is the SIMM/DIMM socket number. Use the System Board Layouts section in the latest Hardware Maintenance Manual, HMM, to reference the memory sockets.		

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"> 1. Attempt to access and recover (back-up) the failing hard disk drive. 2. Using the operating systems programs, format the hard disk drive. 3. Go to "Preparing the hard disk drive for use" on page 140.
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 PC 300 Type 6563/6564/6574 and Aptiva 2178/2198 computers are available in 4 x 4, (Four drive bays, four I/O adapter slots) as desktop and micro-tower models.

Note

Service information is the same for PC 300 types 6563/6564/6574 and Aptiva 2178/2198 computers, unless specifically identified as type 6563 which is the desktop computer or type 2178/2198 which are the Aptiva micro-tower computers.

- Type 6563 is the desktop
- Type 6564 and 6574 are the micro-tower
- Aptiva Type 2178/2198 are the micro-tower

- **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)**

- **Common parts**

(Varies with each model, see “Type/Model configuration tables (6563/6564/6574)” on page 201.)

 - 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 6563

Feature	Description
Size	Depth: 422.8 mm (16.64 inches) Height: 138.8 mm (5.46 inches) Width: 400 mm (15.75 inches)
Weight	Weight: 7.25 kg (16 lb) ⁹
Environment	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)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 256 BTU (75 watts) - Maximum: 706 BTU (207 watts) ¹⁰
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Maximum (as shipped): 0.10 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 38 dB idle At bystander position (1 meter): - 37 dB operating - 33 dB idle Declared (upper limit) sound power levels: - 5.1 bels operating - 4.8 bels idle

⁹ Maximum configuration weight depends on options installed.
Figures above are a system fully populated with options.

¹⁰ Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

¹¹ For additional information, see the *ISO Supplier's Declaration* available from IBM.

Specifications Type 6564/6574 Aptiva 2178/2198

Feature	Description
Size	Depth: 383 mm (15.08 inches) Height: 378 mm (14.88 inches) Width: 192 mm (7.56 inches)
Weight	Weight: 10.43 kg (23 lb) Fully configured ¹²
Environment	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)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 256 BTU (75 watts) - Maximum: 706 BTU (207 watts) ¹³
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Maximum (as shipped): 0.10 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 43 dB operating - 38 dB idle At bystander position (1 meter): - 37 dB operating - 33 dB idle Declared (upper limit) sound power levels: - 5.1 bels operating - 4.8 bels idle

¹² Maximum configuration weight depends on options installed.
Figures above are a system fully populated with options.

¹³ Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

¹⁴ For additional information, see the *ISO Supplier's Declaration* available from IBM.

Additional service information

The following additional service information supports the PC 300 types 6563, 6564, and 6574 and the Aptiva type 2178/2198 computer.

- “Replacing a processor”
- “Replacing a system board” on page 145
- “Security features” on page 145
- “Passwords” on page 145
- “Vital product data” on page 147
- “Management Information Format (MIF)” on page 147
- “Alert on LAN” 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

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 151 “Vital product data” on page 147, 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.
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
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 139 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:

Attention

This procedure will remove the administrator password. Also, this procedure will clear all setup parameters, privilege access, and boot sequence settings. Make sure these settings are recorded before performing this procedure.

1. Unplug the power cord and remove the top cover.
2. Refer to "System board layout" on page 174 to find the switch assembly 1 (SW1).
3. Move switch 2 (SW1-2) from the OFF position to the ON (CMOS clear) position.
4. Power-on the computer. The system senses the change in the position and erases the password.
5. There will be no video. Wait for the system to produce two POST beeps, then power-off and unplug the power cord.
6. Move switch 2 (SW1-2) from the ON (CMOS clear) position to the OFF (original) position.
7. Power-on the system.
8. The system should now produce a video signal and two POST beeps, along with a 162 configuration error.
9. Reset the date and time and follow the on-screen instructions to reconfigure the computer.
10. 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 6563, 6564, and 6574 have Enhanced Security Mode. If Enhanced Security mode is enabled and there is no password given, the computer will act as if Enhanced Security is disabled.

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

Administrator password control The Administrator password is set in the Setup Configuration. Refer to "Setup Utility program" on page 139

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.

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, 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 LAN

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

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

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

Hard disk drive jumper settings

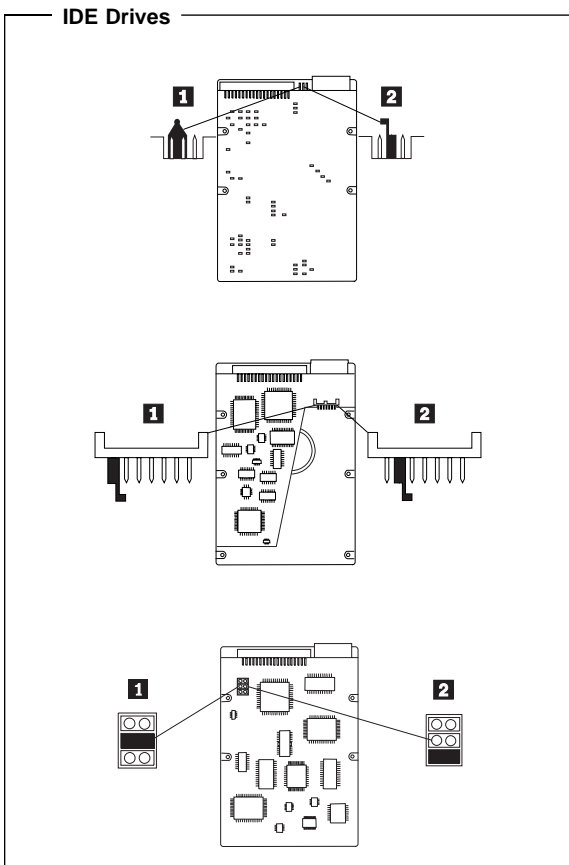
IDE hard disk drives for the PC 300 series computers use jumpers to set the drives as primary (master) or secondary (slave).

Attention

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

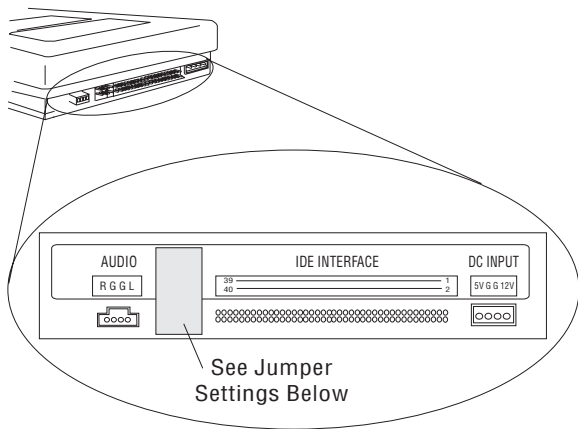
IDE hard disk drive settings

- 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. HelpCenter™
 4. Levels 1 and 2 Support
 5. RETAIN
- Sources for obtaining the latest level BIOS available.
 1. IBM PC Company Home Page
<http://www.ibm.com/pc/us/>
 2. PC PartnerInfo-Technical Database (CTSTIPS.NSF)
 3. HelpCenter
 4. Levels 1 and 2 Support

To update (flash) the BIOS, see “Flash (BIOS/VPD) update procedure” 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 CMOS switch enables you to restart the system and recover the BIOS.

To perform a Flash/BIOS recovery using the CMOS switch:

1. Power-off the computer and remove the cover.
2. Move the system board CMOS switch to the **on** position. Refer to "System board layout" on page 174 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 CMOS switch to the **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 139).
2. Select **Advanced Power Management** from the Configuration/Setup Utility program menu.
3. Be sure **APM BIOS Mode** is set to **Enabled**. If it is not, press Left Arrow (←) or Right Arrow (→) to change the setting.
4. Select **Automatic Hardware Power Management**.
5. Set **Automatic Hardware Power Management** to **Enabled**.
6. Select values for the three levels of power management (system power, processor speed, and display), as necessary.
7. Set **IDE Hard Disk** to **Enabled** or **Disabled**.
8. Press **Esc** twice to return to the Configuration/Setup Utility program menu.
9. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
10. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

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

- **Serial Port Ring Detect:** With this feature set to **Enabled** and an *external* modem connected to serial port (COM1), the computer will turn on automatically when a ring is detected on the modem.
- **PCI Modem Ring Detect:** With this feature set to **Enabled**, the computer will turn on automatically when a ring is detected on the internal modem.
- **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:** The computer can be automatically powered on from any PCI device that will generate a Wake Up event.
- **Wake on LAN:** If the computer has a properly configured token-ring or Ethernet LAN adapter card that is Wake on LAN-enabled and there is remote network management software, you can use the IBM-developed Wake on LAN feature. When you set Wake on LAN to **Enabled**, the computer will turn on when it receives a specific signal from another computer on the local area network (LAN). For further information, see “Wake on LAN” on page 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 139.
2. Select **System Security**.
3. Select **Remote Administration** 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 139.
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.

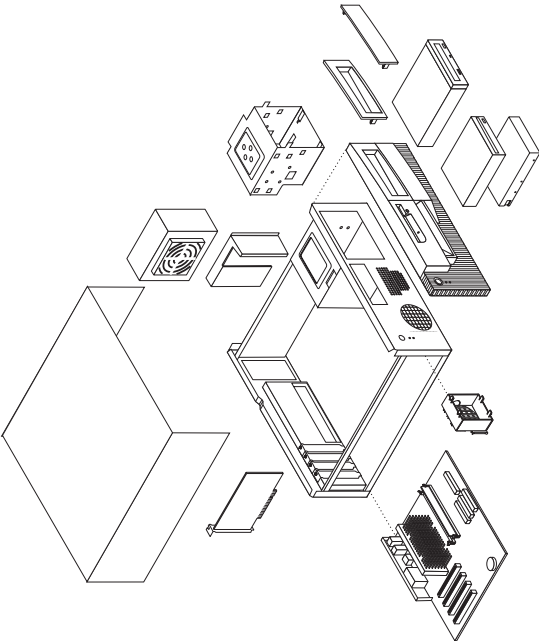
Computer Name	Memory Module		
	Size	Speed	Type
PC 300 Type 6563/6564/ 6574	64 MB 128 MB 256 MB 512 MB 1 GB Maximum	133 MHz	SDRAM ECC/ Non-Parity Industry Standard

Computer Name	Memory Module		
	Size	Speed	Type
Aptiva Type 2178/2198	64 MB 128 MB 256 MB 512 MB Maximum	133 MHz	SDRAM Non-Parity Industry Standard

Supported memory configuration

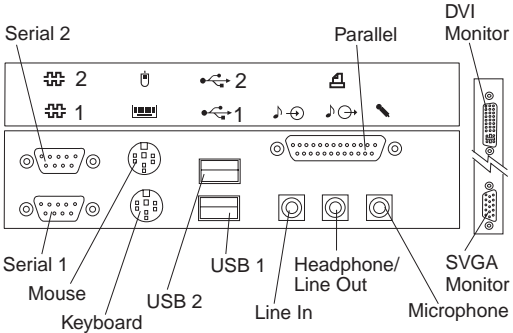
DIMM sizes of 64 MB, 128 MB, and 256 MB are acceptable. Start filling DIMM socket 0, then 1. Use 3.3 V unbuffered 133 MHz. SDRAM Non-Registered DIMMs only.

Computer exploded view (Type 6563)

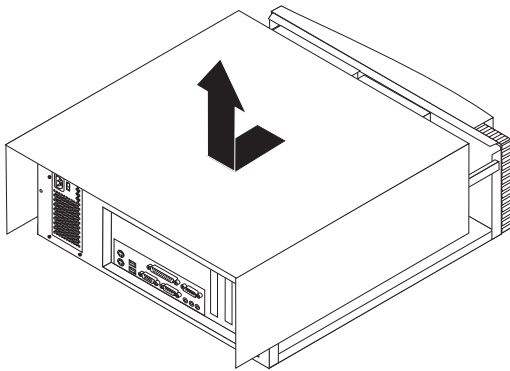
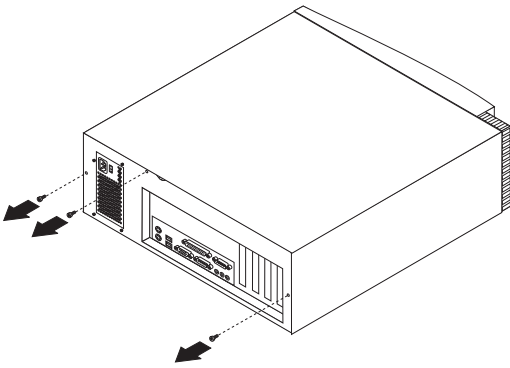


I/O connectors and removal procedures for the cover, front panel, front bezel, diskette/hard drive bracket, CD-ROM drive, and power supply are on the following pages.

Input/Output connectors



Cover removal



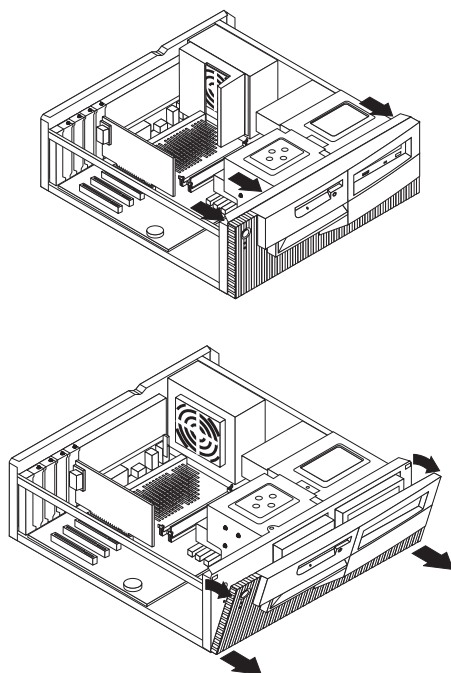
To remove top cover:

1. Remove the three cover thumb screws.
2. Slide cover toward the rear of the chassis about 1-inch (2 cm) to clear the front panel.
3. Lift cover up.

To install top cover:

1. Slide cover down onto the chassis about 1-inch (2 cm) from the front panel.
2. Make sure bottom cover slots are engaged on the chassis.
3. Slide cover forward to engage the front cover slots onto the chassis.
4. Install the three cover thumb screws.

Front panel



To remove the front panel:

1. Remove the top cover.
2. Release the three top latches while gently pulling the top of the panel outward.
3. Keeping the panel at the same angle, gently pull the panel out from the bottom of the chassis.

To install the front panel:

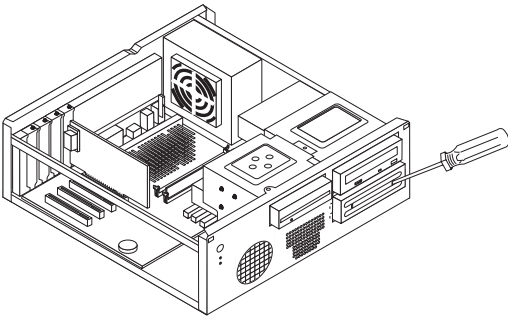
1. At the same angle that the panel was when removed, install the bottom tabs of the panel in the chassis. Push up on the left and right bottom tabs, if necessary, to get the tabs in the holes of the chassis.
2. Push the top of the panel toward the chassis until the three top latches lock in place.

Front bezel

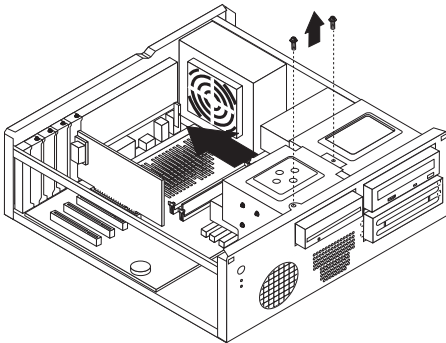
To remove the front blank bezel:

1. Remove the top cover.
2. Remove the front panel.
3. Unlatch the tabs of the bezel and remove it from the panel.

EMC shield



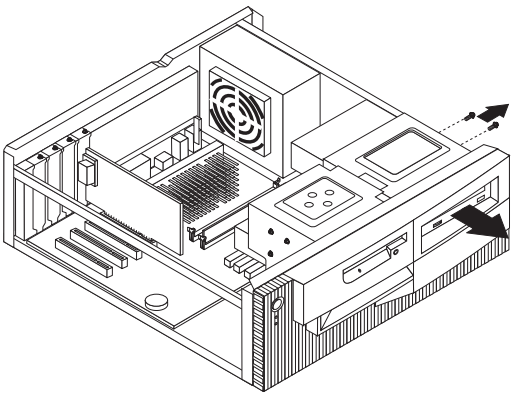
Diskette/hard drive bracket



To remove the diskette/hard drive bracket:

1. Remove the top cover.
2. Remove the diskette and hard drives or disconnect their cables.
3. Remove the two top screws securing the bracket.
4. Slide bracket toward the back of the chassis to unlatch it from the chassis.
5. Lift the bracket out of the chassis.

CD-ROM drive removal



To remove the CD-ROM drive:

1. Remove the top cover.
2. Remove the cables from the CD-ROM drive.
3. Remove two screws securing the CD-ROM drive.
4. Pull the CD-ROM drive out of the chassis.

Note

When connecting the CD-ROM Audio Cable, make sure the cable is routed along the system board near the PCI adapter slots. Continue routing the cable along the system board between the power connector and primary IDE connector and then up to the CD-ROM drive. Do not route the CD-ROM cable near the system board I/O connectors.

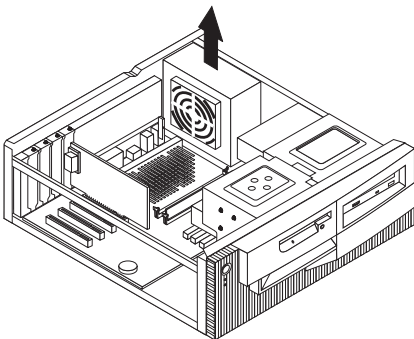
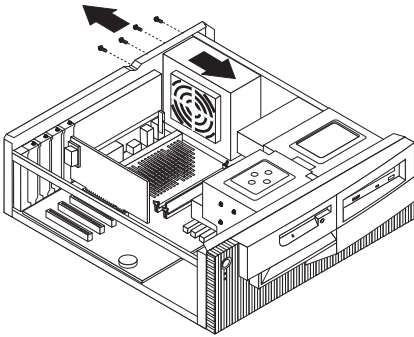
Power supply removal

Note

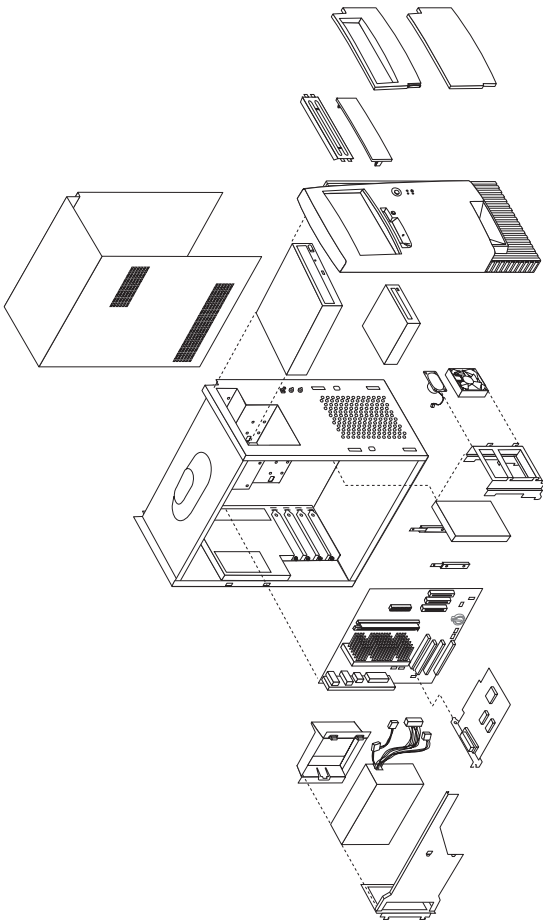
1. Make sure the power supply voltage switch is set to the proper operating voltage; 115V or 230V.

To remove the power supply:

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

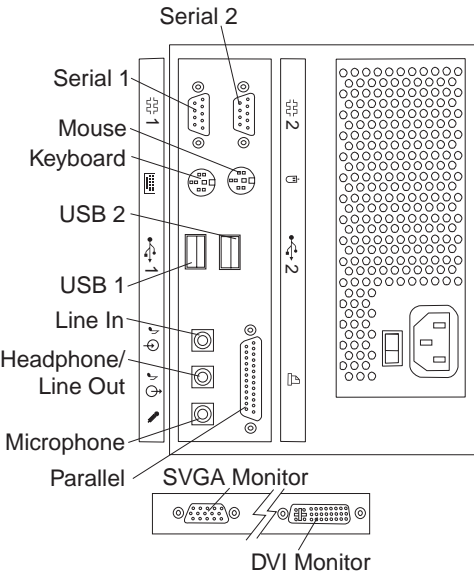


**Computer exploded view (Type
6564/6574/2178/2198)**

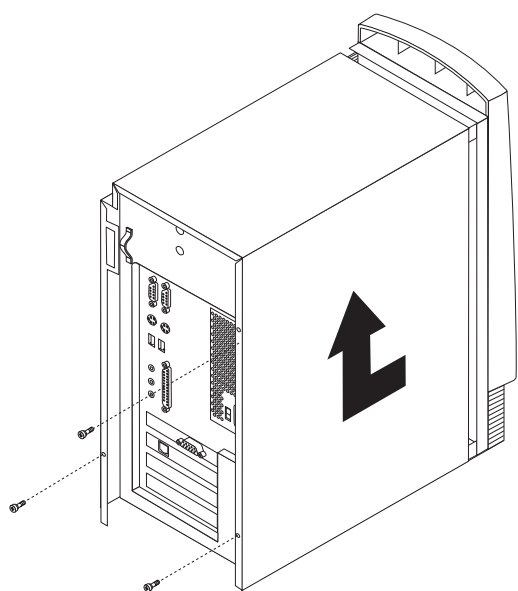


I/O connectors and removal procedures for the cover, front bezel, EMC shield, CD-ROM drive, front panel, ZIP drive, hard drive, HD/fan/speaker bracket, and power supply are on the following pages.

Input/Output connectors



Cover removal



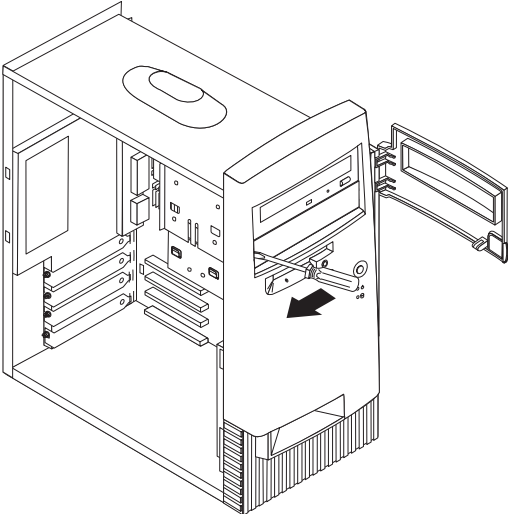
To remove top cover:

1. Remove the three cover thumb screws.
2. Slide cover toward the rear of the chassis about 1-inch (2 cm) to clear the front panel.
3. Lift cover straight up.

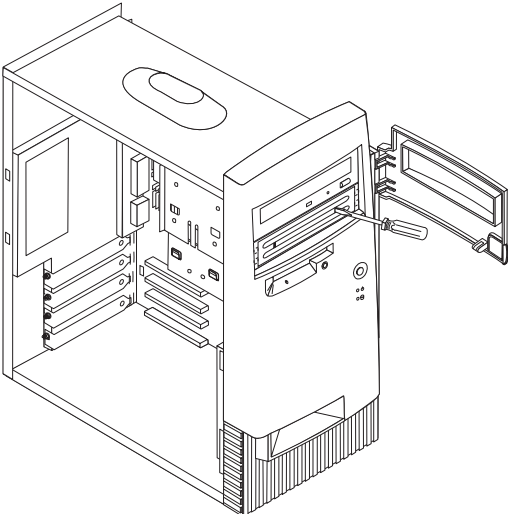
To install top cover:

1. Slide cover down onto the chassis about 1-inch (2 cm) from the front flange.
2. Make sure bottom cover slots are engaged on the chassis.
3. Slide cover forward to engage the front cover slots onto the chassis flange.
4. Install the three cover thumb screws.

