IBM

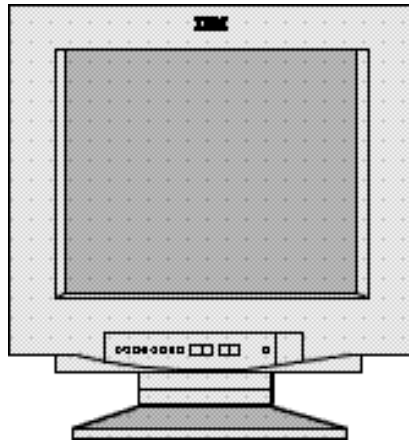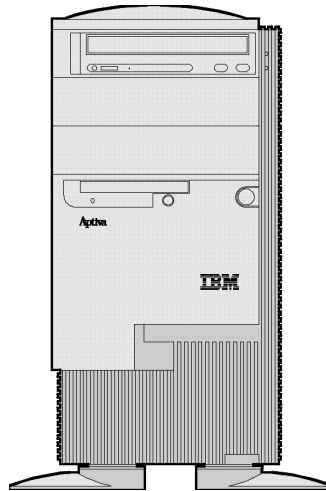# Hardware Maintenance Service
for Service Level A

Machine Type 2137, 2138 and
IBM Monitors Type 2122, 2124, 2126 and 2127

**2122/2124
2126/2127**

**2137
2138**

Aptiva

First Edition (January 1998)

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Contents

Appendix A. FRU Number Index

Appendix B. Online Support Information

Appendix C. Model/Monitor Configurations and FRU Part Numbers

Index

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Voltage Supply Switch Settings

Your IBM Aptiva Personal Computer *might* have voltage switches, which must be set correctly for your voltage supply. If your monitor or system unit has a voltage switch, complete these steps to make sure each switch is set correctly:

1. Determine the correct voltage switch setting for your area:

Voltage Supply Range	Voltage Switch Setting
100-127 V	115 V or 115V
200-240 V	230 V or 230V

2. Locate the voltage switch on the back of your monitor or system unit. If the setting shown on the switch is:

   - Correct: start setting up your IBM Aptiva computer.
   - Incorrect: change the voltage switch setting.

Safety Information

The construction of the IBM Aptiva Personal Computer provides extra protection against the risk of electrical shock. This computer has a power cord with a three-prong plug that is required to ground metal parts. It is the responsibility of the person installing the computer to connect it to a properly grounded electrical outlet. Seek professional assistance before using an adapter or extension cord; these devices could interrupt the grounding circuit.

If the computer is connected to an electrical outlet that is incorrectly connected to the building wiring, serious electrical shock could result.

For continued protection against the risk of electrical shock:

- Connect your computer only to an electrical outlet of the correct voltage. If you are unsure about the voltage of the electrical outlet you are using, contact your local power company.

- If your computer has cables other than the power cords, you must connect them before plugging the power cord into an electrical outlet. Before removing these cables, you must first unplug the power cords from the outlet.

- If your computer has a telephone connection, do not touch the telephone cords when there is lightning in the area.

- Do not use or store the computer in an area where it can become wet.

- Make sure all replacement parts have characteristics identical or equivalent to the original parts. Other parts may not have the same safety features.

- Personal injury or electrical shock may result if you undertake actions other than those specifically described in this book. This is particularly true if you try to service or repair the power supply, monitor, or built-in modem. Always refer service or repairs to qualified service personnel.

Safety Notices (Multi-Lingual Translations)

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

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

Safety Notice 1

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

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

在拆除任何 FRU 之前，關閉計算機電源，從電源插座拔去所有電線，拆除電池(假如有安裝)，然後才拆接任何互連電纜。

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

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

B rmely FRU elt voljt sa elítt ramtalanjtsa a sz mjt¢gépet, h£zza ki a vezetékeket a dugaszol¢ aljzatokb¢l, t voljtsa el az elemet (ha arr¢l mûködik a készülék), majd kapcsolja szét a többi csatlakoztat¢ k belt.

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

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

Pred odstránením lubovolného náhradného diela vypnite poaitaå, odpoj- te napájacie káble z elektrick—ch zásuviek, odpojte batériu (ak je inæ-talovaná), potom odpojte prepojovacie káble.

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

Safety Notice 2

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

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

A lítium elemek tüzet, robban st vagy komoly égési sérüléseket okozhatnak. Nem szabad £jratölteni, polariz lt csatlakoz¢j b¢l elt vol¡tani, szétszedni, 100°C (212°F) feletti hímérsékletre felhev¡teni, elégetni, vagy az elem cell j nak tartalm t nedvesség hat s nak kitenni. Az elem megsemmis¡tésének a helyi rendelkezések és szab lyzatok alapj n kell történnie. Csak a tartozékok list j ban meghat rozott t¡pus£ elemeket haszn lja. Nem megfelelí elem haszn lata esetén az elem felhevülhet és szétrobbanhat.

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

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

Safety Notice 2 (conitued)

鋰電池可以引起火警，爆炸，或嚴重灼傷 請不要把它再充電；
拆除兩級分化的連接物，拆散，加熱超過 100 度 C(212 度 F)，
焚化或把電池內含物暴露於水中 根據本地的條例或規則把電
處理 電池只可以使用於各單道當的部件 不正確的使用電池
可以導致電池燃燒，爆炸

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

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

Li batéria môle zapríåiniù pollar, v-buch alebo ùallké popáleniny. Batériu nanabíjajte neodstranujte polarizované konektory, nerozoberajte, nezohrievajte nad 100°C (212°F), nespopolnujte ju alebo nepokladajte álánky batérie do vody. Zbavte sa batérie podia polladovan-ch lokálnych predpisov a pravidiel. Poulite iba v-robcom odporúåanú batériu. Poullitie nevhodnej batérie mô- le zapríåiniù vznietenie alebo v-buch batérie.

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

Laser Compliance Statement

The CD-ROM drive in the computer is a laser product. The CD-ROM drive's classification label (sample shown below) is located on the drive.

```
CLASS 1 LASER PRODUCT
APPAREIL A LASER CLASSE 1
LASER KLASSE 1
LUOKAN 1 LASERLAITE
PRODUIT LASER
CATEGORIE 1
```

The CD-ROM drive is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products.

In other countries, the drive is certified to conform to the requirements of EN60825.

Class 1 laser products are not considered to be hazardous. The CD-ROM drive has an internal Class 1, 0.5-milliwatt, aluminum gallium-arsenide laser that operates at a wavelength of 760 to 810 manometers.

The design of the laser system and the CD-ROM drive ensures that there is no exposure to laser radiation above a Class 1 level during normal operation, user maintenance, or servicing conditions.

Federal Communications Commission (FCC) Notice

The following statement applies to this IBM product. The statement for other IBM products intended for use with this product will appear in their accompanying manuals.

Federal Communications Commission (FCC) Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

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

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

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class B limits per radio noise emissions for digital apparatus, set out in the Radio Interference Regulation of the Canadian Department of Communications.

Canadian Department of Communications Certification Label

NOTICE: The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

ATTENTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

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HelpCenter	PS/1
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Operating System/2	

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Preface

This manual contains service information for the **2137/2138 Service Level A (SL-A)** model of the IBM Aptiva Personal Computer, worldwide.

This manual is intended to be used as a stand-alone document to service Aptiva machine type 2137/2138 product. It is divided into the following chapters:

"General Information" contains a brief description of this manual.

"Check Procedures" provides step-by-step instructions that aid in locating the falling Field Replaceable Unit (FRU).

" Diagnostic Aids" explains the diagnostics for removing FRUs.

"Removal and Replacements" contains illustrations and descriptions of disassembling and re-assembling machine.

"Parts/Test Point Locations" contains illustrations and descriptions of the locations of the major parts, jumpers, and connectors .

"Safety Inspection Guide" contains information about inspecting a machine for safety problems before putting the machine under a Maintenance Agreement.

"Parts Catalog" contains descriptions, illustrations, and part numbers for individual FRUs.

Appendix A, "Part Number Index" contains part numbers listed in numerical order.

Appendix B, "Online Support Information" contains online support information.

Appendix C, "Model/Monitor Configurations and FRU Part Numbers" contains models and FRUs listed by part number for all countries.

Information

Introduction

This chapter gives a general overview of the Aptiva Machine Type 2137/2138, describes the standard and optional features, and details functional and environmental specifications.

Product Overview

Machine Type 2137 contains three PCI slots and four ISA slots, and the system board supports the Pentium processor. Machine Type 2138 contains four PCI slots and two ISA slots, and the system board supports the Pentium II processor. Machine Type 2138 supports Accelerated Graphics Port (AGP). It allows all installed system memory to be used as texture memory, yielding a huge texture footprint to enhance 3D graphical display performance.

Below lists 2137 and 2138 system features:

Processors (Machine Type 2137)

- Pentium socket-7 Zero Insertion Force (ZIF) connector. You must remove the old processor to install an upgrade processor.

- Detachable CPU heat sink with fan.

- One of the following processors can be installed:

    - Intel Pentium P54C-166 MHz internal; 66 MHz external

    - Intel Pentium P54C-200 MHz internal; 66 MHz external

    - Intel Pentium with MMX P55C-200 MHz internal; 66 MHz external

    - Intel Pentium with MMX P55C-233 MHz internal; 66 MHz external

    - IBM Cyrix 6x86MX-PR166; 66 MHz external, 133 MHz internal

    - AMD K6-166 processor; 66 MHz external, 166 MHz internal

    - AMD K6-200 processor; 66 MHz external, 200 MHz internal

    - AMD K6-233 processor; 66 MHz external, 233 MHz internal

    - AMD K6-266 processor; 66 MHz external, 266 MHz internal

    - AMD K6-300 processor; 66 MHz external, 300 MHz internal

Processors (Machine Type 2138)

- Processor with the capabilities of MMX™ technology

- Processor in Single Edge Contact (S.E.C.) cartridge packaging technology

- Dual Independent Bus architecture separates dedicated external system bus and dedicated internal high-speed cache bus socketability

- One of the following processors can be installed:
    - Intel Pentium II -266 MHz internal, 66 MHz external
    - Intel Pentium II -300 MHz internal, 66 MHz external

Memory

- 256-KB Pipeline Burst Static RAM (PBSRAM). Fixed onboard at 2137, built-in Pentium II processor at 2138. (For some 2137 models, it may come without cache memory.)

- Onboard fixed video Synchronize Graphics RAM (SGRAM). 1- or 2-MB for Machine Type 2137, 4-MB for 2138.

- 168-pin synchronous dynamic random access memory (SDRAM). dual inline memory module (DIMM) sockets.
    - 2 sockets design at Machine Type 2137, 3 sockets at 2138.
    - 8-MB, 16-MB, or 32-MB DIMM (64-MB, 128-MB optional upgrade).
    - Gold contacts, non-Parity (64-bit), 100 MHz, 3.3 volt DIMMs.
    - Maximum system memory is 256 MB at Machine Type 2137 and 384 MB at 2138. Refer to "DIMM Configurations" on page 5-28.

External Ports

- Video port (15-pin D-sub connector)

- Parallel port (25-pin D-sub connector)

- Serial port (9-pin D-sub connector)

- Game/MIDI port (15-pin D-sub connector)

- Keyboard port (6-pin PS/2 mini-din connector)

- Mouse port (6-pin PS/2 mini-din connector)

- Two USB ports

- Microphone-in jack

- Speaker-out jack

- Line-in jack

Diskette Drive

- AT-type

- 3.5-in. 1.44 MB slimline diskette drive.

Hard Disk Drive

- 3.5-in., 1-in. height or 5.25-in, 2-in. height IDE AT drive.

- 128 KB "look-ahead" cache memory in hard disk drive.

- Average and minimum 10 ms seek time, access time varies by the hard disk drive and the hard disk drive manufacturer.

CD-ROM Drive

- 5.25-in. high-performance, sixteen-speed (16X), twenty-speed (20X) or twenty four-speed (24X) CD-ROM IDE/AT drive.

- Read data and play audio from standard and mini CD-ROM and audio compact discs (audio CDs).

Multimedia

- One pair of external speakers with power adapter (some may come with an additional sub-woofer and power adapter)

- Standard unidirectional microphone or advanced noise canceling microphone.

  NOTE: Microphone is an optional item, some models may come without it.

Power Management

- Compliant to advanced power management (APM) specification revision 1.2 and supports display power management signaling (DPMS) monitor.

- Software shutdown by Windows 95.

- System enters suspend mode if any of following conditions are met:
    - Execute suspend feature from Windows 95 Start menu
    - Press system power button if it sets to act as suspend function. See "Power Management Mode" on page 1-25.
    - System sleep timer set in the BIOS Setup elapses.

- Monitor enters standby mode if system sleep timer set in the BIOS elapses.

- Support modem ring wake-up from system suspend. See "Modem Wake-Up on Ring" on page 1-26.

Power Supply

- 200-W switchable high/low voltage power supply

- Thermal sensing variable fan speed

- One connector for a detachable grounded 3-wire power cord.

- Four DASD connectors: one mini power connector and three standard power connectors.

- Power supply itself has no on/off switch. A 3-wire auxiliary control cable connects to system board, it supplies standby power to system for enabling normal on/off switch and Windows 95 software shutdown features.

Internal Cabling

- A pair of 6-pin power input cables from power supply to system board

- One 3-wire auxiliary standby power connector from power supply to system board.

- Two 40-pin ribbon cables for hard disk drive and CD-ROM drive.

- One 34-pin ribbon cable for AT diskette drive.

- One 2-pin (2-wire) cable for power switch.

- One 4-pin (2-wire) cable for hard disk drive light-emitting diode (LED).

- One 3-pin (2-wire) cable for power light-emitting diode (LED).

- One 2-pin to 3-pin (2-wire) adapter connects between the system board and the power LED cable at 2138.

- One 4-pin modem voice-in/speaker-out cable (optional).

- One 2-pin modem ring-in wake-up cable at 2137.

  NOTE: Machine Type 2137 and 2138 both have modem ring-in wake-up feature. 2138 doesn't need a modem ring-in wake-up cable because its BIOS monitors modem IRQ signal.

Modem

- 33.6 Kbps or 56 Kbps ISA plug and play modem adapter card with data/fax/voice features.

> **NOTE:** Modem voice feature is an optional item, some models may come whithout it. If system has this feature, a 4-pin modem voice-in/speaker-out cable should present.

- Telephone line-out (RJ-11) connector.

- Telephone line-in (RJ-11) connector.

Monitor

- Super video graphics array (SVGA) monitor.

- Compliant to VESA power saving mode.

- Connector for a detachable grounded 3-wire power cord.

- 1.8-m (5.8-ft) attached signal cable.

- Auto-sensing power input for 100 Vac to 240 Vac.

- 14" (13.1" viewable image size) monitor

    - 0.28-mm dot pitch

    - Automatic scanning horizontal frequencies from 30KHz to 54KHz and all vertical frequencies between 50Hz and 120Hz.

    - With DDC2A/B feature

- 15" (13.6" viewable image size) monitor

    - 0.28-mm dot pitch

    - Automatic scanning horizontal frequencies from 30KHz to 54KHz and all vertical frequencies between 50Hz and 120Hz.

    - With DDC2A/B feature

- 15" (13.7" viewable image size) monitor

    - 0.28-mm dot pitch

    - Automatic scanning horizontal frequencies from 30KHz to 69KHz and all vertical frequencies between 50Hz and 120Hz.

    - With DDC1/2B+ feature and OSD (on-screen display) menu

- 17" (15.7" viewable image size) monitor

    - 0.27-mm dot pitch

    - Automatic scanning horizontal frequencies from 30KHz to 72KHz and all vertical frequencies between 50Hz and 120Hz.

    - With DDC1/2B+ feature and OSD (on-screen display) menu

Keyboard

- 104-key, or 105-key rubber dome keyboard with 1.8-m(5.8-ft) cable.

Mouse

- PS/2 mouse with 1.8-m(5.8-ft) cable

Hardware Interfaces

The following peripheral interfaces for adapters, options, and drives are supported in the system unit.

Table 1- 1	System Board Hardware Interfaces
Item	**Interface**
Expansion slot for I/O adapter cards	Machine Type 2137: Three PCI (peripheral component interconnect) v2.1 compatible expansion slots that operates up to 33 MHz bus speed Four IBM AT-ISA Plug and Play compatible expansion slots that operates at 8 MHz bus speed. Machine Type 2138: Four PCI v2.1 compatible expansion slots that operates up to 33 MHz bus speed Two IBM AT-ISA Plug and Play compatible expansion slots that operates at 8 MHz bus speed.
Hard disk drives	Two PCI local bus Enhanced IDE v1.0 compatible hard disk drive interfaces that support PIO mode 3/4 and DMA 32-bit access.
CD-ROM drive	5.25-in. high-performance, sixteen-speed (16X), or twenty four-speed (24X) CD-ROM IDE/AT drive Support Bootable CD-ROM Format specification version 1.0. Compliant to Audio-CD, Video-CD, CD-ROM/XA, Karaoke-CD, and Photo-CD (both single and multi-session) format.
Diskette drive	AT diskette interface
Video	Physical interface is compatible with the IBM Personal System/2 (PS/2) VGA interface. For refresh rates and monitor frequency settings, see "Refresh Rates and Monitor Frequencies" on page 1-14 Machine Type 2138: Support Accelerated Graphics Port (AGP) to enhance 3D graphical display performance.

Table 1- 1	System Board Hardware Interfaces
Item	**Interface**
Modem	One 33.6 Kbps or 56 Kbps IBM AT-ISA plug and play modem adapter card with data/fax/voice features. **NOTE:** Modem voice feature is an optional item, some models may come whithout it.
Audio	Audio is compatible with Sound Blaster (Creative Labs, Inc.).
Pointing device	IBM PS/2-compatible mouse
Keyboard device	IBM PS/2-compatible keyboard
Serial port	9-pin connector with RS232D electrical interface
Parallel port	Supports a bidirectional, ECP bidirectional, or EPP bidirectional interface.
Game port	Game port interface for joystick. It also supports MIDI.

Memory Map

This table shows the hexadecimal addresses for the system memory regions. You may use this information for adapter cards that require you to set up memory regions.

Table 1- 2 Memory Map Table	
Address range	**Description**
0~512 KB (000000 ~ 07FFFF)	Base memory
512~640 KB (080000 ~ 09FFFF)	Host/PCI memory
640~768 KB (0A0000 ~ 0BFFFF)	PCI/ISA video buffer memory
768~800 KB (0C0000 ~ 0C7FFF)	Video BIOS memory
800~896 KB (0C8000 ~ 0DFFFF)	ISA card BIOS and buffer memory
896~960 KB (0E0000 ~ 0EFFFF)	BIOS extension memory Setup and POST memory PCI development BIOS
960~1024 KB (0F0000 ~ 0FFFFF)	System BIOS memory
1024 KB ~ Upper Limit	Main memory
Upper Limit ~ 4 GB	PCI memory

System Input / Output Addresses

This table shows the hexadecimal addresses for each of the system board input/output (I/O) functions. You may use this information for adapter cards that require you to set up I/O addresses.

Table 1- 3 System Input / Output Addresses Table	
Address range (hexadecimal)	**Function**
0000-001F	DMA controller 1
0020-003F	Interrupt controller 1

Table 1- 3	System Input / Output Addresses Table
Address range (hexadecimal)	**Function**
0040-0047	System timer
0050-0057	System timer
0060-006F	System controller 8742
0070	CMOS RAM address and NMI mask
0078-007B	Real-time clock
0080-009F	DMA page register
00A0-00BF	Interrupt controller 2
00C0-00DF	DMA controller 2
00F0	Clear math coprocessor
00F1	Reset math coprocessor
00F8-00FF	Math coprocessor
0170-0177, 0376	Secondary IDE controller
01F0-01F7, 03F6	Primary IDE controller
0200-0207	Joystick
0220-022F, 0388-038B, 0534-0537	Audio
0330-0333	MIDI
0278-027F	Parallel port 2
02F8-02FF	Serial port
0378-037F	Parallel port 1
03F0-03F7	Diskette drive controller
03F8-03FF	Modem
0CF8	PCI mechanism #1 configuration address register
0CFC	PCI mechanism #2 configuration data register
7400-740F	Bus master IDE

System Interrupts

This table shows the system interrupt requests (IRQs) and their functions. You may use this information if you install an adapter card that requires you to set IRQs.

Table 1- 4	System Interrupts Table
IRQ	**Function**
0	Timer
1	Keyboard
2	Cascade interrupt control
3	Serial port
4	Modem (available to user if modem is not present)
5	Audio
6	Diskette drive
7	Parallel port
8	Real-time clock
9	Available to user
10	Available to user
11	USB
12	PS/2 mouse
13	Math coprocessor
14	Primary IDE
15	Secondary IDE

DMA Channel Assignments

This table shows the channel assignments for direct memory access (DMA). DMA allows I/O devices to transfer data directly to and from memory. You may need to select an open DMA channel if you add an I/O device that uses DMA.

Table 1- 5	DMA Channel Assignments Table
DMA channel	**Assignment**
0	Available to user
1	Audio
2	Diskette drive
3	Audio/ECP
4	Cascade
5	Available to user
6	Available to user
7	Available to user

Serial Port Addresses

The built-in serial port supports these addresses and interrupts.

Table 1- 6	Serial Port Addresses Table		
Address	Windows 95	Interrupt	Default
3F8	COM1	IRQ 4	Modem
2F8	COM2	IRQ 3	Serial port
3E8	COM3	IRQ 4	
2E8	COM4	IRQ 3	

Parallel Port Addresses

The built-in parallel port supports these addresses and interrupts.

Table 1- 7	Parallel Port Addresses Table	
Address	Interrupt	Default
378	IRQ 7	
3BC	IRQ 7	
278	IRQ 5	Audio

Refresh Rates and Monitor Frequencies

The following table lists the maximum vertical refresh rates supported by the system's ATI 3D Rage II+ and 3D Rage Pro AGP video controller.

IMPORTANT: The maximum refresh rate set for each resolution should be within the monitor's vertical frequency specification. Refer to the service manual provided with your monitor.

Table 1- 8 On-board Video Controller Maximum Vertical Refresh Rate			
Resolution →	640x480	800x600	1024x768
Color ↓			
256	100 Hz.	100 Hz.	100 Hz.
64,000	100 Hz.	100 Hz.	--
16,000,000	100 Hz.	--	--

CMOS Reset

This system does not deny access to the BIOS Setup Utility. Execute "Load BIOS Default Settings" in BIOS Setup to clear the corrupted CMOS data. See "Loading the Default Settings" on page 1-19.

Power-On Password

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

In some cases, you might be required to service a system with an active and unknown power-on password. To clear a password from the system, first identify the system password jumper/switch by referring to "2137 System Board on page 5-5 or "2138 System Board Layout" on page 5-15", then follow these steps.

1. Turn off system unit.

2. Unplug power cable from the electrical outlet.

   WARNING: Do not attempt these steps with the power cord plugged into the electrical outlet. The power supply maintains +5 Vdc of standby power when the power cord is plugged. System damage might result if the power cord is not unplugged during testing.

3. **Machine Type 2137:** Move jumper JP9 from pins 1-2 to pins 2-3 to bypass password check process. See "2137 System Board on page 5-5.
   Machine Type 2138: Set SW1(switch1) to On (bypass password check) position to bypass password check process. See "2138 System Board Layout" on page 5-15".

4. Plug power cable, turn on the system, and depress F1 during POST to enter BIOS Setup menu.

5. Select "Advanced Options", then enter "Security Options" and set "Power-On Password" setting to "None" to clear password.

6. Save and exit from BIOS Setup.

7. Unplug power cable from electrical outlet.

8. **Machine Type 2137:** Move the jumper JP9 from pins 2-3 back to pins 1-2 to enable password check. See "2137 System Board "on page 5-5.
   Machine Type 2138: Reset SW1(switch1) to Off (enable password check) position to enable password check process. See "2138 System Board Layout" on page 5-15.

   IMPORTANT: To reinstall the password, the user must enter a password in the Setup Utility.

BIOS-contained Model Number and Serial Number

The model number and serial number information is stored in BIOS ROM and displayed in the "Product Data" of BIOS Setup main menu. If a repair is completed by replacing a new system board or a new BIOS ROM, then you are required to input the original system's model number and serial number to the new BIOS ROM.

Follow these steps to input the model number and serial number to BIOS:

1. Prepare a bootable DOS diskette with CHGDMI.EXE and MODEL.DMI files.

2. Insert the diskette and boot from drive A.

   WARNING: Do not boot with any memory related driver such as HIMEM.SYS, EMS.SYS ….

4. At the DOS prompt, type `A:>CHGDMI/I` then press Enter. When the screen shows:

         `A:>MODEL NUMBER:`

   Enter the model number and press Enter to continue. You can type a maximum of 16 characters (without space).

5. When the screen shows:

         `A:>S/N NUMBER:`

   Enter the serial number and press Enter to continue. You can type a maximum of 16 characters (without space).

6. Type `A:>CHGDMI/D` and press Enter to display and verify your input model number and serial number information.

Flash (BIOS) Update Procedure

NOTE: The flash update procedure does not change the model number and serial number information in BIOS.

1. Prepare a bootable DOS diskette disk with AFLASH.EXE, MSG.DAT, RXX-YY.RN and RXX-YY.BIN files

   NOTE: The AFLASH.EXE and MSG.DAT are flash utility programs. The RXX-YY.RN file has the BIOS checksum information. The RXX-YY.BIN is BIOS source code binary file and its file size should be 262,144 bytes (256K bytes).

2. Insert the diskette and boot from drive A.

   WARNING: Do not boot with any memory related driver such as HIMEM.SYS, EMS.SYS ….

3. At the DOS prompt, type `A:> AFLASH` then press Enter.

4. Press any key to pass the information screen. Follow the instructions on the screen, execute "LOAD BIOS FILE TO BUFFER" and type BIOS file name (RXX-YY.BIN) and file path. Program then automatically loads BIOS file into memory buffer.

   IMPORTANT: Verify the BIOS checksum value shown on screen is same to the one in RXX-YY.RN file.

5. Follow the instructions on the screen to execute "PROGRAM FLASH ROM".

   WARNING: Do not turn off the system power while the BIOS is programming, or the flash ROM will be destroyed. If a BIOS flash upgrade cannot be done successfully, you can replace a new BIOS FRU. See "Parts Catalog" on page 7-2.

7. Follow the instruction on screen to complete the programming BIOS.

8. Power off system after the BIOS is completely updated.

BIOS Setup Utility

The Setup Utility lets you review and change important information about the computer and its hardware.

Working with the Setup Menus

Starting the Setup Utility

Follow these steps to enter Setup when the computer is off:

1. Turn on your monitor.

2. Turn on the system unit.

3. When you see the IBM logo and the line message "Press F1 to enter Setup", press F1 to enter Setup and display the main menu.

If you have previously set a power-on password, you are prompted to type in the password after you press the F1 key. See the section "Power-On Password" on page 1-15 for information on setting, changing, or removing the password

See the Configuration/Setup Utility main menu below.

```
┌─────────────────────────────────────────┐
│                                          │
│  ┌────────────────────────────────────┐ │
│  │     Configuration/Setup Utility     │ │
│  ├────────────────────────────────────┤ │
│  │                                     │ │
│  │          Select a menu:             │ │
│  │                                     │ │
│  │   • System Information              │ │
│  │   • Product Data                    │ │
│  │   • Disk Drives                     │ │
│  │   • Devices and I/O Ports           │ │
│  │   • Power Management                │ │
│  │   • Startup Options                 │ │
│  │   • Date and Time                   │ │
│  │   • Advanced Options                │ │
│  │                                     │ │
│  │     Load Setup Default settings     │ │
│  │     Abort Settings Change           │ │
│  │                                     │ │
│  └────────────────────────────────────┘ │
│                                          │
│  <↑>  <↓> Move highlight bar <↵>Select   │
│  <Esc>Exit                               │
└─────────────────────────────────────────┘
```
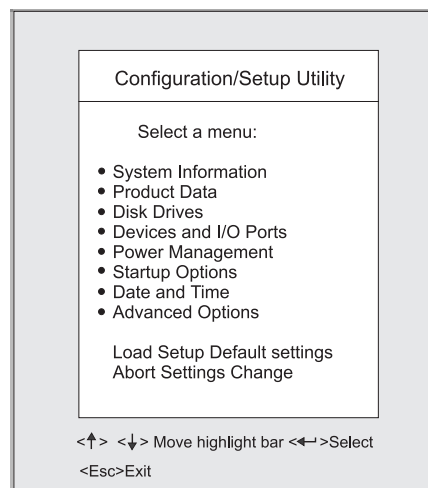
The following table lists specific keys on the keyboard that will help you move through the Setup menus:

Keys	Function
Down- or up-arrow key	Use these arrow keys to highlight an option on the menu. (Press the Enter key to choose the option.)
Left- or right-arrow key	Use these arrow keys to make a selection and change an option's setting. On some menus, you can use these keys to move from one field to another.
PgUp	Press this key to move from a menu to the menu immediately preceding it. This key works only in options with multiple menus.
PgDn	Press this key to move from a menu to the menu immediately following it. This key works only in options with multiple menus.
F1	Press this key if you want help for a selected menu option.
Esc	After viewing or making changes to the settings on a menu, press this key to exit the menu.
Enter	Press this key to choose a highlighted option from a menu.

Changing Parameter Settings

In the Setup menus, the configuration information that you can change are enclosed in brackets like these: [ ]. You cannot change any information that is not enclosed in brackets. Use the up- or down-arrow keys to highlight options then press Enter to display a menu. When changing the setting of a particular parameter, highlight the setting then use the left- or right-arrow key to change the setting.

Loading the Default Settings

When you purchase an Aptiva computer, it is already configured for use. The original configuration settings, also called factory or default settings, are stored in the CMOS. Setup includes an option Load Default Settings that lets you reload the original configuration at any time.

If you have made changes in Setup but would like to restore the default settings, follow these steps:

1. From the main menu, highlight the option Load Default Settings then press Enter. A dialog box appears confirming if you want to load the default settings.

2. Use the left-arrow key to select Yes, then press Enter.

3. Press Esc to exit Setup.
   A dialog box appears confirming if you want to save the CMOS settings (in this case, the default settings that you reloaded).

4. Use the left-arrow key to select Yes, then press Enter to save the changes in CMOS.

You must load the Setup default settings In the following instances:

– When you replace the system battery

– When you customize your system configuration settings and some resource assignments conflict causing the computer to hang

Aborting Setting Changes

There may be times when you have made changes in the Setup parameter settings but decided to discard the changes. The option Abort Settings Change allows you to do this without exiting Setup.

To abort the changes that you have made, follow these steps:

1. Return to the Setup main menu.

2. Highlight the Abort Settings Change option then press Enter.

BIOS then clear up all the changes that you made and reverts the parameters to their saved settings. The saved settings are those that you see when you entered Setup, before you made the changes.

Exiting Setup

When you complete your changes or finish viewing information, return to the main menu. From this location, you can exit Setup and save your changes or exit without saving your changes.

Follow these steps to exit Setup:

1. From the main menu, press the Esc key.

2. The Exit Setup dialog box appears. If you have made changes in the parameter settings, it will contain an option for saving your changes.

   - If you would like to save your changes, press the left-arrow key to select the option Yes then press Enter to save your changes and exit Setup.

- If you do not want to save your changes, press the right-arrow key to select the option No then press Enter, to exit Setup without saving.

Viewing System Information and Product Data

To view general hardware information about your computer, select the System Information option from the Setup main menu. The items displayed in the System Information menu are not configurable.

Setup automatically updates this menu when you do either of the following:

- Add or change hardware on your computer

- Make changes to other menus in Setup and save those changes

To view the computer information such as the model number, serial number, and BIOS version and date, select the Product Data option from the Setup main menu. Like in the System Information menu, the items displayed are not configurable.

Disk Drives

If you install a new diskette, hard disk, or CD-ROM drive, BIOS auto-detects the presence of these devices. Enter Setup to identify or verify the type of drive installed in the computer.

If you want to change any drive setting, select Disk Drives from the main menu. The Disk Drives menu appears showing the diskette drive and IDE drive parameters.

Diskette Drive (A or B)

These options display the size and storage capacity of the currently installed diskette drive or drives. Empty drive bays are indicated with a "None" setting. Your Aptiva computer comes with a diskette drive A:. If you add an additional diskette drive, it will be designated as diskette drive B.

IDE Hard Disk and CD-ROM Drives

The Disk Drives menu includes four IDE drive items that allow you to configure the hard disk drives and the CD-ROM drive. Selecting any one of these items displays a submenu with details on a particular IDE drive.

The IDE drive items are identified as follows:

- *IDE Primary Channel Master* is attached to IDE connector 1 on the system board and set as the master device. This is the hard disk that comes preinstalled with your computer.

- *IDE Primary Channel Slave* (if installed) is attached to IDE connector 1 on the system board and set as the slave device.

- *IDE Secondary Channel Master* (if installed) is attached to IDE connector 2 on the system board and set as the master device.

- *IDE Secondary Channel Slave* (if installed) is attached to IDE connector 2 on the system board and set as the slave device. Normally, a preinstalled CD-ROM drive is connected here.

NOTE: The CD-ROM drive information does not appear among these options. Click on the System Information option in the Setup main menu to verify the presence of a CD-ROM drive.

The following section contains the details on the parameters under each IDE drive submenu.

Type

This item specifies the number of cylinders, heads, and sectors, and the size of a particular IDE drive. If no information appears opposite the parameters, there is no drive installed in that channel.

Hard Disk Block Mode

This function enhances disk performance depending on the hard disk in use. BIOS automatically detects if your hard disk supports this feature.

Setting to Auto allows data transfer in blocks (multiple sectors) to increase the data transfer rate. If your system does not boot after setting this parameter to Auto, change the setting to Disabled. The default setting for this parameter is Auto.

Advanced PIO Mode

The advanced PIO mode feature improves system performance by allowing the use of faster hard disk drives. If your hard disk supports this feature, you may set this parameter to Auto (default), Mode 0, Mode 1, Mode 2, Mode 3, or Mode 4 depending on the hard disk requirements. See the documentation that came with the hard disk.

If your hard disk does not support this function, set this parameter to Disabled.

Hard Disk Size > 504MB

This enhanced IDE feature works only under DOS and Windows environments. If set to Auto, which is the default, BIOS allows you to use a

hard disk with a capacity of more than 504MB. This is made possible through the Logical block address (LBA) mode translation. You may be required to set this parameter to Disabled if you use other operating systems.

To prevent data loss, set this parameter to Auto if you are using a hard disk with more than 504MB capacity that was previously configured through the LBA mode. If you use a hard disk configured through the user-specific cylinder-head-sector (CHS) mode, set this parameter to Disabled.

Hard Disk 32-bit Access

Setting this parameter to Enabled improves system performance by allowing the use of the 32-bit hard disk access. This enhanced IDE feature only works under DOS, Windows 3.x, Windows 95, and Novell NetWare. If your software does not support this function, set this parameter to Disabled. The default setting is Enabled.

CD-ROM Drive DMA Mode

This parameter allows you enable or disable the CD-ROM drive DMA mode. The default setting is Disabled.

Devices and I/O Ports

From the Setup main menu, select the Devices and I/O Ports option to view or change port configuration settings. The Devices and I/O Ports menu appears. This menu lets you configure serial and parallel ports.

Also included in this menu are items for enabling or disabling the onboard controller chipsets.

Onboard Communication Ports

Serial Port

Your computer comes with a 9-pin serial port. This parameter displays the current address for serial port. The default setting Base Address is 2F8. The default IRQ is 3.

If you install a modem or a serial port adapter card, use this parameter to make any changes to the serial port address which may be needed to avoid conflicts with additional hardware. If you change the serial port address, you might also need to make changes in the software that uses the serial port. For instructions on changing your software, see the user's guide or online documentation that came with the software.

Parallel Port

Your computer comes with one parallel port. This parameter shows the default Enabled to activate the parallel port. The default base address is 378h. The default IRQ is 7.

If you install an adapter card with a parallel port, use this menu to make sure that each parallel port has a different address. If you change parallel port addresses in this menu, you might also need to make changes in the software that uses the parallel port. For instructions on changing your software, see the user's guide or online information that came with the software.

Operation mode As long as the parallel port setting is not disabled, this item allows you to choose an operation mode for the parallel port. You can select either the Standard mode or one of the extended modes (Bidirectional, EPP, or ECP) for a parallel port operation mode. The extended modes increase the efficiency of your parallel port; however, these modes use recent technology and are only supported by newer hardware (such as some printer models). The available modes are:

- *Standard.*   This mode allows for one-way operation at a normal speed, and is the default setting.

- *Bidirectional.*   This mode allows for a two-way operation at a normal speed.

- *EPP.*   This mode allows for a bidirectional parallel port operation at a maximum speed.

- *ECP.*   This mode allows the parallel port to operate in a bidirectional mode and at a speed higher than the maximum data transfer rate.

NOTE: If you change the mode of a parallel port on an adapter card, you might need to make changes to the port's adapter card and its software. See the user's guide or online documentation that came with the adapter card.

ECP DMA Channel   This item becomes active only if you select ECP as the operation mode. It allows you to select DMA channel 1 or DMA channel 3 depending on the available system resource.

Onboard Floppy Disk Controller

This parameter allows you to enable or disable to onboard floppy disk controller chipset. When set to Enabled, the controller enables the diskette drive on your computer. When set to Disabled, the controller deactivates the

drive but simultaneously frees IRQ 6 which is normally assigned to the diskette drive. You may then assign IRQ 6 to another device.

Onboard IDE Primary Channel

This parameter allows you to enable or disable the onboard IDE primary channel controller. Setting this parameter to Enabled lets you use the primary IDE connector (IDE 1) to connect up to two IDE drives. Setting to Disabled deactivates IDE 1 but frees IRQ 14 for the use of other devices. The default setting is Enabled.

Onboard IDE Secondary Channel

This parameter allows you to enable or disable the onboard IDE secondary channel controller. Setting this parameter to Enabled lets you use the secondary IDE connector (IDE 2) to connect up to two IDE drives. Setting to Disabled deactivates IDE 2 but frees IRQ 15 for the use of other devices. The default setting is Enabled.

Onboard PS/2 Mouse (IRQ12)

This parameter enables or disables the onboard PS/2 mouse. When set to Enabled, it allows you to use the onboard PS/2 mouse. When set to Disabled, it deactivates the mouse and frees IRQ 12 for the use of other devices.

Onboard USB

This parameter allows you to enable or disable the universal serial bus (USB) controller. The default setting is Enabled.

USB Legacy Mode This parameter enables or disables the USB legacy mode. This item turns gray and non-configurable when the Onboard USB parameter is disabled. The default setting is Disabled.

Onboard Audio Chip

This parameter enables or disables the onboard audio controller chipset. This item does not appear in the menu if there is no physical audio chipset on the system board. The default setting is Enabled.

Power Management

The system power management feature allows you to reduce power consumption.

Power Management Mode

When the Power Management Mode parameter is set to Enabled, you can configure the different power saving timers to your desired settings. Setting this parameter to Disabled deactivates the power management feature and all the timers. The default setting is Enabled.

IDE hard disk standby timer This parameter allows the hard disk to enter standby mode after inactivity of 1 to 15 minutes, depending on your setting. When you access the hard disk again, allow 3 to 5 seconds (depending on the hard disk) for the system to recover and return to normal speed. Set this parameter to Off if your hard disk does not support this function. The default setting is Off.

System sleep timer This timer allows you to set the period of inactivity (in minutes) before the system enters the sleep state. Use the arrow keys to select a setting. You can turn this timer to Off if you prefer. The default setting is 60 minutes.

> – *Stop CPU clock in sleep state* When set to Yes, the system internal clock stops, along with other internal devices, when the computer enters the sleep state. When set to No, the system internal clock continues to run when the system is in the sleep state. This item turns gray and is non-configurable when the System Sleep Timer is off. The default setting is Yes.

Power Switch< 4 sec.

When set to Suspend, this parameter adds the suspend function to the system power button on the front panel. The suspend function allows you to put the system into suspend mode by pressing the power button for less than four seconds while the system is on. When this parameter is set to Power off, the power button simply turns the system power on or off. This parameter is set to Power off by default.

Modem Wake-Up on Ring

This parameter allows you to enable or disable the Modem Wake-Up on Ring feature. When enabled and if the computer is in suspend, an incoming call automatically resumes normal power on mode. When disabled, the system does not return to the "normal on" state even if there is an incoming modem access. The default setting is Enabled.

NOTE: Machine Type 2137 and 2138 both have modem ring-in wake-up feature. 2138 doesn't need a modem ring-in wake-up cable because the BIOS monitors modem IRQ signal.

Startup Options

From the Setup main menu, select Startup Options to view or change start-up configuration settings. The Startup Options menu appears. This menu identifies the start-up devices.

Fast POST Mode

When set to Enabled, which is the default, this parameter allows the system to boot faster by skipping some power on self-test (POST) routines.

Silent Boot

This parameter enables or disables the silent boot function. When set to Enabled, which is the default, BIOS is in graphical mode and displays the IBM logo while booting. If an error occurs while booting, the system automatically switches to text mode.

Even if your setting is Enabled, you may also switch to the text mode while booting by pressing F9 after you see the message "Press <F1> to go to the Setup Utility".

When set to Disabled, BIOS is in the conventional text mode where you see the system initialization details on the screen

Num Lock After Boot

This parameter displays whether the NumLock function on the keyboard turns on automatically each time you turn your computer on. You can set this to Enabled or Disabled. The default is Enabled.

Memory Test

When set to Enabled, this parameter allows the system to perform a RAM test during the POST routine. When set to Disabled, the system detects only the memory size and bypasses the test routine. The default setting is Disabled.

When the Fast POST Mode parameter is set to Auto, the Memory Test parameter is disabled and becomes non-configurable.

System Boot Drive

This parameter has four options:

- – *Drive A Then C.*   In this option, the system BIOS checks drive A first. If there is a diskette in the drive, the system boots from drive A. Otherwise, it boots from drive C. This is the default setting.

- *Drive C Then Drive A.* In this option, the system BIOS checks drive C first. If there is no hard disk drive, the system boots from drive A.

- *Drive A Only.* This option directs BIOS to boot up system from drive A.

- *Drive C Only.* This option directs BIOS to boot up system from drive C.

Boot from CD-ROM

When enabled, this parameter prompts BIOS to look first for a bootable CD in the CD-ROM drive. If a bootable CD is present, the system boots from the CD-ROM. Otherwise, it boots from the drive specified in the System Boot Drive parameter. The default setting is Enabled.

Date and Time

From the Setup main menu, select the Date and Time option to view or change the system clock from the Date and Time menu. If you want to change the system date, enter the date in the format shown on the screen as in the following example:

    Mon Nov 10, 1997

If you change the time, enter the time in 24-hour format (hours, minutes, seconds). For example:

- 12 midnight is 00:00:00

- 12 noon is 12:00:00

- 1 p.m. is 13:00:00

When setting date and time, press the up- or down-arrow key to highlight a field. Press the left- or right-arrow key to change the settings.

Advanced Options

From the Setup main menu, select the Advanced Options option to view or change a variety of configuration settings. The Advanced Options menu appears, with the following options:

- Security Options

- Memory/Cache Options

– PnP/PCI Options

Each of these options opens an additional menu.

Security Options

The Security Options menu lets you change the settings of the following parameters:

– Power-on Password

– Disk Drive Control

Power-on Password

Select this parameter and press the left- or right-arrow key to display the Power-on Password window. In this window, you can set up a password to restrict the use of your computer. You can also change or remove the password.

If you set up a power-on password, you must type this password each time you turn on your computer. If you do not key in the correct password, you cannot use your computer. You must also type this password if you want to enter Setup.

Setting a Power-On Password

1. Enter Setup.

2. From the Setup main menu, select Advanced Options, then Security Options.

3. Highlight the Power-on Password parameter and press the left- or right-arrow key to display the Power-on Password window.

4. Type a password consisting of up to seven characters, then press Enter.

5. Retype the password then press Enter.

6. Press Enter again to confirm setting the password. Pressing Esc aborts the password setting.

   After pressing Enter, the Power-on Password window disappears. The Power-on Password parameter automatically sets to Present.

7. Press Esc to return to Setup main menu.

8. Press Esc to exit Setup and reboot the system. Answer Yes when prompted to save settings.

   If you change your mind and decide not to change your password, just answer No when prompted to save CMOS settings.

The next time you turn on the system, you will be prompted to enter your power-on password. If you press F1 during POST to enter Setup, you must key in the password as well.

If you were not able to set a password after performing the above procedure, or should you encounter any error message when setting a password, open the system unit and check the setting of jumper JP9 for 2137 or SW1(switch 1) for 2138. See "2137 System Board " on page 5-5 or "2138 System Board Layout" on page 5-15 for details on jumper settings information.

Changing the Power-On Password

1. Enter Setup.

2. Key in your current password when prompted.

3. From the Setup main menu, select Advanced Options, then Security Options.

4. Highlight the Power-on Password parameter and press the left- or right-arrow key twice to display the Power-on Password window.

5. Type in a new password then press Enter.

6. Retype the new password then press Enter.

7. Press Enter again to confirm changing the password.

8. Press Esc twice to return to the Setup main menu.

9. Press Esc to exit Setup and reboot the system. Answer Yes when prompted to save CMOS settings.

   If you change your mind and decide not to change your password, just answer No when prompted to save CMOS settings.

Removing the Power-On Password

1. Enter Setup and select Advanced Options, then Security Options.

2. Press the left- or right-arrow key once to select None.

3. Press Esc to return to Setup main menu.

4. Press Esc to exit Setup and reboot the system. Answer Yes when prompted to save CMOS settings.

Disk Drive Control

There are two items under this parameter: Diskette Drive and Hard Disk Drive. These items allow you to write-protect the diskette and hard disk drives.

The settings include:

- *Write Protect All Sectors.* Disables the write function all sectors of the diskette or hard disk drive.

- *Write Protect Boot Sector.* Disables the write function only on the boot sector of the diskette or hard disk drive.

- *Normal.* Allows the diskette or hard disk drive to function normally. This is the default setting.

Memory/Cache Options

The Memory/Cache Options menu allows you to configure the internal and external caches. Enabling the cache parameters optimize system performance.

Some older applications, however, may not run properly with the caches enabled. Set the parameters to Disabled when you run these applications. Disabling the caches will degrade system performance.

Internal Cache

This parameter enables or disables the internal cache memory. The default setting is Enabled.

External Cache

This parameter enables or disables the external cache memory. The default setting is Enabled.

Cache Scheme This item indicates the cache scheme of the external cache. This is fixed to the setting Write Back and is non-configurable.

The Write Back cache scheme allows updates in the cache but not in the memory when there is a write instruction. The memory is only updated when there is inconsistency between the cache and the memory.

Maximum Cacheable Size This parameter indicates the maximum supported cache memory size in the system.

Memory Parity Mode This parameter allows you to activate the Error Check and Correct (ECC) feature. Select ECC to enable BIOS to detect and correct data errors. Select Disabled if you do not wish to use this feature. The default setting is Disabled.

PnP/PCI Options

The parameters in the PnP/PCI Options menu allow you to set the IRQ assignments for your PCI devices.

PCI IRQ Setting

This parameter allows for automatic or manual configuration of PCI devices. If you use Plug and Play devices, you can keep the default setting Auto. The system then automatically configures the Plug and Play devices. If you install non-Plug and Play adapter cards, set this parameter to Manual. This allows you to assign resources to non-Plug and Play cards first.

If you have to configure PCI resources manually, use the up- or down-arrow key to move between fields and select the IRQ assignments using the left- or right-arrow key.

PCI Slots   These parameters allow you to specify the appropriate PCI devices. You may assign IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ12, IRQ14, or IRQ15 if they have not been previously assigned to other devices. Some IRQs are normally assigned to specific system devices. See "System Interrupts" on page 1- 12 to make sure that the IRQ that you want to use is free to avoid resource conflicts.

Bus mastering   When set to Enabled, this option allows the PCI cycles to bypass the CPU for faster operation. When set to Disabled, all PCI transactions pass through the CPU. The default setting is Enabled.

PCI IRQ Sharing

When set to Yes, this parameter allows you to assign the same IRQ to more than one PCI device installed in the system. When set to No, you must assign different IRQs to the PCI devices. The default setting is Yes.

VGA Palette Snoop

The VGA palette snoop function allows the system to refresh all ISA and PCI graphic adapters installed in the system. This is needed if you install an additional graphics overlay card such as an MPEG or an advanced 3D graphics adapter. If the image on your monitor has problems after installing such an adapter, set this parameter to Enabled. Otherwise, leave it to the default Disabled to achieve better performance.

Plug and Play OS

When this parameter is set to Yes, BIOS initializes only Plug and Play boot devices, then the Plug and Play operating system takes care of the other devices. When set to No, BIOS initializes all Plug and Play boot and non-boot devices.

Set this parameter to Yes if you are using the Windows 95 operating system. Set to No if you run any other operating system. The default setting is Yes.

Reset Resource Assignments

Set this parameter to Yes to avoid IRQ conflict when installing non-Plug and Play cards.

Before you install non-Plug and Play cards, set this parameter to Yes, exit Setup and turn off the computer. This clears all resource assignments and allows BIOS to reassign resources to all installed Plug and Play devices the next time the system boots. After clearing the resource data, the parameter resets to the default setting No.

Specifications

Dimension (width x depth x height):

- System unit:
  - 195 mm (7.68 in.) x 455 mm (17.9 in.) x 428 mm (16.85 in.)

- 14" Monitor / 13.1" viewable image size:
  - 352 mm (13.9 in.) x 378 mm (14.9 in.) x 356 mm (14.0 in.)

- 15" Monitor /13.6" viewable image size:
  - 376 mm (14.8 in.) x 385 mm (15.2 in.) x 367 mm (14.4 in.)

- 15" Monitor / 13.7" viewable image size:
  - 376 mm (14.8 in.) x 385 mm (15.2 in.) x 373 mm (14.7 in.)

- 17" Monitor / 15.7" viewable image size:
  - 422 mm (16.6 in.) x 425 mm (16.7 in.) x 418 mm (16.5 in.)

Weight:

- System unit:
  - 12.7 kg (28 lb)

- 14" Monitor / 13.1" viewable image size:
  - 11 kg (24.2 lb)

- 15" Monitor /13.6" viewable image size:
  - 16 kg (35.2 lb)

- 15" Monitor /13.7" viewable image size:
  - 12.5 kg (27.5 lb)

- 17" Monitor /15.7" viewable image size:
  - 17.5 kg (38.5 lb)

Environment:

- Temperature for system unit:
  - Power on: 10° to 35°C (50° to 95°F)
  - Power off: -10° to 60°C (14° to 140°F)

- Temperature for 14"/15" (13.1"/13.6" viewable image size) monitor types:
  - Power on: 10° to 40°C (50° to 104°F)
  - Power off: -40° to 60°C (-40° to 140°F)

- Temperature for 15"/17" (13.7"/15.7" viewable image size) monitor types:
  - Power on: 5° to 40°C (41° to 104°F)
  - Power off: -40° to 60°C (-40° to 140°F)
- Humidity for system unit:
  - Power on: 20% to 80%
  - Power off: 20% to 80%
- Humidity for monitor :
  - Power on: 20% to 90%
  - Power off: 10% to 95%

Power consumption:

- System unit:
  - Maximum: 200 Watts
- 14"/15" (13.1"/13.6" viewable image size) monitor types:
  - Maximum: 90 Watts
- 15"/17" (13.7"/15.7" viewable image size) monitor types:
  - Maximum: 70 Watts

Electrical input:

- Input voltage for system unit (Sine-wave input is required) :
  - Low Range: 90 Vac to 132 Vac
  - High Range: 180 Vac to 264 Vac
- Input voltage for monitor (Sine-wave input is required) :
  - 90 Vac to 264 Vac

Operating Requirements

All machines require two power input: one on the system unit and one on the monitor display.

The system units come with a voltage selector switch, allowing selection of voltage of either 110 Vac or 220 Vac. This switch must be in the 220 Vac position when the machine is plugged into a 220 Vac electrical outlet.

The required power input for the monitor shipped with the system unit is auto-sensing type and does not require any voltage switch adjustment.

Special Tools

The following special tool is required to service this system when running diagnostics program (PC-Doctor) to do serial and parallel ports testing:

• Wrap plug, P/N 72X8546

Check Procedures

Introduction

This chapter contains the check procedures used to diagnose the causes of product failures. The diagnostic information consists of:

Start: This is the starting point for any diagnostic action. Based on high-level symptoms, the check procedure directs you to more detailed procedures to help resolve machine failures.

Index of Symptoms, Messages, Error Codes, or Beeps: The tables for BIOS Error Messages, Codes, Beeps, and Error Symptoms list symptoms along with their probable causes, and direct you to the applicable check procedures to help resolve machine failures. These tables also list the field replaceable units (FRUs) most likely to cause a particular problem.

Check Procedures: When the Start check procedure or the Index of Symptoms, Messages, Error Codes, or Beeps tables point you to a specific check procedure, proceed to that section. If there are any notes or instructions at the top of the page, read them before you begin with the procedure. Carefully read each step of the check procedure and perform the steps as instructed. If you do not remember the location of a specific part or test point, or an adjustment or removal procedure, see the chapter that contains that information. Always return to the check procedure after you do this. In some cases, you are referred to other check procedures to detect the cause of the failure.

Start

This is the entry point for all check procedures. The check procedures use failure symptoms, Power-On Self Test (POST) error codes, or beeps to help determine the defective field replaceable unit (FRU). Follow the suggested check procedures or use the diagnostics diskette to determine the problem FRU.

IMPORTANT: Replace FRUs ONLY when it is determined that the error is not a result of software, loose contact, or dirty component surfaces. Any FRU change should be verified by running a complete test ("Diagnostics - All Tests" in PC-Doctor diagnostics program).