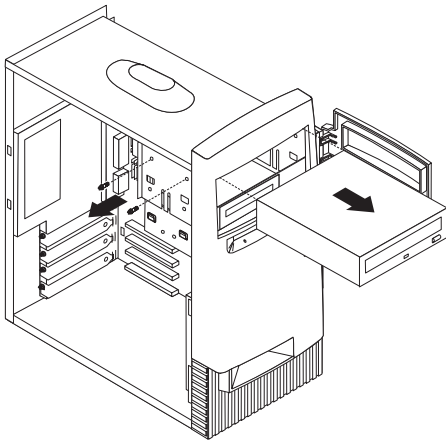
Front bezel



EMC shield



CD-ROM drive removal



To remove the CD-ROM drive:

1. Remove the top cover.
2. Disconnect the cables from the CD-ROM drive
3. Remove two screws securing the CD-ROM drive.
4. Pull the CD-ROM drive out of the chassis.

Note

When connecting the CD-ROM Audio Cable, make sure the cable is routed along the system board near the PCI adapter slots. Continue routing the cable along the system board between the power connector and primary IDE connector and then up to the CD-ROM drive. Do not route the CD-ROM cable near the system board I/O connectors.

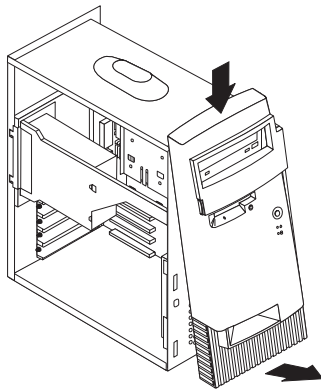
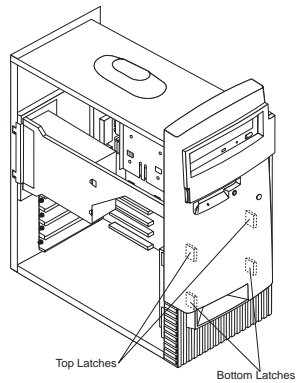
Note

When connecting the EIDE DASD Cable, connect the:

- Blue connector of cable to the system board
- Black connector to the master device
- Gray connector to the slave device

Route the signal cables next to the hard drive and toward the bottom of the diskette drive housing.

Front panel



To remove the front panel:

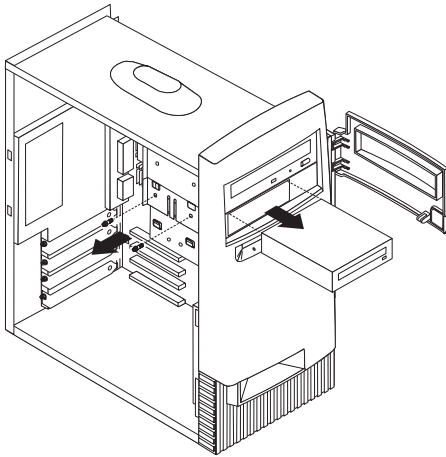
1. Remove the top cover.
2. Remove the top blank bezel and EMC shield or the CD-ROM drive.

Note

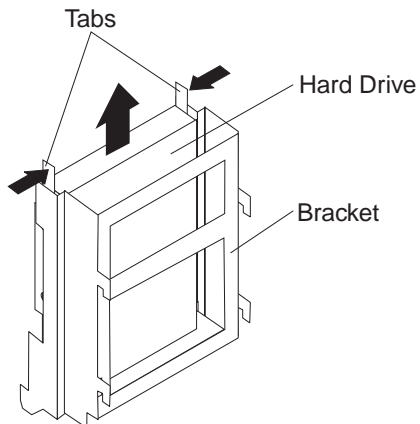
Depending on which one is installed, the blank bezel and EMC shield or the CD-ROM drive must be removed in order to remove the front panel.

3. Reach inside the chassis and pull apart the two bottom latches inside the front panel while pulling the panel out. The two bottom latches will unlatch from the chassis.
4. Next, pull apart the top two latches from inside the panel while pulling the panel out.
5. To remove the front panel, pivot the bottom of the panel out and down at the same time.

ZIP drive removal



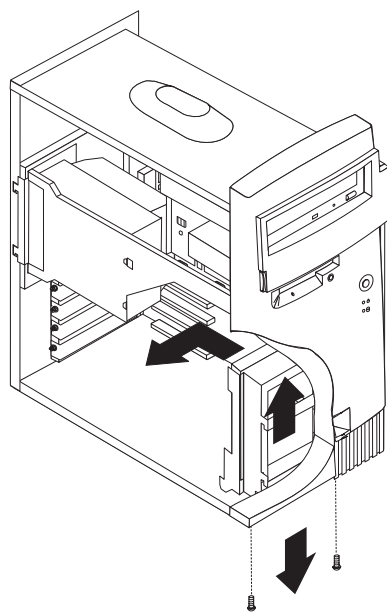
Hard drive removal



To remove the hard drive:

1. Press in on both rail tabs and lift the hard drive up then pull it back and out from the bracket.
2. Remove the signal and power cables from top of the hard drive.
3. When replacing the hard drive, remove the drive rails from the old drive and install them on the new drive.

HD/fan/speaker bracket removal



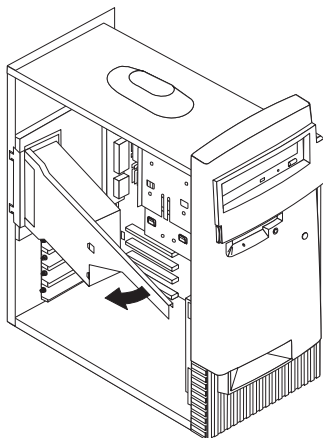
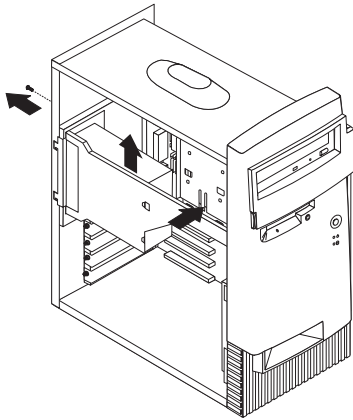
To remove the bracket:

1. Remove the hard drive so it will not be damaged from vibration. The hard drive can be removed from the bracket by depressing the hard drive rail tabs, lifting the hard drive up then pulling it back and away from the bracket. See "Hard drive removal" on page 171.
2. Disconnect the speaker and fan cables from the system board.
3. Remove the two bracket screws at bottom of chassis.
4. Lift the bracket up then pull the bracket out from front of chassis.

Power supply removal

Notes

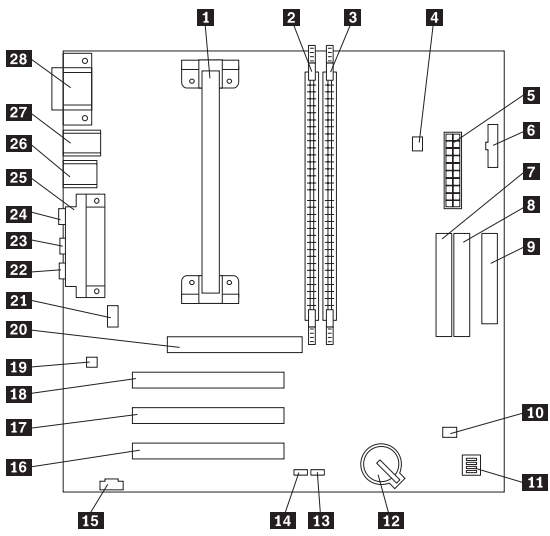
1. Remove the power supply bracket from the old power supply and install it on the new power supply.
2. Make sure the power supply voltage switch is set to the proper operating voltage; 115V or 230V.



To remove the power supply:

1. Remove the top cover
2. Remove the thumb screw from the rear of the power supply
3. Push in on the tab then, push up on the power supply bracket and swing it out to disengage the bracket from the chassis.

System board layout



System board locations

1	Processor socket
2	DIMM socket 0
3	DIMM socket 1
4	Processor fan connector
5	Power connector
6	Power Switch/LED connector
7	Primary IDE connector
8	Secondary IDE connector
9	Diskette Drive connector
10	Front Fan connector
11	Switch assembly (SW1); See (SW2) on page 176
12	Battery
13	Wake on LAN connector
14	Alert on LAN connector
15	CD Audio connector
16	PCI 1 slot
17	PCI 2 slot
18	PCI 3 slot
19	Internal Speaker connector
20	AGP connector
21	Midi port connector (Aptiva 2178/2198 only)
22	Microphone connector
23	Line Out connector
24	Line In connector
25	Parallel connector
26	USB connectors
27	Mouse/Keyboard connectors
28	Serial connectors (COM 1, COM 2)

System board switch settings

The following tables contain the switch setting information. (D) indicates the default setting.

Diskette write access Switch (SW1-1)

Diskette Access	SW1-1
Write enabled	Off (D)
Write protected	On

Clear CMOS Switch (SW1-2)

Clear CMOS	SW1-2
Normal mode	Off (D)
CMOS clear	On

Reserved Switch (SW1-3)

Reserved	SW1-3
Reserved	Off

Reserved Switch (SW1-4)

Reserved	SW1-4
Reserved	Off

Switch (SW2)

Note

Switch (SW2) is a reserved eight position switch block. Switches can either be in the Off or in the On position.

Processor Speed Settings

Processor speed for the PC 300 type 6563, 6564, 6574 and Aptiva type 2178/2198 computers are fixed and are determined by the processor. There are no settings required.

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 122. 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 199.

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 127.)
- 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 178.)
Type 6563/6564/6574 and Aptiva type 2178/2198 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 139.
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"> • One Beep • A pause (or break) • Two beeps • A pause (or break) • Any number of beeps
4	Four continuous beeps

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

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

No beep symptoms

Note

Type 6563/6564/6574 and Aptiva type 2178/2198 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 139.

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

Symptom/Error	FRU/Action
No beep during POST.	<ol style="list-style-type: none">1. See “Undetermined problem” on page 199.2. System Board3. Memory Module4. Any Adapter or Device5. Power Cord6. Power Supply

POST error codes

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

POST Error Code	FRU/Action
000 SCSI Adapter not enabled.	1. Verify adapter device and Bus Master fields are enabled in PCI configuration program. See documentation shipped with computer.
02X	1. SCSI Adapter
08X Check SCSI terminator installation.	1. SCSI Cable 2. SCSI Terminator 3. SCSI Device 4. SCSI Adapter
101 System board interrupt failure.	1. System Board
102 System board timer error.	1. System Board
106	1. System Board
110 System board memory parity error.	1. Memory Module 2. System Board
111 I/O channel parity error.	1. Reseat adapters 2. Any Adapter 3. System Board
114 Adapter ROM error.	1. Adapter Memory 2. System Board
129 Internal cache test error.	1. Processor 2. L2 Cache Memory 3. System Board
151 Real-time clock failure.	1. System Board
161 Bad CMOS battery.	1. Run Setup 2. CMOS Backup Battery (See page "Safety information" on page 420.) 3. System Board

POST Error Code	FRU/Action
162 Configuration mismatch.	<ol style="list-style-type: none"> 1. Run Setup and verify Configuration 2. Had a device been added, removed, changed location? If not, suspect that device. 3. Power-on external devices first, then power-on computer. 4. CMOS Backup Battery (See page "Safety information" on page 420.) 5. System Board
162 And unable to run diagnostics.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
163 Clock not updating or invalid time set.	<ol style="list-style-type: none"> 1. Time and Date Set? 2. CMOS Backup Battery (See page "Safety information" on page 420.) 3. System Board
164 POST detected a base memory or extended memory size mismatch error.	<ol style="list-style-type: none"> 1. Run Setup. Check System Summary menu for memory size change. (See "Setup Utility program" on page 139.) 2. Run the Extended Memory Diagnostic tests.
166 Boot Block Check Sum Error	<ol style="list-style-type: none"> 1. Run Flash Recovery using Boot Block. See "Flash recovery boot block" on page 152 2. System Board
167 Microprocessor installed that is not supported by the current POST/BIOS.	<ol style="list-style-type: none"> 1. Run Setup. Check Stepping level for the BIOS level needed, then perform the flash update. 2. Processor
168 Alert on LAN error	<ol style="list-style-type: none"> 1. Run Setup. Check to see that Ethernet and Alert on LAN are enabled. 2. System Board
17X, 18X	<ol style="list-style-type: none"> 1. C2 Security

POST Error Code	FRU/Action
175	<ol style="list-style-type: none"> 1. Run Configuration (See "Setup Utility program" on page 139.) 2. System Board
176	<ol style="list-style-type: none"> 1. Covers were removed from the computer.
177 Corrupted Administrator Password.	<ol style="list-style-type: none"> 1. System Board
178	<ol style="list-style-type: none"> 1. System Board
183	<ol style="list-style-type: none"> 1. Enter the administrator password
184 Password removed due to check-sum error.	<ol style="list-style-type: none"> 1. Enter new password
185 Corrupted boot sequence.	<ol style="list-style-type: none"> 1. Set configuration and reinstall the boot sequence.
186	<ol style="list-style-type: none"> 1. System Board
187	<ol style="list-style-type: none"> 1. Clear Administration password 2. System Board
189	<ol style="list-style-type: none"> 1. More than three password attempts were made to access the computer.
190 Chassis intrusion detector was cleared. This is information only, no action required. If this code does not clear:	<ol style="list-style-type: none"> 1. System Board
1XX Not listed above.	<ol style="list-style-type: none"> 1. System Board
201, 20X Memory data error.	<ol style="list-style-type: none"> 1. Run Enhanced Diag. Memory Test 2. Memory Module 3. System Board
225	<ol style="list-style-type: none"> 1. Unsupported Memory
229 External cache test error.	<ol style="list-style-type: none"> 1. L2 Cache Memory 2. System Board

POST Error Code	FRU/Action
262 POST detected a base memory or extended memory type error.	<ol style="list-style-type: none"> 1. Run Setup. Check System Summary menu for memory type change. (See "Setup Utility program" on page 139.) 2. Run the Extended Memory Diagnostic tests.
301	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
303 With an 8603 error.	<ol style="list-style-type: none"> 1. Mouse 2. Keyboard 3. Keyboard Cable 4. System Board
303 With no 8603 error.	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
3XX Not listed above.	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
5XX	<ol style="list-style-type: none"> 1. Video Adapter (if installed) 2. System Board
601	<ol style="list-style-type: none"> 1. Diskette Drive A 2. Diskette Drive Cable 3. System Board
602	<ol style="list-style-type: none"> 1. Bad Diskette ? 2. Verify Diskette and retry.
604 And able to run diagnostics.	<ol style="list-style-type: none"> 1. Run Setup and verify diskette configuration settings 2. Diskette Drive A/B 3. Diskette Drive Cable 4. System Board
605 POST cannot unlock the diskette drive.	<ol style="list-style-type: none"> 1. Diskette Drive 2. Diskette Drive Cable 3. System Board
662	<ol style="list-style-type: none"> 1. Diskette drive configuration error or wrong diskette drive type, run Setup Configuration.
6XX Not listed above.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. External Drive Adapter 4. Diskette Drive Cable 5. Power Supply

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

POST Error Code	FRU/Action
11XX Not listed above.	1. System Board
1201	1. System Board 2. Any Serial Device
1202, 1206, 1208, 1209, 12XX	1. Dual Async Adapter/A 2. System Board 3. Any Serial Device
1207	1. Communications Cable 2. Dual Async Adapter/A
13XX	1. Game Adapter
1402 Printer not ready.	Information only
1403 No paper error, or interrupt failure.	Information only
1404 System board timeout failure.	1. Run Enhanced Diagnostics
1405 Parallel adapter error.	1. Run Enhanced Diagnostics
1406 Presence test error.	1. Run Enhanced Diagnostics
14XX Not listed above. Check printer before replacing system board.	1. Printer 2. System Board
15XX	1. SDLC Adapter
1692 Boot sequence error.	1. Run FDISK to ensure at least one active partition is set active.
16XX	1. 36/38 Workstation Adapter
1762 Hard disk drive configuration error.	1. Run Configuration (See "Setup Utility program" on page 139.)
1780 (Disk Drive 0) 1781 (Disk Drive 1) 1782 (Disk Drive 2) 1783 (Disk Drive 3)	1. See "Power supply" on page 127. 2. Hard Disk Drive 3. System Board 4. Hard Disk Cable 5. Power Supply

POST Error Code	FRU/Action
180X, 188X PCI configuration or resource error.	<ol style="list-style-type: none"> 1. Run Setup and verify PCI/ISA configuration settings. 2. If necessary, set ISA adapters to "Not available" to allow PCI adapters to properly configure. 3. Remove any suspect ISA adapters. 4. Rerun diagnostics. 5. PCI Adapter
1962 Boot sequence error.	<ol style="list-style-type: none"> 1. Possible hard disk drive problem, see "Hard disk drive boot error" on page 139.
209X	<ol style="list-style-type: none"> 1. Diskette Drive 2. Diskette Cable 3. 16-bit AT Fast SCSI Adapter
20XX Not listed above	<ol style="list-style-type: none"> 1. BSC Adapter
21XX	<ol style="list-style-type: none"> 1. SCSI Device 2. 16-bit AT Fast SCSI Adapter 3. Alternate BSC Adapter
2401, 2402 If screen colors change.	<ol style="list-style-type: none"> 1. Display
2401, 2402 If screen colors are OK.	<ol style="list-style-type: none"> 1. System Board 2. Display
2409	<ol style="list-style-type: none"> 1. Display
2410	<ol style="list-style-type: none"> 1. System Board 2. Display
2462 Video memory configuration error.	<ol style="list-style-type: none"> 1. Check cable connections. 2. Run Setup and verify video configuration settings. 3. Video Memory Modules 4. Video Adapter (if installed) 5. System Board
3015, 3040 Check for missing wrap or terminator plug on the adapter.	<ol style="list-style-type: none"> 1. Network Attached? 2. LF Translator 3. Cable Problem 4. PC Network Adapter
30XX	<ol style="list-style-type: none"> 1. PC Network Adapter 2. LF Translator 3. Cable Problem?

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

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

POST Error Code	FRU/Action
10450, 10451, 10490 10491, 10492, 10499 Read/write error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics 2. Hard Disk Drive 3. System Board
10452 Seek test error.	1. Run Enhanced Diagnostics
10453 Wrong drive type?	Information only
10454 Sector buffer test error.	1. Run Enhanced Diagnostics
10455, 10456 Controller error.	1. Run Enhanced Diagnostics
10459 Drive diagnostic command error.	Information only
10461 Drive format error	1. Run Enhanced Diagnostics
10462 Controller seek error.	1. Run Enhanced Diagnostics
10464 Hard Drive read error.	1. Run Enhanced Diagnostics
10467 Drive non fatal seek error.	1. Run Enhanced Diagnostics
10468 Drive fatal seek error.	1. Run Enhanced Diagnostics
10469 Drive soft error count exceeded.	1. Run Enhanced Diagnostics
10470, 10471, 10472 Controller wrap error.	1. Run Enhanced Diagnostics
10473 Corrupt data. Low level format might be required.	Information only
10480	<ol style="list-style-type: none"> 1. Hard Disk Drive (ESDI) 2. Drive Cable 3. System Board
10481 ESDI drive D seek error.	1. Run Enhanced Diagnostics
10482 Drive select acknowledgement bad.	1. Run Enhanced Diagnostics
106X1	<ol style="list-style-type: none"> 1. Check Configuration 2. Ethernet Adapter
10635	<ol style="list-style-type: none"> 1. Power-off computer, wait ten seconds; then power-on the computer. 2. Ethernet Adapter

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

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

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

POST Error Code	FRU/Action
24201Y0, 24210Y0 Be sure wrap plug is attached.	<ol style="list-style-type: none"> 1. ISDN/2 Adapter 2. ISDN/2 Wrap Plug 3. ISDN/2 Communications Cable
273XX	<ol style="list-style-type: none"> 1. 1 Mbps Micro Channel Infrared LAN Adapter
27501, 27503 27506, 27507	<ol style="list-style-type: none"> 1. ServerGuard Adapter 2. System Board
27502, 27504, 27510 27511, 27533, 27534 27536, 27537	<ol style="list-style-type: none"> 1. ServerGuard Adapter
27509	<ol style="list-style-type: none"> 1. Remove redundant adapters, run Auto Configuration program, then retest.
27512	<ol style="list-style-type: none"> 1. WMSELF.DGS diagnostics file missing. 2. WMSELF.DGS diagnostics file incorrect.
27535	<ol style="list-style-type: none"> 1. 3V Lithium Backup Battery 2. ServerGuard Adapter
27554	<ol style="list-style-type: none"> 1. Internal Temperature out of range 2. ServerGuard Adapter
27555, 27556	<ol style="list-style-type: none"> 1. ServerGuard Adapter 2. Power Supply
27557	<ol style="list-style-type: none"> 1. 7.2V NiCad Main Battery Pack 2. ServerGuard Adapter
27558, 27559 27560, 27561	<ol style="list-style-type: none"> 1. PCMCIA Type II Modem 2. ServerGuard Adapter
27562	<ol style="list-style-type: none"> 1. External Power Control not connected 2. External Power Control 3. ServerGuard Adapter
27563, 27564	<ol style="list-style-type: none"> 1. External Power Control 2. ServerGuard Adapter
275XX	<ol style="list-style-type: none"> 1. Update Diagnostic Software
27801 to 27879	<ol style="list-style-type: none"> 1. Personal Dictation System Adapter 2. System Board
27880 to 27889	<ol style="list-style-type: none"> 1. External FRU (Speaker, Microphone)

POST Error Code	FRU/Action
1999030X Hard disk reset failure.	Possible hard disk drive problem, see “Hard disk drive boot error” on page 139.

Miscellaneous error messages

Message/Symptom	FRU/Action
CMOS Backup Battery inaccurate.	<ol style="list-style-type: none"> 1. CMOS Backup Battery See page "Safety information" on page 420. 2. System Board
Changing colors.	<ol style="list-style-type: none"> 1. Display
Computer will not power-off. See "Power supply" on page 127.	<ol style="list-style-type: none"> 1. Power Switch 2. System Board
Computer will not RPL from server	<ol style="list-style-type: none"> 1. Ensure Network is in startup sequence as first device or first device after diskette. 2. Ensure Network adapter is enabled for RPL. 3. Network adapter (Advise network administrator of new MAC address)
Computer will not Wake On LAN [™]	<ol style="list-style-type: none"> 1. Check power supply and signal cable connections to network adapter. 2. Ensure Wake On LAN feature is enabled in Setup/Configuration. See "Setup Utility program" on page 139. 3. Ensure network administrator is using correct MAC address. 4. Ensure no interrupt or I/O address conflicts. 5. Network adapter (Advise network administrator of new MAC address)
Dead computer. See "Power supply" on page 127.	<ol style="list-style-type: none"> 1. Power Switch 2. Power Supply 3. System Board
Diskette drive in-use light remains on or does not light when drive is active.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
Flashing cursor with an otherwise blank display.	<ol style="list-style-type: none"> 1. System Board 2. Primary Hard Disk Drive 3. Hard Disk Drive Cable
Incorrect memory size during POST.	<ol style="list-style-type: none"> 1. Run the Memory tests. 2. Memory Module 3. System Board

Message/Symptom	FRU/Action
"Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable 4. Network Adapter
Intensity or color varies from left to right of characters and color bars.	<ol style="list-style-type: none"> 1. Display 2. System Board
No power, or fan not running.	<ol style="list-style-type: none"> 1. See "Power supply" on page 127.
Nonsystem disk or disk error-type message with a known-good diagnostic diskette.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
Other display symptoms not listed above (including blank or illegible display).	<ol style="list-style-type: none"> 1. See "Display" on page 129. 2. System Board 3. Display
Power-on indicator or hard disk drive in-use light not on, but computer works correctly.	<ol style="list-style-type: none"> 1. Power Supply 2. System Board 3. LED Cables
Printer problems.	<ol style="list-style-type: none"> 1. See "Printer" on page 126.
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> 1. Run Setup 2. Diskette Drive 3. Diskette Drive Cable 4. System Board 5. Power Supply
RPL computer cannot access programs from its own hard disk.	<ol style="list-style-type: none"> 1. If network admin. is using LCCM Hybrid RPL, check startup sequence: First device: network; Second device: hard disk 2. Hard disk drive
RPL computer does not RPL from server.	<ol style="list-style-type: none"> 1. Check startup sequence 2. Check the network adapter LED status
Serial or parallel port device failure (system board port).	<ol style="list-style-type: none"> 1. External Device Self-Test OK? 2. External Device 3. Cable 4. System Board
Serial or parallel port device failure (adapter port).	<ol style="list-style-type: none"> 1. External Device Self-Test OK? 2. External Device 3. Cable 4. Alternate Adapter 5. System Board

Message/Symptom	FRU/Action
Some or all keys on the keyboard do not work.	<ol style="list-style-type: none">1. Keyboard2. Keyboard Cable3. System Board

Undetermined problem

Check the power supply voltages. See "Power supply" on page 127. 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. Memory modules
Before removing or replacing memory modules, see "System board memory" on page 157.
 - e. Extended video memory
 - f. External Cache
 - g. External Cache RAM
 - h. Hard disk drive
 - i. Diskette drive
3. Power-on the computer to re-test the system.
4. Repeat steps 1 through 3 until you find the failing device or adapter.