This book comes with a diagnostic program diskette. This diskette should be used ONLY with **2137/2138 Service Level A (SL-A)** IBM Aptiva Personal Computers. Do not use this diskette on other models.

POST error codes and error messages are displayed on the screen after the IBM logo. A beep will precede each error code or message. Please refer to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8 for additional help.

All voltages in the check procedures are positive unless otherwise indicated. Use frame ground for all voltage checks unless otherwise specified.

NOTE: If the check procedures instruct you to replace an FRU and the error message persists, an option adapter card might be causing the failure. Remove all option adapter cards, one at a time, until the error changes or the problem is no longer apparent. Replace the last option adapter card removed.

The hard disk drive contains pre-loaded software. Refer to "Software Recovery Procedure" on page 4-35 to reinstall the original software. Be sure to reload the software on the primary hard disk drive (Drive C) when replacing it.

IMPORTANT: The drives in the system you are servicing may have been rearranged, or the drive startup sequence has 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. **Ask the customer to back up any additional software from the hard disk drive before you reload the software.**

How to Diagnose Combined FRUs: If an adapter or device consists of more than one FRU, any of the FRUs might cause an error code. Before replacing

the device or adapter, remove the FRUs one by one to see if the symptoms change.

If a newly replaced FRU does not correct the problem: If you have reached this point of the check procedures and were instructed to replace an FRU but doing so did not correct the problem, reinstall the original FRU and go through "Start" again.

If you want to print a copy of a BIOS Setup Utility screen to an attached printer, press **Print Screen** key while the following screen is displayed.

>   **PLEASE READ THE FOLLOWING:**
>
>   **Human Error is a cause for concern when applied to check procedures. It exists in every first time set of analysis procedures. It is therefore essential for effective and time-efficient servicing that each stage of every procedure be verified. (For example: When a symptom is found, or when a symptom appears to have been cured; the preceding steps should be repeated for accuracy of analysis.)**

001 - START

To begin, note the following:

- Disable the setting of "Fast POST Mode" from BIOS Setup. See "Fast POST Mode" on page 1-27.

- To disable or reset the power-on password, see "Power-On Password" on page 1-15.

- Disconnect all external cables and devices including speakers and microphone from the system unit, except for the keyboard, mouse, and monitor.

- Power off the system unit before moving it or when replacing FRUs.

- Remove all adapter cards, except for the factory-installed modem adapter card and any other IBM Aptiva factory-installed adapter cards.

- Disconnect all drives except:

- 3.5-in. diskette drive
- Hard disk drive
- IBM Aptiva factory-installed devices (such as a CD-ROM drive)

- Ensure that all power cords and cables are connected properly.

– Ensure that the monitor brightness and contrast controls are not turned down.

  – Power on the system unit.

NOTE: Some monitors have a detachable system I/O signal cable between the monitor and the system unit. In this case, check this signal cable before replacing the unit. See "Monitor Port Signals" on page 5-28 for pin identification.

  – Ensure correct monitor refresh rate. See "Refresh Rates and Monitor Frequencies" on page 1-14.

  – Note any symptoms, messages, error codes, or beeps.

  – Make sure that there are no diskette or CD in the drives.

002 - DOES SYSTEM COMPLETE POST WITH ONE SHORT BEEP AND DOES AN IBM LOGO SCREEN APPEAR? (YES, READ AHEAD. NO, GO TO STEP 004.)

  – Insert diagnostics diskette in the diskette drive.

003 - DOES SYSTEM LOAD THE DIAGNOSTICS PROGRAM FROM THE DISKETTE DRIVE? (YES, READ AHEAD. NO, GO TO STEP 004.)

  – Follow the instructions on the screen and select **Utility** from the diagnostics program menu.

  – Select **Tech Support Form** from the menu, press F5 to execute, then generate a system configuration report.

  – Compare the system configuration list with the actual devices installed in system.

  NOTE: If necessary, remove the machine cover and visually compare the devices installed in system to those shown in the system configuration report.

  – Go to step 006.

004 - DO ANY MESSAGES, ERROR CODES, OR SYMPTOMS APPEAR? (YES, READ AHEAD. NO, GO TO STEP 005)

  – Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8.

  – End.

005 -

– If the keyboard responds incorrectly, go to "Keyboard" on page 2-36.

– If monitor problems appear, such as jittering, shifting, or being out of focus, go to "Monitor" on page 2-42.

006 - DOES THE SYSTEM CONFIGURATION REPORT CORRECTLY IDENTIFY THE DEVICES INSTALLED IN SYSTEM? (YES, READ AHEAD. NO, GO TO STEP 007.)

– Select **Diagnostics** from the diagnostics program menu.

– Select and execute **All Tests**.

– Go to step 008.

007 -

The system configuration report shows only those devices supported by the diagnostics diskette.

If a device is missing from the list and is not factory installed, refer to the service manual provided for that device. (Refer to the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" to determine the factory-installed devices in the model you are servicing.)

008 - DOES THE DIAGNOSTICS FINISH WITHOUT ANY ERRORS? (YES, READ AHEAD. NO, GO TO STEP 009.)

– If the **Diagnostics \ All Tests** did not detect a failure but the system still indicates a failure:

- Check all adapter card jumper settings.

- Check all adapter card switch settings.

- Check all adapter card cables and connectors.

- Make sure that all of the above are set correctly and show the correct voltages and continuity. Replace any defective cables or adapter cards. See "Power Supply Cable Connector Specifications" on page 5-18 and "2137 System Board " on page 5-5 or "2138 System Board Layout" on page 5-15.

- Run the **Diagnostics \ All Tests** again.

- If an error or other symptom is displayed, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8.

- If no error can be detected or the symptom is intermittent, go to "Undetermined Problems" on page 2-44.

– End

009 -

- If the last test stops and you cannot continue, first make sure all switches, power connectors, cables, and jumpers are set correctly and show the correct voltages and continuity.

- Take note of any messages, error codes, beeps, or new symptoms. Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8.

- If there is no error symptom or the error symptom is intermittent, go to "Undetermined Problems" on page 2-44.

Index of Symptoms, Messages, Error Codes, or Beeps

How to Use Error Messages: Use the messages, error codes, and beeps combinations that occur to diagnose failures. If more than one failure occurs, begin the diagnosis from the first failure that appeared. The cause of the first failure can result to false messages, error codes, or beeps. If you did not receive any messages, error codes, or beeps, see if the symptom is listed in Table 2-2, "Error Symptoms List" on page 2-17.

ATTENTION: When you have deemed it necessary to replace an FRU, and did so, you must run a total system check to ensure that no other activity has been affected by the change. This system check can be done through the diagnostics program (Select **Diagnostics**, then select and execute **All Tests** from PC-Doctor).

POST: Some diagnostic aids are resident in the machine, such as the Power-On Self Test (POST). The machine performs the POST each time it is powered on. Use this information throughout the diagnostic procedures. The POST is a series of system checks and initializations that verify the correct operation of the base system.

After a successful POST, the system attempts to load operating system. The system can be customized for different startup (boot) methods by the BIOS Setup Utility. See "Startup Options" on page 1-27.

The system's default startup sequence automatically looks for the operating system files in the hard disk if these files are not found in the diskette.

NOTE: Remember that POST does not test all areas, but only those that allow the system to operate well enough to run the diagnostics program.

Table 2-1 lists BIOS error codes, messages, and beeps to their possible causes, table 2-2 lists error symptoms and their possible causes. The most likely cause is listed first. Make sure you complete all items in the cause or "Action/FRU" column. When servicing a system, always begin with "

Start" on page 2-3.

If you are unable to correct the problem using these two index tables, go to "Undetermined Problems" on page 2-44.

NOTES:

1. If an error message and incorrect audio response occur, diagnose the error message first.

2. If you cannot run the diagnostics program tests but did receive a POST error code, diagnose the POST error message.

3. If you did not receive any error message, look for a description of your error symptoms in "Error Symptoms List" in table 2-2.

4. Check all power supply voltages, switch, and jumper settings before you replace the system board. Also check the power supply voltages if you have a "system no-power" condition. (See "Power Supply Cable Connector Specifications" on page 5-18, "2137 System Board " on page 5-5 and"2138 System Board Layout" on page 5-15.)

5. If you are unable to correct the problem by using the "BIOS Error Codes, Messages, And Beeps List" table and "Error Symptoms List" table, go to "Undetermined Problems" on page 2-44.

Table 2- 1 BIOS Error Codes, Messages, and Beeps List	
BIOS Error Codes, Messages, beeps	**Action/FRU**
NOTE: To diagnose a problem, first find the BIOS error messages, codes, or beeps in left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
POST Error Codes and Messages	
006 Equipment Configuration Error	Ensure the equipment (diskette drive, hard disk drive, keyboard, mouse, etc.) are connected properly and are set correctly in BIOS Setup. System board.

Table 2- 1	BIOS Error Codes, Messages, and Beeps List
BIOS Error Codes, Messages, beeps	**Action/FRU**
NOTE: To diagnose a problem, first find the BIOS error messages, codes, or beeps in left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	

010
  Memory Error at
  MMMM:SSSS:OOOOh
  (R:xxxxh, W:xxxxh)
	Insert the memory modules in the DIMM sockets properly, then reboot the system.
	Memory module. See the "Step 005" of "Memory" on page 2-35 to replace memory module.
	System board.

020
  PS/2 Keyboard Interface
  Error
	Plug the keyboard connector properly, then reboot the system.
	Keyboard.
	System board.

021
  PS/2 Keyboard Error or
  Keyboard Not Connected
	Check if the keyboard and mouse cables are connected to their respective connectors. Make sure that they are not interchanged.
	Plug the keyboard connector properly, then reboot the system.
	Keyboard.
	System board.

030 PS/2 Pointing Device Error	Check if the keyboard and mouse cables are connected to their respective connectors. Make sure that they are not interchanged. Plug the mouse connector properly, then reboot the system. PS/2 mouse. System board.

031
  PS/2 Pointing Device
  Interface Error
	Check if the keyboard and mouse cables are connected to their respective connectors. Make sure that they are not interchanged.
	PS/2 mouse.
	System board.

Table 2- 1	BIOS Error Codes, Messages, and Beeps List
BIOS Error Codes, Messages, beeps	**Action/FRU**
NOTE: To diagnose a problem, first find the BIOS error messages, codes, or beeps in left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
040 Floppy Disk Controller Error	Ensure the diskette drive configuration setting in BIOS Setup is correct. Diskette drive cable/connection. Diskette drive. System board.
041 Floppy Drive A Error	Ensure that the diskette drive A configuration setting in BIOS Setup is correct. Diskette drive power. Diskette drive cable/connection. Diskette drive A.
048 Floppy Drive(s) Write Protected	Ensure that the diskette drive is not set to [Write protect] in the Security Options in BIOS Setup.

050
    IDE Primary Channel Master Drive Error
 	
051
    IDE Primary Channel Slave Drive Error
	Ensure the IDE Primary Channel Master (Slave) is set to [Auto] in BIOS Setup.
	
	Check hard disk jumper. See "3.5-In. Hard Disk Drive Jumper Locations" on page 5-21 or "5.25-In. Hard Disk Drive Jumper Location" on page 5-24.
	
	Hard disk drive power.
	
	Hard disk drive cable/connection.
	
	Hard disk drive.

Table 2-1 BIOS Error Codes, Messages, and Beeps List	
BIOS Error Codes, Messages, beeps	**Action/FRU**
NOTE: To diagnose a problem, first find the BIOS error messages, codes, or beeps in left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
052 IDE Secondary Channel Master Drive Error 053 IDE Secondary Channel Slave Drive Error	Ensure the IDE Secondary Channel Master (Slave) is set to [Auto] in BIOS Setup. Check hard disk jumper. See "3.5-In. Hard Disk Drive Jumper Locations" on page 5-21 or "5.25-In. Hard Disk Drive Jumper Location" on page 5-24. Hard disk drive power. Hard disk drive cable/connection. Hard disk drive.
055 Hard Disk Drive(s) Write Protected	Ensure that the hard disk drive is not set to [Write Protected] in the Security Options in BIOS Setup. Hard disk drive cable/connection. Hard disk drive.
061 CPU Clock Mismatch	Enter BIOS Setup and load the default settings.
070 Real Time Clock Error	Enter BIOS Setup and load the default settings. RTC battery. See "System Backup Battery" on page 4-26. System board.
071 CMOS Battery Bad	Enter BIOS Setup and load the default settings. RTC battery. See "System Backup Battery" on page 4-26. System board.
072 CMOS Checksum Error	Enter BIOS Setup and load the default settings. RTC battery. See "System Backup Battery" on page 4-26. System board.

Table 2- 1 BIOS Error Codes, Messages, and Beeps List	
BIOS Error Codes, Messages, beeps	**Action/FRU**
NOTE: To diagnose a problem, first find the BIOS error messages, codes, or beeps in left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
102 I/O Parity Error	ISA adapter card
	System board
103 Press <Esc> to turn off NMI or other key to reboot	Press Esc to turn off NMI and proceed to reboot system or press any key to reboot system.
	Insert the memory modules in the DIMM sockets properly, then reboot the system.
	Remove all adapter cards that are NOT factory-installed, then reboot the system.
104 Insert system diskette and press <Enter> to reboot	Ensure that the System Boot Drive parameter in the Startup Options of BIOS Setup is not set to [Drive A only].
	Insert a system diskette into diskette drive and reboot system.
	Ensure the diskette drive configuration setting in BIOS Setup is correct.
	Hard disk drive power.
	Diskette drive.
	System board.
120 I/O Resource Conflict(s)	Enter BIOS Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system.
121 Memory Resource Conflict(s)	Enter BIOS Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system.
122 IRQ Setting Error	Enter BIOS Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system.
123 Expansion ROM Allocation Failed	Enter BIOS Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system.

Table 2-1 BIOS Error Codes, Messages, and Beeps List	
BIOS Error Codes, Messages, beeps	**Action/FRU**
NOTE: To diagnose a problem, first find the BIOS error messages, codes, or beeps in left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
180 Onboard Serial Port IRQ Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
182 Onboard Parallel Port IRQ Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
183 Onboard Floppy Drive IRQ Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
184 Onboard Pointing Device IRQ Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
185 Onboard IDE Secondary Channel IRQ Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
186 Onboard ECP Parallel Port DMA Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
187 Onboard Floppy Drive DMA Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.

Table 2- 1 BIOS Error Codes, Messages, and Beeps List	
BIOS Error Codes, Messages, beeps	**Action/FRU**
NOTE: To diagnose a problem, first find the BIOS error messages, codes, or beeps in left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
188 Onboard Floppy Drive I/O Address Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
189 Onboard IDE Secondary Channel I/O Address Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
190 Onboard Serial Port I/O Address Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
192 Onboard Parallel Port I/O Address Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
193 Onboard Serial Port Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
195 Onboard Parallel Port Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
196 Onboard IDE Primary Channel IRQ Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.

Table 2- 1 BIOS Error Codes, Messages, and Beeps List	
BIOS Error Codes, Messages, beeps	**Action/FRU**
NOTE: To diagnose a problem, first find the BIOS error messages, codes, or beeps in left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	

197
    Onboard IDE Primary
    Channel I/O Address
    Conflict(s)
	Enter BIOS Setup and load the default settings.
	
	Remove all adapter cards that are NOT factory-installed, then reboot the system.

198 PnP ISA Card(s) Disabled	Enter BIOS Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system. Remove all adapter cards that are NOT factory-installed, then reboot the system.
Beeps	
One long beep then two short beeps	Restart the system. System board.
Two long beeps then three short beeps	Insert the memory modules in the DIMM sockets properly, then reboot the system. Memory module. See the "Step 005" of "Memory" on page 2-35 to replace memory module. System board.

Table 2- 2 Error Symptoms List	
Error Symptoms	**Action/FRU**
NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
Processor / Processor Fan	
NOTE: Normally, the processor fan should be operative, and the processor clock setting should be exactly set to match its speed requirement before diagnosing any processor problems.	
Processor fan does not run but power supply fan runs.	Ensure that the system is not in power saving mode. See "Power Management" on page 1-25.
	With the system power on, measure the voltage of processor fan connector FN1 (see "2137 System Board on page 5-5 or see 2138 System Board Layout on page 5-15). Its reading should be +12Vdc.
	Processor fan.
	System board.
Processor test failed.	Processor.
	System board.
System Board and Memory	
NOTE: Ensure that the memory modules are installed properly and the contact leads are clean before diagnosing any system problems.	
Memory test failed.	"Memory" on page 2-35.
	System board
Incorrect memory size shown or repeated during POST.	"DIMM Configurations" on page 5-28.
	"Memory" on page 2-35
System works but fails to enter power saving mode when the Power Saving Mode is set to [Enabled], and power saving timer set in BIOS has elapsed.	System board.

Table 2- 2 Error Symptoms List	
Error Symptoms	**Action/FRU**
NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
System hangs before system boot.	"Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8.
	"Undetermined Problems" on page 2-44.
System hangs after system boot.	Execute a system test ("Diagnostics/All Tests" in PC-Doctor diagnostics program) and set it to stop at "Halt on Error" to see the potential cause of the problem.
	"Undetermined Problems" on page 2-44.
Blinking cursor only; system does not work.	"Start" on page 2-3.
	Diskette/hard disk drive connection/cables
	Diskette/hard disk drives
	"Undetermined Problems" on page 2-44.
	System board
Diskette Drive	
NOTE: Ensure that the diskette drive is configured correctly in BIOS Setup and its read/write head is clean before diagnosing any diskette drive problems.	
Media and drive are mismatched.	Ensure that the diskette drive is configured correctly in the Disk Drives of BIOS Setup.
	Diskette drive connection/cable
	Diskette drive
	System board
Diskette drive does not work.	Ensure that the diskette drive is not set to [None] in the Disk Drives of BIOS Setup.
	Diskette drive power
	Diskette drive connection/cable
	Diskette drive
	System board

Table 2- 2 Error Symptoms List	
Error Symptoms	**Action/FRU**
NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
Diskette drive read/write error.	Diskette.
	Ensure that the diskette drive is not set to [Write protect] in the Security Options of BIOS Setup.
	Diskette drive cable.
	Diskette drive.
	System board.
Diskette drive LED comes on for more than 2 minutes when reading data.	Diskette
	Diskette drive connection/cable
	Diskette drive
	System board
Diskette drive LED fails to light, and the drive is unable to access for more than 2 minutes.	Diskette
	Diskette drive power
	Diskette drive connection/cable
	Diskette drive
	System board
Diskette drive test failed.	Diskette
	Diskette drive
	Diskette drive cable
	System board
Hard Disk Drive	
NOTE: Ensure hard disk drive is configured correctly in BIOS Setup, cable/jumper are set correctly before diagnosing any hard disk drive problems.	
Hard disk drive test failed.	Hard disk drive.
	Hard disk drive cable.
	System board.

Table 2- 2 Error Symptoms List	
Error Symptoms	**Action/FRU**
NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
Hard disk drive format error.	Hard disk drive cable.
	Hard disk drive.
	System board.
Hard disk drive write error.	Hard disk drive.
Hard disk drive LED fails to light, but system operates normally.	With the system power on, measure the voltage of hard disk LED connector CN12(see "2137 System Board "on page 5-5) or CN21 (see "2138 System Board Layout" on page 5-15.. Its reading should be:
	CN12(for 2137) HDD Idle/Active CN21(for 2138) HDD Idle/Active pin-1 +5 Vdc / +5 Vdc pin-2 +5 Vdc / 0 Vdc pin-3 +5 Vdc / 0 Vdc pin-4 +5 Vdc / +5 Vdc
	Hard drive LED cable.
CD-ROM Drive	
NOTE: Ensure CD-ROM drive is configured correctly in BIOS Setup, cable/jumper are set correctly and its laser beam is clean before diagnosing any CD-ROM drive problems.	
CD-ROM drive LED flashes for more than 30 seconds before LED shutting off. Software asks to reinstall disc. Software displays a reading CD error.	CD may have dirt or foreign material on it. Check with a known good disc. CD is not inserted properly. CD is damaged.
CD-ROM drive LED doesn't come on but works normally.	CD-ROM drive

Table 2-2	Error Symptoms List
Error Symptoms	**Action/FRU**
NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
CD-ROM drive cannot load or eject when the system is turned on and its eject button is pressed and held.	"CD-ROM Emergency-exit <option 1>" on page 5-25 or CD-ROM Emergency-exit Option <2> page 5-26. CD-ROM drive power. "CD-ROM Drive" on page 2-34. CD-ROM drive
CD-ROM drive does not read and there are no error codes or messages are displayed.	CD may have dirt or foreign material on it. Check with a known good disc. Ensure that the CD-ROM driver is installed properly. CD-ROM drive.
CD-ROM drive can play audio CD but no sound output.	Ensure that the headphone jack of the CD-ROM has an output, then check if the audio cable from CD-ROM drive to system board CN6 (see "2137 System Board "on page 5-5) or CN15 (see "2138 System Board Layout" on page 5-15 is connected properly. Turn up the voice. Speaker power/connection/cable. CD-ROM drive.
Real-Time Clock	
Real-time clock is inaccurate.	Ensure that the information in the Date and Time of BIOS Setup is set correctly. RTC battery. See "System Backup Battery" on page 4-26. System board
Audio	
Audio software program invokes but no sound comes from speakers.	Speaker power/connection/cable.

Table 2- 2	Error Symptoms List
Error Symptoms	**Action/FRU**
NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
Modem	
Data/fax modem software program invokes but cannot receive/send data/fax	"Factory-Installed Modem Card" on page 2-30.
Fax/voice modem software program invokes but has no sound output. (Data files are received normally; voice from modem cannot be produced, but system sound feature works normally.)	Ensure that the modem voice-in/speak-out cable from modem adapter card to system board CN2 (see "2137 System Board "on page 5-5) or CN13 (see "2138 System Board Layout" on page 5-15) is connected properly. "Factory-Installed Modem Card" on page 2-30.
Modem ring cannot wake up system from suspend mode.	Ensure that the "Modem Wake-Up on Ring" in BIOS Setup is set to [Enabled]. Ensure that the modem ring-in cable from the modem adapter card to system board CN9 (see "2137 System Board "on page 5-5) or CN17 (see "2138 System Board Layout" on page 5-15) is connected properly.
Video and Monitor	
Video memory test failed. Video adapter failed.	System board
Display problem: - Incorrect colors - No high intensity - Missing, broken, or incorrect characters - Blank monitor(dark) - Blank monitor(bright) - Distorted image - Unreadable monitor - Other monitor problems	Monitor signal connection/cable. Monitor System board

Table 2- 2	Error Symptoms List
Error Symptoms	**Action/FRU**
NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
Display changing colors.	Monitor signal connection/cable Monitor System board
Display problem not listed above (including blank or illegible monitor).	"Monitor" on page 2-42. System board
Parallel/Serial Ports	
NOTE: Execute "Load BIOS Default Settings" in BIOS Setup to confirm ports' presence before diagnosing any parallel/serial ports problems.	
Serial or parallel port loop-back test failed.	Make sure that the LPT# or COM# you test is the same as what you set in BIOS Setup. See "Serial Port Addresses" on page 1-13 and "Parallel Port Addresses" on page 1-14. Loop-back. System board.
Printing failed.	Ensure that the printer driver is properly installed. Refer to the service manual for the printer. Printer. Printer cable. System board.
Printer problems.	Refer to the service manual for the printer.

Table 2- 2	Error Symptoms List
Error Symptoms	**Action/FRU**
NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
Joystick	
Game port does not respond or does not work.	Connect a joystick to the game port, then execute "Interactive Test/Joystick" test in PC-Doctor diagnostics program. System board.
Diagnostic Program	
Diagnostics programs cannot be executed.	Reboot the system from the diagnostics diskette. Diagnostics diskette. Memory module. System board.
Missing diagnostics files(s).	Diagnostics diskette.
Keyboard	
Some or all keys on keyboard do not work.	"Keyboard "on page 2-36.
Power Supply	
Pressing power switch cannot turn off system.. (Only unplug power cord from electrical outlet can turn off system.)	See "Power Switch< 4 sec." on page 1-26. Power switch cable assembly "Power Supply" on page 2-39. System board

Table 2- 2 Error Symptoms List	
Error Symptoms	**Action/FRU**
NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.	
Executing software shutdown from Windows95 Start menu cannot turn off system. (Only pressing power switch can force system to turn off).	System board.
No system power, or power supply fan is not running.	Ensure that a 3-wire standby power cable from power supply to system board CN15 is connected properly. See "2137 System Board "on page 5-5 or "2138 System Board Layout" on page 5-15) "Power Supply" on page 2-39. System board.
Other Problems	
Any other problems.	"Undetermined Problems" on page 2-44.

Check Procedures

Failing Parts or Assemblies: The check procedures generally help you trace a problem to one part or assembly. The last step of the specific check procedure you are using indicates that a part or assembly is failing. You should inspect the part or assembly before you decide to replace it. It might be loose, dirty, or in need of a small repair. The check procedures might lead you to two, or even three, possible failing parts or assemblies. The parts that might be failing are listed in order of the most probable failure. Also, the FRU parts are defined as replaced units and are not repaired in the field.

Measuring Voltages: Some check procedure steps instruct you to measure voltages on cable plugs and electronic board connectors. If you are asked to measure voltage at several places on a plug or connector, a chart next to or near the instruction indicates the number of the plug or connector, the pin numbers you should measure, the signal name, and the correct voltage for the condition you are measuring. Measure the voltage only at the pins listed in the chart. Remember to set the meter on the correct scale and to put the meter leads in the correct position for the voltage you are asked to measure.

NOTE: Use frame ground as the ground reference. Attach the black (ground) lead of meter to frame ground, except where specified otherwise.

Factory-Installed Storage Devices

Use this check procedure to test any factory-installed drives.

ATTENTION: The customer may have customized settings in the Setup Utility (other than default settings) on the computer you are servicing. Running the Setup Utility might alter those settings. Take note of the current settings and verify that the customer settings are in place when service is complete.

NOTE: If you cannot access the hard disk drive or load a diskette from Drive A or load a CD from the CD-ROM drive, make sure that the BIOS Setup Utility has the startup sequence set with diskette, CD-ROM, and hard disk drives.

001 - START

– Insert the diagnostics diskette into the diskette drive.

– Power-off then power-on the system unit.

002 - DO ANY POST MESSAGES, ERROR CODES, BEEPS, OR SYMPTOMS APPEAR? (YES, READ AHEAD. NO, GO TO STEP 003)

– Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8.

– End.

003 -

– Select **Utility** from the menu.

– Select and execute **Tech Support Form** from the menu to generate a system configuration report.

– Compare the system configuration list with the actual devices installed in system.

NOTE: If necessary, remove the cover and visually compare the devices installed in the system unit to those shown in the Tech Support Form.

004 - IF THE NUMBER OF DISKETTE, HARD DISK, OR CD-ROM DRIVE IS NOT CORRECT, READ AHEAD; OR GO TO STEP 005.

– Check the cable installation of all disk drives.

- Diskette drive should be connected to the system board connector CN16 (see "2137 System Board "on page 5-5) or CN19 (see "2138 System Board Layout" on page 5-15).

- IDE Primary Channel Master and Slave Drives in BIOS Setup should be connected to the system board connector CN13(see "2137 System Board "on page 5-5) or CN9 (see "2138 System Board Layout" on page 5-15).

- IDE Secondary Channel Master and Slave Drives in BIOS Setup should be connected to the system board connector CN10(see "2137 System Board "on page 5-5) or CN8 (see "2138 System Board Layout" on page 5-15).

  NOTE: The CD-ROM drive comes with system unit should be configured as IDE Secondary Channel Slave device.

  – Check the hard disk and CD-ROM drives jumper settings. See "3.5-In. Hard Disk Drive Jumper Locations" on page 5-21 or "5.25-In. Hard Disk Drive Jumper Location" on page 5-24 and "CD-ROM Drive" on page 2-34.

  – Check the voltages of all disk drive power connectors. See "Power Supply Cable Connector Specifications" on page 5-18.

  – Correct the parameter settings under Disk Drives in the BIOS Setup. See "Disk Drives" on page 1-21.

  – In the BIOS Setup, check that the correct drive size is set for the flagged drive shown in the Installed Devices list.

  – If the problem remains, check the continuity on the drive and the cable and replace it if necessary. If that does not fix the problem, replace the system board.

  – End.

005 –

  – Select **Diagnostics** from the PC-Doctor diagnostics program main menu. Select and execute **Floppy Disk Test** if you want to test diskette drive. Select and execute **Hard Disk Test** if you want to test hard disk drive.

  – Select **Interactive Tests** from the PC-Doctor diagnostics program main menu, then select and execute **CD-ROM/DVD Test** if you want to test CD-ROM drive.

  – If the diagnostics program did not detect a failure, but the system still displays a failure:

- If an error or other symptom appears, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8.
- If no error can be detected or the symptom is intermittent, go to "Undetermined Problems" on page 2-44.
    - End.

Factory-Installed Modem Card

NOTE: The factory-installed modem is 33.6 Kbps or 56 Kbps modem. A 4-pin voice-in/speaker-out cable should present if it has voice feature.

001 - START

- Power off the system unit.

- Ensure that the modem is not configured with a conflicting COM port and IRQ setting.

- Ensure that the communication software is configured with the correct COM and IRQ settings (same COM port and IRQ as the modem).

- Ensure that all communication parameters (baud rate, data, stop and parity bits) are properly configured and are identical on both sides.

- Connect the phone line to the LINE port of the modem card.

   NOTE: Check the outside phone line by connecting a working telephone to the telephone wall jack.   Listen for a dial tone to ensure that the phone line is good.

002 -

- Insert the diagnostics diskette into the diskette drive.

- Power on the system unit.

- Select **Diagnostics** menu,

- Select **All Tests,** then execute **Modem** test.

003 -   DOES THE MODEM PASS THE TEST? (YES, READ AHEAD. NO, GO TO STEP 004.)

- Power off the system unit.

- Remove all adapter cards.

- Connect a hard disk drive with pre-loaded Windows 95 inside.

- Power on the system unit.

- Perform the following steps under Windows 95.

2-30

> **NOTE:** If an operating system other than Microsoft Windows 95 is installed, the program screens and icons may differ from these instructions.

1. Start Microsoft Windows 95.
2. Select the **Start** icon.
3. Select **Program**, then select **Accessories**, **Hyper Terminal**.
4. Select the any a on-line service station, dial and connect to it.

004 - CAN THE MODEM DIAL OUT AND CONNECT TO ANY BBS SUCCESSFULLY? (YES, READ AHEAD. NO, GO TO STEP 005.)

– The modem adapter functions normally.

– End.

005 -

– Ensure that Windows 95 is properly installed, then power off the system unit.

– Plug the modem adapter card into a different ISA expansion slot.

– Go to step 002.

– If the error symptom still remains, replace the modem adapter card.

– End.

Audio (Not Supported by Diagnostics Program)

NOTE: While performing this check, you may need to enter and exit Microsoft Windows 95 several times. When instructed to select an icon or button, double-click on the item with the mouse.

For more information about using Microsoft Windows 95, see the user's guide that came with the computer.

If an operating system other than Microsoft Windows 95 is installed, the program screens and icons may differ from these instructions.

001 - START

– Power off the system unit.

– Remove all adapter cards.

– Connect a hard disk drive with pre-loaded Windows 95 inside.

– Power on the system unit.

002 - DO ANY POST MESSAGES, ERROR CODES, BEEPS, OR SYMPTOMS APPEAR? (YES, READ AHEAD. NO, GO TO STEP 003)

– Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8.

– End.

003 - DO ANY MESSAGES OR ERROR CODES DISPLAY AFTER POST COMPLETES BUT BEFORE MICROSOFT WINDOWS 95 STARTS? (YES, READ AHEAD. NO, GO TO STEP 004)

NOTE: If POST does not complete, answer this question "No."

– Ensure that Windows 95 is properly installed.

– End.

004 -

– Perform the following under Windows 95.

NOTE: If an operating system other than Microsoft Windows 95 is installed, the program screens and icons may differ from these instructions.

1. Start Microsoft Windows 95.
2. Select the **Start** icon.
3. Select **Settings**, then select **Control Panel**.
4. Select the **Sound** icon.
5. In the Sound window, select chimes from the **Names** field. (To test other adapter card software, select an action from a menu in that software.)

005 - IS THE PREVIEW BUTTON, OR ACTION IN OTHER SOFTWARE, SELECTABLE ON THE SCREEN (SHOWN IN BLACK AND NOT GRAY)? (YES, GO TO STEP 006. NO, READ AHEAD.)

– Ensure that Windows 95 is properly installed.

– Go to step 001.

006 -

– Select the **Preview** button from the Sound window.

007 - DO YOU HEAR ANY SOUND FROM THE SPEAKER? (YES, READ AHEAD. NO, GO TO STEP 008.)

– The audio feature is functioning normally. Click Cancel to close the dialog box. Exit Microsoft Windows 95.

– If the symptom remains or has changed, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8.

– End.

008 -

– Make sure that the volume control is not turned low.

– Make sure that the speaker and its adapter are not damaged.

– Make sure that the speaker is plugged in speak-out jack. See "2137 System Board "on page 5-5 or "2138 System Board Layout" on page 5-15.

– If the error cannot be resolved, replace the system board.

– End.

CD-ROM Drive

001 -   START

- Insert the diagnostics diskette into the diskette drive and ensure that there is no CD in the CD-ROM drive.

- Select **Interactive Tests** menu, then select and execute **CD-ROM Test**.

002 -   DO YOU SEE A MESSAGE "NO CD-ROM DRIVE OR MSCDEX DEVICE DRIVER INSTALLED."? (YES, READ AHEAD. NO, GO TO 003.)

- Exit the diagnostics program and power off the system.

- Check and ensure that the CD-ROM drive power cable and audio and data cables are not damaged and are connected properly.

- Check and ensure that the CD-ROM drive driver is loaded correctly.

003 -   DO THE TESTS OF OPEN/CLOSE TRAY BY DIAGNOSTICS PROGRAM AND BY DEPRESSING CD-ROM DRIVE BUTTON WORK? (YES, READ AHEAD. NO, GO TO STEP 006.)

- Load a known good data CD into the CD-ROM drive and try to read its content by typing DIR on DOS prompt.

004 -   CAN A CD BE READ FROM THE CD-ROM DRIVE? (YES, THEN THE CD-ROM DRIVE FUNCTIONS NORMALLY.   NO, READ AHEAD.)

- Try reading the CD with a known good CD-ROM drive.

005 -   IS THE CD STILL NOT READABLE? (YES, READ AHEAD. NO, GO TO STEP 006.)

- Replace system board.

- End.

006 -

- Replace CD-ROM drive.

- End.

Memory

001 - START

– Power off the system unit.

– Insert the diagnostics diskette into the diskette drive.

– Ensure that all DIMMs are installed correctly.

– Power on the system unit.

– Take note of any messages, error codes, or symptoms.

002 - DO YOU RECEIVE POST MEMORY ERROR MESSAGE? (YES, READ AHEAD. NO, GO TO STEP 003)

– Enter BIOS Setup Utility then reboot the system. Take note of any messages, error codes, or symptoms. If the error message remains, go to step 005.

003 -

– Follow the screen instructions to run the **Memory** test.

004 - DOES THE MEMORY TEST COMPLETE WITHOUT AN ERROR? (YES, READ AHEAD. NO, GO TO STEP 005.)

– The system memory is now functioning correctly. If you suspect an intermittent problem, run the **Memory** test again.

– End.

005 -

– Replace each DIMM, one at a time, with a known working DIMM of the same size and type.

– If the problem does not appear, it means that the last DIMM replaced is defective. If all DIMMs on the system board, have been replaced and the problem remains, replace system board.

– Go to step 001.

Keyboard

001 - START

– Power off system unit and ensure the keyboard plug is connected properly.

002 -

– Insert the diagnostics diskette into the diskette drive and power on the system unit.

– Select **Interactive Tests** menu, then execute **Keyboard** test.

003 - DOES THE KEYBOARD FUNCTION CORRECTLY? (YES, READ AHEAD. NO, GO TO STEP 004.)

– Keyboard is functioning normally.

– End.

004 - ARE THERE ANY STUCK KEYS OR ANY GRIME IN THE GAP OF KEYCAPS? (YES, READ AHEAD. NO, GO TO STEP 005.)

– Power off the system unit. Carefully remove the grime and solve the stuck keys problem.

– Go to step 001.

005 - ARE THERE ANY BROKEN PINS IN THE KEYBOARD PLUG? (YES, GO TO STEP 007. NO, READ AHEAD.)

– Try with a known good keyboard.

006 - DOES THE ERROR SYMPTOM STILL REMAIN? (YES, READ AHEAD. NO, GO TO STEP 007.)

– Replace the system board.

– End.

007 -

– Replace the keyboard.

– End.

Mouse

NOTE: A sticking key button can cause the mouse to operate incorrectly. If you suspect this, go to "Keyboard" on page 2-35.

001 - START

– Make sure that the mouse ball turns freely.

– Make sure that the mouse plug connects properly.

002 -

– Power off the system unit.

– Insert the diagnostics diskette into the diskette drive.

– Power on the system unit.

– Select **Interactive Tests** menu, then execute **Mouse** test.

003 - DO YOU SEE THE MOUSE CURSOR IN THE DIAGNOSTICS PROGRAM? (YES, READ AHEAD. NO, GO TO STEP 011)

– Test right (left) button and check if right (left) button works.

004 - DOES THE MOUSE BUTTON WORK? (YES, READ AHEAD. NO, GO TO STEP 007)

– Test mouse cursor movement.

005 - DOES THE MOUSE MOVE SMOOTHLY AND KEEP X AND Y COORDINATES CHANGED? (YES, READ AHEAD. NO, GO TO STEP 006)

– Mouse is functioned normally.

– End.

006 -

– Power off the system unit.

– Open mouse bottom cover and clean track ball.

– Go to step 002.

007

– Power off the system unit.

− Check the mouse plug.

008 - **ARE THERE ANY BROKEN PINS IN THE MOUSE PLUG? (YES, GO TO STEP 010. NO, READ AHEAD.)**

− Try with a known good mouse.

009 - **DO THE ERROR SYMPTOMS STILL REMAIN? (YES, READ AHEAD. NO, GO TO STEP 010.)**

− Replace the system board.

− End

010 -

− Replace the mouse.

− End.

011 -

− Exit diagnostics program.

− Ensure that the mouse driver is properly installed.

− Go to step 002.

Power Supply

001 - START

– Power off the system unit.

– Check that the power cord for continuity. Replace if necessary.

– Check for the correct line voltage from the power outlet, and verify that the voltage selector switch (if present) is set to the correct voltage.

– Power on the system unit.

002 - DOES THE POWER SUPPLY FAN RUN? (YES, GO TO STEP 003. NO, GO TO STEP 004)

003 - DOES THE SYSTEM FAIL TO SHUT OFF WHEN THE ON/OFF SWITCH IS PRESSED? (YES, READ AHEAD. NO, GO TO STEP 005)

– You might have a damaged on/off switch cable assembly.

– Disconnect the on/off switch cable assembly connector from the power supply connector and take an ohm reading.

– Go to step 007.

004 -

– Disconnect the power cord from the back of the system unit.

– Disconnect all power and switch cable connectors from the system board and the power supply.

– Disconnect the power connectors to all drives.

– Make a connection (jumper) between the black and white wires of the standby power control cable as shown in the following figure.

White(S/W Shutdown Control

Black(GND)

Red(+5V)
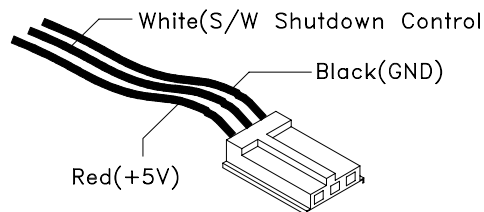
Figure 2- 1   Standby Power Cable

- Connect any one of the power connector to system board or drive as power load for driving up power supply.

- Reconnect the power cord.

005 - DOES THE POWER SUPPLY FAN RUN? (YES, READ AHEAD. NO, GO TO STEP 009)

- With the system powered on and the power supply fan running, check the voltages of the power supply connectors for the system board and all drive connectors, as shown in the following figures.
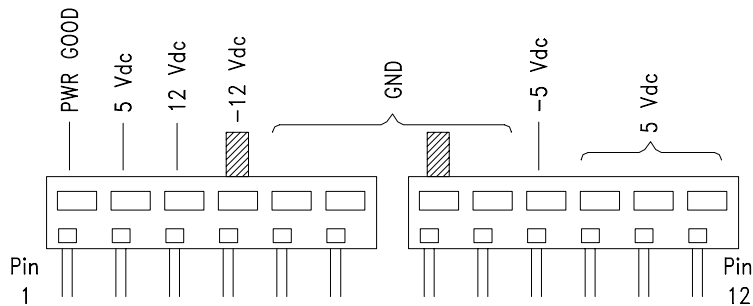
Figure 2- 2   . System Board Power Supply Connectors (Bottom View)
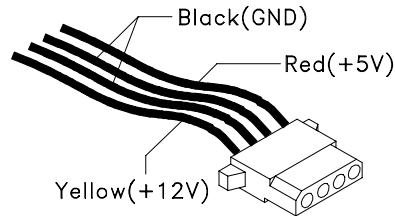
Figure 2- 3   Hard Drive or CD-ROM End of Power Cable
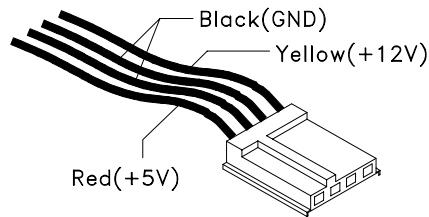
Figure 2- 4   3.5-In. Diskette Drive End of Power Cable

2-40

006 -   **ARE THE VOLTAGES CORRECT AND DOES THE FAN RUN? (YES, READ AHEAD. NO, GO TO STEP 009)**

  – The power supply is working normally.

  – If you suspect the on/off switch cable assembly, see Step 003.

  – If the fan continues to run when all connectors are plugged back in, go to "Undetermined Problems" on page 2-44.

  – If the fan stops running when a drive connector is plugged back in, go to "Start" on page 2-3.

007 -   **DO YOU HAVE AN OHM READING WHEN THE SWITCH IS PRESSED AND AN OPEN READING WHEN THE SWITCH IS RELEASED? (YES, READ AHEAD. NO, GO TO STEP 008)**

  – Replace the on/off switch cable assembly.

008 -

  – Replace the system board.

  – End.

009 -

  – Replace the power supply.

  – End.

Monitor

First, set the system to VGA mode. To do this in Windows 95, depress the **F8** function key during startup. Safe mode (VGA) will be set for Windows 95. Use the operating system's video setup to change the monitor resolution.

The monitors that come with the system are DDC2A/B or DDC1/2B+ (Display Data Channel) compliant. While starting Windows 95, the DDC2 monitor passes resolution and frequency information to the system. The system interprets the data and sets up the proper refresh rate.

If the monitor type is set to the power saving mode, the screen remains black and the LED lights or flashes in amber color. When the monitor is turned on alone, or is turned on and connected to a powered-off system unit, the monitor LED blinks in amber color. Under the normal operating conditions, the LED lights in green color.

NOTE: Some monitors have a detachable system I/O signal cable between the monitor and the system unit. Check the line voltage, power cord, and continuity for the system I/O signal cable before replacing the monitor. See "Monitor Port Signals" on page 5-28 for pin identification.

001 - START

– Power off the system unit and monitor.

– Remove all adapter cards.

– Make sure that the monitor I/O signal cable is properly connected to the system unit and monitor.

– Make sure that the power cords are properly connected to the system unit and monitor, and that the line voltage is correct.

– Make sure that the monitor contrast and brightness controls are not turned too low.

– Make sure that the diagnostics diskette is in the diskette drive.

– Power on the monitor, and wait 20 seconds.

– Power on the system unit.

NOTE: If the monitor was not sold together with the system unit, you may need to refer to the service information provided with the monitor.

002 -   IS THE SCREEN READABLE? (YES, READ AHEAD. NO, GO TO STEP 004)

NOTE: If the screen shows a blinking cursor with no memory count running, answer this question "No."

- − Select **Interactive Tests** from the Main Menu.

- − Select and execute **Video** test from the menu.

- − Follow the prompts and perform the video test.

- − Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8.

NOTE: You might have to adjust the monitor controls to obtain the best image.

003 -   DOES THE MONITOR SUCCESSFULLY PASS ALL TESTS? (YES, READ AHEAD. NO, GO TO STEP 004)

- − You have successfully completed the video diagnostics tests. If the problem remains, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8.

- − End.

004 -

- − Power off the system unit.

- − Remove the hard disk drive system cable.

- − Power on the system unit.

005 -   IS THE SCREEN READABLE?

- − Replace the monitor. If the symptom remains, replace the system board.

- − End.

Undetermined Problems

If an error code is present, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8. If no error code is present, continue with this check. Check the power supply voltages (see "Power Supply Cable Connector Specifications" on page 5-18). If the voltages are correct, return here and continue with the following steps:

1. Power off the system unit.

2. Perform the following checks, one by one, until you have isolated the problem FRU (refer to "Parts/Test Point Locations" on page 5-1 for locations):

    - Check all system board jumper positions and switch settings.
    - Check all adapter card jumper positions.
    - Check all device jumper positions.
    - Check all cables and connectors for proper installation.

If the jumpers, switch, and voltage settings are correct, return here and continue:

3. Remove or disconnect the following, one at a time:

    - Non-IBM devices
    - External devices
    - Any adapters
    - Modem card, if installed
    - CD-ROM drive
    - Diskette drive
    - Hard disk drive
    - DIMM
    - Processor
    - System board

4. Power on the system unit.

5. Repeat steps 1 through 4 until you find the failing device or adapter.

If the symptom changes, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8 or to the check procedure for the last item tested.

Replace the last item tested if the system operates normally after removing the last item.

Diagnostic Aids

Introduction

This section explains the diagnostic aids, power-on self test (POST) and diagnostics program (PC-Doctor), that are available for troubleshooting problems on the system.

Power-On Self Test

Each time you power-on the system, the power-on self test (POST) is initiated. Several items are tested during POST, but is for the most part transparent to the user.

POST checks the following:

- System Board
- Memory
- VGA Controller
- Hard Disk Drive(s)
- Floppy Diskette Drive(s)
- Keyboard

- Mouse
- Parallel Port(s)
- Serial Port(s)
- Modem(s)
- CD-ROM Drive(s)
- Sound Controller

To start POST, turn on the monitor and then the system unit. The following will happen:

1. The IBM logo will appear on center of the screen, followed by a beep from the internal system buzzer and the message "Press F1 to go to the Setup Utility" will appear at the lower left corner of the screen.

2. At this time one of two hot-keys may be used. The F1 key, as described on screen, will cause the system Setup Utility menu to appear. The F9 key will switch the graphical IBM logo screen to the traditional text-based system startup screen, which displays BIOS version and system memory tested.

3. If an error is detected during POST, the IBM logo screen will automatically switch to the text-based screen and display the error message or code. Depending on the criticality of the POST error, the system may halt and/or display the message "Press F1 to go to the Setup or Enter to continue…" If this message appears, pressing the Enter key will allow the system to attempt to proceed despite the reported error; pressing F1 will cause the system Setup Utility menu to appear.

4. If no keyboard keys are pressed, and if POST is completed without errors, the system will then proceed with the loading of DOS or other operating

system from diskette drive A or a hard disk drive or CD-ROM drive,
depending on the options selected in the Setup Utility.
If any errors are detected by POST, there will be an error message
accompanied with an error code shown on display screen. See "Index of
Symptoms, Messages, Error Codes, or Beeps" on page 2-8 to find the
most likely cause and countermeasure.

Diagnostic Diskette

WARNING: This manual is intended to test the IBM Aptiva 2137 and 2138
machine type only. Testing devices which are not included with the
original product package, including other IBM products, prototype
cards, or modifying hardware settings may give false errors and
invalid system responses. The diagnostics not specifically made for
this model may also report incorrect errors and information.

The diagnostics program comes on diskette along with this book. This version
of PC-Doctor diagnostics program, developed by Watergate for IBM, is the
primary method of testing the computer. You can use it to test the IBM
components of the system and some external devices. The amount of time
required to test components depends on the number of components installed
and selected. The more devices you have attached to your system and
selected in PC-Doctor, the longer the testing will take.

WARNING: The diagnostics program for Aptiva 2137 and 2138 are different.
Use the diagnostics program not specifically made for this model will
report false errors and incorrect information.

Diagnostics Program Features

Diagnostics program (PC-Doctor) includes the following features:

Table 3- 1 Diagnostic Program Main Menu Selections	
Main Menu Selections	**Submenu Selections**
Diagnostics	- System Test - Memory Test - Hard Disk Test - Floppy Disk Test - All Tests

Table 3- 1	Diagnostic Program Main Menu Selections
Interactive Tests	• Keyboard • Video • Internal Speaker • Mouse • Joystick Test • Diskette • Printer Test • SCSI Test • CD-ROM/DVD Test • Stereo Speaker
Hardware Info	• System Configuration • Memory Contents • IRQ and DMA Use • Device Drivers • COM and LPT Ports • Physical Disk Drives • Logical Disk Drives • VGA Information • Software Interrupts • SCSI Devices • I/O Use • IDE Drive Info • Network Information • PCMCIA Information • PCI Information • SMP Information • PNPISA Information • DMIBIOS Information

Table 3- 1	Diagnostic Program Main Menu Selections
Utility	• Run External Tests
	• File Editor
	• Surface Scan Hard Disk
	• DOS Shell
	• Terminal
	• Tech Support Form
	• Battery Rundown
	• Select Language
Quit	• Exit Diags
	• Park HD
	• Reboot
	• Upgrade Now

Using the Diagnostic Diskette

WARNING: The diagnostics program for Aptiva 2137 and 2138 are different. Use the diagnostics program not specifically made for this model will report false errors and incorrect information. You must check out the right diagnostics program before you test.

1. Put diagnostic diskette in drive A.

2. Turn off your computer and wait for 30 seconds.

3. Turn on your monitor and computer.

   NOTE: Do not press F1 during POST. If any POST errors appear after POST, make a note of the errors and see "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-8 to diagnose.

4. DOS should load. During boot, verify the each driver loads successfully. For drivers that do not load successfully, verify that the device driver is associated with it and is installed properly.

5. Diagnostics program (PC-Doctor) will load, then follow the screen instruction to operate.

   IMPORTANT: Machine Type 2138 diagnostic diskette will load and execute a system diagnostics automatically. It takes about 30 minutes. You may press Esc+Space when diagnostic program is running, then press F10 to stop when a "Testing Aborted" message shown on screen. Then, you can follow the screen instruction to choose individual test items.

Using Diagnostic Program from Recovery CD

To recover the factory installed system and program files, follow these steps:

1. Depress F1 while POST to enter BIOS Setup menu. Select and enter "Startup Options", set "Boot from CD-ROM" to "Enabled". Save the exit from BIOS Setup.

2. Turn on your computer, put the Aptiva 2137 or 2138 recovery CD into the CD-ROM drive

3. Turn off your computer and wait for 30 seconds.

4. Turn on your monitor and computer.

5. When screen prompts to install original software, type N to exit the installation program. Then type PCDR and press Enter to start the diagnostics program. Follow the instructions on the screen to operate

    IMPORTANT: For Machine Type 2138, the diagnostic program will execute a system diagnostics automatically. It takes about 30 minutes. You may press Esc+Space when diagnostic program is running, then press F10 to stop when a "Testing Aborted" message shown on screen. Then, you can follow the screen instruction to choose individual test items.

Repair Information

Removals and Replacements

See *Safety Notices (Multi-Lingual Translations)* ***on page VII***

BEFORE REMOVING ANY FRU, POWER-OFF THE COMPUTER, UNPLUG ALL POWER CORDS FROM ELECTRICAL OUTLETS, THEN DISCONNECT ANY INTERCONNECTING CABLES.

ATTENTION: The system board, processors, adapter cards, SIMMs, and upgrade processors can be damaged by electrostatic discharge. Use an electrostatic discharge (ESD) strap to establish personal grounding. If you don't have an ESD strap, establish personal grounding by touching a ground point with one hand before touching the static-sensitive FRUs.

The arrows in the removals and replacements procedures shows the direction of movement to remove a field-replaceable unit (FRU), to turn a screw, or direction to press a tab to release the FRU.

Begin all removals by removing the cover (and rear cover, if applicable).

When other FRUs must be removed prior to removing the failing FRU, they are listed at the top of the page. Go to the removal procedure for each FRU listed, remove the FRU, and then continue with the removal of the failing FRU.

To replace a FRU, reverse the removal procedure and follow any notes that pertains to replacement.

Before disconnecting any cables, note their location and orientation. Reinstall any new FRUs with cabling in their original locations.