If all devices and adapters have been removed, and the problem continues, replace the system board. See "Replacing a system board" on page 145.

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 5. Country/Region/Language Model Definition.

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

Type/Model configuration tables (6563/6564/6574)

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.

Note

These model tables are for the PC 300 models only. For Aptiva type and 2178/2198 models, please refer to the IBM on-line site, www.ibm.com/pc/

Table	Page
PC 300 Type 6563	202
PC 300 Type 6564	206
PC 300 Type 6574	209

Table 6 (Page 1 of 4). PC 300 Type 6563 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
20X - Open Bay	450 MHz	N/A	N/A	N/A	4X4	N/A	N/A
22X	450 MHz	64 MB	8.4 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows 98
23X	450 MHz	64 MB	8.4 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows NT
24X	450 MHz	64 MB	8.4 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows 98
25X	450 MHz	64 MB	8.4 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows NT
26X	450 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows 98
27X	450 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows NT
40X - Open Bay	500 MHz	N/A	N/A	N/A	4X4	N/A	N/A
42X	500 MHz	64 MB	8.4 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows NT
43X	500 MHz	64 MB	8.4 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows 98
44X	500 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	40X 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 200.
3. Processor = Pentium® III
4. Audio = integrated on system board.
5. Open Bay = Authorized Assembler Program. See the note on page 201

Table 6 (Page 2 of 4). PC 300 Type 6563 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
45X	500 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows NT
47X	500 MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows 98
60X - Open Bay	533EB MHz	N/A	N/A	N/A	4X4	N/A	N/A
62X	533EB MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows 98
63X	533EB MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows NT
64X	533 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows 98
65X	533 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows NT
66X	533EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows 98
67X	533EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows NT
68X	533EB MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows 98
69X	533EB MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	40X 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 200.
3. Processor = Pentium® III
4. Audio = integrated on system board.
5. Open Bay = Authorized Assembler Program. See the note on page 201

Table 6 (Page 3 of 4). PC 300 Type 6563 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
71X	600 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16MB	4X4	R/W CD	Windows NT
80X - Open Bay	600EB MHz	N/A	N/A	N/A	4X4	N/A	N/A
82X	600EB MHz	128 MB	13.5 GB EIDE	S3 AGP4 - 16MB	4X4	48X Max	Windows 98
83X	600EB MHz	128 MB	13.5 GB EIDE	S3 AGP4 - 16MB	4X4	48X Max	Windows NT
84X	600EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	48X Max	Windows 98
85X	600EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	48X Max	Windows NT
86X	600EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows 98
87X	600EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows NT
8CX	600B MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	48X Max	Windows 98
8DX	600B MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	48X Max	Windows NT
90X - Open Bay	667 MHz	N/A	N/A	N/A	4X4	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 200.
3. Processor = Pentium® III
4. Audio = integrated on system board.
5. Open Bay = Authorized Assembler Program. See the note on page 201

Table 6 (Page 4 of 4). PC 300 Type 6563 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
91X	667 MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	48X Max	Windows NT
92X	667 MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	48X Max	Windows 98
93X	667 MHz	128 MB	13.5 GB EIDE	S3 AGP4 - 16MB	4X4	48X Max	Windows NT
94X	667 MHz	128 MB	13.5 GB EIDE	S3 AGP4 - 16MB	4X4	48X Max	Windows 98
99X - Open Bay	733 MHz	N/A	N/A	N/A	4X4	N/A	N/A
9FX	600B MHz	128 MB	10.1 GB EIDE	S3 AGP2 - 8 MB	4X4	48X Max	Windows 2000
A1X	733 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16MB	4X4	48X Max	Windows 98
A2X	733 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16MB	4X4	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 200.
3. Processor = Pentium® III
4. Audio = integrated on system board.
5. Open Bay = Authorized Assembler Program. See the note on page 201

Table 7 (Page 1 of 3): PC 300 Type 6564 - Microtower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
S3X	450 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	48X Max	Windows 98
S4X	450 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	48X Max	Windows 98
S6X	500 MHz	128 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	48X Max	Windows 98
S7X	500 MHz	128 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	48X Max	Windows NT
S8X	500 MHz	128 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	48X Max	Windows 98
S9X	533 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows 98
SAX	533 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows NT
SBX	533 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows NT
SCX	600EB MHz	128 MB	27.2 GB EIDE	S3 AGP4 - 16 MB	4X4	R/W CD	Windows 98
SDX	600EB MHz	128 MB	27.2 GB EIDE	S3 AGP4 - 16 MB	4X4	R/W CD	Windows NT

Notes:

1. N/A = Not included in model.
2. For last digit model number, see "Model tables - Country/Region/Language" on page 200.
3. Processor = Pentium® III
4. Audio = integrated on system board.
5. Models S4X, S7X, S8X, S9X, SAX, SCX, SDX, SGX, SHX, SKX, SLX, SMX, SPX, SQX, T3X, T4X, come with LC 2.3 Ethernet card
6. Models S3X, S6X, SBX, SEx, SJX, SNX, SUX, come with a modem.
7. Open Bay = Authorized Assembler Program. See the note on page 201

Table 7 (Page 2 of 3). PC 300 Type 6564 - Microtower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
SEX	600EB MHz	128 MB	27.2 GB EIDE	S3 AGP4 - 16 MB	4X4	R/W CD	Windows NT
SFX	500 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	48X Max	Windows 98
SGX	600 MHz	128 MB	27.2 GB EIDE	S3 AGP4 - 16 MB	4X4	R/W CD	Windows 98
SHX	600 MHz	128 MB	27.2 GB EIDE	S3 AGP4 - 16 MB	4X4	R/W CD	Windows NT
SJX	600 MHz	128 MB	27.2 GB EIDE	S3 AGP4 - 16 MB	4X4	R/WCD	Windows NT
SKX	600 MHz	128 MB	27.2 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows 98
SLX	667 MHz	128 MB	27.2 GB EIDE	S3 AGP4 - 16 MB	4X4	R/W CD	Windows 98
SMX	667 MHz	128 MB	27.2 GB EIDE	S3 AGP4 - 16 MB	4X4	R/W CD	Windows NT
SNX	667 MHz	128 MB	27.2 GB EIDE	S3 AGP4 - 16 MB	4X4	R/W CD	Windows NT
SPX	533EB MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16 MB	4X4	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 200.
3. Processor = Pentium® III
4. Audio = integrated on system board.
5. Models S4X, S7X, S8X, S9X, SAX, SCX, SDX, SGX, SHX, SKX, SLX, SMX, SPX, SQX, T3X, T4X, come with LC 2.3 Ethernet card
6. Models S3X, S6X, SBX, SEx, SJX, SNX, SRX, SUx, come with a modem.
7. Open Bay = Authorized Assembler Program. See the note on page 201

Table 7 (Page 3 of 3). PC 300 Type 6564 - Microtower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
SQX	533EB MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows NT
SRX	533EB MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows NT
SUX	600B MHz	128 MB	20 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows 2000
T3X	600B MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	48X Max	Windows 98
T4X	600B MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	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 200.
3. Processor = Pentium® III
4. Audio = integrated on system board.
5. Models S4X, S7X, S8X, S9X, SAX, SCX, SDX, SGX, SHX, SKX, SLX, SMX, SPX, SOX, T3X, T4X, come with LC 2.3 Ethernet card
6. Models S3X, S6X, SBX, SEx, SJX, SNX, SRX, SUx, come with a modem.
7. Open Bay = Authorized Assembler Program. See the note on page 201

Table 8 (Page 1 of 2): PC 300 Type 6574 - Microtower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
20X - Open Bay	450 MHz	N/A	N/A	N/A	4X4	N/A	N/A
23X	450 MHz	64 MB	8.4 GB EIDE	S3 AGP2 - 8 MB	4X4	N/A	Windows NT
28X	450 MHz	64 MB	8.4 GB EIDE	S3 AGP2 - 8 MB	4X4	N/A	Windows 98
45X	500 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	40X Max	Windows 98
47X	500 MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	40X Max	Windows NT
40X - Open Bay	500 MHz	N/A	N/A	N/A	4X4	N/A	N/A
60X - Open Bay	533EB MHz	N/A	N/A	N/A	4X4	N/A	N/A
61X	533EB MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	40X Max	Windows NT
62X	533EB MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8 MB	4X4	40X Max	Windows 98
80X - Open Bay	600EB MHz	N/A	N/A	N/A	4X4	N/A	N/A
82X	600EB MHz	128 MB	13.5 GB EIDE	S3 AGP4 - 16 MB	4X4	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 200.
3. Processor = Pentium® III with 512 KB L2 Cache.
4. Audio = integrated on system board.
5. Open Bay = Authorized Assembler Program. See the note on page 201

Table 8 (Page 2 of 2). PC 300 Type 6574 - Microtower

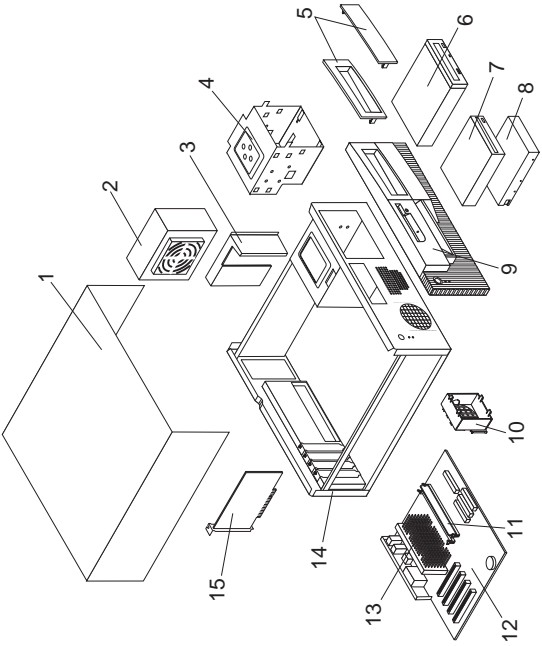
Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
83X	600EB MHz	128 MB	13.5 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows NT
90X - Open Bay	667 MHz	N/A	N/A	N/A	4X4	N/A	N/A
91X	667 MHz	128 MB	13.5 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows NT
92X	667 MHz	128 MB	13.5 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows 98
99X - Open Bay	733 MHz	N/A	N/A	N/A	4X4	N/A	N/A
A1X	733 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16 MB	4X4	48X Max	Windows 98
A2X	733 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16 MB	4X4	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 200.
3. Processor = Pentium® III with 512 KB L2 Cache.
4. Audio = integrated on system board.
5. Open Bay = Authorized Assembler Program. See the note on page 201

Notes:

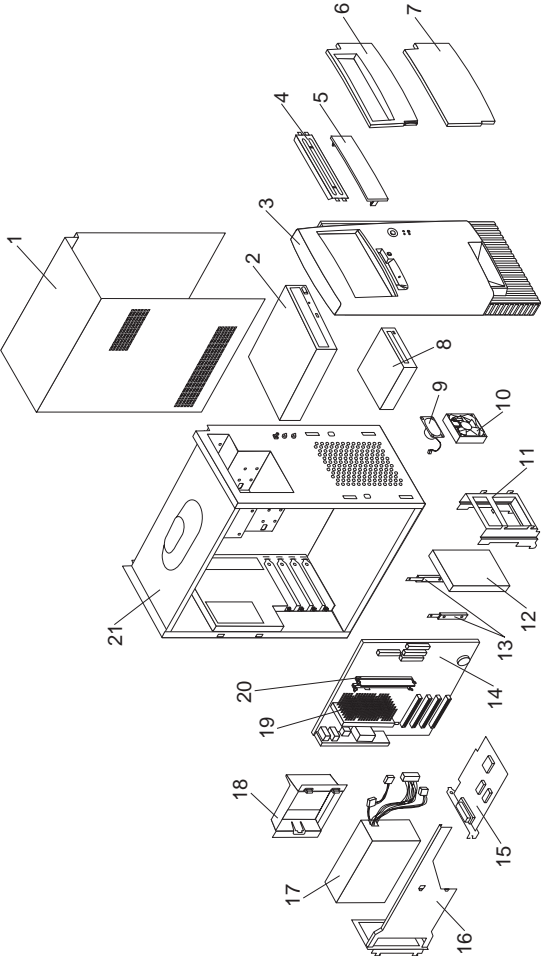
Parts (Type 6563)



Parts listing

Index	System (Type 6563)	FRU No.
1	Top Cover Assembly	09K9825
2	Power Supply-145W	01K9870
2	Power Supply-145W (China)	36L8815
2	Power Supply-145W (Japan)	20L2314
3	Fan Duct Kit	09N4512
4	Hard File/Floppy Bracket	37L5094
5	Bezel Kit	37L5097
6	CD-ROM (40X Max)	36L8789
6	CD-ROM (48X Max)	09N0735
6	CD-ROM Read/Write	36L8719
7	1.44 MB, 3.5-Inch Diskette Drive	75H9550
7	1.44 MB, 3.5-Inch Diskette Drive (Japan)	75H9552
8	10.1 GB EIDE Hard Disk Drive	36L8681
8	13.5 GB EIDE Hard Disk Drive	36L8689
	Order either of the below	
	20.4 GB hard drives	
8	20.4 GB EIDE Hard Disk Drive	36L8628
8	20.4 GB EIDE Hard Disk Drive	37L5723
9	Front Bezel Assembly	37L5096
10	Fan/Card Guide Assembly	37L5093
11	Memory - 64 MB SDRAM, Non-Parity	33L3072
11	Memory - 128 MB SDRAM, Non-Parity	33L3074
14	System Board - for 500/533/600B processors (no processor, no memory)	61H2587
14	System Board - for 533EB/600EB and higher processors (no processor, no memory)	61H2569
13	Pentium III 450/100 MHz.	00N3878
13	Pentium III 500/100 MHz.	00N3879
13	Pentium III 533/133 MHz.	33L4066
13	Pentium III 533EB MHz.	09N3462
13	Pentium III 600B/133 MHz.	01N2657
13	Pentium III 600EB MHz	37L6034
13	Pentium III 667 MHz	00N3622
13	Pentium III 733 MHz	00N7174
14	Chassis Assembly	09N4508
15	Ethernet Adapter - Lake Clark 2.3	30L5929
	Cable - ATA-66 2 Drop	37L5098
	Cable - CD-ROM Audio	75H9219
	Cable - Diskette Drive	33L2596
	Cable - Hard Disk Cable, ATA	37L4525
	Cable - Wake On Ring	76H7345
	EMC Shield Kit for System Board	37L5095
	Foot (4)	03K9655
	EMC Shield for 5.25-inch Bay	20L3073
	LED/Power Switch Assembly	37L5092
	Lithium Battery	33F8354
	Miscellaneous Hardware Kit	20L3094
	Mouse - 2 button	10L6145
	Name Plate (6563)	00n6083
	Savage2 Video Card-143 4xAGP	33L1618
	Savage2 Video Card-143 4xAGP dongle	09N3435
	Savage4 Video Card 2x AGP	09N5898
	Speaker/Cable Assembly	01K4909
	URM retainer Kit	33L4521

Parts (Type 6564/6574)



Parts listing

Index	System (Type 6564, 6574)	FRU No.
1	Top Cover Assembly	37L2499
	Order either of the below	
	40X Max CD-ROM Drives	
2	CD-ROM (40X Max)	36L8789
2	CD-ROM (40X Max)	09N0879
2	CD-ROM (48X Max)	09N0735
2	CD-ROM (Read/Write)	36L8719
3	Front Bezel Assembly	37L2505
4	EMC Shield for 5.25" Bay	20L3073
5	Blank Bezel 5.25" Bay	37L2508
6	Door Assembly	37L2506
7	Blank Door Bezel	37L2507
8	1.44 MB, 3.5-Inch Diskette Drive	75H9550
8	1.44 MB, 3.5-Inch Diskette Drive (Japan)	75H9552
9	Speaker with Cable Assembly	01K4909
10	Fan Assembly	37L4526
11	Hard Disk Mounting Bracket	37L2501
12	10.1 GB EIDE Hard Disk Drive	36L8681
12	13.5 GB EIDE Hard Disk Drive	36L8689
	Order either of the below	
	20.4 GB hard drives	
12	20.4 GB EIDE Hard Disk Drive	36L8628
12	20.4 GB EIDE Hard Disk Drive	37L5723
12	27.2 GB EIDE Hard Disk Drive (6564)	09N0707
13	Hard Drive Rails (Qty 2)	01K1539
14	System Board - for 450/500/533/600B processors (no processor, no memory)	61H2587
14	System Board - for 533EB/600EB and higher processors (no processor, no memory)	61H2569
15	Savage4 Video Card 2x AGP	09N5898
15	Savage2 Video Card - 143 4xAGP	33L1618
15	Ethernet Adapter - Lake Clark 2.3	30L5929
16	Power Supply Bracket	37L2502
17	Power Supply-145W	01K9870
17	Power Supply-145W (China)	36L8815
17	Power Supply-145W (Japan)	20L2314
18	Fan Duct	37L2512
19	Pentium III 450/100 MHz.	00N3878
19	Pentium III 500/100 MHz.	00N3879
19	Pentium III 533/133 MHz.	37L5708
19	Pentium III 533EB MHz.	09N3464
19	Pentium III 600B/133 MHz	01N2656
19	Pentium III 600EB MHz	37L5710
19	Pentium III 667 MHz	01N2718
19	Pentium III 733 MHz	09N3466
20	Memory - 64 MB SDRAM, Non-Parity	33L3072
20	Memory - 128 MB SDRAM, Non-Parity	33L3074
21	Base Frame Assembly	37L2500
	Cable - CD-ROM Audio	75H9219
	Cable - ATA-66 2 Drop	37L5098
	Cable - Diskette Drive	01K1513
	Cable - Hard Disk Cable, ATA	37L4525
	Cable - Wake On Ring	76H7345
	EMC Shield for System Board	37L2504
	Foot (4)	03K9655
	LED/Power Switch Assembly	37L2511

Index	System (Type 6564, 6574)	FRU No.
	Lithium Battery	33F8354
	Miscellaneous Hardware Kit	20L3094
	Modem - Domestic (6564)	01N2833
	Modem - Universal - EMEA and Asia Pacific South (6564)	01N2834
	Mouse - 2 button (6574)	10L6145
	Mouse - Scrollpoint (6564)	28L1865
	Name Plate (6564, 6574)	37L2510
	URM retainer Kit	33L4521
	Savage2 Video Card-143 4xAGP dongle	09N3435

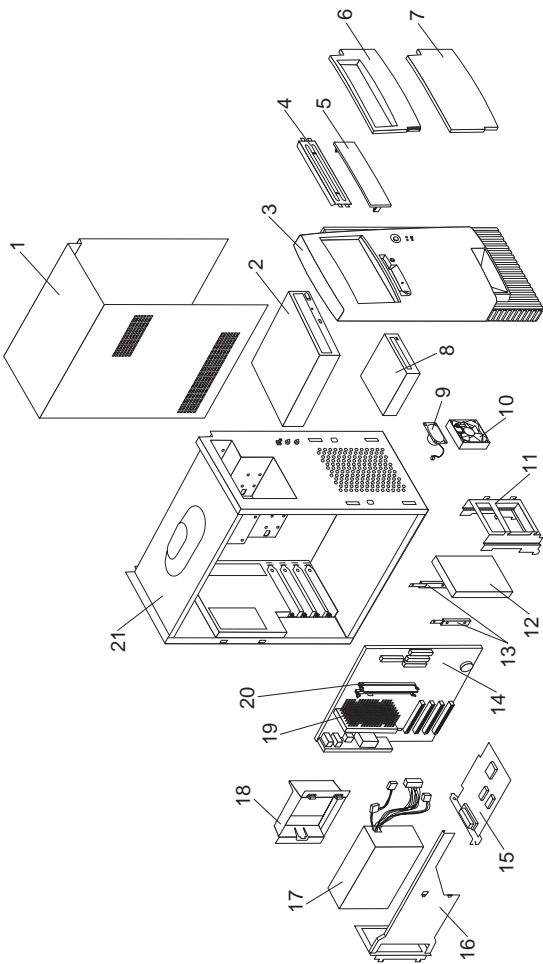
Keyboards - PCNext Lite (PC 300 Type 6563/6564/6574)

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 044	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
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

Parts (Type 2178/2198)



Parts listing

Index	System (Type 2178, 2198)	FRU No.
1	Top Cover Assembly	37L2499
1	Top Cover Assembly (2178-black)	09N1745
2	CD-ROM DRIVE - 48X	09N0735
2	CD-ROM (Read/Write)	09N0897
2	CD-ROM (Read/Write) (2178-black)	19K1509
2	8X DVD	09N0765
2	8X DVD (2178-black)	09N0767
2	8X DVD Primary	09N0749
2	8X DVD Primary (2178-black)	09N0751
3	Front Bezel Assembly	37L2505
3	Front Bezel Assembly (2178-black)	09N1746
4	EMC Shield for 5.25" Bay	20L3073
5	Blank Bezel 5.25" Bay	37L2508
5	Blank Bezel 5.25" Bay (2178-black)	09N1749
6	Door Assembly	37L2506
6	Door Assembly (2178-black)	09N1747
7	Blank Door Bezel	37L2507
7	Blank Door Bezel (2178-black)	09N1748
8	1.44 MB, 3.5-Inch Diskette Drive	75H9550
9	Speakers with Cable Assembly	10K2601
9	Speakers (2178-black)	10K2603
9	Speaker brick - Australia/New Zealand (2178)	10K2595
9	Speaker brick - Brazil (2178)	10K2789
9	Speaker brick - China (2178)	10K2597
9	Speaker brick - EMEA (2178)	10K2591
9	Speaker brick - Hong Kong/GB/UK (2178)	10K2589
9	Speaker brick - US/Taiwan/Canada	10K2587
10	Fan Assembly	37L4526
11	Hard Disk Mounting Bracket	37L2501
12	10.1 GB EIDE Hard Disk Drive (2178)	36L8681
12	15.0 GB EIDE Hard Disk Drive	09N0851
	Order either of the below	
	20.4 GB hard drives	
12	20.4 GB EIDE Hard Disk Drive	36L8628
12	20.4 GB EIDE Hard Disk Drive	37L5723
12	30 GB EIDE Hard Disk Drive	09N0925
13	Hard Drive Rails (Qty 2)	01K1539
14	System Board (no processor, no memory)	61H2541
14	System Board (2178 model 70P only) (no processor, no memory)	61H2569
15	Savage4 Video Card 2x AGP (2178)	09N5898
15	Video card - 4xAGP W/32MB w/TV out	09N1708
	Dongle for 4xAGP video card	09N3435
15	Aureal Audio Adapter (2178)	09N1661
15	Askey modem - domestic (2178)	09N1627
15	Askey modem - universal (2178)	09N1626
15	GVC modem - domestic primary (2178)	09N1678
15	GVC modem - universal primary (2178)	09N1676
15	Home PNA combo adapter (2178)	09N1663
16	Power Supply Bracket	37L2502
17	Power Supply-145W	01K9870
17	Power Supply-145W (China) (2178)	36L8815
18	Fan Duct	37L2512
19	Pentium III 533EB MHz.	09N3462
19	Pentium III 600EB MHz	37L5710

Index	System (Type 2178, 2198)	FRU No.
19	Pentium III 667 MHz	01N2718
19	Pentium III 733 MHz	09N3466
20	Memory - 64 MB SDRAM, Non-Parity	33L3072
20	Memory - 128 MB SDRAM, Non-Parity	33L3074
21	Base Frame Assembly	09N1788
	Cable - CD-ROM Audio	09N1782
	Cable - ATA-66 2 Drop	37L5098
	Cable - Diskette Drive	01K1513
	Cable - Hard Disk Cable, ATA	37L4525
	Cable - Midi game port	09N1786
	Cable - Wake On Ring	76H7345
	EMC Shield for System Board	37L2504
	Foot (4)	03K9655
	LED/Power Switch Assembly	37L2511
	Lithium Battery	33F8354
	Microphone	01N1851
	Miscellaneous Hardware Kit	20L3094
	Mouse - Scrollpoint	28L1865
	Mouse - Scrollpoint (2178-black)	28L1868
	Name Plate (2178/2198)	01N3057
	Name Plate (2178-black)	09N1750
	URM retainer Kit	33L4521

Keyboards - Rapid Access II - Aptiva Type 2178/2198)

Belgian-French	37L2612
Belgian-French (black)	37L2634
Belgian-UK	37L2596
Belgian-UK (black)	37L2618
Brazil/Portugal	37L2594
Brazil/Portugal (black)	37L2616
Chinese	37L2611
Chinese (black)	37L2633
Danish	37L2597
Danish (black)	37L2619
Dutch	37L2598
Dutch (black)	37L2620
French	37L2599
French (black)	37L2621
French/Canadian-ID 045	37L2592
French/Canadian-ID 045 (black)	37L2635
French/Canadian-ID 058	37L2591
French/Canadian-ID 058 (black)	37L2614
Latin/Spanish	37L2593
Latin/Spanish (black)	37L2615
Norwegian	37L2603
Norwegian (black)	37L2625
Portuguese	37L2604
Portuguese (black)	37L2626
Spanish	37L2605
Spanish (black)	37L2627
Swedish /Finland	37L2606
Swedish/Finland (black)	37L2628
UK English	37L2608
UK English (black)	37L2630
UK English (ISO)	37L2609
UK English (ISO) (black)	37L2631
US English	37L2590
US English (black)	37L2613

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 v.