Removal Sequence

The chart below shows the sequence of removing certain system parts. Detailed removal descriptions are available in the following section of this chapter.
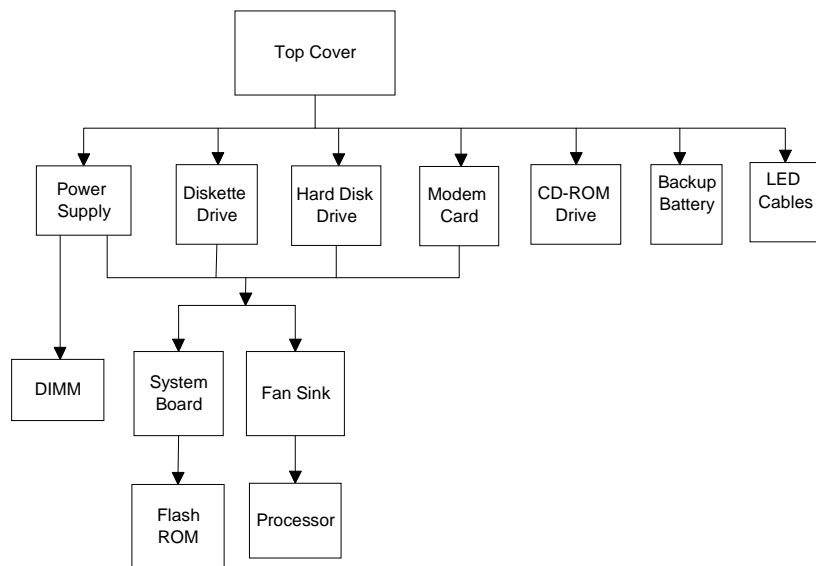
Figure 4- 1   Removal sequence

Identifying the Parts of the System Unit
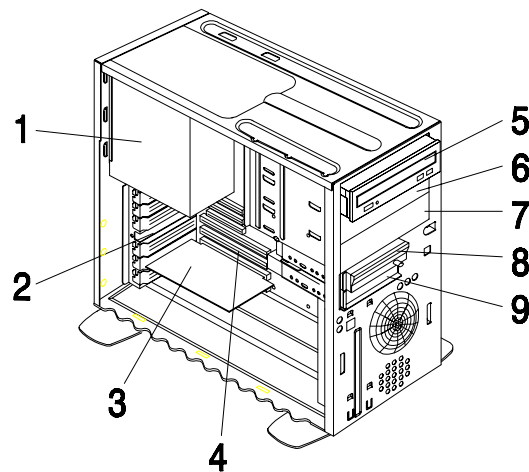
Figure 4- 2   The parts of the system unit

This computer system has five bays that can hold up to three 5.25-inch and two 3.5-inch drives.   Additional devices can be installed in the empty bays.

Diskette drives in this unit uses the standard diskette advanced technology (AT) interface. Hard disk drives in this unit uses an integrated drive electronics (IDE) AT interface. This computer supports the American National Standards Institute (ANSI) standard for AT attachment disk drives.

It also has interface slots for installation of additional cards devices. Industry standard architecture (ISA) and peripheral component interconnect (PCI) adapter cards are both supported.

1. **Switching Power Supply.**
   The system comes with a 200-watt switching power supply.

2. **Expansion slots.**
   On the rear panel of the system chassis are seven slot openings for installation of adapter cards. When installing an adapter, remove the cover of the slot that you intend to use.

3. **Modem Card**.
   The system includes either a 33.6K or a 56K voice fax modem.

4. **System board.**
   The system board is secured by screws on the inner wall of the chassis.

5. **Bay 1.**
   This drive bay may accommodate a 5.25-inch half-high drive, such as diskette, hard disk, tape, or CD-ROM drive. Normally, this bay holds the factory-installed CD-ROM drive.

6. **Bay 2.**
   This drive bay may accommodate a 5.25-inch half-high drive, such as diskette, hard disk, tape or CD-ROM drive.

7. **Bay 3.**
   This drive bay may accommodate a 5.25-inch half-high drive, such as diskette, hard disk, tape or CD-ROM drive.

8. **Bay 4.**
   This drive bay may accommodate a 3.5-inch slim drive, such as a diskette, hard disk or tape drive. Normally, this bay holds a factory-installed diskette drive.

9. **Bay 5.**
   This drive bay may accommodate an internal 3.5-inch slim drive, such as a hard disk drive.

Cover

- Disconnect the system unit power cord.

- Release the lock that secures the cover at the back of the unit by pressing it toward the unlocked icon.

- Slip your hand into the underside of the front panel and pull the release handle forward to release the cover.

- The cover slides along grooves that run on the sides of the unit. While still holding the handle, slide the cover forward to remove it completely.

- Touch the bare metal frame of the system to dissipate any static electricity from your body (do not touch any of the components inside the frame until you have done this). Do not touch any component(s) with a voltage warning label.
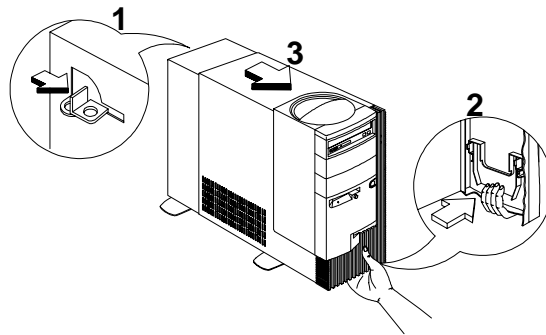
Figure 4- 3   Pull out on the cover

NOTE: Replacing the Cover

- Align the end corners of the cover with the front corners of the chassis. Ensure that the rails of the cover slides along the grooves on the sides of the chassis.
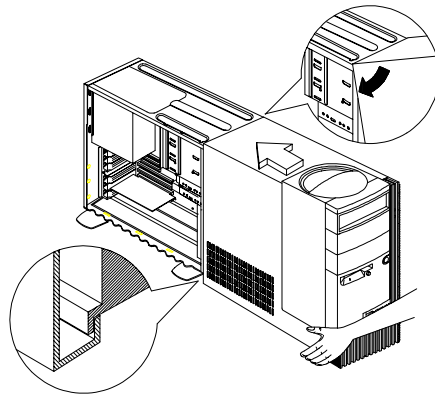
Figure 4- 4   Replacing the cover

- Slide back the cover until it fits in place.   If the cover does not slide all the way to the rear, hold the upper rear corners of the cover and slightly press it inward while pushing it toward the rear end of the unit.
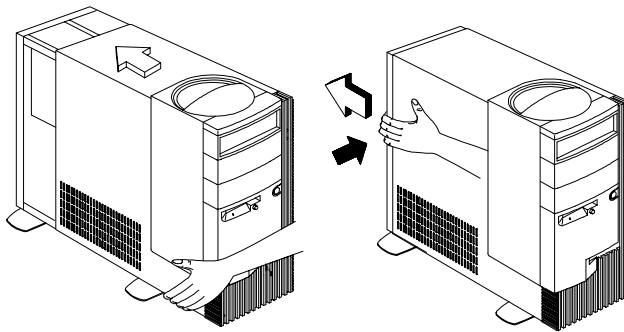
Figure 4- 5   Align and slide the cover

- Slide the lock on the back of the unit to the "locked" icon to secure the cover to the chassis.

Bay Panels

If you remove a drive from an external bay and you do not intend to install a new drive immediately, reinstall the bay panel on the empty exposed drive bay.

Follow these steps to remove the plastic bay panel from the front of the system unit cover.

- Hold a bay panel and press either side to unlatch it from the front of the system unit cover.

- Pull the bay panel out.
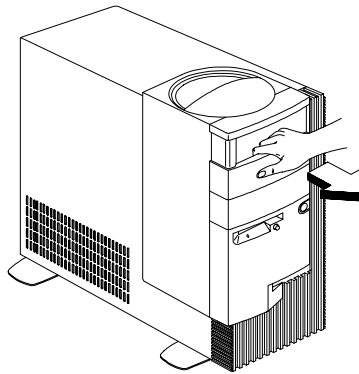
Figure 4- 6   Remove the drive bay panel

- Removing the system cover, exposes metal plates in front of each unpopulated drive bay. Push back and break-off these metal plates before installing additional drives.

- Use a screwdriver to push back the metal bay plate. After pushing the metal cover for about an inch, you may use your hand to push it all the way to a 90-degree angle.

NOTE: To Reinstall A Bay Panel

- Insert a bay panel into the opening at the front of the system cover, aligning the panel latches with the sides of the unit.

- Push the panel back until you hear the latches click in place.

Bays 1, 2, 3 (5.25-In. Internal/External Bays)

- Disconnect any cables on the drive (note location of cables).

  NOTE: For easiest removal of the power supply connector from the drive, follow these instructions:

  1. Place your right hand beneath the connector.
  2. Grasp the sides of the connector.
  3. Apply slight downward pressure as you slide the connector from side to side and toward the back of the system unit.

  The connector may be difficult to remove. It is not "locked" into the drive.

- Remove the screws.

  WARNING: For 5.25-In. hard disk drive installation, it uses different screws from 3.5-In. hard disk drive which may installed in Bay 5.

- Pull out the drive.
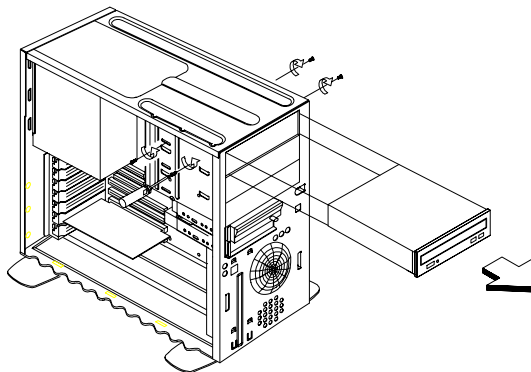
Figure 4- 7   Bay 1 (5.25-In.)

Bay 4, 5 (3.5-In. Diskette/Hard Disk Drives)

- Disconnect the cables (note location of cables).

    NOTE: Please refer to the note on Bays 1, 2, 3 (5.25-In. Internal/External
    Bays) on page 4-9.

- Press the lever and rotate outward.

- Pull carefully and slowly as soon as the warning arrow appears.

- The drive frame becomes free after the line behind the arrow appears.
  Remove the frame from the chassis.

    NOTE: Bay 4 is for external drive and Bay 5 is for internal drive only.
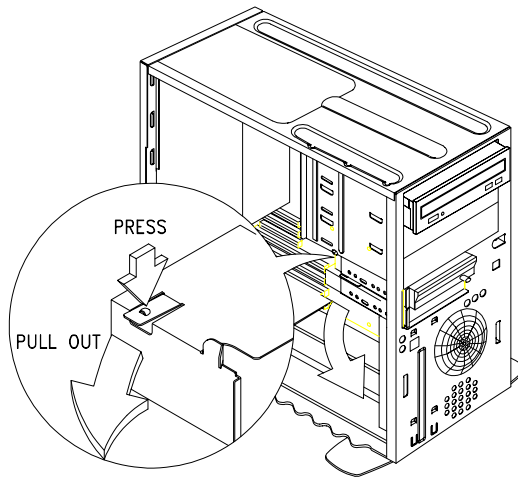
Figure 4- 8   Bay 4 (3.5-In)

- Remove screws for drive, then pull the drive out.
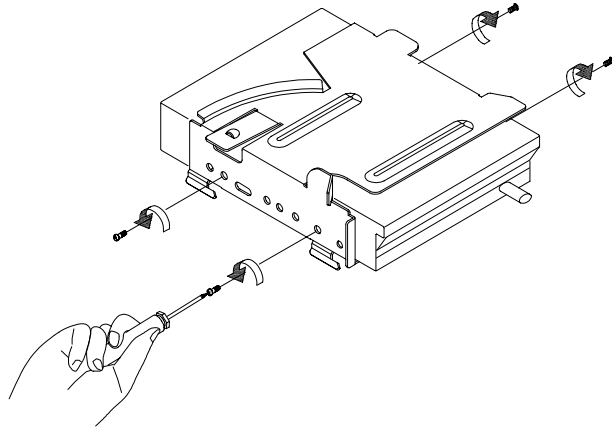
Figure 4- 9   Remove the drive

- If upper and lower frames needs to be detached (Machine Type 2137), please refer to figure 4-10.
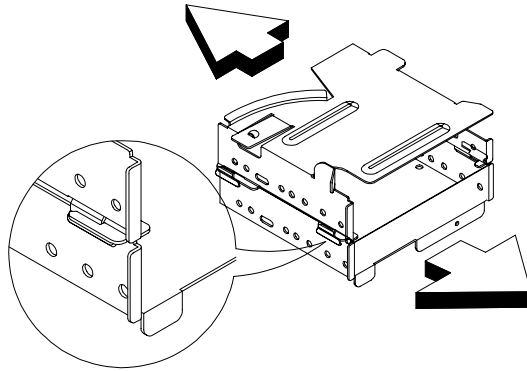
Figure 4- 10   Detach drive frame

NOTE: Reinstall the 3.5-in Drive Frame

- Before reinstalling the drive frame into the main unit, make sure the upper and lower drive frames are properly reattached.

- Align the front notch of the drive frame with the system chassis

- Align the top rail of the drive frame with the system chassis and swing inward until "click" to locked.
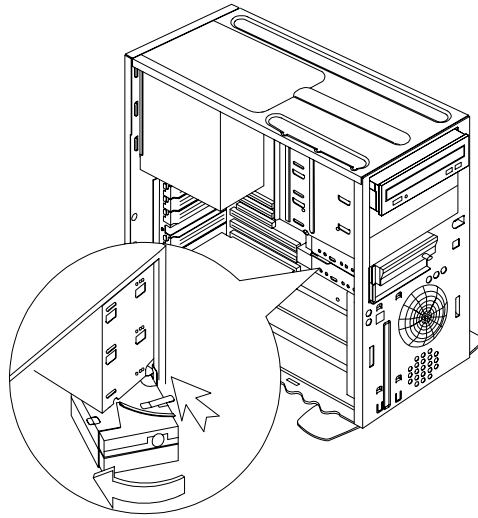
Figure 4- 11   Reattach the 3.5-inch drive

- Re-attach the power and signal cables to the drives.

Power Supply (2137 only)

- Rotate the feet of the system unit inward.

- Position the unit so it lies flat on the table.

- Remove the cables tie that secures the power supply cables.

    NOTE: Please refer to the note on Bays 1, 2, 3 (5.25-In. Internal/External Bays) on page 4-9.

- Locate and press the tab(1) on top of the system unit to release the power supply.

- Firmly hold the power supply and swing it outward(2).

- Carefully place the power supply on top of the disk drive frame.
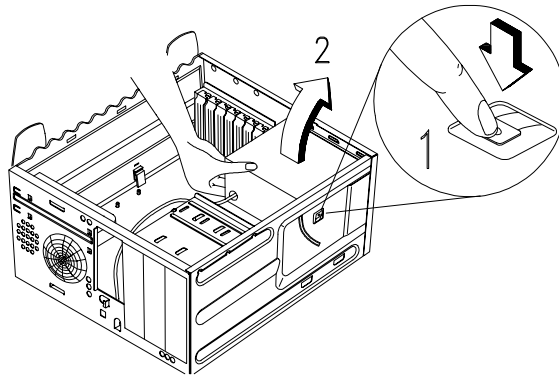
Figure 4- 12   Remove the power supply

- Detach the power supply from the frame by releasing 4 screws.

NOTE: Replace the power supply

- Position the power supply over the chassis, then insert its side hooks into the holes on the back of the chassis. See step 1 in the figure below.

- Carefully swing the power supply inward, making sure that the arc on top of the power supply matches the curved railing on top of the system unit. See step 2 in the figure below.

- Push the power supply all the way in until you hear a click that locks it into the system unit.

- Arrange the power cables and secure them with the cable tie to prevent them from touching the system board components.
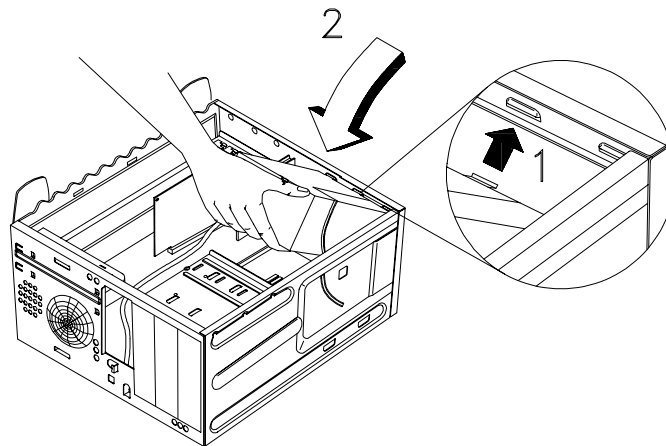
Figure 4- 13   Replace the power supply

Power Supply (2138 only)

- Rotate the feet of the system unit inward.

- Position the unit so it lies flat on the table.

- Release the cable tie that secures the power supply cables.

  NOTE: Please refer to the note on Bays 1, 2, 3 (5.25-In. Internal/External Bays) on page 4-9.

- Remove the screw that secures the power supply to the chassis. See step 1 in the figure below.

- Locate and press the tab on top of the power supply frame. See step 2 in the figure below.

- Firmly hold the power supply frame and pull it toward the front of the system unit. See step 3 in the figure below.
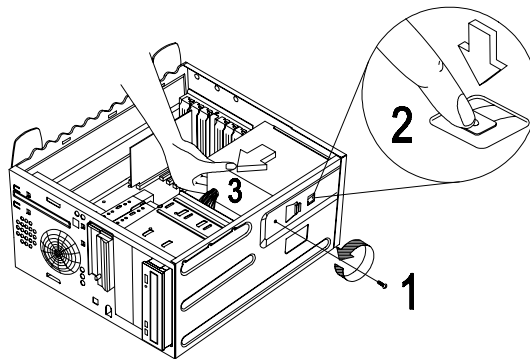
Figure 4- 14   Remove the power supply

- Carefully place the power supply on top of the disk drive frame.

- Detach the power supply from the frame by releasing 4 screws.

NOTE: Replace the power supply

- Position the power supply on the power supply bay. Make sure that: (1) The side hooks of the power supply frame go into the tab on the back of the system unit. See step 1 in the figure below.   (2) The tab on top of the power supply goes into the slot on top of the chassis. See step 2 in the figure below.

- Push the power supply all the way in until you hear all the way in until you hear a click that locks it in place.
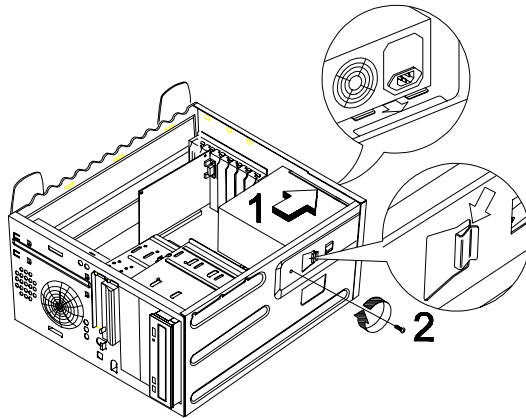
Figure 4- 15   Replace the power supply

- Secure the power supply with the screw that you removed earlier.

Adapter Cards

NOTE: 1. Before removing an adapter card, note the location of the adapter
card and any cables. When removing an adapter card, install the
replacement card in the same slot as the one you removed.
2. If necessary, remove cards from the adjacent slots of the failed
card.

- Position the system unit such that the card is accessible to you.

- If the adapter card has cables, disconnect them. Be sure to take note
  where those cables are connected. You will need to reconnect those
  cables when you reinstall the card.

- Remove the adapter card screw.

- Carefully pull the adapter card straight out of the slot so that the card does
  not bend.
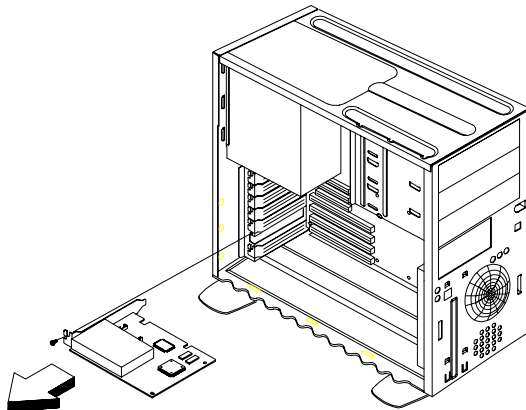
Figure 4- 16   Remove Adapter Cards

Memory (DIMM)

ATTENTION: Memory modules are sensitive to static discharge.

- Press down and out the levers on both sides of the socket.

- Lift the DIMM to remove.

CAUTION: Place your forefingers on the top of the DIMM before you press
the holding clips to gently disengage the DIMM from the socket.
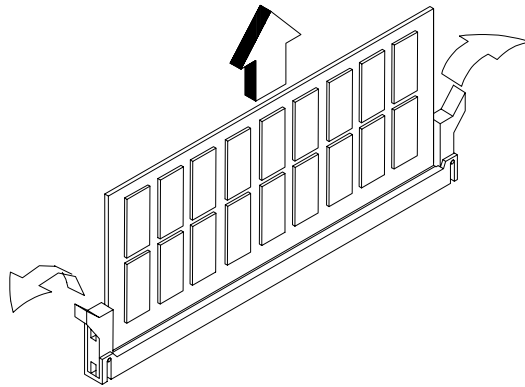
Figure 4- 17   Remove memory modules (DIMM)

Processor (2137 only)

NOTE: 1. Determine the type of processor you are installing and make sure
the jumpers are set correctly. See "System Board Jumper Settings"
on page 5-16.
2. Run the Setup Utility after correctly installing a processor. See
"BIOS Setup Utility" on page 1-18"

- **ATTENTION:** Processors are sensitive to static discharge.

- Remove adapter cards if applicable.

- Detach the heat sink cable from the fan connector FN1.

- Remove the fan sink by pressing the release tab (rectangular end) and
lifting it up from the Processor.

- Pull up the ZIF socket release lever.

- Lift the processor out of the socket.
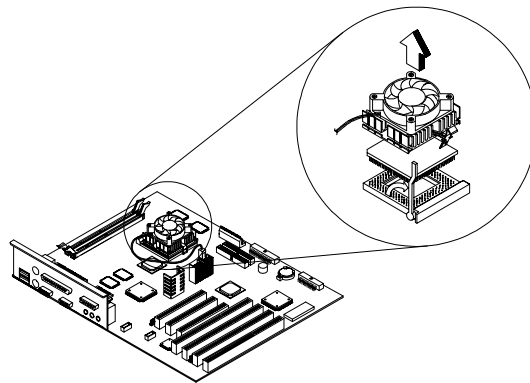
Figure 4- 18   Remove processor

NOTE: Processor Install

- Place the ZIF socket release lever to the release (up) position.

- Insert the new processor, matching the notched corner of the processor with pin the 1 indicator on the socket.
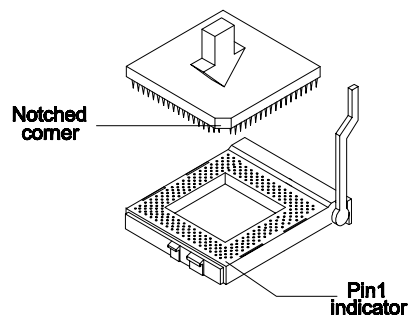
Figure 4- 19   Insert processor

- Push down the lever to lock the processor to the socket.

- Place the processor heat sink fan over the processor.

- Insert one side of fan brace onto the ZIF socket

- Secure by latching the other side to the ZIF socket.

- Reconnect the processor fan sink cable to the connector FN1 on the system board.
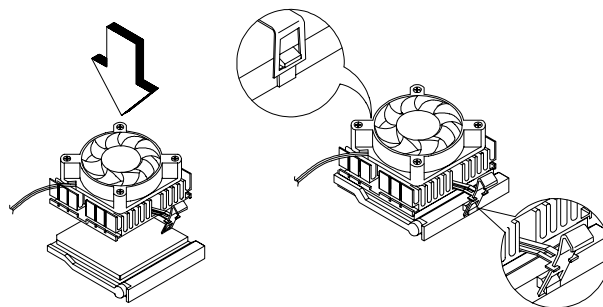
Figure 4- 20   Install the processor

Pentium II Processor Module (2138 only)

Follow these steps to remove the Pentium II CPU module from the slot.

NOTE: 1. Determine the type of processor you are installing and make sure the jumpers are set correctly. See "System Board Jumper Settings" on page 5-16.
2. Run the Setup Utility after correctly installing a processor. See "BIOS Setup Utility" on page 1-18"

ATTENTION: Processors are sensitive to static discharge.

- Unlock the latches that secure the processor module.
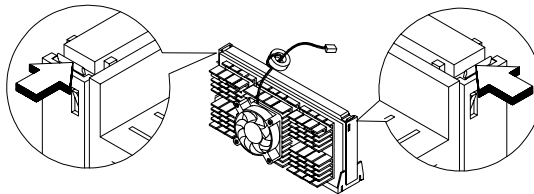
Figure 4- 21   Unlocking the Module Latches

- Firmly hold the processor module and pull it out of the socket.
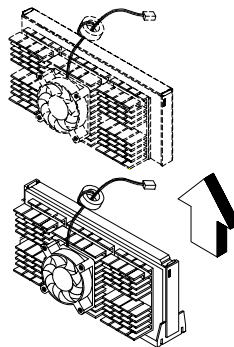
Figure 4- 22   Removing the Pentium II Processor

NOTE: Pentium II Processor Install

If the retention module is not already installed on the system board:

- Place the EMC clip over the correct post on the screw bracket.

- Press the screw bracket onto the bottom of the system board.

  Note: Be sure the EMC Clips are aligned with the holes with ground pad on the system board.

- Turn the system board over.

- Place the retention mechanism over the socket on the system board make sure the groove matches the one on the processor socket.
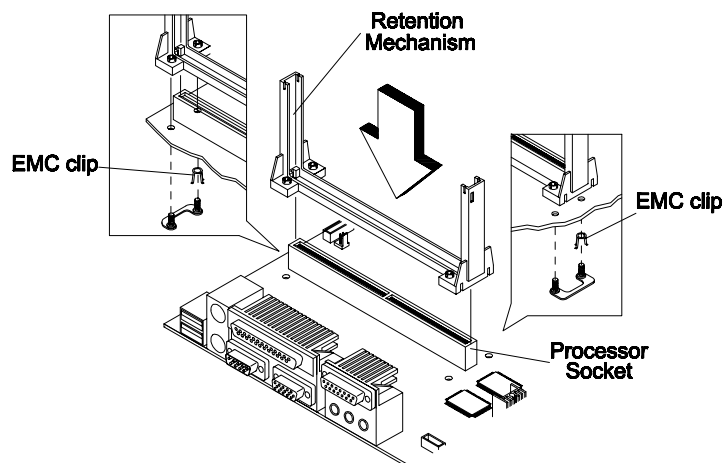
Figure 4- 23   Installing the Pentium II Retention Mechanism

To install processor to retention module:

- With the processor module golden fingers pointing downward, align the processor to the posts of the retention mechanism then lower it down.

- The golden fingers of the Pentium II module is slotted such that it only fits in one direction. Make sure that module groove matches the one on the processor socket.

Installing the Processor Heat Sink and Fan (2138 only)

The Pentium II processor module comes with holes on one side to hold the clips of the heat sink and fan. The upper set of holes (near the latches) on the processor are wider and should match the wider ends of the clips on the heat sink. The lower set of holes are smaller and should match the narrow ends of the heat sink clips.
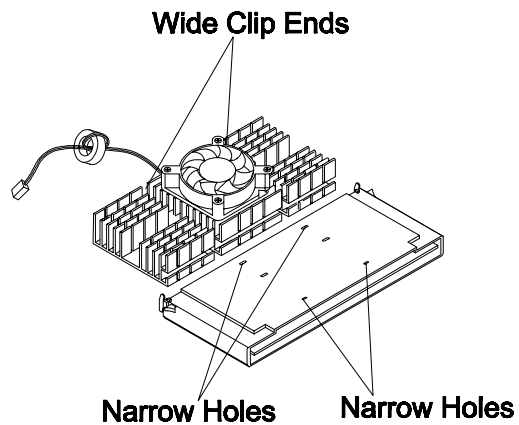
Figure 4- 24   Matching the Fan-Heat Sink Clips with the Holes on the
                 Processor

Follow these steps when installing the heat sink and fan to the Pentium II processor module:

- Remove the thermal tape protector at the back of the heat sink.

- Insert the wide clip ends to the wide holes on the processor and the narrow clip ends to the narrow holes.
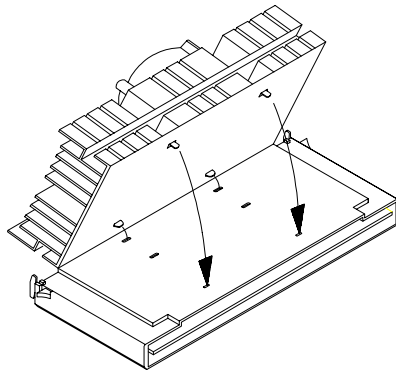
Figure 4- 25   Inserting the Clip Ends to the Processor Holes

- Use a screwdriver to press and lock in the wide end of a clip first. Then without lifting the screwdriver, point it downward to press and lock the narrow end of the clip.
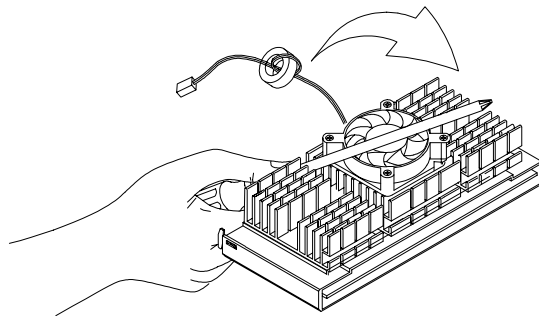
Figure 4- 26   Locking a Wide Clip End
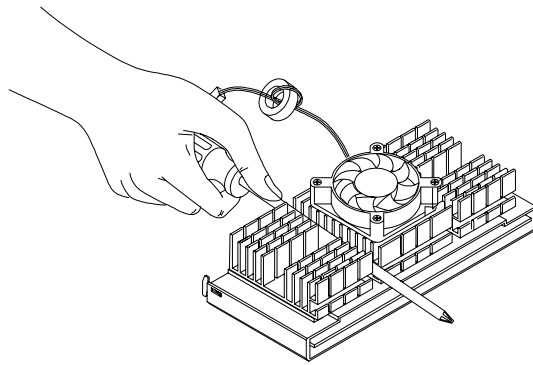
Figure 4- 27   Locking a Narrow Clip End

• Repeat to lock clip on the other side.

System Backup Battery (2137 only)

CAUTION: All BIOS configuration settings will be lost when the backup battery is removed!

ATTENTION: Be careful when removing the backup battery. If the metal lever is damaged or broken, the system board must be replaced.

- Gently pull the metal lever away from the backup battery.

- Lift the backup battery out.
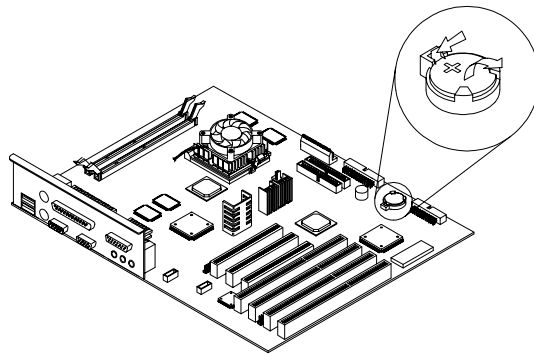
Figure 4- 28   Remove the backup battery

IMPORTANT: Make sure to insert the battery with the positive side facing up. A plus(+) sign indicates the positive side.

- If you replace the system battery, you need to reset the system date and time. You can perform this task from the Window 95 desktop or from the Setup Utility. To reset the system date and time in the Setup Utility, select the Date and Time option from the Main Menu.

System Backup Battery (2138 only)

CAUTION: All BIOS configuration settings will be lost when the backup battery is removed!

ATTENTION: Be careful when removing the backup battery. If the metal lever is damaged or broken, the system board must be replaced.

- Gently pull the metal lever away from the backup battery.

- Lift the backup battery out.
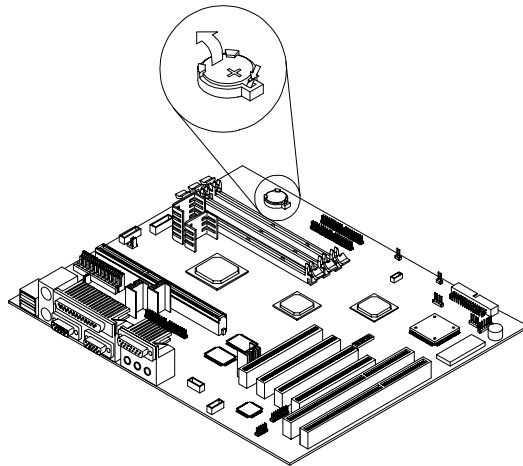
Figure 4- 29   Remove the backup battery

IMPORTANT: Make sure to insert the battery with the positive side facing up. A plus(+) sign indicates the positive side.

- If you replace the system battery, you need to reset the system date and time. You can perform this task from the Window 95 desktop or from the Setup Utility. To reset the system date and time in the Setup Utility, select the Date and Time option from the Main Menu.

Indicator LED and Cable

- Push in on the indicator LED and remove from the rear.

- Disconnect the LED and cable from the system board.
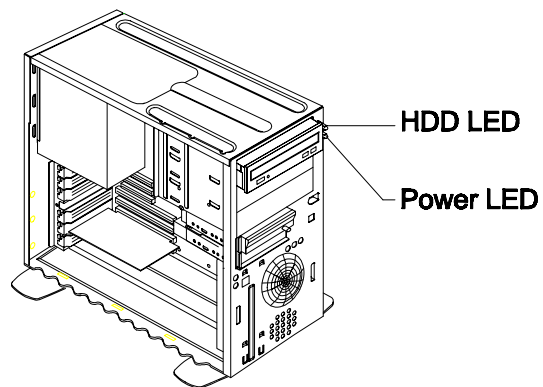
Figure 4- 30   Remove the LED indicator

NOTE: When reinstalling the LED assembly, please be note, the EMI core
should be approximately 20mm from lower cable tie.

NOTE: If the system board Power LED is a 2 pin connector, a conversion (3-pin to 2-pin) cable must be used.
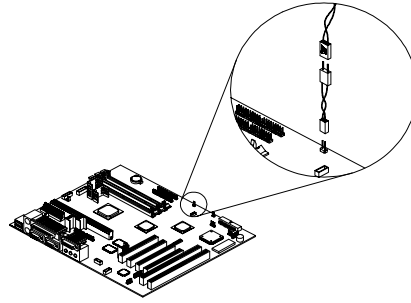
Figure 4- 31   Power LED 3-pin to 2-pin Conversion Cable

System Board (2137 only)

- Remove all adapter cards.

- Disconnect all cables connected to the system board.

- Remove the screws securing the system board to the chassis.

- Lift the system board to remove from chassis.

- Remove memory (DIMM) if applicable.

- Remove processor if necessary.
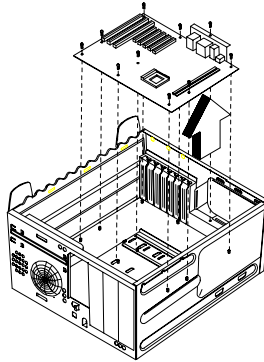
Figure 4- 32   Remove the system board

- Detach the I/O port bracket from the system board.
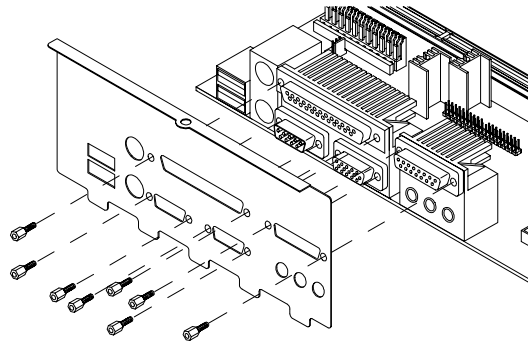
Figure 4- 33   Detach the I/O Port Bracket

NOTE: System Board Install

- Before reinstallation, position the housing on its side. When reinstalling a new system board, push the board to the rear and align it with the front locating pin. Visually verify that the board is aligned properly, then press the board down.

- Be sure to reinstall the processor, DIMMs, I/O port bracket onto the new system board if applicable.

- After installing the system board, secure with original screws.

- Upgrade the BIOS version on the new system board. See "Flash (BIOS) Update Procedure" on page 1-17.

- Run the Setup Utility after correctly changing the system board. See "BIOS Setup Utility" on page 1-18.

- Change the Machine Type and Serial Number in the BIOS for the new system. See "BIOS-contained Model Number and Serial Number" on page 1-16

System Board (2138 only)

- Remove all adapter cards.

- Disconnect all cables connected to the system board.

- Remove the screws securing the system board to the chassis.

- Lift the system board to remove from chassis.

- Remove memory (DIMM) if applicable.

- Remove processor.
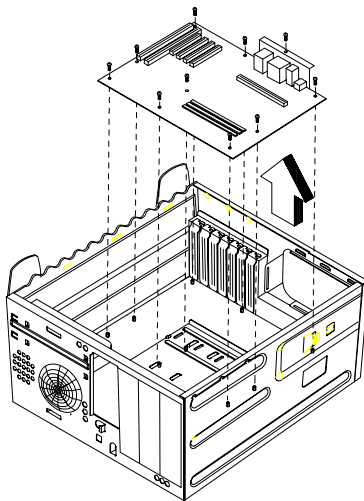
Figure 4- 34   Remove the system board

NOTE: System Board Install

- Before you re-install the new system board, the CPU retention module and the I/O Port Bracket should be assembled on the system board if they are not already installed. (refer to the illustration in Chapter 7, Assembly 2)

- Be sure to reinstall the processor, DIMMs, onto the new system board if applicable.

- Before reinstallation, position the housing on its side. When reinstalling a new system board, push the board to the rear and align it with the front locating pin. Visually verify that the board is aligned properly, then press the board down

- After installing the system board, secure with original screws.

- Run the Setup Utility after correctly changing the system board.

- Upgrade the BIOS version on the new system board. See "Flash (BIOS) Update Procedure" on page 1-17.

- Run the Setup Utility after correctly changing the system board. See "BIOS Setup Utility" on page 1-18.

- Change the Machine Type and Serial Number in the BIOS for the new system. See "BIOS-contained Model Number and Serial Number" on page 1-16.

Handling ESD-Sensitive Parts

Many electronic parts are sensitive to electrostatic discharge (ESD). To prevent damage when working with ESD-sensitive parts, observe the following instructions. Do these in addition to taking all the usual precautions, such as switching off the power and unplugging the power cord.

- Keep the ESD-sensitive part in its original shipping container (or special ESD bag) until you are ready to install the part.

- Make the fewest possible movements with your body to prevent an increase of static electricity from clothing fibers, carpets, and furniture.

- Put the ESD wrist strap on your wrist. Ensure the machine is turned off. Connect the wrist strap to the serial bracket mounting screw. This discharges any static electricity in your body to the machine frame.

- Hold the ESD-sensitive part by its edge connector shroud (cover). Do not touch its pins. If you are removing a plug-able module, use the correct tool.

- Do not place the ESD-sensitive part on the machine cover or on a metal table. If you need to put down the ESD-sensitive part for any reason, put it into its original container.

- Machine covers and metal tables are electrical grounds. They increase the risk of damage because they make a discharge path from your body through the ESD-sensitive part. (Large metal objects can be discharge paths without being grounded.)

- Prevent ESD-sensitive parts from being accidentally touched by other persons. Reinstall machine covers when you are not working on the machine.

- If possible, keep all ESD-sensitive parts in a grounded metal cabinet (case).

- Be extra careful when working with ESD-sensitive parts while cold-weather heating is being used. Low humidity increases static electricity.

Software Recovery Procedure

The Recovery CD includes an install program that can be used to restore the original system software.

To recover the original software on the hard disk drive, use the following procedures:

1. Insert the Recovery CD into the CD-ROM drive.

2. Power-off, then power-on the system unit.

3. You will be prompted with a message.

   "Do you wish to update the software on your hard disk (Y/N)?"
   Press "y" to continue.

4. A warning message will show.

   " Do you accept these terms and conditions (Y/N)?"
   Press "y" to continue.

5. A message will appear telling you that old data will be erased and asks if you wish to continue. If you wish to continue, press enter.
   If your hard disk drive is not partitioned, the following message will be displayed.

   "Do you want to partition it (Y/N)?"
   Press "y" to continue, then press any key to reboot.

6. Follow the instructions on the display (Auto-formatted and copied.).

Parts/Test Point Locations

Introduction

This chapter contains system board layouts and jumper settings. It is useful when you are asked to measure voltages. Use this information to help you locate parts such as electronic boards, connectors, pin numbers, and test points. This chapter also contains jumper settings for the hard disk drive, CD-ROM (compact disc-read-only memory) drive, and the connector information for modem adapter card.

2137 System Board Family

Table 5- 1	Machine Type 2137 System Board Family	
FRU Number	**Description**	**Refer to…**
Machine Type 2137 (Non-cache and 1MB video SGRAM onboard; cost reduced models.)		
02K2551	Supports Pentium P-166, -200 processor Pentium MMX P-166, -200 -233 processor Cyrix/IBM 6x86L PR166+, PR200+ processor Cyrix/IBM 6x86MX PR166+ processor AMD K6-166, -200, -233 processor AMD K6-266 (A9 stepping, core voltage 2.2V) **NOTE:** 02K2551 may come with or without a port bracket secured at rear side. If you have a board without the port bracket, you can disassemble from a defective board to replace it.	Figure 5-3
Machine Type 2137 (256KB cache and 2MB video SGRAM onboard)		
12J6830	Supports Pentium P-166, -200 processor Pentium MMX P-166, -200 -233 processor Cyrix/IBM 6x86L PR166+, PR200+ processor Cyrix/IBM 6x86MX PR166+ processor AMD K6-166, -200,-233 processor	Figure 5-1
12J6890	Supports Pentium P-166, -200 processor Pentium MMX P-166, -200 -233 processor Cyrix/IBM 6x86L PR166+, PR200+ processor Cyrix/IBM 6x86MX PR166+ processor AMD K6-166, -200, -233 processor	Figure 5-1
	Additionally supports AMD K6-266 (core voltage 2.1V) processor	Figure 5-2
02K2550	Supports Pentium P-166, -200 processor Pentium MMX P-166, -200 -233 processor Cyrix/IBM 6x86L PR166+, PR200+ processor Cyrix/IBM 6x86MX PR166+ processor AMD K6-166, -200, -233 processor AMD K6-266 (A7 stepping, core voltage 2.2V)	Figure 5-2

Table 5- 1	Machine Type 2137 System Board Family	
FRU Number	**Description**	**Refer to…**
10L6595	Supports Pentium P-166, -200 processor Pentium MMX P-166, -200 -233 processor Cyrix/IBM 6x86L PR166+, 200+ processor Cyrix/IBM 6x86MX PR166+ processor AMD K6-166, -200, -233 processor AMD K6-266 (A9 stepping, core voltage 2.2V) **NOTE:** 10L6595 may come with or without a port bracket secured at rear side. If you have a board without the port bracket, you can disassemble from a defective board to replace it.	Figure 5-2
10L6653	Supports Pentium P-166, -200 processor Pentium MMX P-166, -200 -233 processor Cyrix/IBM 6x86L PR166+, 200+ processor Cyrix/IBM 6x86MX PR166+ processor AMD K6-166, -200, -233 processor AMD K6-266 (A9 stepping, core voltage 2.2V) AMD K6-300 processor **NOTE:** 10L6653 may come with or without a port bracket secured at rear side. If you have a board without the port bracket, you can disassemble from a defective board to replace it.	Figure 5-2

2137 System Board Layout (12J6830, 12J6890)
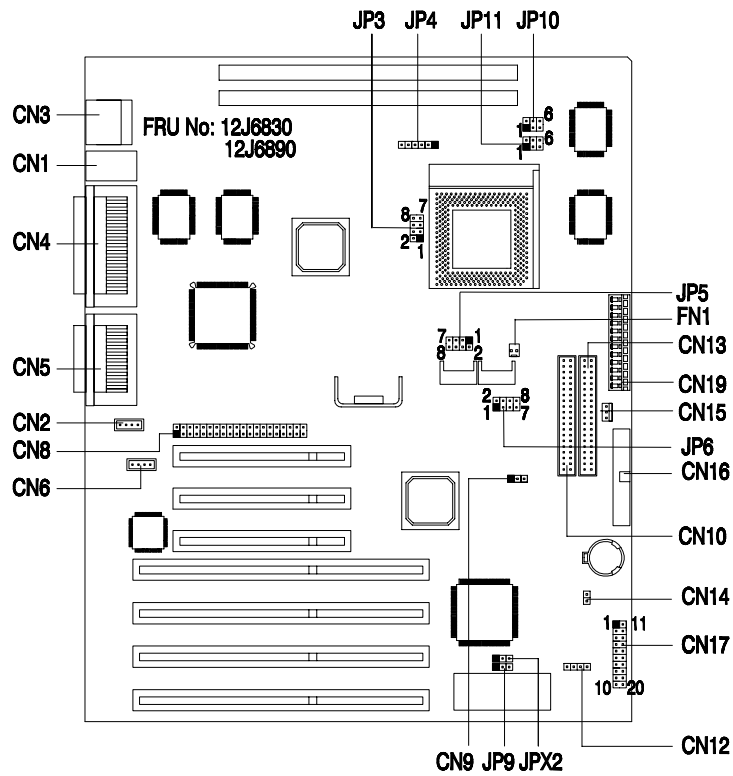
NOTE: The blackened pin of a jumper represents pin 1.

Figure 5- 1   2137 System Board Jumper and Connector Locations (for system board FRU number 12J6830 and 12J6890)

System Board Jumper Settings
(12J6830, 12J6890)

Table 5- 2	2137 System Board Jumper Settings (for system board FRU number 12J6830 and 12J6890)
Jumper/Settings	**Function**

JPX2
    1-2
 	
    2-3*
	BIOS logo setting
	    Without IBM logo shown on screen
	        during POST
	    With IBM logo shown on screen during
	        POST

Core/bus frequency rate:

JPX3, JP4	P54C	6X86L	P55C/6X86MX/K6
2-3, (1-2, 4-5)	1.5	3.0	3.5
2-3, (1-2, 5-6)	2.0	2.0	2.0
2-3, (2-3, 5-6)	2.5	--	2.5
2-3, (2-3, 4-5)	3.0	--	3.0

JP3, JP5, JP6	Processor core voltage
Closed$^\beta$, Open$^\alpha$, 3-5	2.1V (reserved)
Closed$^\beta$, Open$^\alpha$, 2-4	2.8V
Closed$^\beta$, Open$^\alpha$, 4-6	2.9V
Closed$^\beta$, Open$^\alpha$, 7-8	3.2V
Open$^\alpha$, Closed$^\beta$, 1-3	3.3V
Open$^\alpha$, Closed$^\beta$, 3-5	3.52V

JP9
    1-2*
    2-3
	Password security
	    Check password
	    Bypass password

JP10, JP11
  (1-3, 2-4), (1-3, 2-4)
  (3-5, 4-6), (1-3, 2-4)
  (1-3, 2-4), (3-5, 4-6)
  (3-5, 4-6), (3-5, 4-6)
	Host / PCI bus frequency
	    60 /30 MHz
	    66 /33 MHz
	    75 /30 MHz
	    83 /33 MHz

$^\alpha$: Disconnected, no jumper installed.

$^\beta$: Connections pins 1-2, 3-4, 5-6, 7-8.

* : Default setting.

Processor Type Jumper Settings
(12J6830, 12J6890)

WARNING: You must check out the exact processor type before setting the processor type jumpers. The wrong processor type jumper setting may damage CPU, especially the single/dual voltage setting.

Table 5- 3   2137 Processor Type Jumper Settings (for system board FRU number 12J6830 and 12J6890)

CPU	JP3	JP4	JP5	JP6	JP10	JP11
Pentium						
P-166	Open$^\alpha$	2-3, 5-6	Closed$^\beta$	1-3	3-4, 5-6	1-3, 2-4
P-200	Open$^\alpha$	2-3, 4-5	Closed$^\beta$	1-3	3-4, 5-6	1-3, 2-4
Pentium MMX						
P-166	Closed$^\beta$	2-3, 5-6	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
P-200	Closed$^\beta$	2-3, 4-5	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
P-233	Closed$^\beta$	1-2, 4-5	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
Cyrix/IBM 6x86L						
PR166+	Closed$^\beta$	1-2, 5-6	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
PR200+	Closed$^\beta$	1-2, 5-6	Open$^\alpha$	2-4	1-3, 2-4	3-5, 4-6
Cyrix/IBM 6x86MX						
PR166+	Closed$^\beta$	1-2, 5-6	Open$^\alpha$	4-6	3-5, 4-6	1-3, 2-4
AMD K6						
K6-166	Closed$^\beta$	2-3, 5-6	Open$^\alpha$	4-6	3-5, 4-6	1-3, 2-4
K6-200	Closed$^\beta$	2-3, 4-5	Open$^\alpha$	4-6	3-5, 4-6	1-3, 2-4
K6-233	Closed$^\beta$	1-2, 4-5	Open$^\alpha$	7-8	3-5, 4-6	1-3, 2-4

$^\alpha$: Disconnected, no jumper installed.

$^\beta$: Connections pins 1-2, 3-4, 5-6, 7-8.

2137 System Board Layout (12J6890, 02K2550, 10L6595, 10L6653)
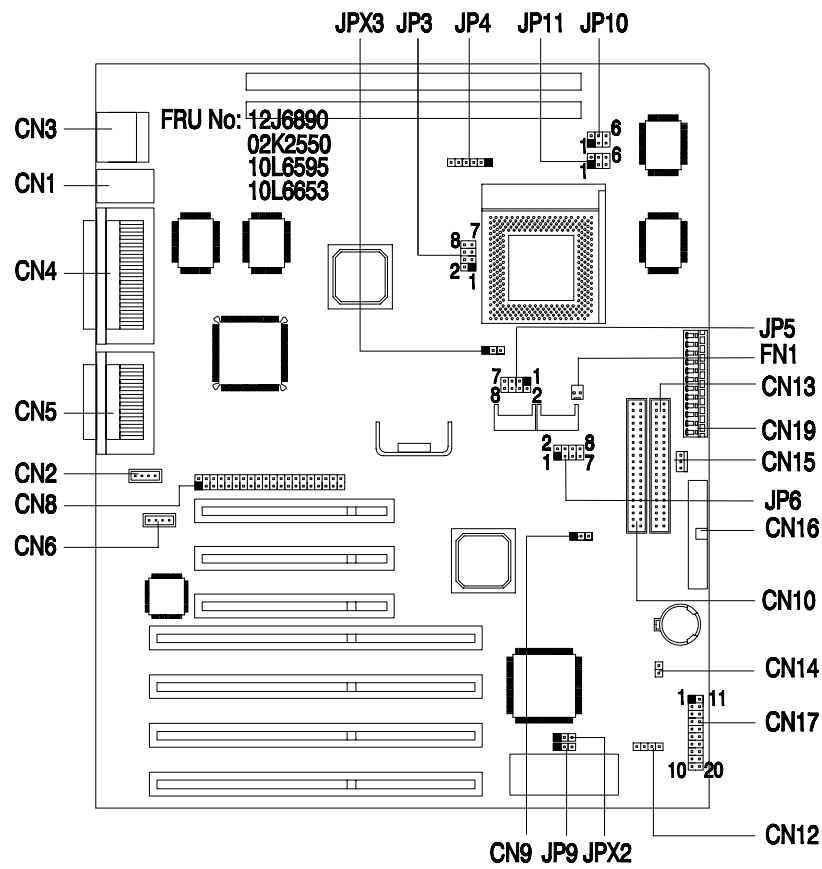
NOTE: The blackened pin of a jumper represents pin 1.

Figure 5- 2   2137 System Board Jumper and Connector Locations (for system board FRU number 12J6890, 02K2550 10L6595, and 10L6653)

System Board Jumper Settings (12J6890, 02K2550, 10L6595, 10L6653)

Table 5- 4	2137 System Board Jumper Settings (for system board FRU number 12J6890, 02K2550 10L6595, and 10L6653)

Jumper/Settings	Function

JPX2
  1-2
 	
  2-3*
	BIOS logo setting
	    Without IBM logo shown on screen
	      during POST
	    With IBM logo shown on screen during
	      POST

JPX3, JP4	Core/bus frequency rate

JPX3, JP4	P54C	6X86L	P55C/6X86MX/K6
2-3, (1-2, 4-5)	1.5	3.0	3.5
2-3, (1-2, 5-6)	2.0	2.0	2.0
2-3, (2-3, 5-6)	2.5	--	2.5
2-3, (2-3, 4-5)	3.0	--	3.0
1-2, (1-2, 5-6)	--	--	4.0
1-2, (2-3, 5-6)	--	--	4.5

Jumper/Settings	Function

JP3, JP5, JP6
  Closed$^\beta$, Open$^\alpha$, 3-5
 	
  Closed$^\beta$, Open$^\alpha$, 2-4
  Closed$^\beta$, Open$^\alpha$, 4-6
  Closed$^\beta$, Open$^\alpha$, 7-8
  Open$^\alpha$, Closed$^\beta$, 1-3
  Open$^\alpha$, Closed$^\beta$, 3-5
	Processor core voltage
	    2.1V (for 12J6890 system board)
	    2.2V (for 02K2550, 10L6595 &
	        10L6653 system boards)
	    2.8V
	    2.9V
	    3.2V
	    3.3V
	    3.52V

JP9
  1-2*
  2-3
	Password security
	    Check password
	    Bypass password

JP10, JP11
  (1-3, 2-4), (1-3, 2-4)
  (3-5, 4-6), (1-3, 2-4)
  (1-3, 2-4), (3-5, 4-6)
  (3-5, 4-6), (3-5, 4-6)
	Host / PCI bus frequency
	    60 /30 MHz
	    66 /33 MHz
	    75 /30 MHz
	    83 /33 MHz

*: Default setting.

Processor Type Jumper Settings (12J6890, 02K2550, 10L6595, 10L6653)

WARNING: You must check out the exact processor type before setting the processor type jumpers. The wrong processor type jumper setting may damage CPU, especially the single/dual voltage setting.