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

PC 300 - 6565

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 6565 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.

General checkout	228
Module test menu and hardware configuration	
report	231
Keyboard	232
Printer	232
Power supply	233
20-pin main power supply connection	234
Display	235
Diagnostics and test information	236
Power-on self-test (POST)	236
POST beep codes	236
Error code format	237
IBM PC Enhanced Diagnostics	238
Starting the IBM PC Enhanced Diagnostics	
Program	238
Navigating through the diagnostic programs	238
Running diagnostic tests	239
Test selection	239
IBM PC Enhanced Memory Diagnostics	239
Alert On LAN test	240
Asset ID test	240
Test results	240
Hard file Smart test	241
IBM Fixed Disk Optimized Test	241
Quick and Full erase - hard drive	242
Iomega Zip Drive Test	242
Asset EEPROM backup	242
Viewing the test log	243
SIMM/DIMM memory errors	243
Setup Utility program	245
Hard disk drive boot error	245
When to use the Low-Level Format program	246
Preparing the hard disk drive for use	246
Product description	247
Specifications Type 6565	248
Additional service information	249

Replacing a processor	249
Replacing a system board	250
Security features	250
Passwords	250
Power-on password	251
Administrator password	252
Administrator password control	252
Operating system password	252
Vital product data	252
Management Information Format (MIF)	252
Alert on LAN	253
Hard disk drive jumper settings	254
IDE hard disk drive settings	254
CD-ROM drive jumper settings	255
BIOS levels	256
Flash (BIOS/VPD) update procedure	257
Flash recovery boot block	257
Power management	258
Automatic configuration and power interface (ACPI) BIOS	258
Advanced Power Management	258
Automatic Hardware Power Management features	258
Setting Automatic Hardware Power Management features	259
Automatic Power-On features	259
Enhanced Security	260
Network settings	261
Flash over LAN (update POST/BIOS over network)	261
Wake on LAN	262
System board memory	263
Computer exploded view (Type 6565)	264
Input/Output connectors	265
Cover removal	266
Front panel	267
Front bezel	268
EMC shield	268
Diskette/hard drive bracket	268
CD-ROM drive removal	269
Power supply removal	270
Optional pedestal	270
System board layout	271
System board locations	272
System board switch settings	273
Symptom-to-FRU index	274
Beep symptoms	275
No beep symptoms	276
POST error codes	278
Miscellaneous error messages	293
Undetermined problem	296
Model tables - Country/Region/Language	297
Type/Model configuration tables (6565)	298
Parts (Type 6565)	303

Parts listing	304
Special tools	307

General checkout

This general checkout procedure is for Type 6565 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 238.

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 256.
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 274.
4. If the computer hangs and no error is displayed, go to "Undetermined problem" on page 296.
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 245) 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 6565 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 245.

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 245)
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 238.

003

Run the IBM PC Enhanced Diagnostics test. If necessary, refer to "Diagnostics and test information" on page 236.

- If you receive an error, replace the part that the diagnostic program calls out or go to "IBM PC Enhanced Diagnostics" on page 238.
- 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 232.
- If the printer has incorrect responses, go to "Printer" on page 232.

(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 235.
-

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 296 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 296.

Keyboard

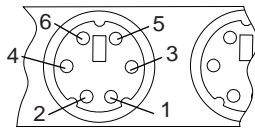
Note

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

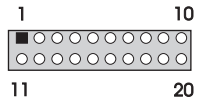
If the above are correct, check the following voltages.

20-pin main power supply connection

See "System board layout" on page 271 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	not used	not used
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 296.

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 6565 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 245.

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 6565 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 245.

Error code format

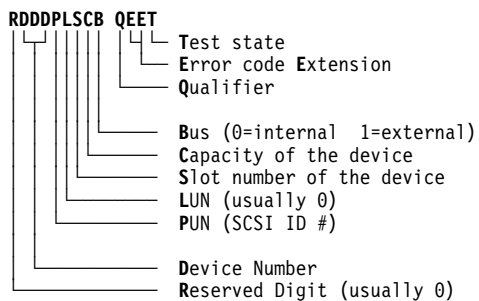
This section provides an explanation of the encoded non-SCSI and SCSI POST error codes.

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 PC Enhanced Memory Diagnostics
 - The memory diagnostic tests determine which memory module (SIMM or DIMM) is defective and report the socket where the failing module is located. The Memory diagnostics can run a quick and full test of the system. Diagnostics can also be run on a single SIMM or DIMM.

Note

See "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 243.

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 (SIMM/DIMM) 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 'SIMM/DIMM 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 SIMM/DIMM socket.

Only sockets containing a SIMM or DIMM can be selected for testing. Unpopulated 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 DIMM, or a device on the PCI bus.

Date:	Contains the date on which the diagnostic test was run. Date is retrieved from CMOS and displayed using the YYYYMMDD format.
ChkDigits:	Contains a 2-digit check-digit value to ensure that: <ul style="list-style-type: none"> • 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 copy of the FAT Table on all partitions (both the master and backup).
- Destroys the partition table.
- Provides messages that warn the user that this is a non-recoverable process.

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

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

Important

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

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

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

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.

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

Message	Failure Found	Recommended Actions
2xx-1y	A memory error was detected in SIMM socket Y	Replace the SIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board.
2xx-2y	A memory error was detected in DIMM socket Y	Replace the DIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board or where memory is on the processor card, replace the processor card.
Corrupt BIOS	Information in BIOS is not as expected. Not able to find expected DMI information from BIOS. Memory controller chipset vendor ID does not match expected value.	Reflash the BIOS. Perform boot block recovery. Replace the system board.

Message	Failure Found	Recommended Actions
Test aborted by user	User stopped test.	Restart test.
Note: "Y" is the SIMM/DIMM socket number. Use the System Board Layouts section in the latest PC 300/700, IntelliStation Hardware Maintenance Manual, HMM, to reference the memory sockets.		

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"> 1. Attempt to access and recover (back-up) the failing hard disk drive. 2. Using the operating systems programs, format the hard disk drive. 3. Go to "Preparing the hard disk drive for use" on page 246.
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 PC 300 Type 6565 computer is available in 4 x 4, (Four drive bays, four I/O adapter slots, including an AGP socket) as desktop models.

- **Security**

- Administrator password
- Cover lock
- Power-on password
- Operating system password
- C2 security
- U-bolt and cable (Optional for some models)

- **CMOS backup battery (lithium)**

- **Common parts**

(Varies with each model, see "Type/Model configuration tables (6565)" on page 298.)

- 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 6565

Feature	Description
Size	Depth: 429 mm (16.9 inches) Height: 138 mm (5.43 inches) Width: 400 mm (15.75 inches)
Weight	Weight: 9.53 kg (21 lb) ¹⁵
Environment	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)
Heat Output	Approximate heat output in BTUs per hour: - Minimum: 256 BTU (75 watts) - Maximum: 706 BTU (207 watts) ¹⁶
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 90 V ac - Maximum: 137 V ac High range input voltage: - Minimum: 180 V ac - Maximum: 265 V ac Input kVA (approximately): - Maximum (as shipped): 0.10 kVA
Airflow	Approximately 0.5 cubic meters/minute (18 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 39 dB operating - 33 dB idle At bystander position (1 meter): - 34 dB operating - 30 dB idle Declared (upper limit) sound power levels: - 4.9 bels operating - 4.4 bels idle

¹⁵ Maximum configuration weight depends on options installed.

Figures above are a system fully populated with options.

¹⁶ Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

¹⁷ For additional information, see the *ISO Supplier's Declaration* available from IBM.

Additional service information

The following additional service information supports the PC 300 types 6565.

- “Replacing a processor”
- “Replacing a system board” on page 250
- “Security features” on page 250
- “Passwords” on page 250
- “Vital product data” on page 252
- “Management Information Format (MIF)” on page 252
- “Alert on LAN” on page 253
- “Hard disk drive jumper settings” on page 254
- “CD-ROM drive jumper settings” on page 255
- “BIOS levels” on page 256
- “Flash (BIOS/VPD) update procedure” on page 257
- “Flash recovery boot block” on page 257
- “Power management” on page 258
- “Enhanced Security” on page 260
- “Network settings” on page 261
- “Flash over LAN (update POST/BIOS over network)” on page 261
- “Wake on LAN” on page 262
- “System board memory” on page 263

Replacing a processor

Make sure the processor is fully seated in its socket and that the gold 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 256 “Vital product data” on page 252, and “Flash (BIOS/VPD) update procedure” on page 257.
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
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 245 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:

Attention

If Enhanced Security is **not** enabled, this procedure will remove the administrator password, all setup and boot sequence settings and privilege access. Make sure these settings are recorded before you perform this procedure.

If Enhanced Security is enabled, Only Enhanced Security functions like boot sequence and privilege access will not be changed. Other settings will be cleared

1. Unplug the power cord and remove the top cover.
2. Refer to "System board layout" on page 271 to find the CMOS switch.
3. Move the CMOS switch to the **on** position.
4. Power-on the computer. The system senses the change in the position and erases the password.
 - It is necessary to move the CMOS switch to the **off** 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 6565 have Enhanced Security Mode. If Enhanced Security mode is enabled and there is no password given, the computer will act as if Enhanced Security is disabled.

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

Administrator password control The Administrator password is set in the Setup Configuration. Refer to "Setup Utility program" on page 245

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 257.

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, 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 LAN

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

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

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

Hard disk drive jumper settings

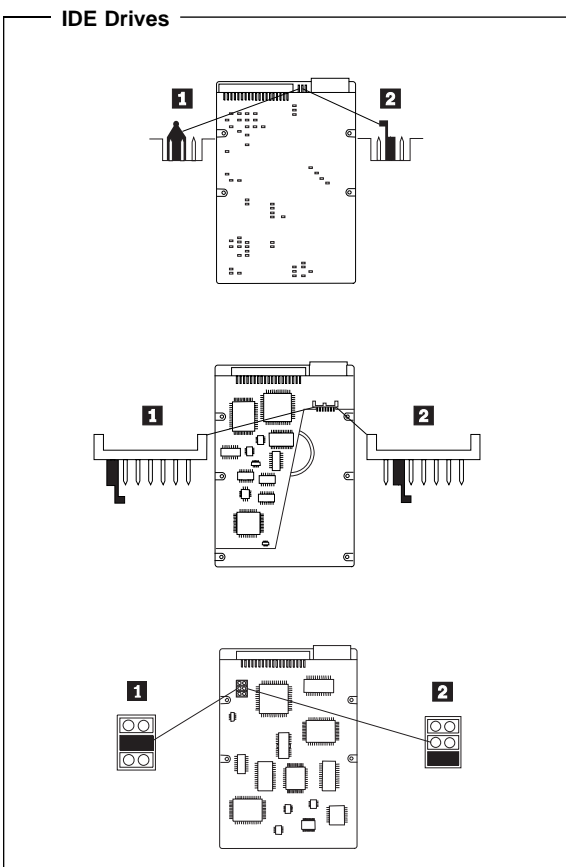
IDE hard disk drives for the PC 300 series computers use jumpers to set the drives as primary (master) or secondary (slave).

Attention

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

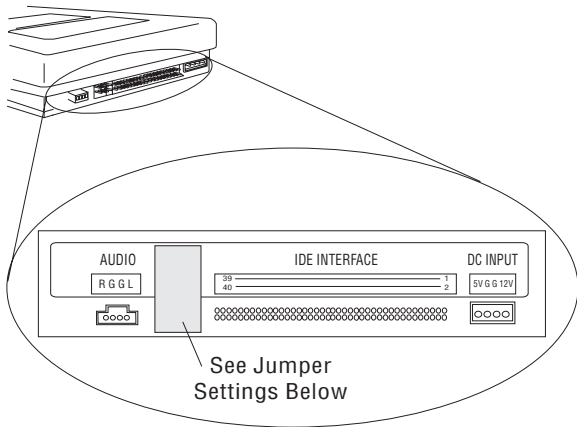
IDE hard disk drive settings

- 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. HelpCenter™
 4. Levels 1 and 2 Support
 5. RETAIN
- Sources for obtaining the latest level BIOS available.
 1. IBM PC Company Home Page
<http://www.ibm.com/pc/us/>
 2. PC PartnerInfo-Technical Database (CTSTIPS.NSF)
 3. HelpCenter
 4. Levels 1 and 2 Support

To update (flash) the BIOS, see “Flash (BIOS/VPD) update procedure” on page 257.

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 CMOS switch enables you to restart the system and recover the BIOS.

To perform a Flash/BIOS recovery using the CMOS Switch:

1. Power-off the computer and remove the cover.
2. Move the system board CMOS switch to the **on** position. Refer to "System board layout" on page 271 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 CMOS switch to the **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.

Automatic configuration and power

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

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

Attention

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

Automatic Hardware Power Management

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

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

Level 1 Set time from 5 minutes to 4 hours.

Level 2 Set time from 10 minutes to 5 hours.

Level 3 Set time from 15 minutes to 6 hours.

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

- **System Power:**
 - Select **On** for the computer to remain on.
 - Select **Off** for the computer to shut down.
- **Processor Speed:**

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

- **Display:**

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

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

Setting Automatic Hardware Power Management features

1. Start the Configuration/Setup Utility program (see "Setup Utility program" on page 245).
2. Select **Advanced Power Management** from the Configuration/Setup Utility program menu.
3. Be sure **APM BIOS Mode** is set to **Enabled**. If it is not, press Left Arrow (←) or Right Arrow (→) to change the setting.
4. Select **Automatic Hardware Power Management**.
5. Set **Automatic Hardware Power Management** to **Enabled**.
6. Select values for the three levels of power management (system power, processor speed, and display), as necessary.
7. Set **Hard Disk** to **Enabled** or **Disabled**.
Note: This does not apply to SCSI drives.
8. Press **Esc** twice to return to the Configuration/Setup Utility program menu.
9. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
10. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

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

- **Serial Port Ring Detect:** With this feature set to **Enabled** and an *external* modem connected to 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.
- **Wake on LAN:** If the computer has a properly configured token-ring or Ethernet LAN adapter card that is Wake on LAN-enabled and there is remote network management software, you can use the IBM-developed Wake on LAN feature. When you set Wake on LAN to **Enabled**, the computer will turn on when it receives a specific signal from another computer on the local area network (LAN). For further information, see "Wake on LAN" on page 262.

Enhanced Security

Note

Type 6565 have Enhanced Security Mode. If Enhanced Security mode is enabled and there is no password given, the computer will act as if Enhanced Security is disabled.

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

Enhanced Security is an additional security feature available on type 6565.

Enhanced Security can be enabled or disabled only when you update system programs. If Enhanced Security is enabled and the administrator password has not been set, the computer will operate as if Enhanced Security is disabled.

If Enhanced Security is enabled and the administrator password has been set, the computer has these additional security measures:

- The contents of the security EEPROM (the administrator password and startup sequence) are protected if the battery or CMOS memory fails.
- The security EEPROM is protected from unauthorized access. The security EEPROM cannot be read from or written to by any software application or system software until Enhanced Security is disabled and the computer is restarted. In a network environment, this might prevent certain functions from being performed on the computer.

- Remote Administration is locked and cannot be unlocked until Enhanced Security is disabled and the computer is restarted. This prevents the system programs in the computer from being updated remotely.
- The configuration settings in the Configuration/Setup Utility program are protected and cannot be changed until the administrator password has been entered. Any changes in computer hardware detected by the system programs in the computer will generate a configuration error until the administrator password has been entered.

To enable or disable Enhanced Security:

1. Insert a system programs update diskette into the diskette drive (drive A). System programs updates are available at <http://www.ibm.com/pc/support/us/> on the World Wide Web.
2. Power-on the computer. If it is powered on, you must power-off then power-on.
3. The update begins, the computer halts, and you are prompted for the administrator password (if you have set an administrator password). The computer remains in a halted state until the administrator password is entered.
4. When the administrator password is entered, or if no administrator password has been set, the update diskette will continue to run, and you are given the option of enabling or disabling Enhanced Security. The choice is automatically recorded in the System Security menu of the Configuration/Setup Utility program.

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 257.

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 245.
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 245.
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

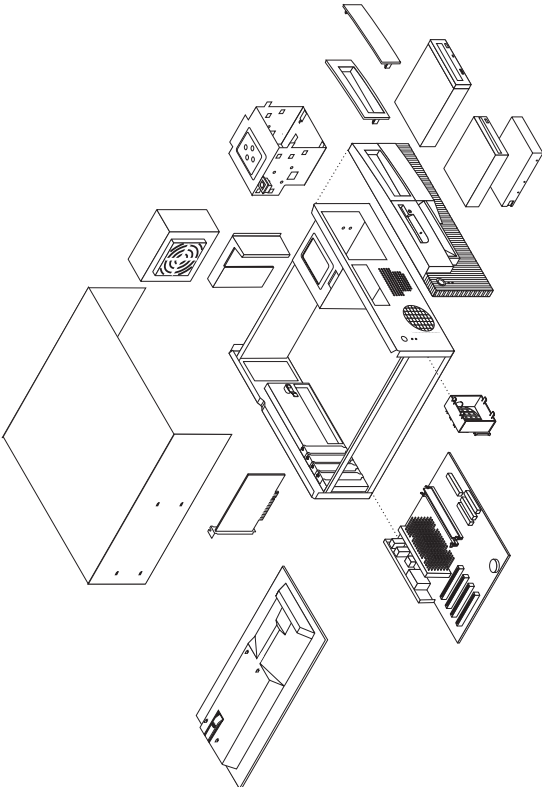
The following matrix cross-references the name of the computer (printed on the logo) and the size, speed, and type of memory modules supported in the computer.

Computer Name	Memory Module		
	Size	Speed	Type
PC 300 Type 6565	64 MB 128 MB 256 MB 512 MB 1 GB Maximum	133 MHz	SDRAM ECC/ Non-ECC Industry Standard

Supported memory configuration

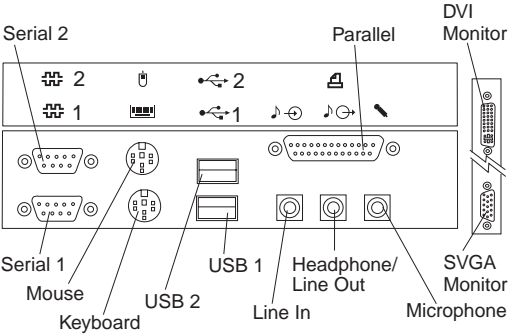
DIMM sizes of 64 MB, 128 MB, and 256 MB ECC or 64 MB, 128 MB, and 256 MB, and 512 MB Non-ECC are acceptable. Start filling DIMM socket 0, then 1. Use 3.3 V unbuffered 133 MHz. SDRAM DIMMs only.

Computer exploded view (Type 6565)

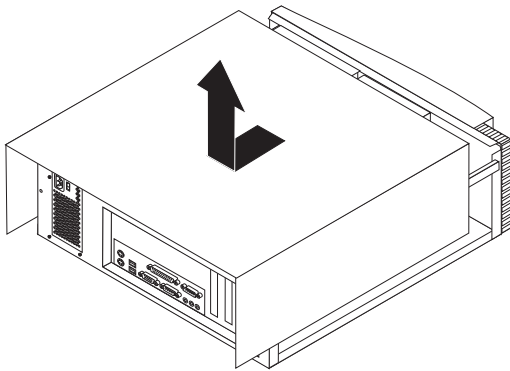
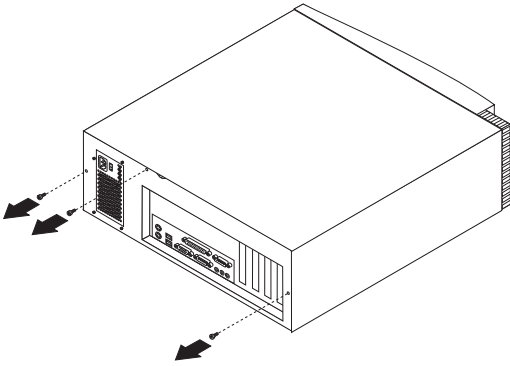


I/O connectors and removal procedures for the cover, front panel, front bezel, EMC shield, diskette/hard drive bracket, CD-ROM drive, power supply, and optional pedestal are on the following pages.

Input/Output connectors



Cover removal



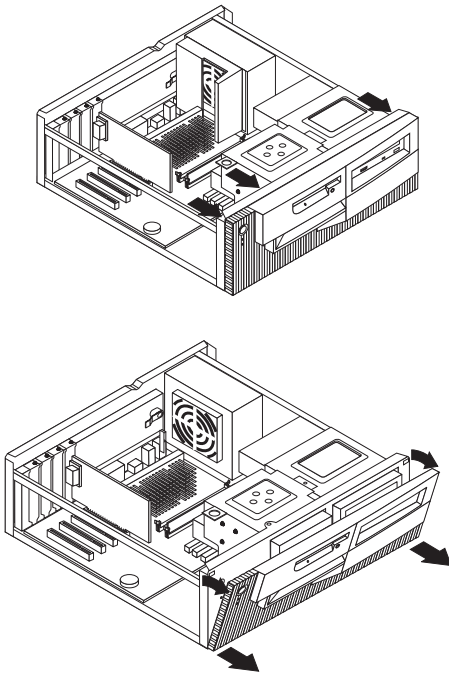
To remove top cover:

1. Remove the three cover thumb screws.
2. Slide cover toward the rear of the chassis about 1-inch (2 cm) to clear the front panel.
3. Lift cover up.

To install top cover:

1. Slide cover down onto the chassis about 1-inch (2 cm) from the front panel.
2. Make sure bottom cover slots are engaged on the chassis.
3. Slide cover forward to engage the front cover slots onto the chassis.
4. Install the three cover thumb screws.

Front panel



To remove the front panel:

1. Remove the top cover.
2. Release the three top latches while gently pulling the top of the panel outward.
3. Keeping the panel at the same angle, gently pull the panel out from the bottom of the chassis.

To install the front panel:

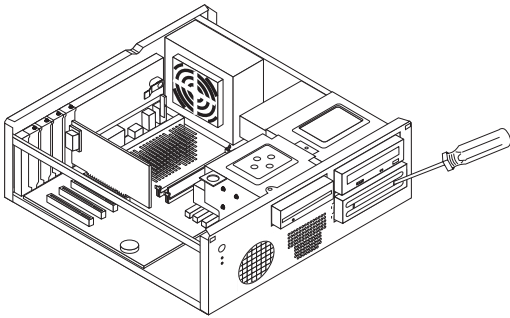
1. At the same angle that the panel was when removed, install the bottom tabs of the panel in the chassis. Push up on the left and right bottom tabs, if necessary, to get the tabs in the holes of the chassis.
2. Push the top of the panel toward the chassis until the three top latches lock in place.

Front bezel

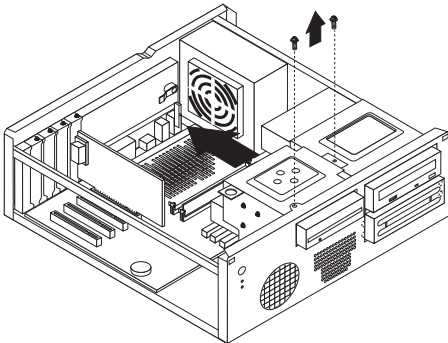
To remove the front blank bezel:

1. Remove the top cover.
2. Remove the front panel.
3. Unlatch the tabs of the bezel and remove it from the panel.

EMC shield



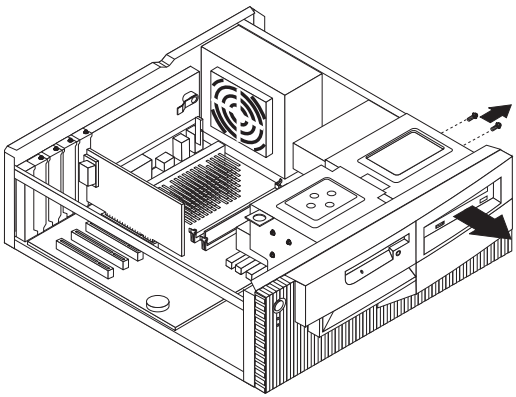
Diskette/hard drive bracket



To remove the diskette/hard drive bracket:

1. Remove the top cover.
2. Remove the diskette and hard drive cables.
3. Remove the two top screws securing the bracket.
4. Slide bracket toward the back of the chassis to unlatch it from the chassis.
5. Lift the bracket out of the chassis.

CD-ROM drive removal



To remove the CD-ROM drive:

1. Remove the top cover.
2. Remove the cables from the CD-ROM drive.
3. Remove two screws securing the CD-ROM drive.
4. Pull the CD-ROM drive out of the chassis.

Note

When connecting the CD-ROM Audio Cable, make sure the cable is routed along the system board near the PCI adapter slots. Continue routing the cable along the system board between the power connector and primary IDE connector and then up to the CD-ROM drive. Do not route the CD-ROM cable near the system board I/O connectors.

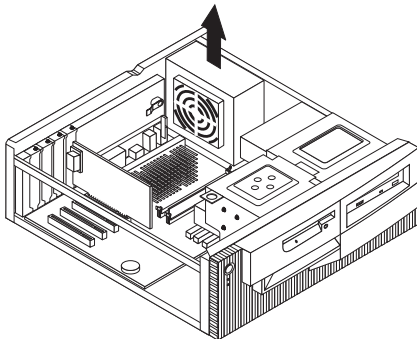
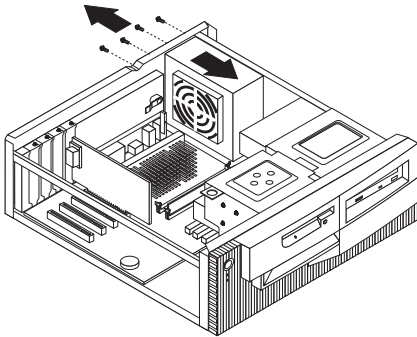
Power supply removal

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. Remove the air duct.
3. Disconnect the power supply connectors.
4. Remove the four screws securing the power supply to the chassis.
5. Move power supply inward, then lift out of the chassis.

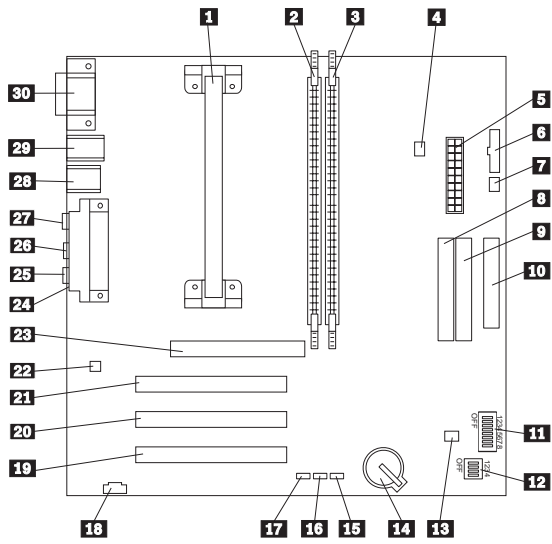


Optional pedestal

To remove the optional pedestal:

1. Lay the computer on its side where the pedestal is overhanging the edge of a table or desk.
2. Pull out on the plastic tab underneath the pedestal and move the pedestal toward the tab end, then, pull the pedestal away from the cover.

System board layout



System board locations

1	Processor socket
2	DIMM socket 0
3	DIMM socket 1
4	Processor fan connector
5	Power connector
6	Power Switch/LED connector
7	RFID connector
8	Primary IDE connector
9	Secondary IDE connector
10	Diskette Drive connector
11	Switch 2 assembly
12	Switch 1 assembly
13	Front Fan connector
14	Battery
15	C2 security connector
16	Wake on LAN connector
17	Alert on LAN connector
18	CD Audio connector
19	PCI 1 slot
20	PCI 2 slot
21	PCI 3 slot
22	Internal Speaker connector
23	AGP connector
24	Parallel connector
25	Microphone connector
26	Line Out connector
27	Line In connector
28	USB connectors
29	Mouse/Keyboard connectors
30	Serial connectors (COM 1, COM 2)

System board switch settings

The following tables contain the switch (SW1) setting information. (D) indicates the default setting.

Note

Switch assembly 2 (SW2) switches should be in the off position.

Diskette write access Switch (SW1-1)

Diskette Access	SW1-1
Write enabled	Off (D)
Write protected	On

Clear CMOS Switch (SW1-2)

Note

The Clear CMOS switch (SW1-2) is also used to reset passwords.

Clear CMOS	SW1-2
Normal mode	Off (D)
CMOS clear	On

Reserved Switch (SW1-3)

Reserved	SW1-3
Reserved	Off

Reserved Switch (SW1-4)

Reserved	SW1-4
Reserved	Off

Processor Speed Settings

Processor speed for the PC 300 type 6565 computer is fixed and is determined by the processor. There are no settings required.

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 228. 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 296.

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 233.)
- Check the hard disk drive jumper settings before you replace a hard disk drive. (See "Hard disk drive jumper settings" on page 254.)

Important

1. Some errors are indicated with a series of beep codes. (See "Beep symptoms" on page 275.)
Type 6565 computer defaults 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 245.
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"> • One Beep • A pause (or break) • Two beeps • A pause (or break) • Any number of beeps
4	Four continuous beeps

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

Beep Symptom	FRU/Action
3-4-1 Screen retrace test detected an error.	<ol style="list-style-type: none"> Video Adapter (if installed) System Board Display
3-4-2 POST is searching for video ROM.	<ol style="list-style-type: none"> Video Adapter (if installed) System Board
4	<ol style="list-style-type: none"> Video Adapter (if installed) System Board
All other beep code sequences.	<ol style="list-style-type: none"> System Board
One long and one short beep during POST. Base 640 KB memory error or shadow RAM error.	<ol style="list-style-type: none"> Memory Module System Board
One long beep and two or three short beeps during POST. (Video error)	<ol style="list-style-type: none"> Video Adapter (if installed) System Board
Three short beeps during POST.	<ol style="list-style-type: none"> See "System board memory" on page 263. System Board
Continuous beep.	<ol style="list-style-type: none"> System Board
Repeating short beeps.	<ol style="list-style-type: none"> Keyboard stuck key? Keyboard Cable System Board

No beep symptoms

Note

Type 6565 computer defaults 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 245.

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

Symptom/Error	FRU/Action
No beep during POST.	<ol style="list-style-type: none">1. See “Undetermined problem” on page 296.2. System Board3. Memory Module4. Any Adapter or Device5. Power Cord6. Power Supply

POST error codes

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

POST Error Code	FRU/Action
000 SCSI Adapter not enabled.	1. Verify adapter device and Bus Master fields are enabled in PCI configuration program. See documentation shipped with computer.
02X	1. SCSI Adapter
08X Check SCSI terminator installation.	1. SCSI Cable 2. SCSI Terminator 3. SCSI Device 4. SCSI Adapter
101 System board interrupt failure.	1. System Board
102 System board timer error.	1. System Board
106	1. System Board
110 System board memory parity error.	1. Memory Module 2. System Board
111 I/O channel parity error.	1. Reseat adapters 2. Any Adapter 3. System Board
114 Adapter ROM error.	1. Adapter Memory 2. System Board
129 Internal cache test error.	1. Processor 2. L2 Cache Memory 3. System Board
151 Real-time clock failure.	1. System Board
161 Bad CMOS battery.	1. Run Setup 2. CMOS Backup Battery (See page "Safety information" on page 420.) 3. System Board

POST Error Code	FRU/Action
162 Configuration mismatch.	<ol style="list-style-type: none"> 1. Run Setup and verify Configuration 2. Had a device been added, removed, changed location? If not, suspect that device. 3. Power-on external devices first, then power-on computer. 4. CMOS Backup Battery (See page "Safety information" on page 420.) 5. System Board
162 And unable to run diagnostics.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
163 Clock not updating or invalid time set.	<ol style="list-style-type: none"> 1. Time and Date Set? 2. CMOS Backup Battery (See page "Safety information" on page 420.) 3. System Board
164 POST detected a base memory or extended memory size mismatch error.	<ol style="list-style-type: none"> 1. Run Setup. Check System Summary menu for memory size change. (See "Setup Utility program" on page 245.) 2. Run the Extended Memory Diagnostic tests.
166 Boot Block Check Sum Error	<ol style="list-style-type: none"> 1. Run Flash Recovery using Boot Block. See "Flash recovery boot block" on page 257 2. System Board
167 Microprocessor installed that is not supported by the current POST/BIOS.	<ol style="list-style-type: none"> 1. Run Setup. Check Stepping level for the BIOS level needed, then perform the flash update. 2. Processor
168 Alert on LAN error	<ol style="list-style-type: none"> 1. Run Setup. Check to see that Ethernet and Alert on LAN are enabled. 2. System Board
17X, 18X	<ol style="list-style-type: none"> 1. C2 Security

POST Error Code	FRU/Action
175	<ol style="list-style-type: none"> 1. Run Configuration (See "Setup Utility program" on page 245.) 2. System Board
176	<ol style="list-style-type: none"> 1. Covers were removed from the computer.
177 Corrupted Administrator Password.	<ol style="list-style-type: none"> 1. System Board
178	<ol style="list-style-type: none"> 1. System Board
183	<ol style="list-style-type: none"> 1. Enter the administrator password
184 No RFID Antenna	<ol style="list-style-type: none"> 1. Make sure Asset Care and Asset ID™ are enabled in Configuration/Setup. 2. RFID Antenna 3. System Board
185 Corrupted boot sequence.	<ol style="list-style-type: none"> 1. Set configuration and reinstall the boot sequence.
186	<ol style="list-style-type: none"> 1. System Board
187	<ol style="list-style-type: none"> 1. Clear Administration password 2. System Board
189	<ol style="list-style-type: none"> 1. More than three password attempts were made to access the computer.
190 Chassis intrusion detector was cleared. This is information only, no action required. If this code does not clear:	<ol style="list-style-type: none"> 1. System Board
1XX Not listed above.	<ol style="list-style-type: none"> 1. System Board
201, 20X Memory data error.	<ol style="list-style-type: none"> 1. Run Enhanced Diag. Memory Test 2. Memory Module 3. System Board
225	<ol style="list-style-type: none"> 1. Unsupported Memory
229 External cache test error.	<ol style="list-style-type: none"> 1. L2 Cache Memory 2. System Board

POST Error Code	FRU/Action
262 POST detected a base memory or extended memory type error.	<ol style="list-style-type: none"> 1. Run Setup. Check System Summary menu for memory type change. (See "Setup Utility program" on page 245.) 2. Run the Extended Memory Diagnostic tests.
301	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
303 With an 8603 error.	<ol style="list-style-type: none"> 1. Mouse 2. Keyboard 3. Keyboard Cable 4. System Board
303 With no 8603 error.	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
3XX Not listed above.	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
5XX	<ol style="list-style-type: none"> 1. Video Adapter (if installed) 2. System Board
601	<ol style="list-style-type: none"> 1. Diskette Drive A 2. Diskette Drive Cable 3. System Board
602	<ol style="list-style-type: none"> 1. Bad Diskette ? 2. Verify Diskette and retry.
604 And able to run diagnostics.	<ol style="list-style-type: none"> 1. Run Setup and verify diskette configuration settings 2. Diskette Drive A/B 3. Diskette Drive Cable 4. System Board
605 POST cannot unlock the diskette drive.	<ol style="list-style-type: none"> 1. Diskette Drive 2. Diskette Drive Cable 3. System Board
662	<ol style="list-style-type: none"> 1. Diskette drive configuration error or wrong diskette drive type, run Setup Configuration.
6XX Not listed above.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. External Drive Adapter 4. Diskette Drive Cable 5. Power Supply

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

POST Error Code	FRU/Action
11XX Not listed above.	1. System Board
1201	1. System Board 2. Any Serial Device
1202, 1206, 1208, 1209, 12XX	1. Dual Async Adapter/A 2. System Board 3. Any Serial Device
1207	1. Communications Cable 2. Dual Async Adapter/A
13XX	1. Game Adapter
1402 Printer not ready.	Information only
1403 No paper error, or interrupt failure.	Information only
1404 System board timeout failure.	1. Run Enhanced Diagnostics
1405 Parallel adapter error.	1. Run Enhanced Diagnostics
1406 Presence test error.	1. Run Enhanced Diagnostics
14XX Not listed above. Check printer before replacing system board.	1. Printer 2. System Board
15XX	1. SDLC Adapter
1692 Boot sequence error.	1. Run FDISK to ensure at least one active partition is set active.
16XX	1. 36/38 Workstation Adapter
1762 Hard disk drive configuration error.	1. Run Configuration (See "Setup Utility program" on page 245.)
1780 (Disk Drive 0) 1781 (Disk Drive 1) 1782 (Disk Drive 2) 1783 (Disk Drive 3)	1. See "Power supply" on page 233. 2. Hard Disk Drive 3. System Board 4. Hard Disk Cable 5. Power Supply

POST Error Code	FRU/Action
180X, 188X PCI configuration or resource error.	<ol style="list-style-type: none"> 1. Run Setup and verify PCI/ISA configuration settings. 2. If necessary, set ISA adapters to "Not available" to allow PCI adapters to properly configure. 3. Remove any suspect ISA adapters. 4. Rerun diagnostics. 5. PCI Adapter
1962 Boot sequence error.	<ol style="list-style-type: none"> 1. Possible hard disk drive problem, see "Hard disk drive boot error" on page 245.
209X	<ol style="list-style-type: none"> 1. Diskette Drive 2. Diskette Cable 3. 16-bit AT Fast SCSI Adapter
20XX Not listed above	<ol style="list-style-type: none"> 1. BSC Adapter
21XX	<ol style="list-style-type: none"> 1. SCSI Device 2. 16-bit AT Fast SCSI Adapter 3. Alternate BSC Adapter
2401, 2402 If screen colors change.	<ol style="list-style-type: none"> 1. Display
2401, 2402 If screen colors are OK.	<ol style="list-style-type: none"> 1. System Board 2. Display
2409	<ol style="list-style-type: none"> 1. Display
2410	<ol style="list-style-type: none"> 1. System Board 2. Display
2462 Video memory configuration error.	<ol style="list-style-type: none"> 1. Check cable connections. 2. Run Setup and verify video configuration settings. 3. Video Memory Modules 4. Video Adapter (if installed) 5. System Board
3015, 3040 Check for missing wrap or terminator plug on the adapter.	<ol style="list-style-type: none"> 1. Network Attached? 2. LF Translator 3. Cable Problem 4. PC Network Adapter
30XX	<ol style="list-style-type: none"> 1. PC Network Adapter 2. LF Translator 3. Cable Problem?

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

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

POST Error Code	FRU/Action
10450, 10451, 10490 10491, 10492, 10499 Read/write error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics 2. Hard Disk Drive 3. System Board
10452 Seek test error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10453 Wrong drive type?	Information only
10454 Sector buffer test error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10455, 10456 Controller error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10459 Drive diagnostic command error.	Information only
10461 Drive format error	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10462 Controller seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10464 Hard Drive read error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10467 Drive non fatal seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10468 Drive fatal seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10469 Drive soft error count exceeded.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10470, 10471, 10472 Controller wrap error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10473 Corrupt data. Low level format might be required.	Information only
10480	<ol style="list-style-type: none"> 1. Hard Disk Drive (ESDI) 2. Drive Cable 3. System Board
10481 ESDI drive D seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10482 Drive select acknowledgement bad.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
106X1	<ol style="list-style-type: none"> 1. Check Configuration 2. Ethernet Adapter
10635	<ol style="list-style-type: none"> 1. Power-off computer, wait ten seconds; then power-on the computer. 2. Ethernet Adapter

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

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

POST Error Code	FRU/Action
210XXXX Internal bus, size unknown. 210XXX1 External bus, size unknown.	<ol style="list-style-type: none"> 1. SCSI Hard Disk Drive 2. SCSI Adapter or System Board 3. SCSI Cable 4. SCSI ID Switch (on some models)
Tape Drive amber LED remains on.	<ol style="list-style-type: none"> 1. Tape Drive 2. SCSI Cable (internal) 3. SCSI Adapter or System Board
Tape Drive green "in use" LED fails to come on.	<ol style="list-style-type: none"> 1. Tape Drive 2. SCSI Adapter or System Board 3. SCSI Cable (internal) SCSI Cable (external)
Tape automatically ejected from drive.	<ol style="list-style-type: none"> 1. Tape Cassette 2. Drive
SCSI ID on rotary switch does not match SCSI ID set in configuration. Verify drive switches inside cover are set to zero.	<ol style="list-style-type: none"> 1. Rotary Switch Circuit Board 2. Circuit Board Cable 3. Tape Drive
Tape sticks/breaks in drive. Verify that the tapes used meet ANSI standard X3B5.	<ol style="list-style-type: none"> 1. Tape Cassette
212XX	<ol style="list-style-type: none"> 1. SCSI Printer 2. Printer Cable
213XX	<ol style="list-style-type: none"> 1. SCSI Processor
214XX	<ol style="list-style-type: none"> 1. WORM Drive
215XXXC 215XXXD 215XXXE 215XXXU If an external device, and power-on LED is off, check external voltages.	<ol style="list-style-type: none"> 1. CD-ROM Drive I CD-ROM Drive II Enhanced CD-ROM Drive II Any CD-ROM Drive 2. SCSI Cable 3. SCSI Adapter or System Board
216XX	<ol style="list-style-type: none"> 1. Scanner
217XX If an external device, and power-on LED is off, check external voltages.	<ol style="list-style-type: none"> 1. Rewritable Optical Drive 2. SCSI Adapter or System Board 3. SCSI Cable
218XX Check for multi CD tray, or juke box.	<ol style="list-style-type: none"> 1. Changer
219XX	<ol style="list-style-type: none"> 1. SCSI Communications Device

POST Error Code	FRU/Action
24201Y0, 24210Y0 Be sure wrap plug is attached.	<ol style="list-style-type: none"> 1. ISDN/2 Adapter 2. ISDN/2 Wrap Plug 3. ISDN/2 Communications Cable
273XX	<ol style="list-style-type: none"> 1. 1 Mbps Micro Channel Infrared LAN Adapter
27501, 27503 27506, 27507	<ol style="list-style-type: none"> 1. ServerGuard Adapter 2. System Board
27502, 27504, 27510 27511, 27533, 27534 27536, 27537	<ol style="list-style-type: none"> 1. ServerGuard Adapter
27509	<ol style="list-style-type: none"> 1. Remove redundant adapters, run Auto Configuration program, then retest.
27512	<ol style="list-style-type: none"> 1. WMSELF.DGS diagnostics file missing. 2. WMSELF.DGS diagnostics file incorrect.
27535	<ol style="list-style-type: none"> 1. 3V Lithium Backup Battery 2. ServerGuard Adapter
27554	<ol style="list-style-type: none"> 1. Internal Temperature out of range 2. ServerGuard Adapter
27555, 27556	<ol style="list-style-type: none"> 1. ServerGuard Adapter 2. Power Supply
27557	<ol style="list-style-type: none"> 1. 7.2V NiCad Main Battery Pack 2. ServerGuard Adapter
27558, 27559 27560, 27561	<ol style="list-style-type: none"> 1. PCMCIA Type II Modem 2. ServerGuard Adapter
27562	<ol style="list-style-type: none"> 1. External Power Control not connected 2. External Power Control 3. ServerGuard Adapter
27563, 27564	<ol style="list-style-type: none"> 1. External Power Control 2. ServerGuard Adapter
275XX	<ol style="list-style-type: none"> 1. Update Diagnostic Software
27801 to 27879	<ol style="list-style-type: none"> 1. Personal Dictation System Adapter 2. System Board
27880 to 27889	<ol style="list-style-type: none"> 1. External FRU (Speaker, Microphone)

POST Error Code	FRU/Action
1999030X Hard disk reset failure.	Possible hard disk drive problem, see “Hard disk drive boot error” on page 245.

Miscellaneous error messages

Message/Symptom	FRU/Action
CMOS Backup Battery inaccurate.	<ol style="list-style-type: none"> 1. CMOS Backup Battery See page "Safety information" on page 420. 2. System Board
Changing colors.	<ol style="list-style-type: none"> 1. Display
Computer will not power-off. See "Power supply" on page 233.	<ol style="list-style-type: none"> 1. Power Switch 2. System Board
Computer will not RPL from server	<ol style="list-style-type: none"> 1. Ensure Network is in startup sequence as first device or first device after diskette. 2. Ensure Network adapter is enabled for RPL. 3. Network adapter (Advise network administrator of new MAC address)
Computer will not Wake On LAN [™]	<ol style="list-style-type: none"> 1. Check power supply and signal cable connections to network adapter. 2. Ensure Wake On LAN feature is enabled in Setup/Configuration. See "Setup Utility program" on page 245. 3. Ensure network administrator is using correct MAC address. 4. Ensure no interrupt or I/O address conflicts. 5. Network adapter (Advise network administrator of new MAC address)
Dead computer. See "Power supply" on page 233.	<ol style="list-style-type: none"> 1. Power Switch 2. Power Supply 3. System Board
Diskette drive in-use light remains on or does not light when drive is active.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
Flashing cursor with an otherwise blank display.	<ol style="list-style-type: none"> 1. System Board 2. Primary Hard Disk Drive 3. Hard Disk Drive Cable
Incorrect memory size during POST.	<ol style="list-style-type: none"> 1. Run the Memory tests. 2. Memory Module 3. System Board

Message/Symptom	FRU/Action
"Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable 4. Network Adapter
Intensity or color varies from left to right of characters and color bars.	<ol style="list-style-type: none"> 1. Display 2. System Board
No power, or fan not running.	<ol style="list-style-type: none"> 1. See "Power supply" on page 233.
Nonsystem disk or disk error-type message with a known-good diagnostic diskette.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
Other display symptoms not listed above (including blank or illegible display).	<ol style="list-style-type: none"> 1. See "Display" on page 235. 2. System Board 3. Display
Power-on indicator or hard disk drive in-use light not on, but computer works correctly.	<ol style="list-style-type: none"> 1. Power Supply 2. System Board 3. LED Cables
Printer problems.	<ol style="list-style-type: none"> 1. See "Printer" on page 232.
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> 1. Run Setup 2. Diskette Drive 3. Diskette Drive Cable 4. System Board 5. Power Supply
RPL computer cannot access programs from its own hard disk.	<ol style="list-style-type: none"> 1. If network admin. is using LCCM Hybrid RPL, check startup sequence: First device: network; Second device: hard disk 2. Hard disk drive
RPL computer does not RPL from server.	<ol style="list-style-type: none"> 1. Check startup sequence 2. Check the network adapter LED status
Serial or parallel port device failure (system board port).	<ol style="list-style-type: none"> 1. External Device Self-Test OK? 2. External Device 3. Cable 4. System Board
Serial or parallel port device failure (adapter port).	<ol style="list-style-type: none"> 1. External Device Self-Test OK? 2. External Device 3. Cable 4. Alternate Adapter 5. System Board

Message/Symptom	FRU/Action
Some or all keys on the keyboard do not work.	<ol style="list-style-type: none">1. Keyboard2. Keyboard Cable3. System Board

Undetermined problem

Check the power supply voltages. See "Power supply" on page 233. 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. Memory modules
Before removing or replacing memory modules, see "System board memory" on page 263.
 - e. Extended video memory
 - f. External Cache
 - g. External Cache RAM
 - h. Hard disk drive
 - i. Diskette drive
3. Power-on the computer to re-test the system.
4. Repeat steps 1 through 3 until you find the failing device or adapter.

If all devices and adapters have been removed, and the problem continues, replace the system board. See "Replacing a system board" on page 250.

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 9. Country/Region/Language Model Definition.