CPU	JP3	JPX3	JP4	JP5	JP6	JP10	JP11
Table 5- 5 2137 Processor Type Jumper Settings (for system board FRU number 12J6890, 02K2550, 10L6595 and 10L6653)							
Pentium							
P-166	Open$^\alpha$	2-3	2-3, 5-6	Closed$^\beta$	1-3	3-4, 5-6	1-3, 2-4
P-200	Open$^\alpha$	2-3	2-3, 4-5	Closed$^\beta$	1-3	3-4, 5-6	1-3, 2-4
Pentium MMX							
P-166	Closed$^\beta$	2-3	2-3, 5-6	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
P-200	Closed$^\beta$	2-3	2-3, 4-5	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
P-233	Closed$^\beta$	2-3	1-2, 4-5	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
Cyrix/IBM 6x86L							
PR166+	Closed$^\beta$	2-3	1-2, 5-6	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
PR200+	Closed$^\beta$	2-3	1-2, 5-6	Open$^\alpha$	2-4	1-3, 2-4	3-5, 4-6
Cyrix/IBM 6x86MX							
PR166+	Closed$^\beta$	2-3	1-2, 5-6	Open$^\alpha$	4-6	3-5, 4-6	1-3, 2-4
AMD K6							
K6-166	Closed$^\beta$	2-3	2-3, 5-6	Open$^\alpha$	4-6	3-5, 4-6	1-3, 2-4
K6-200	Closed$^\beta$	2-3	2-3, 4-5	Open$^\alpha$	4-6	3-5, 4-6	1-3, 2-4
K6-233	Closed$^\beta$	2-3	1-2, 4-5	Open$^\alpha$	7-8	3-5, 4-6	1-3, 2-4
K6-266	Closed$^\beta$	1-2	1-2, 5-6	Open$^\alpha$	3-5	3-5, 4-6	1-3, 2-4
K6-300	Closed$^\beta$	1-2	2-3, 5-6	Open$^\alpha$	3-5	3-5, 4-6	1-3, 2-4

$^\alpha$: Disconnected, no jumper installed.

$^\beta$: Connections pins 1-2, 3-4, 5-6, 7-8.

2137 System Board Layout (02K2551)
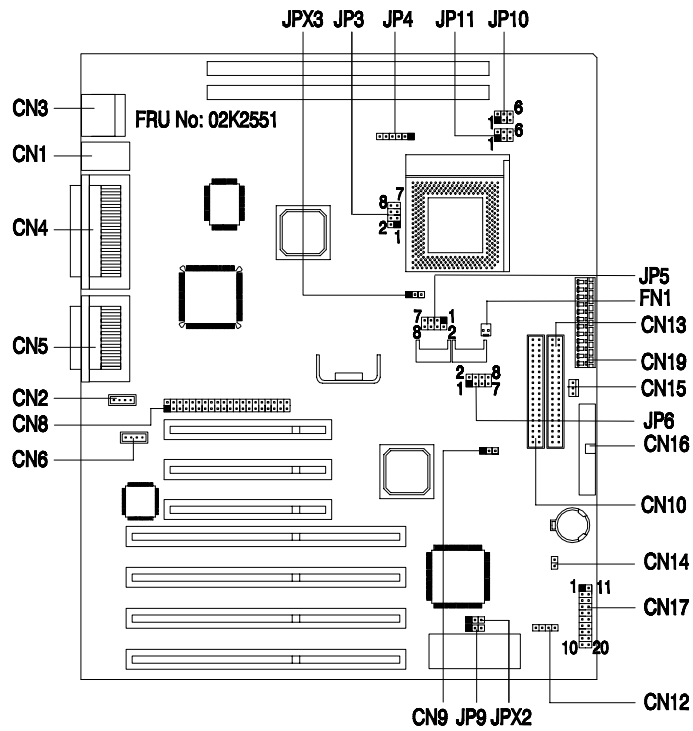
NOTE: The blackened pin of a jumper represents pin 1.

Figure 5- 3   2137 System Board Jumper and Connector Locations (for system board FRU number 02K2551)

System Board Jumper Settings (02K2551)

Table 5- 6	2137 System Board Jumper Settings (for system board FRU number 02K2551)

Jumper/Settings	Function

JPX2
   1-2
 	
   2-3*
	BIOS logo setting
	   Without IBM logo shown on screen during POST
	   With IBM logo shown on screen during POST

JPX3, JP4
 	
   2-3, (1-2, 4-5)
   2-3, (1-2, 5-6)
   2-3, (2-3, 5-6)
   2-3, (2-3, 4-5)
   1-2, (1-2, 5-6)
   1-2, (2-3, 5-6)
	Core/bus frequency rate
	   P54C 6X86L P55C/6X86MX/K6
	   1.5 3.0 3.5
	   2.0 2.0 2.0
	   2.5 -- 2.5
	   3.0 -- 3.0
	   -- -- 4.0
	   -- -- 4.5

JP3, JP5, JP6
   Closed$^\beta$, Open$^\alpha$, 3-5
   Closed$^\beta$, Open$^\alpha$, 2-4
   Closed$^\beta$, Open$^\alpha$, 4-6
   Closed$^\beta$, Open$^\alpha$, 7-8
   Open$^\alpha$, Closed$^\beta$, 1-3
   Open$^\alpha$, Closed$^\beta$, 3-5
	Processor core voltage
	   2.2V
	   2.8V
	   2.9V
	   3.2V
	   3.3V
	   3.52V

JP9
   1-2*
   2-3
	Password security
	   Check password
	   Bypass password

JP10, JP11
   (1-3, 2-4), (1-3, 2-4)
   (3-5, 4-6), (1-3, 2-4)
   (1-3, 2-4), (3-5, 4-6)
   (3-5, 4-6), (3-5, 4-6)
	Host / PCI bus frequency
	   60 /30 MHz
	   66 /33 MHz
	   75 /30 MHz
	   83 /33 MHz

---

* : Default setting.

Processor Type Jumper Settings (02K2551)

WARNING: You must check out the exact processor type before setting the processor type jumpers. The wrong processor type jumper setting may damage CPU, especially the single/dual voltage setting.

Table 5- 7	2137 Processor Type Jumper Settings (for system board FRU number 02K2551)						
CPU	**JP3**	**JPX3**	**JP4**	**JP5**	**JP6**	**JP10**	**JP11**
Pentium							
P-166	Open$^\alpha$	2-3	2-3, 5-6	Closed$^\beta$	1-3	3-4, 5-6	1-3, 2-4
P-200	Open$^\alpha$	2-3	2-3, 4-5	Closed$^\beta$	1-3	3-4, 5-6	1-3, 2-4
Pentium MMX							
P-166	Closed$^\beta$	2-3	2-3, 5-6	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
P-200	Closed$^\beta$	2-3	2-3, 4-5	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
P-233	Closed$^\beta$	2-3	1-2, 4-5	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
Cyrix/IBM 6x86L							
PR166+	Closed$^\beta$	2-3	1-2, 5-6	Open$^\alpha$	2-4	3-5, 4-6	1-3, 2-4
PR200+	Closed$^\beta$	2-3	1-2, 5-6	Open$^\alpha$	2-4	1-3, 2-4	3-5, 4-6
Cyrix/IBM 6x86MX							
PR166+	Closed$^\beta$	2-3	1-2, 5-6	Open$^\alpha$	4-6	3-5, 4-6	1-3, 2-4
AMD K6							
K6-166	Closed$^\beta$	2-3	2-3, 5-6	Open$^\alpha$	4-6	3-5, 4-6	1-3, 2-4
K6-200	Closed$^\beta$	2-3	2-3, 4-5	Open$^\alpha$	4-6	3-5, 4-6	1-3, 2-4
K6-233	Closed$^\beta$	2-3	1-2, 4-5	Open$^\alpha$	7-8	3-5, 4-6	1-3, 2-4
K6-266	Closed$^\beta$	1-2	1-2, 5-6	Open$^\alpha$	3-5	3-5, 4-6	1-3, 2-4

$^\alpha$: Disconnected, no jumper installed.

$^\beta$: Connections pins 1-2, 3-4, 5-6, 7-8.

System Board Connectors and Functions

Table 5- 8	2137 System Board Connector Functions	
Connector	**Function**	**Connect to…**
CN1	Lower: PS/2 keyboard connector Upper: PS/2 mouse connector	Keyboard Mouse
CN2	Modem/voice-in connector	Modem card
CN3	Universal serial bus (USB) connectors	USB devices
CN4	Upper: Printer port (25-pin female) Lower: Serial port (9-pin male) Video port (15-pin female)	Printer Serial device Monitor
CN5	Upper: MIDI/game port Lower: Line-out, line-in, mic-in connectors	Joystick Speaker, microphone
CN6	CD audio input connector	CD-ROM drive
CN8	ATI media connector (AMC)	Reserved
CN9	Modem ring-in wake-up connector	Modem card
CN10	Secondary IDE channel	CD-ROM drive

CN12	IDE LED connector
	    Connect the red wire to pin-1, white
	    wire to pin-2, then leave pin-3, -4 as
	    non-connected; or connect the red
	    wire to pin-4, white wire to pin-3, then
	    leave pin-1, -2 as non-connected.
		Hard drive LED

CN13	Primary IDE channel	Hard disk drive

CN14	Power/suspend switch connector
	    This connector has no directional
	    concern.
		Power/suspend
		switch

CN15	Standby power connector	Power supply
CN16	Diskette connector	Diskette drive

CN17	Power LED connector.
	    Connect the green wire to pin-12,
	    white wire to pin-14.
		Power LED

CN19	Power connector	Power supply
FN1	Processor fan connector	CPU heat sink

2138 System Board Layout
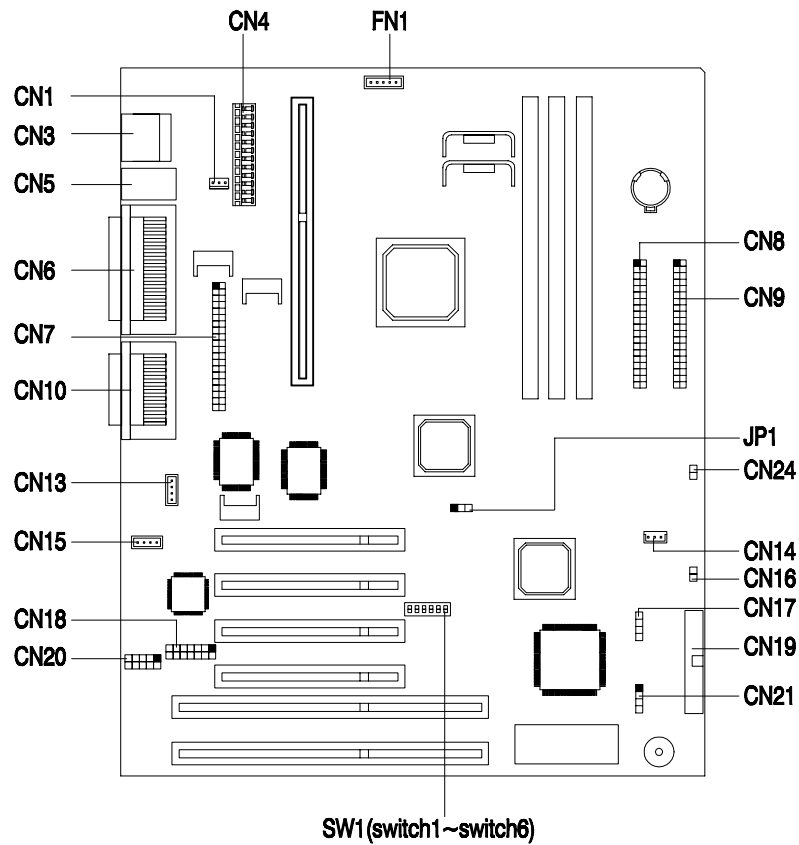
NOTE: The blackened pin of a jumper represents pin 1.

Figure 5- 4   2138 System Board Jumper and Connector Locations

System Board Jumper Settings

Table 5- 9	2138 System Board Jumper Settings
Jumper/Settings	**Function**
JP1 　1-2 　2-3	Video IRQ (IRQ9) setting 　Disabled 　Enabled
SW1, switch 1 　On 　Off*	Password security 　Bypass password 　Check password
SW1, switch 2 　On* 　Off	BIOS logo setting 　With IBM logo shown on screen during 　　POST 　Without IBM logo shown on screen 　　during POST
SW1, switch 3,4,5,6 　On, On, On, On 　On, Off, Off, On 　Off, On, On, On 　Off, On, Off, On 　Off, Off, On, On	Core/bus frequency rate 　2 　3.5 　4 　4.5 　5

System Board Connectors and Functions

Table 5- 10	2138 System Board Connector Functions	
Connector	**Function**	**Connect to…**
CN1	Standby power connector	Power supply
CN3	Universal Serial Bus (USB) connector	USB device
CN4	Standby power connector	Power supply
CN5	Upper: PS/2 mouse connector Lower: PS/2 keyboard connector	Keyboard Mouse
CN6	Upper: Printer port (25-pin female) Lower: Serial port 1 (9-pin male) Video port (15-pin female)	Printer Serial device Monitor
CN7	ATI media connector (AMC)	Reserved
CN8	Secondary IDE connector	Hard disk drive
CN9	Primary IDE connector	Hard disk drive
CN10	Upper: MIDI connector Lower: Mic-in/Line-in/Line-out connectors	Joystick Speaker, microphone
CN13	Modem/Line-in connector	Modem card
CN14	Wake-up on LAN connector	LAN card
CN15	CD audio input connector	CD-ROM drive
CN16	Software shutdown connector	Power switch
CN17	Modem wakeup on ring connector	Modem card
CN18	CS4610 adapter feature connector	Reserved
CN19	Diskette drive connector	Diskette drive
CN20	Serial port 2 connector	Serial device
CN21	IDE LED connector Connect the red wire to pin-1, white wire to pin-2, then leave pin-3, -4 as non-connected; or connect the red wire to pin-4, white wire to pin-3, then leave pin-1, -2 as non-connected.	Hard drive LED
CN24	Power LED connector Connect the green wire to pin-1, white wire to pin-2.	Power LED
FN1	Processor heat-sink fan connector	Processor fan

Power Supply Cable Connector Specifications

Refer to the following figures when checking for voltages on power supply cable connectors.

When checking voltages, the power supply fan must be running. To power-on the power supply without using the on/off switch, use a screwdriver or other tool to short the connector CN14 (with the switch cable disconnected from the connector on the system board) or use a connection (jumper) to short the black and white wires of the standby power cable on power supply.
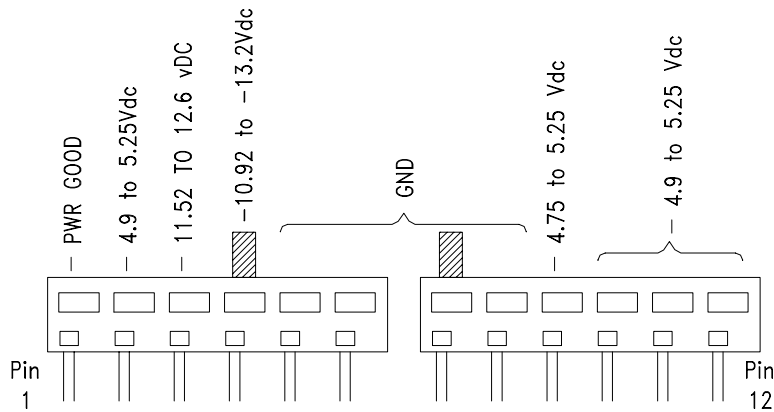
Figure 5- 5   System Board Power Supply Connectors
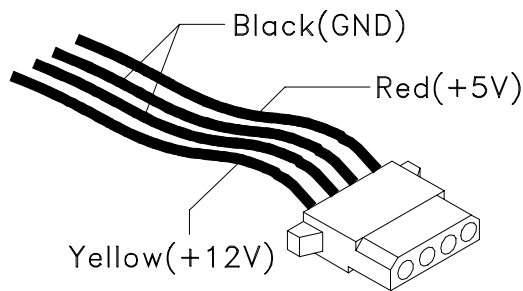
Figure 5- 6   Hard Drive or CD-ROM Power Cable Connector
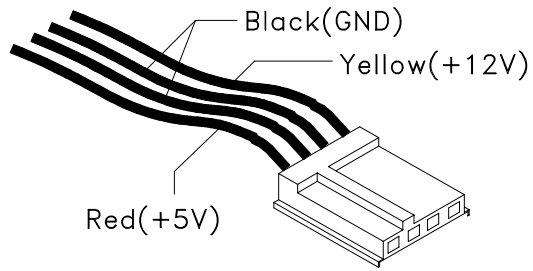
Figure 5- 7   3.5-In. Diskette Drive Power Cable Connector
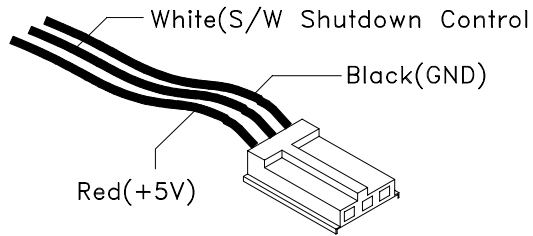
Figure 5- 8   Standby Power Connector

Factory-Installed Modem Card Layout
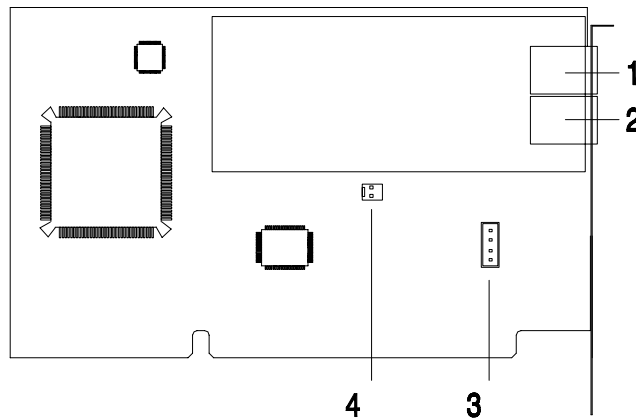
Figure 5- 9   Factory-Installed Modem Card Layout

Factory-Installed Modem Card Connector Functions

Table 5- 11 Factory-Installed Modem Card Connector Functions		
Item	**Function**	**Connect to…**

1	Telephone line-out
	   Some modem adapters may
	   come without this jack.
		Telephone set

2	Telephone line-in	Telephone line

3	Voice-in/speaker-out connector
	
	NOTE: The modem without voice
	   feature has no this
	   connector.
		System board
		Machine Type 2137: CN2
		Machine Type 2138: CN13

4	Ring-in wake-up connector
	
	NOTE: 2138 modem adapter has
	   no this connector because
	   it utilizes BIOS to monitor
	   modem IRQ status instead.
		System board
		Machine Type 2137: CN9
		Machine Type 2138: None

3.5-In. Hard Disk Drive Jumper Locations
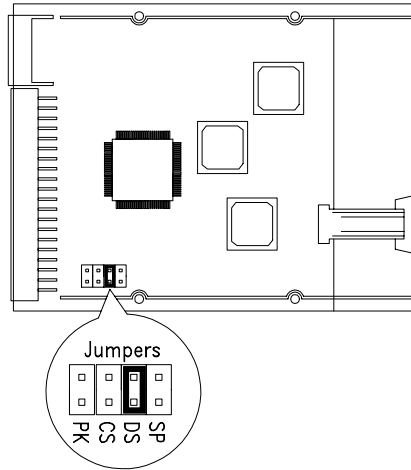
Figure 5- 10   3.5-In. Hard Disk (Quantum Fireball TM Series) Jumper
               Locations
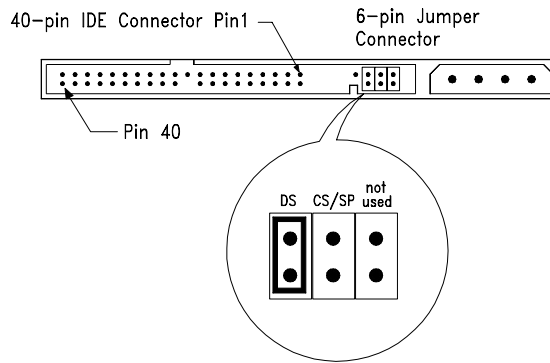
Figure 5- 11   3.5-in Hard Disk (Quantum Fireball ST Series) Jumper
               Locations
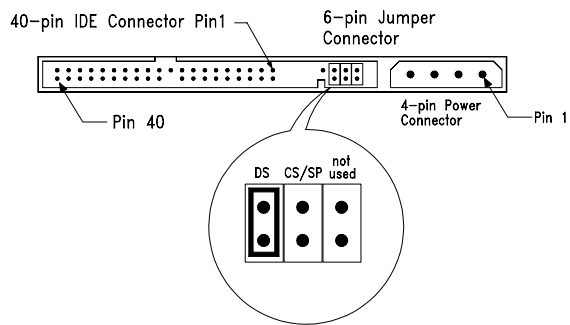
Figure 5- 12   3.5-in Hard Disk (Seagate) Jumper Settings Locations
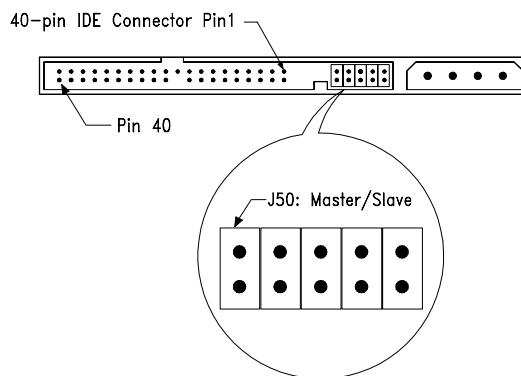
Figure 5- 13   3.5-in Hard Disk (Maxtor) Jumper Settings Locations

3.5-In. Hard Disk Drive Jumper Settings

The configuration of the following jumpers controls the drive's mode of operation:

- SP – Slave Present

- DS – Drive Select

- CS – Cable Select

- PK – Park, used as a place to store a jumper

Quantum Fireball TM and ST Series Hard Disk Drives

Table 5-12			Quantum Fireball TM and ST Series Hard Disk Drives Jumper Settings
DS	**CS**	**SP**	**DESCRIPTION**
On	Off	--	Drive configured as a Master, or Drive configured as a Master, with an attached Slave
Off	Off	--	Drive configured as a Slave.

Seagate Hard Disk Drive

Table 5-13		Seagate Hard Disk Drive Jumper Settings
DS	**CS/SP**	**DESCRIPTION**
On	Off	Drive configured as a Master.
Off	Off	Drive configured as a Slave.
On	On	Drive configured as a Master, with an attached Slave

Maxtor Hard Disk Drive

Table 5-14	Maxtor Hard Disk Drive Jumper Settings
J50:Master/Slave	**DESCRIPTION**
On	Drive configured as a Master, or Drive configured as a Master, with an attached Slave
Off	Drive configured as a Slave.

5.25-In. Hard Disk Drive Jumper Locations
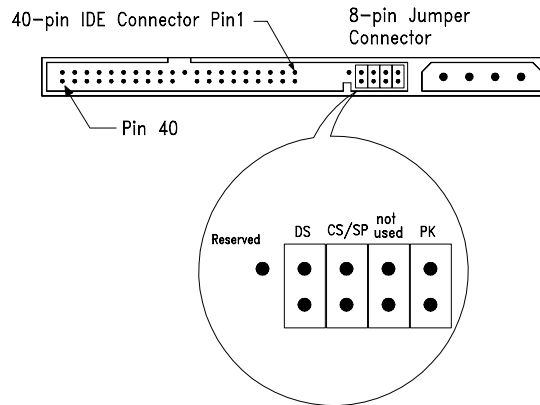
Figure 5- 14   5.25-in Hard Disk Jumper Locations

The configuration of the following four jumpers controls the drive's mode of operation:

- DS – Drive Select

- CS/ SP–Cable Select / Slave Present

- PARK – Used as a place to store a jumper

5.25-In. Hard Disk Drive Jumper Settings

Table 5-15	5.25-in Hard Disk Drive Jumper Settings	
DS	**CS/SP**	**DESCRIPTION**
On	Off	Drive configured as a Master.
Off	Off	Drive configured as a Slave.
On	On	Drive configured as a Master, with an attached Slave

CD-ROM Drive

ATTENTION: Either <option 1> or <option 2> CD-ROM drive may come with your Aptiva machine. Their front panel buttons, indicators and emergency eject method could be different.
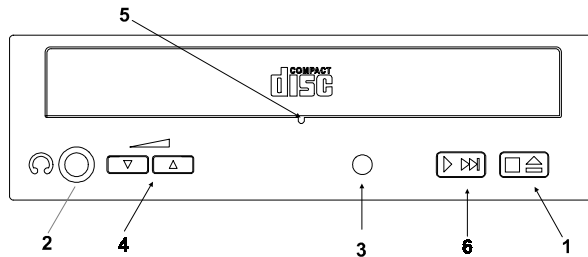
Figure 5- 15   CD-ROM Front Panel <option 1>

Item	Description
Table 5- 16   CD-ROM Front Panel Introduction <option 1>
Item	**Description**
1	Load / eject button
2	Headphone jack
3	Power-on / busy indicator, lights up in green color while disc is set in ready state; lights up and flashes in amber color during data read or seek operation.
4	Headphone volume control
5	Emergency eject hole. See CD-ROM Emergency-exit <option 1> below.
6	Audio Play/Skip track control button

CD-ROM Emergency-exit <option 1>
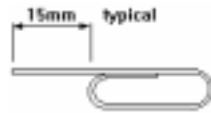
If for any reason the tray does not eject automatically, insert and press an eject-bar inside the emergency eject hole to manually eject the tray. A straightened paper clip with a diameter of 1.2 mm (typical) can be used as an eject-bar.

NOTE: Make sure to turn off the power before manual disc eject operation.
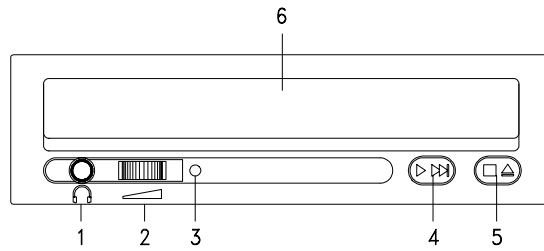
Figure 5- 16   CD-ROM Front Panel <option 2>

Table 5- 17 CD-ROM Front Panel Introduction <option 2>	
Item	**Description**
1	Headphone jack
2	Headphone volume control
3	Busy indicator, lights up and flashes in amber color during data read or seek operation.
4	Audio Play/Skip track control button
5	Load / eject button
6	Disc tray and emergency eject See CD-ROM Emergency-exit <option 2> below.

CD-ROM Emergency-exit Option <2>
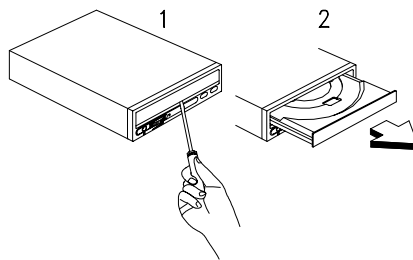
Locate the bottom edge of the disc tray. Gently pry the disk tray open with a screwdriver.   When the disc tray opens, simply remove the disc from the CD-ROM drive.