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

Type/Model configuration tables (6565)

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 6565	299

Table 10 (Page 1 of 3). PC 300 Type 6565 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
40X - Open Bay	500 MHz	N/A	N/A	N/A	4X4	N/A	N/A
41X	500 MHz	64 MB SDRAM	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows 98
42X	500 MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows NT
43X	500 MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows 98
44X	500 MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows NT
49X	500 MHz	64 MB	9.1 GB SCSI	S3 AGP2 - 8MB	4X4	N/A	OS/2 License
60X - Open Bay	533EB MHz	N/A	N/A	N/A	4X4	N/A	N/A
61X	533EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows 98
62X	533EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows NT
63X	533B MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows 98
64X	533B MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	40X 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 297.
3. Processor = Pentium® III
4. Audio = integrated on system board.
5. Open Bay = Authorized Assembler Program. See the note on page 298

Table 10 (Page 2 of 3). PC 300 Type 6565 - Desktop

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
65X	533EB MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16MB	4X4	40X Max	Windows NT
66X	533EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows NT
67X	533EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	40X Max	Windows 98
70X - Open Bay	800 MHz	N/A	N/A	N/A	4X4	N/A	N/A
80X - Open Bay	600EB MHz	N/A	N/A	N/A	4X4	N/A	N/A
82X	600EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows 98
83X	600EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows NT
84X	600EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	48X Max	Windows 98
85X	600EB MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	48X Max	Windows NT
86X	600EB MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16MB	4X4	48X Max	Windows 98
87X	600EB MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16MB	4X4	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 297.
3. Processor = Pentium® III
4. Audio = integrated on system board.
5. Open Bay = Authorized Assembler Program. See the note on page 298

Table 10 (Page 3 of 3). PC 300 Type 6565 - Desktop

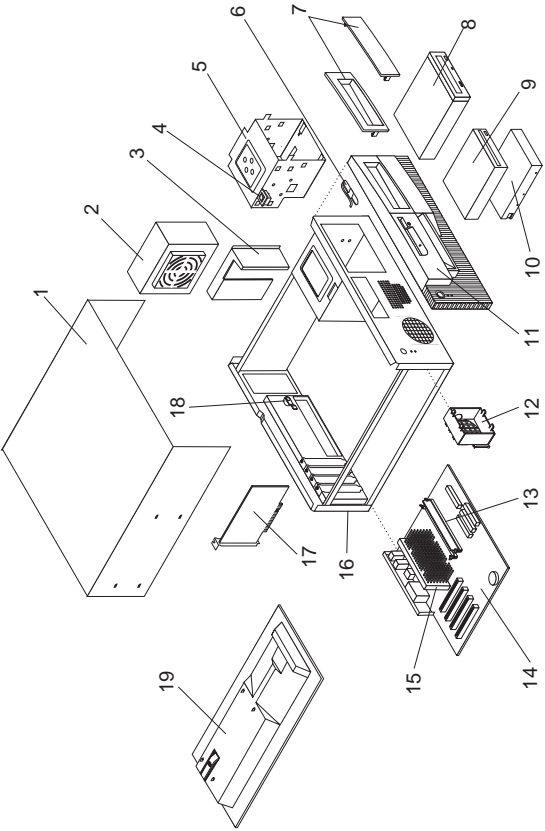
Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
90X - Open Bay	667 MHz	N/A	N/A	N/A	4X4	N/A	N/A
92X	667 MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows 98
93X	667 MHz	64 MB	10.1 GB EIDE	S3 AGP2 - 8MB	4X4	N/A	Windows NT
96X	667 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16MB	4X4	48X Max	Windows 98
97X	667 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16MB	4X4	48X Max	Windows NT
98X - Open Bay	733 MHz	N/A	N/A	N/A	4X4	N/A	N/A
99X	667 MHz	64 MB	9.1 GB SCSI	S3 AGP2 - 8MB	4X4	N/A	OS/2 License
D1(J)	533B MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	48X Max	Windows 98
D2(J)	533B MHz	64 MB	13.5 GB EIDE	S3 AGP2 - 8MB	4X4	48X Max	Windows NT
E1X	733 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16MB	4X4	48X Max	Windows 98
E2X	733 MHz	128 MB	20.4 GB EIDE	S3 AGP4 - 16MB	4X4	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 297.
3. Processor = Pentium® III
4. Audio = integrated on system board.
5. Open Bay = Authorized Assembler Program. See the note on page 298

Notes:

Parts (Type 6565)



Parts listing

Index	System (Type 6565)	FRU No.
1	Top Cover Assembly	09K9825
2	Power Supply-145W	01K9870
2	Power Supply-145W (China)	36L8815
2	Power Supply-145W (Japan)	20L2314
3	Fan Duct Kit	37L4995
4	C2 security switch assembly	09K9827
5	Hard File/Floppy Bracket	09K9847
6	RFID antenna	03K9654
7	Bezel Kit	37L5097
8	CD-ROM (40X Max)	36L8789
8	CD-ROM (48X Max)	09N0735
9	1.44 MB, 3.5-Inch Diskette Drive	75H9550
9	1.44 MB, 3.5-Inch Diskette Drive (Japan)	75H9552
	Order either of the 10.1 GB hard drives below	
10	10.1 GB EIDE Hard Disk Drive	37L5717
10	10.1 GB EIDE Hard Disk Drive	36L8627
10	13.5 GB EIDE Hard Disk Drive	36L8689
	Order either of the below 20.4 GB hard drives	
10	20.4 GB EIDE Hard Disk Drive	36L8628
10	20.4 GB EIDE Hard Disk Drive	37L5723
10	9.1 GB SCSI Hard Disk Drive 7200 rpm	36L8648
11	Front Bezel Assembly	37L5096
12	Fan/Card Guide Assembly	37L5093
13	Memory - 64 MB ECC	33L3080
13	Memory - 64 MB SDRAM	33L3072
13	Memory - 128 MB SDRAM	33L3074
14	System Board - for 500/533B/600B processors (no processor, no memory)	61H2533
14	System Board - for 533EB/600EB and higher processors (no processor, no memory)	61H2578
15	Pentium III 500/100 MHz.	00N3879
15	Pentium III 533B/133 MHz.	33L4066
15	Pentium III 600B/133 MHz.	01N2657
15	Pentium III 533EB/133 MHz.	09N3462
15	Pentium III 600EB/133 MHz	37L6034
15	Pentium III 667 MHz	00N3622
15	Pentium III 733 MHz	00N7174
16	Chassis Assembly	09K9823
17	Ethernet Adapter - Lake Clark 2.4	34L1109
17	SCSI Adapter - Adaptec 2940	10L7122
18	Key lock assembly	09K9829
19	Pedestal (Order via OBI option)	33L5136
	Cable - ATA-66 2 Drop	37L5098
	Cable - CD-ROM Audio	75H9219
	Cable - Diskette Drive	33L2596
	Cable - Hard Disk Cable, ATA	37L4525
	Cable - SCSI, hard disk	10K0805
	Cable - Wake On Ring	76H7345
	EMC Shield Kit for System Board	37L5095
	Foot (4)	03K9655
	EMC Shield for 5.25-inch Bay	20L3073
	LED/Power Switch Assembly	37L5092
	Lithium Battery	33F8354
	Miscellaneous Hardware Kit	20L3094

Index	System (Type 6565)	FRU No.
	Mouse - Scrollpoint 2	28L1865
	Name Plate (6565)	09K9849
	Savage2 Video Card-100 2xAGP	09N5898
	Savage2 Video Card-143 4xAGP	33L1618
	Savage2 Video Card-143 4xAGP dongle	09N3435
	Speaker/Cable Assembly	01K4909
	URM retainer Kit	33L4521

Keyboards - PCNext Lite (PC 300 Type 6565)

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 044	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
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 v.

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 - 6868/6878

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 6868/6878 computer.

Note

Service information is the same for types 6868 computers, unless specifically identified as type 6868 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.

General checkout	312
Module test menu and hardware configuration	
report	315
Keyboard	316
Printer	316
Power supply	317
20-pin main power supply connection	318
Display	319
Diagnostics and test information	320
Power-on self-test (POST)	320
POST beep codes	320
Error code format	321
IBM PC Enhanced Diagnostics	322
Starting the IBM PC Enhanced Diagnostics	
Program	322
Navigating through the diagnostic programs	322
Running diagnostic tests	323
Test selection	323
IBM PC Enhanced Memory Diagnostics	323
Alert On LAN test	324
Asset ID test	324
Test results	324
Hard file Smart test	325
IBM Fixed Disk Optimized Test	325
Quick and Full erase - hard drive	326
Iomega Zip Drive Test	326
Asset EEPROM backup	326
Viewing the test log	327
SIMM/DIMM/RIMM memory errors	327
Setup Utility program	329

Hard disk drive boot error	329
When to use the Low-Level Format program	330
Preparing the hard disk drive for use	330
Product description	331
Specifications Type 6868/6878	332
Additional service information	333
Replacing a processor	333
Replacing a system board	334
Security features	334
Passwords	334
Power-on password	335
Administrator password	336
Administrator password control	336
Operating system password	336
Vital product data	336
Management Information Format (MIF)	336
Alert on LAN	337
Asset ID	337
Hard disk drive jumper settings	339
IDE hard disk drive settings	339
CD-ROM drive jumper settings	340
BIOS levels	341
Flash (BIOS/VPD) update procedure	342
Flash recovery boot block	342
Power management	343
Automatic configuration and power interface (ACPI) BIOS	343
Advanced Power Management	343
Automatic Hardware Power Management features	343
Setting Automatic Hardware Power Management features	344
Automatic Power-On features	344
Enhanced Security	345
Network settings	346
Flash over LAN (update POST/BIOS over network)	346
Wake on LAN	347
System board memory	348
RIMM diagnostic approach	349
Computer exploded view (Type 6868/6878)	350
Input/Output connectors	351
Side cover removal	352
Top handle cover removal	352
Bezel removal	353
Top drive cage removal	353
Lower drive cage removal	354
Adapter removal	354
Support rail removal	355
Air Baffle removal	355
Terminator card removal	355
RIMM memory removal	356
RIMM memory installation	356
Lithium battery removal	356

Lithium battery installation	356
System board layout	357
System board locations	358
System board jumper settings	359
Symptom-to-FRU index	360
Beep symptoms	361
No beep symptoms	362
POST error codes	364
Miscellaneous error messages	379
Undetermined problem	382
Model tables - Country/Region/Language	383
Type/Model configuration tables (6868/6878)	384
Parts (Type 6868/6878)	390
Parts listing	391
Special tools	394

General checkout

This general checkout procedure is for IntelliStation Type 6868/6878 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 322.

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 341.
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 360.
4. If the computer hangs and no error is displayed, go to "Undetermined problem" on page 382.
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 329) 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 6868/6878 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 329.

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 329)
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 322.

003

Run the IBM PC Enhanced Diagnostics test. If necessary, refer to "Diagnostics and test information" on page 320.

- If you receive an error, replace the part that the diagnostic program calls out or go to "IBM PC Enhanced Diagnostics" on page 322.
- 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 316.

(Step **003** continues)

(CONTINUED)

003 (continued)

- If the printer has incorrect responses, go to "Printer" on page 316.
 - If the display has problems such as jittering, rolling, shifting, or being out of focus, go to "Display" on page 319.
-

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 382 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 382.

Keyboard

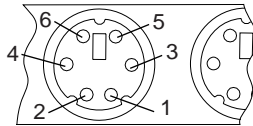
Note

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

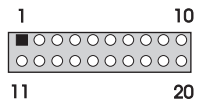
If the above are correct, check the following voltages.

20-pin main power supply connection

See "System board layout" on page 357 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 382.

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 6868/6878 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 329.

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 6868/6878 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 329.

Error code format

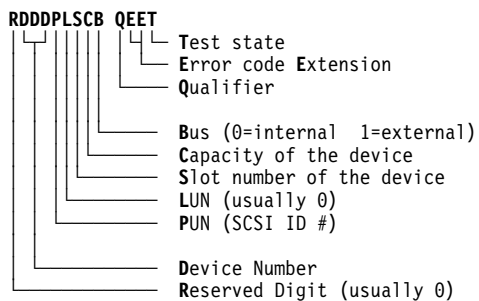
This section provides an explanation of the encoded non-SCSI and SCSI POST error codes.

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 PC Enhanced Memory Diagnostics
 - The memory diagnostic tests determine which memory module (SIMM, DIMM, or 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 memory module.

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 327.

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 which fails during testing. Use the System Board Layout section to reference the memory sockets.

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 SIMM/DIMM socket.

Only sockets containing a SIMM or DIMM can be selected for testing. Unpopulated 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 DIMM, or a device on the PCI bus.

Date:	Contains the date on which the diagnostic test was run. Date is retrieved from CMOS and displayed using the YYYYMMDD format.
ChkDigits:	Contains a 2-digit check-digit value to ensure that: <ul style="list-style-type: none"> • 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 copy of the FAT Table on all partitions (both the master and backup).
- Destroys the partition table.
- Provides messages that warn the user that this is a non-recoverable process.

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

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

Important

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

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

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

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.

Note

Type 6868/6878 computers use only RIMM memory modules.

SIMM/DIMM/RIMM memory errors:

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

Message	Failure Found	Recommended Actions
2xx-1y	A memory error was detected in SIMM socket Y	Replace the SIMM in the socket identified by the last digit of the error code. Re-run the test. If the same error code occurs again, replace the system board.
2xx-2y	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>Note:</p> <p>"Y" is the SIMM/DIMM/RIMM socket number. Use the System Board Layouts section in the latest PC 300/700, IntelliStation 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"> 1. Attempt to access and recover (back-up) the failing hard disk drive. 2. Using the operating systems programs, format the hard disk drive. 3. Go to "Preparing the hard disk drive for use" on page 330.
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 IntelliStation Type 6868/6878 computer is available in 6x7, (Six drive bays, seven I/O adapter slots, including an AGP socket) as minitower models.

- **Security**

- Administrator password
- Operating system password
- Power-on password
- Cover lock
- C2 security
- U-bolt and cable
- Startup sequence control
- Startup without diskette, keyboard, or mouse
- Unattended startup mode
- Diskette and hard drive I/O control
- Serial and parallel port I/O control
- Security profile by device
- IBM Security Solutions

- **CMOS backup battery (lithium)**

- **Common parts**

(Varies with each model, see “Type/Model configuration tables (6868/6878)” on page 384.)

- 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 6868/6878

Feature	Description
Size	Depth: 460 mm (18.1 inches) Height: 492 mm (19.4 inches) Width: 200 mm (7.9 inches)
Weight	Weight: 20.5 kg (45 lb) ¹⁸
Environment	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)
Heat Output	Approximate heat output in BTUs per hour: - As shipped: 361 BTU (106 watts) - Maximum: 1564 BTU (460 watts) ¹⁹
Electrical Input	Sine-wave input (50 to 60 Hz) required. Low range input voltage: - Minimum: 100 V ac - Maximum: 127 V ac High range input voltage: - Minimum: 200 V ac - Maximum: 240 V ac Input kVA (approximately): - Maximum (as shipped): 0.75 kVA
Airflow	Approximately 0.56 cubic meters/minute (20 CFM)
Acoustical Noise Emission Values	Average sound pressure levels: At operator position: - 44 dB operating - 40 dB idle At bystander position (1 meter): - 40 dB operating - 37 dB idle Declared (upper limit) sound power levels: - 5.5 bels operating - 5.2 bels idle

¹⁸ Maximum configuration weight depends on options installed.
Figures above are a system fully populated with options.

¹⁹ Maximum power and heat specifications are based on the 145-watt maximum capacity of the system power supply.

²⁰ For additional information, see the *ISO Supplier's Declaration* available from IBM.

Additional service information

The following additional service information supports the IntelliStation type 6868/6878.

- “Replacing a processor”
- “Replacing a system board” on page 334
- “Security features” on page 334
- “Passwords” on page 334
- “Vital product data” on page 336
- “Management Information Format (MIF)” on page 336
- “Alert on LAN” on page 337
- “Asset ID” on page 337
- “Hard disk drive jumper settings” on page 339
- “CD-ROM drive jumper settings” on page 340
- “BIOS levels” on page 341
- “Flash (BIOS/VPD) update procedure” on page 342
- “Flash recovery boot block” on page 342
- “Power management” on page 343
- “Enhanced Security” on page 345
- “Network settings” on page 346
- “Flash over LAN (update POST/BIOS over network)” on page 346
- “Wake on LAN” on page 347
- “System board memory” on page 348

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 341 “Vital product data” on page 336, and “Flash (BIOS/VPD) update procedure” on page 342.
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
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
- Asset ID

Passwords

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

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

Power-on and Administrator passwords are set in the Setup Utility program. See “Setup Utility program” on page 329 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:

Attention

If Enhanced Security is **not** enabled, this procedure will remove the administrator password, all setup and boot sequence settings and privilege access. Make sure these settings are recorded before you perform this procedure.

If Enhanced Security is enabled, Only Enhanced Security functions like boot sequence and privilege access will not be changed. Other settings will be cleared

1. Unplug the power cord and remove the top cover.
2. Refer to "System board layout" on page 357 to find the ROM Recover jumper.
3. Move the ROM Recover jumper to pins**2,3** position.
4. Power-on the computer. The system senses the change in the position and erases the password.
 - It is necessary to move the ROM Recover jumper to pins**1,2** 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 6868/6878 have Enhanced Security Mode. If Enhanced Security mode is enabled and there is no password given, the computer will act as if Enhanced Security is disabled.

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

Administrator password control The Administrator password is set in the Setup Configuration. Refer to "Setup Utility program" on page 329

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 342.

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, 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 LAN

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

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

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

Asset ID

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

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

Note

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

Hard disk drive jumper settings

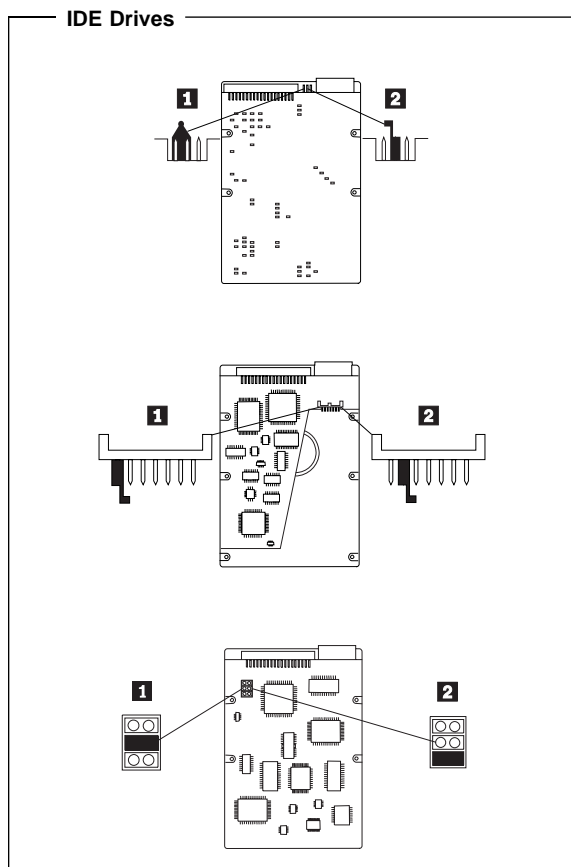
IDE hard disk drives for the IntelliStation series computers use jumpers to set the drives as primary (master) or secondary (slave).

Attention

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

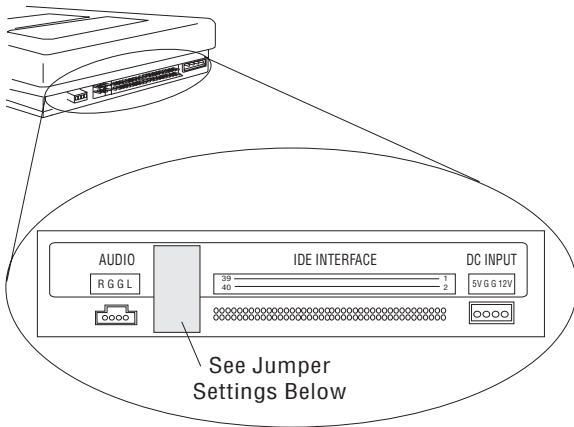
IDE hard disk drive settings

- 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. HelpCenter™
 4. Levels 1 and 2 Support
 5. RETAIN
- Sources for obtaining the latest level BIOS available.
 1. IBM PC Company Home Page
<http://www.ibm.com/pc/us/>
 2. PC PartnerInfo-Technical Database (CTSTIPS.NSF)
 3. HelpCenter
 4. Levels 1 and 2 Support

To update (flash) the BIOS, see “Flash (BIOS/VPD) update procedure” on page 342.

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 ROM Recover jumper enables you to restart the system and recover the BIOS.

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

1. Power-off the computer and remove the cover.
2. Move the system board ROM Recover jumper to pins **2,3**. Refer to "System board layout" on page 357 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 ROM Recover jumper to pins **1,2** position. Then, replace the cover and power-on the computer.

Power management

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

Automatic configuration and power

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

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

Attention

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

Automatic Hardware Power Management

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

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

Level 1 Set time from 5 minutes to 4 hours.

Level 2 Set time from 10 minutes to 5 hours.

Level 3 Set time from 15 minutes to 6 hours.

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

- **System Power:**
 - Select **On** for the computer to remain on.
 - Select **Off** for the computer to shut down.
- **Processor Speed:**

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

- **Display:**

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

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

Setting Automatic Hardware Power Management features

1. Start the Configuration/Setup Utility program (see “Setup Utility program” on page 329).
2. Select **Advanced Power Management** from the Configuration/Setup Utility program menu.
3. Be sure **APM BIOS Mode** is set to **Enabled**. If it is not, press Left Arrow (←) or Right Arrow (→) to change the setting.
4. Select **Automatic Hardware Power Management**.
5. Set **Automatic Hardware Power Management** to **Enabled**.
6. Select values for the three levels of power management (system power, processor speed, and display), as necessary.
7. Set **Hard Disk** to **Enabled** or **Disabled**.
Note: This does not apply to SCSI drives.
8. Press **Esc** twice to return to the Configuration/Setup Utility program menu.
9. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
10. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

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

- **Serial Port Ring Detect:** With this feature set to **Enabled** and an *external* modem connected to 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 6868 computer. For further information, see "Wake on LAN" on page 347.

Enhanced Security

Note

Type 6868/6878 have Enhanced Security Mode. If Enhanced Security mode is enabled and there is no password given, the computer will act as if Enhanced Security is disabled.

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

Enhanced Security is an additional security feature available on type 6868/6878.

Enhanced Security can be enabled or disabled only when you update system programs. If Enhanced Security is enabled and the administrator password has not been set, the computer will operate as if Enhanced Security is disabled.

If Enhanced Security is enabled and the administrator password has been set, the computer has these additional security measures:

- The contents of the security EEPROM (the administrator password and startup sequence) are protected if the battery or CMOS memory fails.
- The security EEPROM is protected from unauthorized access. The security EEPROM cannot be read from or written to by any software application or system software until Enhanced Security is disabled and the

computer is restarted. In a network environment, this might prevent certain functions from being performed on the computer.

- Remote Administration is locked and cannot be unlocked until Enhanced Security is disabled and the computer is restarted. This prevents the system programs in the computer from being updated remotely.
- The configuration settings in the Configuration/Setup Utility program are protected and cannot be changed until the administrator password has been entered. Any changes in computer hardware detected by the system programs in the computer will generate a configuration error until the administrator password has been entered.

To enable or disable Enhanced Security:

1. Insert a system programs update diskette into the diskette drive (drive A). System programs updates are available at <http://www.ibm.com/pc/support/us/> on the World Wide Web.
2. Power-on the computer. If it is powered on, you must power-off then power-on.
3. The update begins, the computer halts, and you are prompted for the administrator password (if you have set an administrator password). The computer remains in a halted state until the administrator password is entered.
4. When the administrator password is entered, or if no administrator password has been set, the update diskette will continue to run, and you are given the option of enabling or disabling Enhanced Security. The choice is automatically recorded in the System Security menu of the Configuration/Setup Utility program.

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 342.

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 329.
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 329.
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 6868/6878 computer. RIMM modules are not compatible with SIMM or DIMM memory modules. Refer to the information below regarding RIMM memory for type 6868, 6878.

Computer Name	RIMM Memory Module		
	Size	Memory	Type
IntelliStation Type 6868/ 6878	64 MB	PC600	RDRAM
	128 MB	PC800	ECC/ Non-ECC
	256 MB		
	512 MB		
	2 GB Maximum		

Supported RIMM memory configuration

Type 6868/6878 has two memory channels with two memory sockets for each channel making a total of four RIMM memory sockets. RIMM sockets must have a RIMM memory module or a C-RIMM (RIMM Continuity module) installed. There can be no empty RIMM sockets. RIMM sockets must contain either a RIMM or a C-RIMM. At least one socket, from each memory channel, must have a RIMM memory module installed.

Note

Both memory channels must be populated the same.

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

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

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

RIMM sizes of 64 MB, 128 MB, 256 MB, and 512 MB are acceptable. RIMM sockets, within each memory channel, can be filled in any order. However, both memory

channels must be populated the same. ECC or non-ECC, RAMBUS dynamic random access memory (RDRAM) are supported. If ECC and non-ECC are installed together, all memory will function as non-ECC.

Note

Mixed RIMM speeds will run at the lower speed.

RIMM diagnostic approach: Identify any Beep or POST codes. See “Symptom-to-FRU index” on page 360.

Use the IBM PC Enhanced Diagnostics program to run memory tests. See “IBM PC Enhanced Diagnostics” on page 322.

Procedures to determine memory errors:

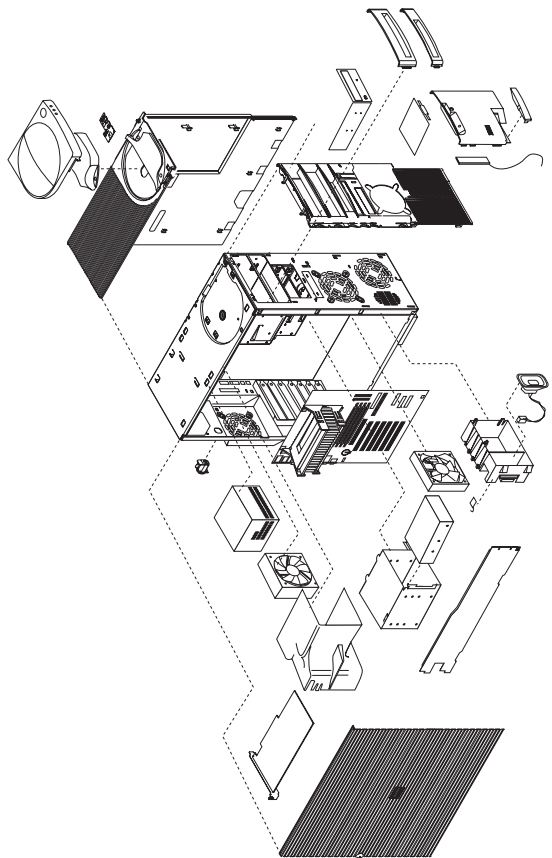
1. If a memory error occurs, and the system is operational, run memory diagnostics.
2. If a memory error occurs, and the system is not operational:
 - a. Replace one RIMM module at a time until the system comes up.

Note

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

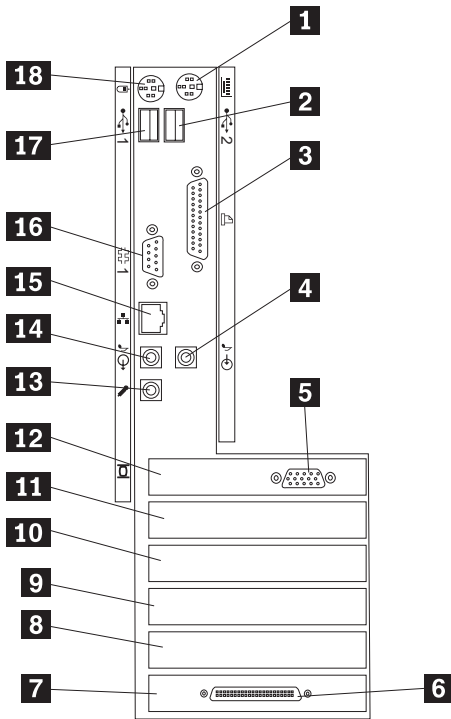
- b. Run memory diagnostics.
- c. Replace the other RIMMs and run diagnostics again to identify the failing RIMM.

Computer exploded view (Type 6868/6878)



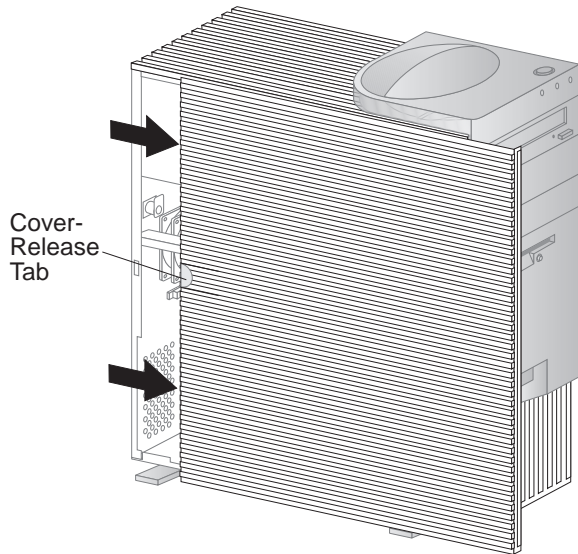
Input/Output connectors and removal procedures for the side cover, top handle, bezels, top and lower drive cage, adapter cards, support rail, air baffle, terminator card, RIMM memory, and lithium battery are on the following pages.

Input/Output connectors



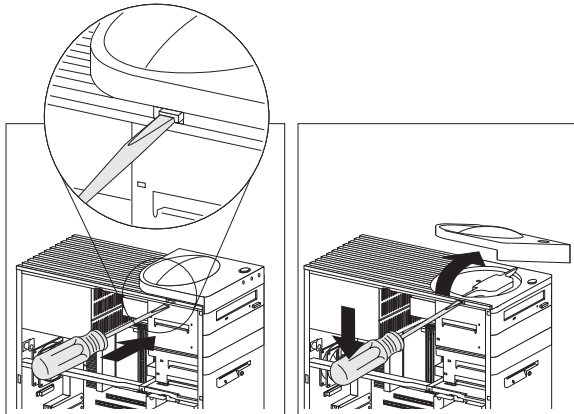
- 1** Keyboard connector
- 2** USB-2 connector
- 3** Parallel connector
- 4** Audio line in
- 5** Monitor connector
- 6** SCSI connector
- 7** PCI slot 5
- 8** PCI slot 4
- 9** PCI slot 3
- 10** PCI slot 2
- 11** PCI slot 1
- 12** AGP slot
- 13** microphone
- 14** Audio line out
- 15** Ethernet
- 16** Serial connector
- 17** USB-1 connector
- 18** Mouse connector

Side cover removal



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

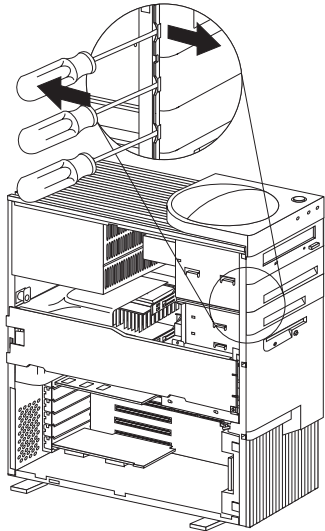
Top handle cover removal



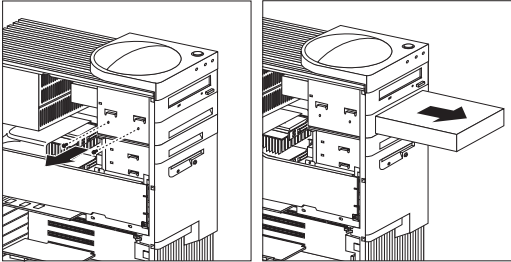
Attention

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

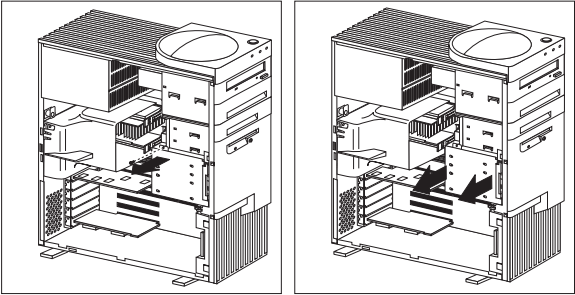
Bezel removal



Top drive cage removal

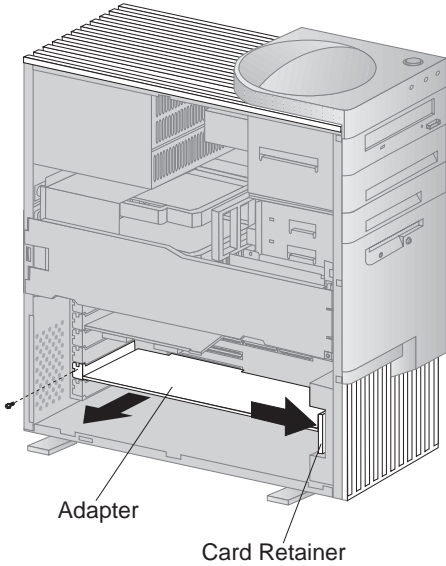


Lower drive cage removal

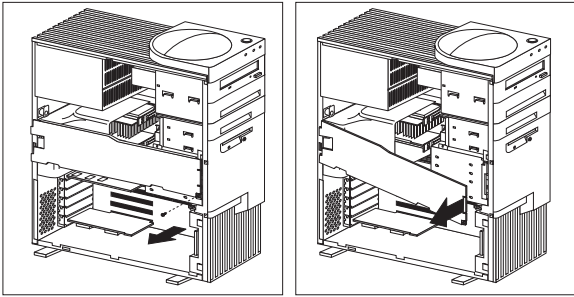


Note
Make sure the vibration insulation mounts are installed on the cage when installing a disk drive.

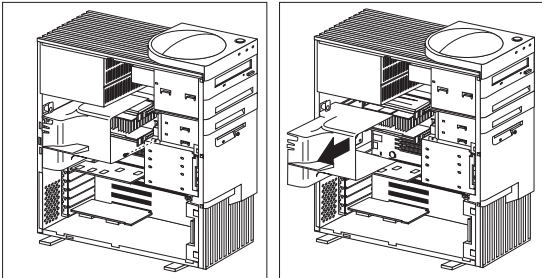
Adapter removal



Support rail removal



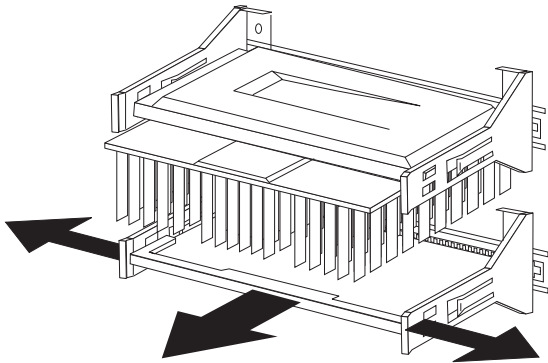
Air Baffle removal



Note

The baffle must be installed for proper air flow to the microprocessor(s).

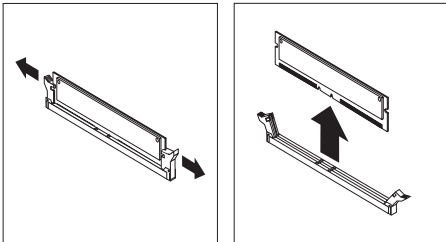
Terminator card removal



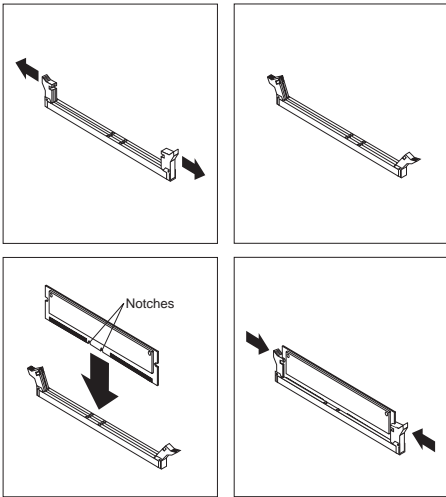
Note

Use this same procedure to remove the processor.

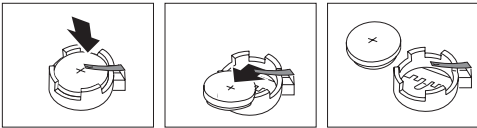
RIMM memory removal



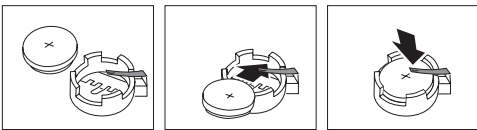
RIMM memory installation



Lithium battery removal



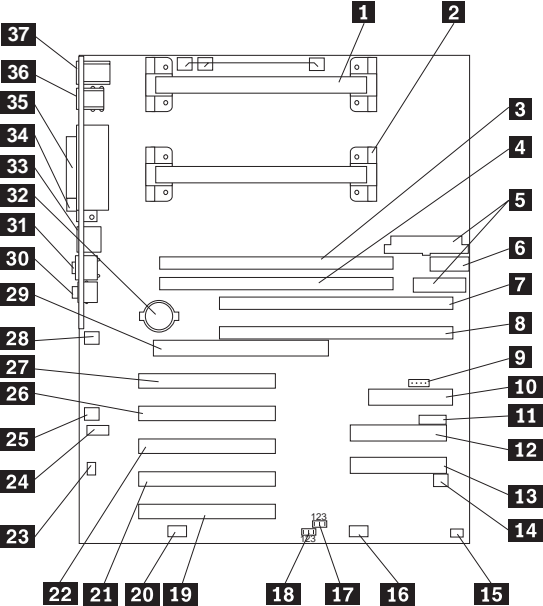
Lithium battery installation



Note

Do not bend the top contact tab of the battery holder as it might not make connection with the battery.

System board layout



System board locations

1	Primary processor socket
2	Secondary processor socket
3	RIMM socket 1 (Channel A)
4	RIMM socket 2 (Channel A)
5	Power connectors
6	Extra power connectors
7	RIMM socket 3 (Channel B)
8	RIMM socket 4 (Channel B)
9	SCSI LED connector
10	Diskette Drive connector
11	Front panel connector
12	Secondary IDE connector
13	Primary IDE connector
14	Fan connector, front chassis
15	C2 security connector
16	RFID connector
17	ROM recovery jumper
18	Administrator password jumper
19	PCI 5 slot
20	Alert on LAN
21	PCI 4 slot
22	PCI 3 slot
23	Internal Speaker connector
24	CD Audio connector
25	Wake on LAN
26	PCI 2 slot
27	PCI 1 slot
28	Fan connector, rear chassis
29	AGP slot
30	Microphone connector
31	Line In/Line Out connector
32	Battery
33	Ethernet connector
34	Serial connector
35	Parallel connector
36	USB connectors
37	Mouse/Keyboard connectors

System board jumper settings

The following tables contain the jumper setting information. (D) indicates the default setting.

Administrator jumper

Admin jumper	Jumper
enable	1-2
Disable	2-3 (D)

ROM Recover jumper

Note

The ROM Recover jumper clears CMOS and is also used for Flash update and Flash recovery boot block.

ROM Recover	Jumper
Normal	1-2 (D)
Boot Block Recover	2-3

Processor Speed Settings

Processor speed for the IntelliStation type 6868/6878 computer is fixed and is determined by the processor. There are no settings required.

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 312. 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 382.

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 317.)
- Check the hard disk drive jumper settings before you replace a hard disk drive. (See "Hard disk drive jumper settings" on page 339.)

Important

1. Some errors are indicated with a series of beep codes. (See "Beep symptoms" on page 361.)
Type 6868/6878 computer defaults 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 329.
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"> • One Beep • A pause (or break) • Two beeps • A pause (or break) • Any number of beeps
4	Four continuous beeps

Beep Symptom	FRU/Action
1-1-3 CMOS read/write error	<ol style="list-style-type: none"> 1. Run Setup 2. System Board
1-1-4 ROM BIOS check error	<ol style="list-style-type: none"> 1. System Board
1-2-X DMA error	<ol style="list-style-type: none"> 1. System Board
1-3-X	<ol style="list-style-type: none"> 1. Memory Module 2. C-RIMM not installed 3. Memory channels not same 4. System Board
1-4-4	<ol style="list-style-type: none"> 1. Keyboard 2. System Board
1-4-X Error detected in first 64 KB of RAM.	<ol style="list-style-type: none"> 1. Memory Module 2. System Board
2-1-1, 2-1-2	<ol style="list-style-type: none"> 1. Run Setup 2. System Board
2-1-X First 64 KB of RAM failed.	<ol style="list-style-type: none"> 1. Memory Module 2. System Board
2-2-2	<ol style="list-style-type: none"> 1. Video Adapter (if installed) 2. System Board
2-2-X First 64 KB of RAM failed.	<ol style="list-style-type: none"> 1. Memory Module 2. System Board
2-3-X	<ol style="list-style-type: none"> 1. Memory Module 2. System Board
2-4-X	<ol style="list-style-type: none"> 1. Run Setup 2. Memory Module 3. System Board
3-1-X DMA register failed.	<ol style="list-style-type: none"> 1. System Board
3-2-4 Keyboard controller failed.	<ol style="list-style-type: none"> 1. System Board 2. Keyboard

Beep Symptom	FRU/Action
3-3-4 Screen initialization failed.	<ol style="list-style-type: none"> Video Adapter (if installed) System Board Display
3-4-1 Screen retrace test detected an error.	<ol style="list-style-type: none"> Video Adapter (if installed) System Board Display
3-4-2 POST is searching for video ROM.	<ol style="list-style-type: none"> Video Adapter (if installed) System Board
4	<ol style="list-style-type: none"> Video Adapter (if installed) System Board
All other beep code sequences.	<ol style="list-style-type: none"> System Board
One long and one short beep during POST. Base 640 KB memory error or shadow RAM error.	<ol style="list-style-type: none"> Memory Module System Board
One long beep and two or three short beeps during POST. (Video error)	<ol style="list-style-type: none"> Video Adapter (if installed) System Board
Three short beeps during POST.	<ol style="list-style-type: none"> See "System board memory" on page 348. System Board
Continuous beep.	<ol style="list-style-type: none"> System Board
Repeating short beeps.	<ol style="list-style-type: none"> Keyboard stuck key? Keyboard Cable System Board

No beep symptoms

Note

Type 6868/6878 computer defaults 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 329.

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

Symptom/Error	FRU/Action
No beep during POST.	<ol style="list-style-type: none">1. See “Undetermined problem” on page 382.2. System Board3. Memory Module4. Any Adapter or Device5. Power Cord6. Power Supply

POST error codes

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

POST Error Code	FRU/Action
000 SCSI Adapter not enabled.	1. Verify adapter device and Bus Master fields are enabled in PCI configuration program. See documentation shipped with computer.
02X	1. SCSI Adapter
08X Check SCSI terminator installation.	1. SCSI Cable 2. SCSI Terminator 3. SCSI Device 4. SCSI Adapter
101 System board interrupt failure.	1. System Board
102 System board timer error.	1. System Board
106	1. System Board
110 System board memory parity error.	1. Memory Module 2. System Board
111 I/O channel parity error.	1. Reseat adapters 2. Any Adapter 3. System Board
114 Adapter ROM error.	1. Adapter Memory 2. System Board
129 Internal cache test error.	1. Processor 2. L2 Cache Memory 3. System Board
151 Real-time clock failure.	1. System Board
161 Bad CMOS battery.	1. Run Setup 2. CMOS Backup Battery (See page "Safety information" on page 420.) 3. System Board

POST Error Code	FRU/Action
162 Configuration mismatch.	<ol style="list-style-type: none"> 1. Run Setup and verify Configuration 2. Had a device been added, removed, changed location? If not, suspect that device. 3. Power-on external devices first, then power-on computer. 4. CMOS Backup Battery (See page "Safety information" on page 420.) 5. System Board
162 And unable to run diagnostics.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
163 Clock not updating or invalid time set.	<ol style="list-style-type: none"> 1. Time and Date Set? 2. CMOS Backup Battery (See page "Safety information" on page 420.) 3. System Board
164 POST detected a base memory or extended memory size mismatch error.	<ol style="list-style-type: none"> 1. Run Setup. Check System Summary menu for memory size change. (See "Setup Utility program" on page 329.) 2. See "System board memory" on page 348. 3. Run memory tests. See "IBM PC Enhanced Diagnostics" on page 322.
166 Boot Block Check Sum Error	<ol style="list-style-type: none"> 1. Run Flash Recovery using Boot Block. See "Flash recovery boot block" on page 342 2. System Board
167 Microprocessor installed that is not supported by the current POST/BIOS.	<ol style="list-style-type: none"> 1. Run Setup. Check Stepping level for the BIOS level needed, then perform the flash update. 2. Processor
168 Alert on LAN error	<ol style="list-style-type: none"> 1. Run Setup. Check to see that Ethernet and Alert on LAN are enabled. 2. System Board
17X, 18X	<ol style="list-style-type: none"> 1. C2 Security

POST Error Code	FRU/Action
175	<ol style="list-style-type: none"> 1. Run Configuration (See "Setup Utility program" on page 329.) 2. System Board
176	<ol style="list-style-type: none"> 1. Covers were removed from the computer.
177 An inventory violation occurred.	<ol style="list-style-type: none"> 1. Enter the administrator password 2. System Board
178	<ol style="list-style-type: none"> 1. System Board
183	<ol style="list-style-type: none"> 1. Enter the administrator password
184 No RFID Antenna	<ol style="list-style-type: none"> 1. Make sure Asset Care and Asset ID™ are enabled in Configuration/Setup. 2. RFID Antenna 3. System Board
185 Corrupted boot sequence.	<ol style="list-style-type: none"> 1. Set configuration and reinstall the boot sequence.
186	<ol style="list-style-type: none"> 1. System Board
187	<ol style="list-style-type: none"> 1. Clear Administration password 2. System Board
189	<ol style="list-style-type: none"> 1. More than three password attempts were made to access the computer.
190 Chassis intrusion detector was cleared. This is information only, no action required. If this code does not clear:	<ol style="list-style-type: none"> 1. System Board
1XX Not listed above.	<ol style="list-style-type: none"> 1. System Board
201, 20X Memory data error.	<ol style="list-style-type: none"> 1. Run Enhanced Diag. Memory Test 2. Memory Module 3. System Board
225	<ol style="list-style-type: none"> 1. Unsupported Memory
229 External cache test error.	<ol style="list-style-type: none"> 1. L2 Cache Memory 2. System Board

POST Error Code	FRU/Action
262 POST detected a base memory or extended memory type error.	<ol style="list-style-type: none"> 1. Run Setup. Check System Summary menu for memory type change. (See "Setup Utility program" on page 329.) 2. Run the Extended Memory Diagnostic tests.
301	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
303 With an 8603 error.	<ol style="list-style-type: none"> 1. Mouse 2. Keyboard 3. Keyboard Cable 4. System Board
303 With no 8603 error.	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
3XX Not listed above.	<ol style="list-style-type: none"> 1. Keyboard 2. Keyboard Cable 3. System Board
5XX	<ol style="list-style-type: none"> 1. Video Adapter (if installed) 2. System Board
601	<ol style="list-style-type: none"> 1. Diskette Drive A 2. Diskette Drive Cable 3. System Board
602	<ol style="list-style-type: none"> 1. Bad Diskette 2. Verify Diskette and retry. 3. Diskette Drive 4. Diskette Drive Cable 5. System Board
604 And able to run diagnostics.	<ol style="list-style-type: none"> 1. Run Setup and verify diskette configuration settings 2. Diskette Drive A/B 3. Diskette Drive Cable 4. System Board
605 POST cannot unlock the diskette drive.	<ol style="list-style-type: none"> 1. Diskette Drive 2. Diskette Drive Cable 3. System Board
662	<ol style="list-style-type: none"> 1. Diskette drive configuration error or wrong diskette drive type, run Setup Configuration.
6XX Not listed above.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. External Drive Adapter 4. Diskette Drive Cable 5. Power Supply

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

POST Error Code	FRU/Action
11XX Not listed above.	1. System Board
1201	1. System Board 2. Any Serial Device
1202, 1206, 1208, 1209, 12XX	1. Dual Async Adapter/A 2. System Board 3. Any Serial Device
1207	1. Communications Cable 2. Dual Async Adapter/A
13XX	1. Game Adapter
1402 Printer not ready.	Information only
1403 No paper error, or interrupt failure.	Information only
1404 System board timeout failure.	1. Run Enhanced Diagnostics
1405 Parallel adapter error.	1. Run Enhanced Diagnostics
1406 Presence test error.	1. Run Enhanced Diagnostics
14XX Not listed above. Check printer before replacing system board.	1. Printer 2. System Board
15XX	1. SDLC Adapter
1692 Boot sequence error.	1. Run FDISK to ensure at least one active partition is set active.
16XX	1. 36/38 Workstation Adapter
1762 Hard disk drive configuration error.	1. Run Configuration (See "Setup Utility program" on page 329.)
1780 (Disk Drive 0) 1781 (Disk Drive 1) 1782 (Disk Drive 2) 1783 (Disk Drive 3)	1. See "Power supply" on page 317. 2. Hard Disk Drive 3. System Board 4. Hard Disk Cable 5. Power Supply

POST Error Code	FRU/Action
180X, 188X PCI configuration or resource error.	<ol style="list-style-type: none"> 1. Run Setup and verify PCI/ISA configuration settings. 2. If necessary, set ISA adapters to "Not available" to allow PCI adapters to properly configure. 3. Remove any suspect ISA adapters. 4. Rerun diagnostics. 5. PCI Adapter
1962 Boot sequence error.	<ol style="list-style-type: none"> 1. Possible hard disk drive problem, see "Hard disk drive boot error" on page 329.
209X	<ol style="list-style-type: none"> 1. Diskette Drive 2. Diskette Cable 3. 16-bit AT Fast SCSI Adapter
20XX Not listed above	<ol style="list-style-type: none"> 1. BSC Adapter
21XX	<ol style="list-style-type: none"> 1. SCSI Device 2. 16-bit AT Fast SCSI Adapter 3. Alternate BSC Adapter
2401, 2402 If screen colors change.	<ol style="list-style-type: none"> 1. Display
2401, 2402 If screen colors are OK.	<ol style="list-style-type: none"> 1. System Board 2. Display
2409	<ol style="list-style-type: none"> 1. Display
2410	<ol style="list-style-type: none"> 1. System Board 2. Display
2462 Video memory configuration error.	<ol style="list-style-type: none"> 1. Check cable connections. 2. Run Setup and verify video configuration settings. 3. Video Memory Modules 4. Video Adapter (if installed) 5. System Board
3015, 3040 Check for missing wrap or terminator plug on the adapter.	<ol style="list-style-type: none"> 1. Network Attached? 2. LF Translator 3. Cable Problem 4. PC Network Adapter
30XX	<ol style="list-style-type: none"> 1. PC Network Adapter 2. LF Translator 3. Cable Problem?

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

POST Error Code	FRU/Action
8603, 8604	<ol style="list-style-type: none"> 1. System Board 2. Pointing Device (Mouse)
86XX Not listed above	<ol style="list-style-type: none"> 1. Mouse 2. System Board
89XX	<ol style="list-style-type: none"> 1. PC Music Adapter 2. MIDI Adapter Unit
91XX	<ol style="list-style-type: none"> 1. Optical Drive 2. Adapter
96XX	<ol style="list-style-type: none"> 1. SCSI Adapter 2. Any SCSI Device 3. System Board
10101, 10102, 10104 10105, 10106, 10107 10108, 10109, 10111 10112, 10113, 10114 10115, 10116	<ol style="list-style-type: none"> 1. Have customer verify correct operating system device drivers are installed and operational. 2. Modem
10103, 10110, 101171	<ol style="list-style-type: none"> 1. System Board 2. Data/Fax Modem
10117 Not listed above.	<ol style="list-style-type: none"> 1. Check system speaker 2. Check PSTN cable 3. External DAA (if installed) 4. Modem
10118	<ol style="list-style-type: none"> 1. Run Diagnostics and verify the correct operation of the modem slot 2. Modem
10119	<ol style="list-style-type: none"> 1. Diagnostics detected a non-IBM modem 2. Modem
10120	<ol style="list-style-type: none"> 1. Check PSTN Cable 2. External DAA (if installed) 3. Modem
10132, 10133, 10134 10135, 10136, 10137 10138, 10139, 10140 10141, 10142, 10143 10144, 10145, 10146 10147, 10148, 10149 10150, 10151, 10152	<ol style="list-style-type: none"> 1. Modem
10153	<ol style="list-style-type: none"> 1. Data/Fax Modem 2. System Board
101XX Not listed above.	<ol style="list-style-type: none"> 1. Modem Adapter/A 2. Data/Fax Modem 3. System Board

POST Error Code	FRU/Action
10450, 10451, 10490 10491, 10492, 10499 Read/write error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics 2. Hard Disk Drive 3. System Board
10452 Seek test error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10453 Wrong drive type?	Information only
10454 Sector buffer test error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10455, 10456 Controller error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10459 Drive diagnostic command error.	Information only
10461 Drive format error	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10462 Controller seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10464 Hard Drive read error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10467 Drive non fatal seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10468 Drive fatal seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10469 Drive soft error count exceeded.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10470, 10471, 10472 Controller wrap error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10473 Corrupt data. Low level format might be required.	Information only
10480	<ol style="list-style-type: none"> 1. Hard Disk Drive (ESDI) 2. Drive Cable 3. System Board
10481 ESDI drive D seek error.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
10482 Drive select acknowledgement bad.	<ol style="list-style-type: none"> 1. Run Enhanced Diagnostics
106X1	<ol style="list-style-type: none"> 1. Check Configuration 2. Ethernet Adapter
10635	<ol style="list-style-type: none"> 1. Power-off computer, wait ten seconds; then power-on the computer. 2. Ethernet Adapter

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

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

POST Error Code	FRU/Action
210XXXX Internal bus, size unknown. 210XXX1 External bus, size unknown.	<ol style="list-style-type: none"> 1. SCSI Hard Disk Drive 2. SCSI Adapter or System Board 3. SCSI Cable 4. SCSI ID Switch (on some models)
Tape Drive amber LED remains on.	<ol style="list-style-type: none"> 1. Tape Drive 2. SCSI Cable (internal) 3. SCSI Adapter or System Board
Tape Drive green "in use" LED fails to come on.	<ol style="list-style-type: none"> 1. Tape Drive 2. SCSI Adapter or System Board 3. SCSI Cable (internal) SCSI Cable (external)
Tape automatically ejected from drive.	<ol style="list-style-type: none"> 1. Tape Cassette 2. Drive
SCSI ID on rotary switch does not match SCSI ID set in configuration. Verify drive switches inside cover are set to zero.	<ol style="list-style-type: none"> 1. Rotary Switch Circuit Board 2. Circuit Board Cable 3. Tape Drive
Tape sticks/breaks in drive. Verify that the tapes used meet ANSI standard X3B5.	<ol style="list-style-type: none"> 1. Tape Cassette
212XX	<ol style="list-style-type: none"> 1. SCSI Printer 2. Printer Cable
213XX	<ol style="list-style-type: none"> 1. SCSI Processor
214XX	<ol style="list-style-type: none"> 1. WORM Drive
215XXXC 215XXXD 215XXXE 215XXXU If an external device, and power-on LED is off, check external voltages.	<ol style="list-style-type: none"> 1. CD-ROM Drive I CD-ROM Drive II Enhanced CD-ROM Drive II Any CD-ROM Drive 2. SCSI Cable 3. SCSI Adapter or System Board
216XX	<ol style="list-style-type: none"> 1. Scanner
217XX If an external device, and power-on LED is off, check external voltages.	<ol style="list-style-type: none"> 1. Rewritable Optical Drive 2. SCSI Adapter or System Board 3. SCSI Cable
218XX Check for multi CD tray, or juke box.	<ol style="list-style-type: none"> 1. Changer
219XX	<ol style="list-style-type: none"> 1. SCSI Communications Device

POST Error Code	FRU/Action
24201Y0, 24210Y0 Be sure wrap plug is attached.	<ol style="list-style-type: none"> 1. ISDN/2 Adapter 2. ISDN/2 Wrap Plug 3. ISDN/2 Communications Cable
273XX	<ol style="list-style-type: none"> 1. 1 Mbps Micro Channel Infrared LAN Adapter
27501, 27503 27506, 27507	<ol style="list-style-type: none"> 1. ServerGuard Adapter 2. System Board
27502, 27504, 27510 27511, 27533, 27534 27536, 27537	<ol style="list-style-type: none"> 1. ServerGuard Adapter
27509	<ol style="list-style-type: none"> 1. Remove redundant adapters, run Auto Configuration program, then retest.
27512	<ol style="list-style-type: none"> 1. WMSELF.DGS diagnostics file missing. 2. WMSELF.DGS diagnostics file incorrect.
27535	<ol style="list-style-type: none"> 1. 3V Lithium Backup Battery 2. ServerGuard Adapter
27554	<ol style="list-style-type: none"> 1. Internal Temperature out of range 2. ServerGuard Adapter
27555, 27556	<ol style="list-style-type: none"> 1. ServerGuard Adapter 2. Power Supply
27557	<ol style="list-style-type: none"> 1. 7.2V NiCad Main Battery Pack 2. ServerGuard Adapter
27558, 27559 27560, 27561	<ol style="list-style-type: none"> 1. PCMCIA Type II Modem 2. ServerGuard Adapter
27562	<ol style="list-style-type: none"> 1. External Power Control not connected 2. External Power Control 3. ServerGuard Adapter
27563, 27564	<ol style="list-style-type: none"> 1. External Power Control 2. ServerGuard Adapter
275XX	<ol style="list-style-type: none"> 1. Update Diagnostic Software
27801 to 27879	<ol style="list-style-type: none"> 1. Personal Dictation System Adapter 2. System Board
27880 to 27889	<ol style="list-style-type: none"> 1. External FRU (Speaker, Microphone)

POST Error Code	FRU/Action
1999030X Hard disk reset failure.	Possible hard disk drive problem, see “Hard disk drive boot error” on page 329.

Miscellaneous error messages

Message/Symptom	FRU/Action
CMOS Backup Battery inaccurate.	<ol style="list-style-type: none"> 1. CMOS Backup Battery See page "Safety information" on page 420. 2. System Board
Changing colors.	<ol style="list-style-type: none"> 1. Display
Computer will not power-off. See "Power supply" on page 317.	<ol style="list-style-type: none"> 1. Power Switch 2. System Board
Computer will not RPL from server	<ol style="list-style-type: none"> 1. Ensure Network is in startup sequence as first device or first device after diskette. 2. Ensure Network adapter is enabled for RPL. 3. Network adapter (Advise network administrator of new MAC address)
Computer will not Wake On LAN [™]	<ol style="list-style-type: none"> 1. Check power supply and signal cable connections to network adapter. 2. Ensure Wake On LAN feature is enabled in Setup/Configuration. See "Setup Utility program" on page 329. 3. Ensure network administrator is using correct MAC address. 4. Ensure no interrupt or I/O address conflicts. 5. Network adapter (Advise network administrator of new MAC address)
Dead computer. See "Power supply" on page 317.	<ol style="list-style-type: none"> 1. Power Switch 2. Power Supply 3. System Board
Diskette drive in-use light remains on or does not light when drive is active.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
Flashing cursor with an otherwise blank display.	<ol style="list-style-type: none"> 1. System Board 2. Primary Hard Disk Drive 3. Hard Disk Drive Cable
Incorrect memory size during POST.	<ol style="list-style-type: none"> 1. Run the Memory tests. 2. Memory Module 3. System Board

Message/Symptom	FRU/Action
"Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable 4. Network Adapter
Intensity or color varies from left to right of characters and color bars.	<ol style="list-style-type: none"> 1. Display 2. System Board
No power, or fan not running.	<ol style="list-style-type: none"> 1. See "Power supply" on page 317.
Nonsystem disk or disk error-type message with a known-good diagnostic diskette.	<ol style="list-style-type: none"> 1. Diskette Drive 2. System Board 3. Diskette Drive Cable
Other display symptoms not listed above (including blank or illegible display).	<ol style="list-style-type: none"> 1. See "Display" on page 319. 2. System Board 3. Display
Power-on indicator or hard disk drive in-use light not on, but computer works correctly.	<ol style="list-style-type: none"> 1. Power Supply 2. System Board 3. LED Cables
Printer problems.	<ol style="list-style-type: none"> 1. See "Printer" on page 316.
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	<ol style="list-style-type: none"> 1. Run Setup 2. Diskette Drive 3. Diskette Drive Cable 4. System Board 5. Power Supply
RPL computer cannot access programs from its own hard disk.	<ol style="list-style-type: none"> 1. If network admin. is using LCCM Hybrid RPL, check startup sequence: First device: network; Second device: hard disk 2. Hard disk drive
RPL computer does not RPL from server.	<ol style="list-style-type: none"> 1. Check startup sequence 2. Check the network adapter LED status
Serial or parallel port device failure (system board port).	<ol style="list-style-type: none"> 1. External Device Self-Test OK? 2. External Device 3. Cable 4. System Board
Serial or parallel port device failure (adapter port).	<ol style="list-style-type: none"> 1. External Device Self-Test OK? 2. External Device 3. Cable 4. Alternate Adapter 5. System Board

Message/Symptom	FRU/Action
Some or all keys on the keyboard do not work.	<ol style="list-style-type: none">1. Keyboard2. Keyboard Cable3. System Board

Undetermined problem

Check the power supply voltages. See "Power supply" on page 317. 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. Memory modules
Before removing or replacing memory modules, see "System board memory" on page 348.
 - e. Extended video memory
 - f. External Cache
 - g. External Cache RAM
 - h. Hard disk drive
 - i. Diskette drive
3. Power-on the computer to re-test the system.
4. Repeat steps 1 through 3 until you find the failing device or adapter.

If all devices and adapters have been removed, and the problem continues, replace the system board. See "Replacing a system board" on page 334.

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.

<i>Table 11. Country/Region/Language Model Definition.</i>	
EMEA	Model
EMEA preload	xxG
North America	Model
US English	xxU
Canadian French	xxF
Latin America (LA)	Model
Portuguese (Brazil)	xxP
LA Spanish	xxS
LA English	xxL
Asia Pacific (AP)	Model
AP English w/Keyboard	xxA
AP English w/o Keyboard	xxB
Japan (Japanese)	xxJ
Hong Kong (AP English)	xxH
China (Chinese)	xxC
China (AP English)	xxD
Thailand (Thai)	xxT
Taiwan (Chinese)	xxV
Taiwan (AP English)	xxW
Korea (Korean)	xxK
Korea (AP English)	xxR

Type/Model configuration tables (6868/6878)

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 6868/6878	385

Table 12 (Page 1 of 4). IntelliStation Type 6868/6878 - Minitower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
10X	600 MHz	2x64 MB RIMM	13.5 GB EIDE	Matrox G400 (AGP) 16MB	7X6	48X MAX	Windows NT
11X	600 MHz	2x64 MB RIMM	9.1 GB SCSI 7200 RPM	Applan Gemini (Dual Monitor) 16 MB	7X6	48X MAX	Windows NT
12X	600 MHz	2x64 MB RIMM	9.1 GB SCSI 7200 RPM	Matrox G400 (AGP) 16MB	7X6	48X MAX	Windows NT
13X	600 MHz	2x64 MB RIMM	13.5 GB EIDE	Applan Gemini (Dual Monitor) 16 MB	7X6	48X MAX	Windows NT
14X	600 MHz	2x64 MB RIMM	13.5 GB EIDE	Fire GL1 (AGP) 32 MB	7X6	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 383.
3. Memory = PC600 Memory, ECC RAMBUS RIMM memory modules.
4. Processor = Pentium® III, 133 MHz, FSB.
5. Audio = integrated on system board.
6. SCSI adapter = Ultra 2 SCSI w/U2B.
7. Open Bay = Authorized Assembler Program. See the note on page 384.

Table 12 (Page 2 of 4). IntelliStation Type 6868/6878 - Minitower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
15X	600 MHz	2x128 MB RIMM	9.1 GB SCSI 10,000 RPM	Fire GL1 (AGP) 32 MB	7X6	48X MAX	Windows NT
18X - Open Bay	600 MHz	N/A	N/A	N/A	7X6	N/A	N/A
20X	667 MHz	2x64 MB RIMM	13.5 GB EIDE	Matrox G400 (AGP) 16MB	7X6	48X MAX	Windows NT
21X	667 MHz	2x64 MB RIMM	9.1 GB SCSI 7200 RPM	Applan Gemini (Dual Monitor) 16 MB	7X6	48X MAX	Windows NT
22X	667 MHz	2x128 MB RIMM	9.1 GB SCSI 7200 RPM	Matrox G400 (AGP) 16MB	7X6	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 363.
3. Memory = PC600 Memory. ECC RAMBUS RIMM memory modules.
4. Processor = Pentium® III, 133 MHz. FSB.
5. Audio = integrated on system board.
6. SCSI adapter = Ultra 2 SCSI w/L2B.
7. Open Bay = Authorized Assembler Program. See the note on page 384.

Table 12 (Page 3 of 4). IntelliStation Type 6868/6878 - Minitower

Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
23X	667 MHz	2x64 MB RIMM	13.5 GB EIDE	Applian Gemini (Dual Monitor) 16 MB	7X6	48X MAX	Windows NT
25X	667 MHz	2x128 MB RIMM	9.1 GB SCSI 10,000 RPM	Fire GL1 (AGP) 32 MB	7X6	48X MAX	Windows NT
27X	667 MHz	2x128 MB RIMM	9.1 GB SCSI 10,000 RPM	Intense 3D 4110 (AGP) 80 MB	7X6	48X MAX	Windows NT
28X - Open Bay	667 MHz	N/A	N/A	N/A	7X6	N/A	N/A
30X	733 MHz	2x64 MB RIMM	13.5 GB EIDE	Matrox G400 (AGP) 16MB	7X6	48X MAX	Windows NT
31X	733 MHz	2x128 MB RIMM	9.1 GB SCSI 7200 RPM	Matrox G400 (AGP) 16MB	7X6	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 383.
3. Memory = PC600 Memory. ECC RAMBUS RIMM memory modules.
4. Processor = Pentium® III, 133 MHz. FSB.
5. Audio = integrated on system board.
6. SCSI adapter = Ultra 2 SCSI w/U2B.
7. Open Bay = Authorized Assembler Program. See the note on page 384.

Table 12 (Page 4 of 4). IntelliStation Type 6868/6878 - Minitower

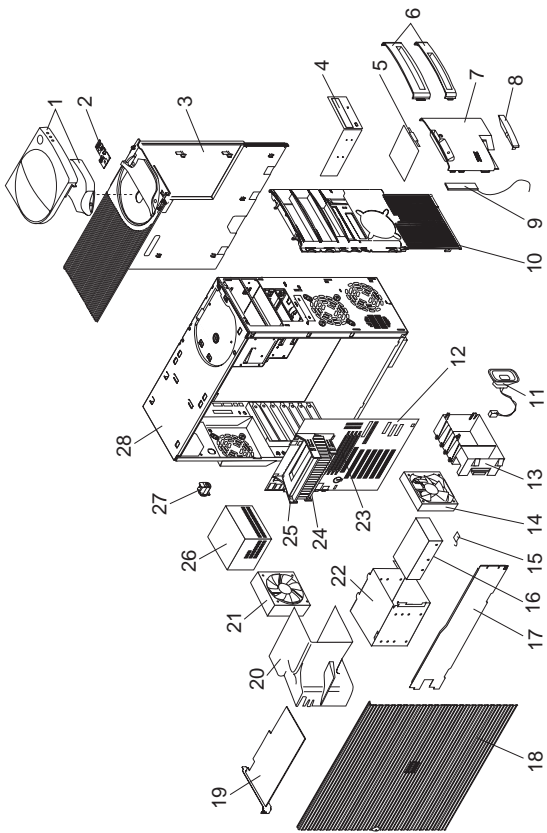
Model	Processor	Memory	Hard Drive	Graphics	Bays/Slots	CD-ROM	Preload
32X	733 MHz	2x128 MB RIMM	9.1 GB SCSI 7200 RPM	Matrox G400 (AGP) 16MB	7X6	48X MAX	Windows NT
35X	733 MHz	2x128 MB RIMM	9.1 GB SCSI 10,000 RPM	Fire GL1 (AGP) 32 MB	7X6	48X MAX	Windows NT
37X	733 MHz	2x128 MB RIMM	9.1 GB SCSI 10,000 RPM	Intense 3D 4110 (AGP) 80 MB	7X6	48X MAX	Windows NT
39X - Open Bay	733 MHz	N/A	N/A	N/A	7X6	N/A	N/A
91X	600 MHz	2x64 MB RIMM	9.1+18.2 GB SCSI 7200 RPM	Matrox G400 (AGP) 16MB + Canopus DVRaptor	7X6	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 383.
3. Memory = PC600 Memory. ECC RAMBUS RIMM memory modules.
4. Processor = Pentium® III, 133 MHz. FSB.
5. Audio = integrated on system board.
6. SCSI adapter = Ultra 2 SCSI w/L2B.
7. Open Bay = Authorized Assembler Program. See the note on page 384.

Notes:

Parts (Type 6868/6878)



Parts listing

Index	System (Type 6868/6878)	FRU No.
1	Handle/Cap Assembly	12J5547
2	Power Switch/LED Cable Assembly	02K1414
3	Top/Side Cover Assembly	01K1637
4	CD-ROM Drive (48X Max)	09N0737
5	3.5-In. 1.44 MB Diskette Drive	75H9550
5	3.5-In. 1.44 MB Diskette Drive - Japan	75H9552
6	Blank Louver Bezels (3.5-In. and 5.25-In.)	01K1888
	Miscellaneous Optional Bezels	12J5551
7	3.5-In. Bezel Assembly	12J5549
8	Name Plate	12J5552
9	RFID Antenna	03K9654
10	Front Bezel	10L5596
11	Speaker	01N2032
12	System Board-without processor or memory	01N2026
13	Card Guide	10L5592
14	Fan Assembly, front, 120x25 mm	37L2355
15	C2 Switch Assembly	10L5595
16	13.5 GB EIDE Hard Disk Drive	37L5719
16	15.0 GB EIDE Hard Disk Drive	09N0921
	Order either of the below 9.1 GB SCSI 7.2K RPM hard drives	
16	9.1 GB LVD SCSI Hard Disk Drive, 7.2K RPM	36L8648
16	9.1 GB LVD SCSI Hard Disk Drive, 7.2K RPM	36L8763
	Order either of the below 9.1 GB SCSI 10K RPM hard drives	
16	9.1 GB LVD SCSI Hard Disk Drive, 10K RPM	36L8767
16	9.1 GB LVD SCSI Hard Disk Drive, 10K RPM	36L8771
	Order either of the below 18.2 GB SCSI 7.2K RPM hard drives	
16	18.2 GB LVD SCSI Hard Disk Drive, 7.2K RPM	36L8649
16	18.2 GB LVD SCSI Hard Disk Drive, 7.2K RPM	36L8765
17	Removable Rail	37L2358
18	Access Cover Assembly	12J5546
19	SCSI Adapter - Adaptec 2940 LVD	00N3269
19	Video Adapter - Appian Gemini	09N0087
	Appian Gemini video cable	01N2333
19	Video Adapter - Canopus DVRaptor (model 91X)	01N2264
	Canopus DVRaptor cable assembly (model 91X)	01N2377
19	Video Adapter - Intergraph Intense 3D PRO 4110 (AGP)	37L2406
19	Video Adapter - Matrox G400-REV E (AGP)	01N2197
19	Video Adapter - IBM Fire GL1 (AGP)	37L2375
20	Air Baffle	00N3649
21	Fan Assembly, rear, 120x38 mm	10L5593
22	3.5-In. Hard Disk Bracket	10L5591
23	64 MB ECC RAMBUS RIMM Memory	33L3094

Index	System (Type 6868/6878)	FRU No.
23	128 MB ECC RAMBUS RIMM Memory	33L3096
23	256 MB ECC RAMBUS RIMM Memory	33L3098
23	Memory Continuity card (C-RIMM)	00N5223
24	Terminator Card	37L5949
	Terminator Card Housing	10L6936
25	600 MHz Pentium III microprocessor	37L6034
25	667 MHz Pentium III microprocessor	00N3622
25	733 MHz Pentium III microprocessor	00N7174
	Processor Retainer Kit	33L4321
26	Power Supply 330 W.	36L8849
27	Keylock Assembly	12J5102
28	Chassis Assembly, with support bracket	37L2354
	Cable - Audio CD-ROM	75H9219
	Cable - CD-ROM, IDE	01K1548
	Cable - Diskette Drive	01K1546
	Cable - Hard Disk, ATA 2-drop	33L2564
	Cable - LVD SCSI 5-drop	01K1549
	Cable - SCSI LED	76H7344
	Cable - Wake on LAN	76H7345
	EMC Kit	37L2352
	Foot (Qty 4)	12J4506
	Hard Disk Screw Kit	01N2199
	Hard Disk Tray, 5.14-inch to 3.5-inch	28L5045
	Miscellaneous Hardware Kit	10L5600
	Mouse, 3 button	28L1868

**Keyboards - PCNext A-Lite (IntelliStation Type
6868/6878)**

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 America/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 v.

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

Related Service Information

Safety notices (multi-lingual translations)	396
Safety information	420
General safety	420
Electrical safety	421
Safety Inspection Guide	422
Handling electrostatic discharge-sensitive devices	424
Grounding requirements	424
Miscellaneous information	425
Send us your comments!	427
Do you need technical references?	428
Problem determination tips	429
File updates	430
Hardware considerations	430
Software considerations	431
BIOS	431
Drivers	431
Adding adapters to the system	432
System resource conflicts	432
Notices	436
Trademarks	437

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 멀리 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.

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.

Miscellaneous information

Acronyms, Abbreviations and Terms

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

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

Send us your comments!

We want to know your opinion about this manual (part number 09N8610). Your input will help us to improve our publications.

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

Name _____

Phone Number _____

1. Do you like this manual?

_____ Yes _____ No

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

3. What is your service experience level?

_____ Less than five years

_____ More than five years

4. Which computers do you service most?

Thanks in advance for your response!

Do you need technical references?

We have a wide range of hardware technical references that provide in-depth information about IBM personal computer products. Our Technical Reference Library includes information about:

- Micro Channel, Setup, and Subsystem Control Block architectures
- Common interfaces (including microprocessors, system timers, parallel and serial port controllers, keyboards and keystrokes, SCSI, DMA, video, and more)
- Specific Personal System/2 systems (including system board connectors, jumpers, memory subsystems, I/O subsystems, programming interfaces and registers, and error codes)
- Basic input/output system (BIOS)
- Options and adapters

Note

Technical information manuals for the latest Commercial Desktop computers are available on the World Wide Web at:

<http://www.ibm.com/pc/us/cdt/hmm.html>

These publications can be viewed online in BookManager format, or they can be downloaded as PostScript files.

Problem determination tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination.

- Verify any recent hardware changes. See "Hardware considerations" on page 430.
- Verify any recent software changes. See "Software considerations" on page 431.
- Verify the BIOS is at the latest level. See "BIOS" on page 431.
- Verify the drivers are at latest levels. See "Drivers" on page 431.
- Verify the Configuration matches hardware. See "System resource conflicts" on page 432.
- Verify the Diagnostic diskette is at latest level. See "File updates" on page 430.

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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