CD-ROM Drive Rear Panel Connectors and Features

```
              CABLE SELECT
              SLAVE
  DIGITAL           MASTER
  AUDIO    AUDIO  C S M   IDE INTERFACE      DC INPUT
  D G      R G G L S L A  39 ───────── 1    5V  G  G  12V
                          40 ───────── 2
```
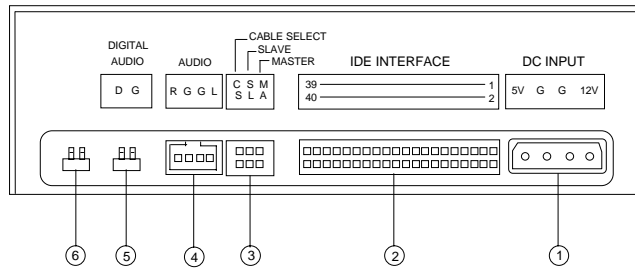
Figure 5- 17   CD-ROM Rear Panel

Note: CD-ROM drives may come with no item 5 and 6 (digital audio output and testing jumper) connectors.

Table 5- 18 CD-ROM Drive Rear Panel Connectors and Features		
Item	**Function**	**Connect to…**
1	Power supply connector	Power supply
2	Interface connector	System board (CN10)
3	Configuration jumper. See table Table 5-19.	--
4	Audio line out connector	System board (CN6)
5	Digital audio output	--
6	Testing jumper is reserved for manufacturer internal testing purposes.	--

CD-ROM Drive Jumper Settings

Table 5-19 CD-ROM Drive Jumper Settings			
CS	**SL**	**MA**	**DESCRIPTION**
--	--	On	Drive configured as a Master.
--	On	--	Drive configured as a slave.
On	--	--	Cable select

DIMM Configurations

The 2137 system board has two DIMM sockets. A maximum of 256KB memory may be installed. The 2138 system board has three DIMM sockets. A maximum of 384KB memory may be installed.

You can install 8MB, 16MB, 32MB, 64MB, or 128MB 3.3V DIMM at any sockets and with any combinations.

System Board Connector Pin Signals

Monitor Port Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Red Video	O	9	+5 V dc	
2	Green Video	O	10	Synch Ground	
3	Blue Video	O	11	Monitor ID Bit 0	I
4	Monitor ID Bit 2	I	12	SDA	I
5	Synch Ground		13	Horizontal Synch	O
6	Red Ground		14	Vertical Synch	O
7	Green Ground		15	SCL	I
8	Blue Ground				

Serial Port Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Data Carrier Detect	I	6	Data Set Ready	I
2	Receive Data	I	7	Request To Send	O
3	Transmit Data	O	8	Clear To Send	I
4	Data Terminal Ready	O	9	Ring Indicator	I
5	Signal Ground				

Parallel Port Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Strobe	O	14	Auto Feed	N/A
2	Data Bit 0	I/O	15	Error	I
3	Data Bit 1	I/O	16	Initialize	O
4	Data Bit 2	I/O	17	Select (In)	O
5	Data Bit 3	I/O	18	Ground	Power
6	Data Bit 4	I/O	19	Ground	Power
7	Data Bit 5	I/O	20	Ground	Power
8	Data Bit 6	I/O	21	Ground	Power
9	Data Bit 7	I/O	22	Ground	Power
10	Acknowledge	I	23	Ground	Power
11	Busy	I	24	Ground	Power
12	Paper Empty	I	25	Ground	Power
13	Select	O			

Mouse Port Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Mouse Data	I/O	4	+5 V dc	Power
2	No Connection		5	Mouse Clock	I/O
3	Ground	Power	6	No Connection	

Keyboard Port Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Data	I/O	4	+5 V dc	Power
2	Mouse Data		5	Clock	I/O
3	Ground	Power	6	Mouse Clock	

Diskette Drive Cable Connector Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Ground		18	Direction	O
2	Density Select	O	19	Ground	
3	No Connection		20	Step	O
4	No Connection		21	Ground	
5	Ground		22	Write Data	I
6	No Connection		23	Ground	
7	Ground		24	Write Enable	O
8	Index	I	25	Ground	
9	Ground		26	Track 0	I
10	Motor Enable 0	O	27	Ground	
11	Ground		28	Write Protect	I
12	Drive Select 1	O	29	Ground	
13	Ground		30	Read Data	I
14	Drive Select 0	O	31	Ground	
15	Ground		32	Select Head 1	O
16	Motor Enable 1	O	33	Ground	
17	Ground		34	Diskette Change	I

Hard Disk Cable Connector Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Host Reset	O	21	No Connection	
2	Ground		22	Ground	
3	Host Data 7	I/O	23	Host IOW	O
4	Host Data 8	I/O	24	Ground	Power
5	Host Data 6	I/O	25	Host IOR	O
6	Host Data 9	I/O	26	Ground	Power
7	Host Data 5	I/O	27	I/O Channel Ready	I
8	Host Data 10	I/O	28	No Connection	
9	Host Data 4	I/O	29	No Connection	
10	Host Data 11	I/O	30	Ground	Power
11	Host Data 3	I/O	31	Host IRQ	I
12	Host Data 12	I/O	32	No Connection	
13	Host Data 2	I/O	33	Host A1	O
14	Host Data 13	I/O	34	No Connection	
15	Host Data 1	I/O	35	Host A0	O
16	Host Data 14	I/O	36	Host A2	O
17	Host Data 0	I/O	37	Host CS0	O
18	Host Data 15	I/O	38	Host CS1	O
19	Ground	Power	39	ACTIVE bar	I
20	No Connection		40	Ground	Power

Safety Inspection Guide

General Guidelines

The purpose of this Safety Inspection Guide is to help you identify possible unsafe conditions on machines that are being inspected for a Maintenance Agreement. Each machine has needed items installed to provide the operators and service personnel with an acceptable level of safety. This guide lists only these items. Good judgment should be used to identify possible safety conditions not covered by this Safety Inspection Guide.

If any unsafe conditions are present, you must find out how serious the hazard is and if you can continue before you correct the hazard.

All current IBM Aptiva service supplements outlining feature/model changes, along with the machine history, should be reviewed.

Check the following items:

- Damaged, missing, or changed parts, especially in the area of the On/Off switch and the power supply.

- Damaged, missing, or changed covers.

- Possible safety exposure from any non-IBM attachments.

Parts Catalog

Abbreviations

In this chapter, the following abbreviations are used to identify country and language version:

AT	Austria
AU	Australia
BD	Belgium - Dutch
BF	Belgium - French
CA	Canada
CE	Canada - English
CF	Canada - French
CN	China
DK	Denmark - Danish
FI	Finland - Finish
FR	France
GE	Germany
HK	Hong Kong
IT	Italy
JP	Japan
LS	LA-Spanish
ND	Netherlands - Dutch
NL	Netherlands - Dutch
NO	Norway - Norwegian
SF	Swiss - French
SG	Swiss - German
SP	Spain
SW	Sweden - Swedish
TW	Taiwan
UK	United Kingdom
US	United States

Assembly 1: Machine Type 2137 System Unit - Exterior

Asm-Index	FRU Number	Description
1-1	02K2324	Top/Side Panel
1-2	02K2325	Front Panel
1-3	02K2326	Top Cover
1-4	02K2327	Screw for Top/Side Panel
1-5	02K2329	Screw for Top/Side Panel
1-6	02K2329	Screw for Front Panel
1-7	02K2330	Drive Bay Panel - 2nd & 3rd 5.25-in. Drive
1-8	02K2331	Drive Bay Panel - 1st 5.25-in. Drive

Assembly 2: Machine Type 2137 System Unit - Interior
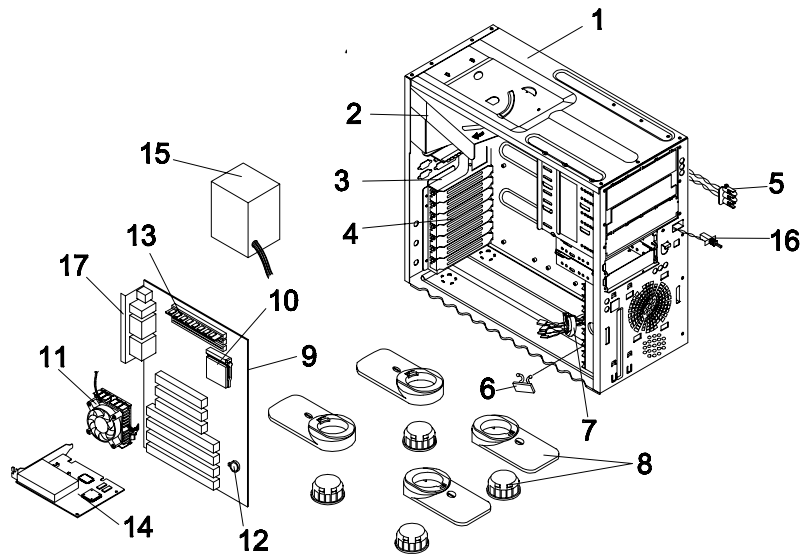
Asm-Index	FRU Number	Description
2-1	02K2332	Assembly Lower Case (with Power Supply Frame, Driver Frame, Bracket Port, w/o Housing Stands)
2-2	02K2333	Power Supply Frame
2-NS	02K2334	Screw for Power Supply Frame
2-3	01K4200	Bracket Port
2-4	02K2334	Screw for Bracket Port
2-5	02K2335	Assembly Wire LED
2-6	01K4213	Mounting Purse Lock
2-7	01K4192	EMI Core
2-8	02K2337	Housing Stand

Asm-Index	FRU Number	Description
2-9	12J6890	System Board V58XA-1,1N-600
2-9	02K2551	System Board V58XA-2CR, 220
2-9	10L6595	System Board V58XA-2, 220
2-9	10L6653	System Board V58XA-2, 220 (support K6-300,Vpll 3.3V processor)
2-9	10L6659	System Board V58XA-2, 220 (support K6-300,Vpll 3.3V processor, w/o ROC mark)
2-NS	02K2334	Screw for System Board
2-10	03K0345	Intel Pentium 200 MHz Processor
2-10	03K0346	Intel Pentium 166 MHz MMX Processor
2-10	03K0347	Intel Pentium 200 MHz MMX Processor
2-10	02K2271	Intel Pentium 233 MHz MMX Processor
2-10	02K2273	IBM 6x86MX-PR166 Processor
2-10	02K2275	AMD K6 166MHz Processor
2-10	02K2276	AMD K6 200MHz Processor
2-10	02K2277	AMD K6 233MHz Processor
2-10	12J6886	AMD K6 266MHz Processor
2-10	10L6632	AMD K6 300MHz Processor (Vpll 3.3V)
2-NS	02K2345	Flash ROM
2-11	02K2323	Processor Fan Sink
2-11	02K2269	Processor Fan Sink (for K6-233/266)
2-12	01K4278	Backup Battery (CR2032)
2-13	02K2287	DIMM 8MB
2-13	02K2288	DIMM 16MB
2-13	02K2289	DIMM 32MB
2-14		Modem Card, see page 7-9 to 7-11
2-15	02K2297	Power Supply 200W (API)
2-15	02K2562	Power Supply 200W for IDATX-2 Housing
2-15	02K2298	Power Supply 200W, (for JP)

Asm-Index	FRU Number	Description
2-16	12J6877	Power Switch and Cable
2-NS	01K4259	Screw for Power Switch
2-17	02K2627	Assembly I/O Port Bracket(bracket, label, hex screws) for 02K2332 Lower Case
2-17	02K2626	Assembly I/O Port Bracket(bracket, label, hex screws) for 02K2605 Lower Case

Assembly 3: Machine Type 2137 FDD, HDD Drive
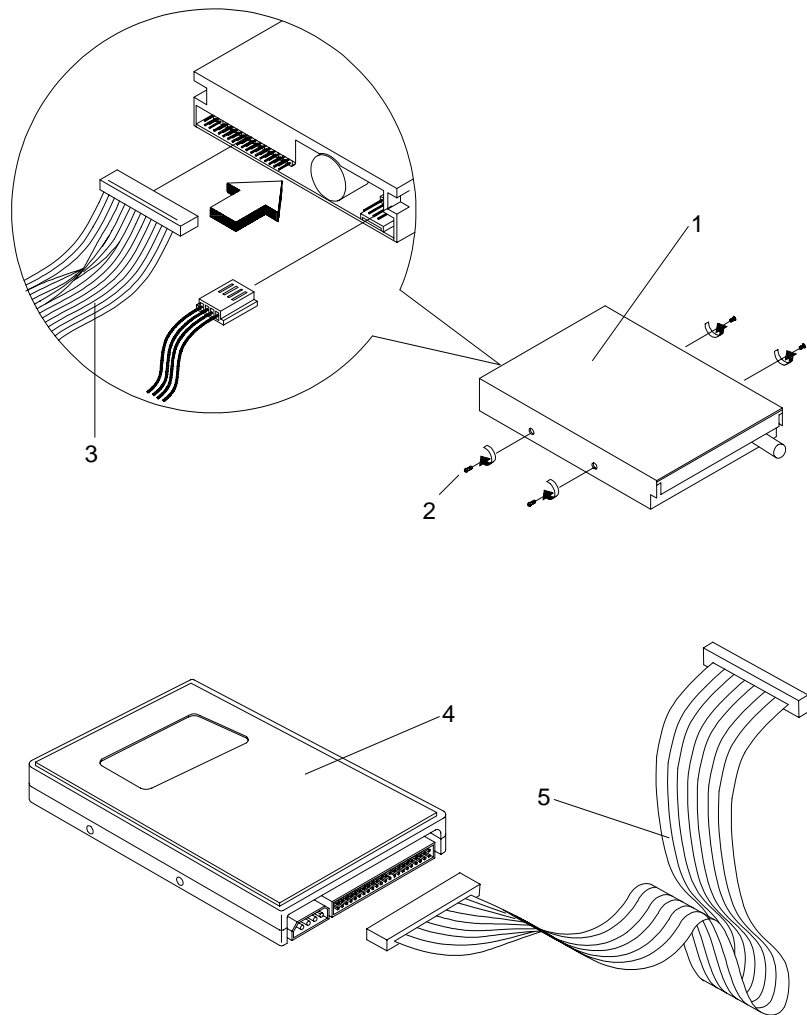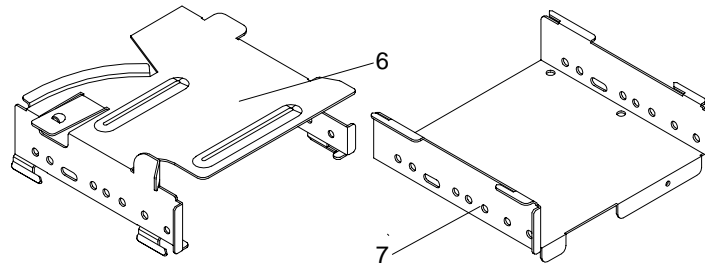
Asm-Index	FRU Number	Description
3-1	02K2299	Assembly 1.44MB Diskette Drive
3-2	01K4259	Screw for Diskette Drive
3-3	02K2342	Diskette Drive Cable
3-4	03K0330	2.1GB Hard Disk Drive, Quantum, 5.25-in.
3-4	02K2263	4.3GB Hard Disk Drive, Quantum, 5.25-in.
3-4	02K2278	6.4GB Hard Disk Drive, Quantum, 5.25-in.
3-4	10L6627	2.1GB Hard Disk Drive, Quantum, 3.5-in., Supports Ultra DMA
3-4	10L6629	3.2GB Hard Disk Drive, Quantum, 3.5-in., Support Ultra DMA
3-4	10L6630	4.3GB Hard Disk Drive, Quantum, 3.5-in., Supports Ultra DMA
3-4	10L6629	3.2GB Hard Disk Drive, Segate, 3.5-in.
3-4	10L6630	4.3GB Hard Disk Drive, Segate, 3.5-in.
3-4	10L6628	2.5GB Hard Disk Drive, Maxtor, 3.5-in., Supports Ultra DMA
3-5	01K4224	Hard Disk Drive Cable
3-NS	01K4260	Mounting Screw for 3.5-in. Hard Disk Drive
3-NS	01K4259	Mounting Screw for 5.25-in. Hard Disk Drive
3-NS	12J6861	Hard Disk Drive Cover for K6-233/266 CPU only
3-6	01K4201	3.5-in. Drive Frame, Upper
3-7	01K4202	3.5-in. Drive Frame, Lower

Assembly 4: Machine Type 2137 CD-ROM, Modem Card

8

9

10
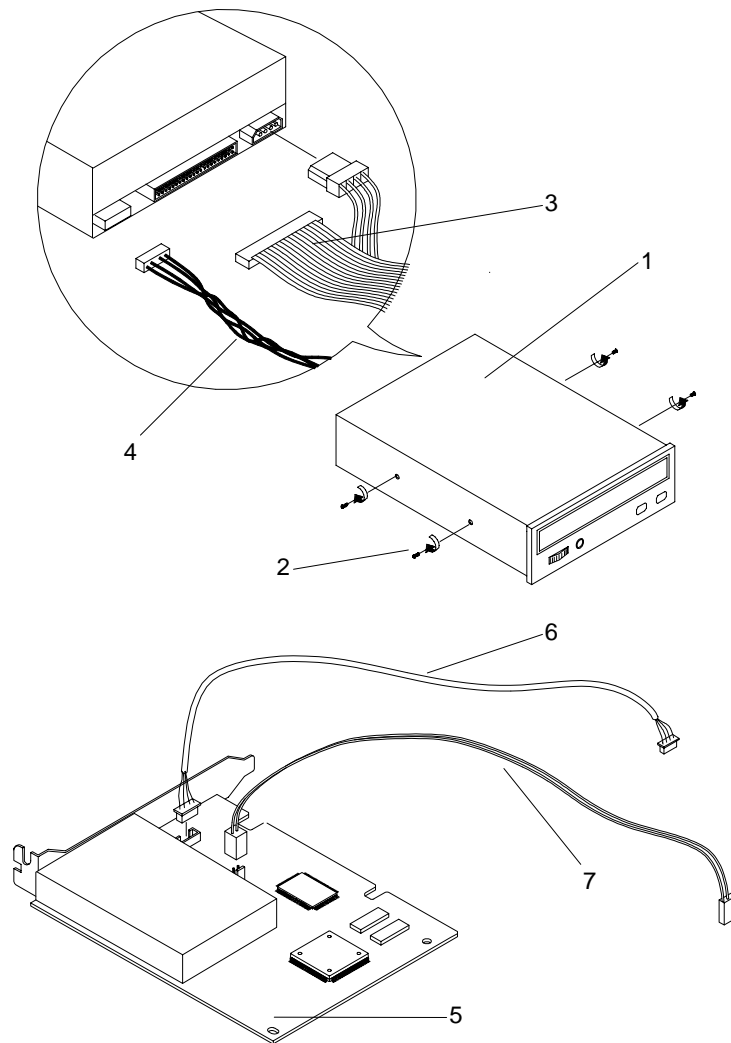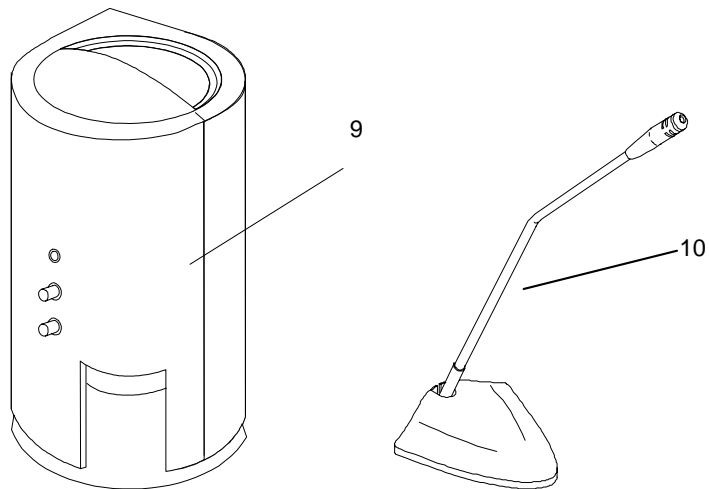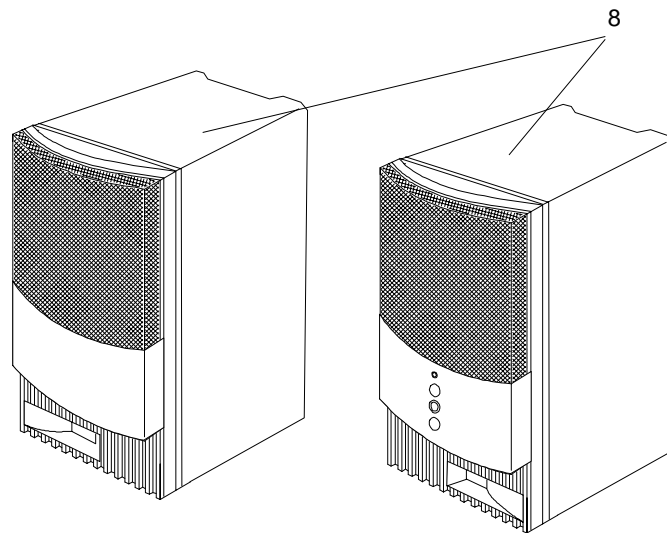
Asm-Index	FRU Number	Description
4-1	10L6647	CD-ROM (24X)
4-1	12J6908	CD-ROM (20X), API
4-2	01K4259	Mounting Screw for CD-ROM

Asm-Index	FRU Number	Description
4-3	01K4224	CD-ROM IDE Cable
4-4	02K2339	CD-ROM Drive Audio Cable
4-5	02K2303	Modem, GVC 33.6K –D/F/V (UK, ND, SW,DK,.FI, NO, BD/BF)
4-5	02K2304	Modem, GVC 33.6K –D/F/V (FR)
4-5	02K2305	Modem, GVC 33.66K –D/F/V (IT)
4-5	02K2307	Modem, GVC 33.6K –D/F/V (GE)
4-5	12J6873	Modem, GVC 33.6K –D/F/V (SP)
4-5	02K2557	Modem, GVC 56K -D/F (US/CA)
4-5	02K2580	Modem, GVC 56K –D/F/V (UK/NL/SW/DK/NO/FI/BD/BF/GE/SG)
4-5	02K2581	Modem, GVC 56K-D/F/V (IT)
4-5	02K2582	Modem, GVC 56K-D/F/V (FR)
4-5	02K2583	Modem, GVC 56K-D/F/V (SP)
4-5	02K2294	Modem, CIS 56K –D/F/V (JP)
4-5	02K2295	Modem, CIS 56K-D/F/V (US/CA)
4-6	02K2308	Modem Card Cable
4-7	02K2336	Modem Ring-In Cable
4-8	02k0321	Speaker, Plastek, 3W (JP)
4-8	02K0322	Speaker, Jazz, 3W
4-NS	02K2312	Speaker Adapter, 3W, UL/CSA
4-NS	02K2313	Speaker Adapter, 3W, BS
4-NS	02K2314	Speaker Adapter, 3W, TUV/CE
4-NS	02K2315	Speaker Adapter, 3W, T-mark
4-NS	10L6650	Speaker Adapter, 3W (AU)
4-9	12J6874	Sub-woofer, Jazz, 10W, with BS Adapter
4-9	02K2311	Sub-Woofer, Jazz, 10W, with TUV/CE Adapter
4-NS	12J6878	Sub-Woofer Adapter-Jazz 10W, BS
4-NS	02K2319	Sub-Woofer Adapter-Jazz 10W, TUV/CE
4-10	01K4191	Microphone, Unidirectional, Jazz
4-10	02K2320	Microphone, Noise Cancelling, Andrea

Assembly 5: Machine Type 2137 Monitor and Power Cord
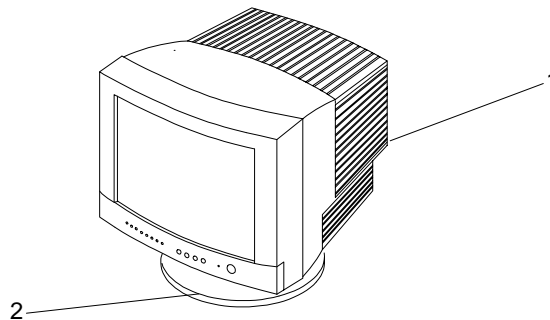
Asm-Index	FRU Number	Description
5-1	02K2350	Monitor 14-in. with stand (54KHz, 13.1-in. viewable screen size)
5-1	02K2353	Monitor 15-in. with stand (54KHz, 13.6-in. viewable screen size)
5-1	02K2359	Monitor 15-in. with stand (69KHz, JP, 13.7-in. viewable screen size)
5-1	02K2355	Monitor 15-in. with stand (69KHz, AU, 13.7-in. viewable screen size)
5-1	02K2363	Monitor 17-in. with stand (72KHz, JP 15.7-in. viewable screen size)
5-1	12J6903	Monitor 17-in. with stand (72KHz, US, 15.7-in. viewable screen size)
5-1	12J6904	Monitor 17-in. with stand (72KHz, EMEA, 15.7-in. viewable screen size)
5-1	12J6905	Monitor 17-in. with stand (72KHz, Comtech, 15.7-in. viewable screen size)
5-1	02K2362	Monitor 17-in. with stand (72KHz, AU, 15.7-in. viewable screen size)
5-2	02K2347	Monitor Stand for 14/15-in.
5-2	02K2328	Monitor Stand for 17-in.
5-NS	06J7900	Power Cord, CSA/UL
5-NS	01K4198	Power Cord, 10A/125V (UK)
5-NS	01K4196	Power Code, 10A/250V (CE)

Asm-Index	FRU Number	Description
5-NS	10L6651	Power Code, Volex 10A/250V (AU)
5-NS	02K2300	Power Code, T-mark 10A/250V (JP)
5-NS	02K2296	Power Code Adapter, 10A/250V (JP)

Assembly 6: Machine Type 2137 Keyboard and Mouse

Asm-Index	FRU Number	Description
6-1	07H0666	Keyboard-104 (CE)
6-1	07H0668	Keyboard-104 (CF)
6-1	07H0680	Keyboard-105 (FR)
6-1	07H0681	Keyboard-105 (GE)
6-1	07H0701	Keyboard-105 (UK)
6-1	07H0679	Keyboard (ND)
6-1	07H0697	Keyboard (SW/FI)
6-1	07H0678	Keyboard (DK)
6-1	07H0688	Keyboard (NO)
6-1	07H0687	Keyboard (IT)
6-1	07H0670	Keyboard (LS)
6-1	07H0675	Keyboard (BD)
6-1	07H0674	Keyboard (BF)
6-1	07H0704	Keyboard (JP)
6-1	07H0705	Keyboard (TW/HK)
6-2	01K4263	Mouse

Assembly 7: Machine Type 2137 Software

Asm-Index	FRU Number	Description
7-		Application CD Pack, Voice Type 3.0 Kit, Lotus SmartSuite 97, MS Win95 Pack and Aptiva Customized I.E. 4.0 Aptiva owners and servicers will need to call their local IBM HelpCenter to order the above software

Assembly 1: Machine Type 2138 System Unit - Exterior

Asm-Index	FRU Number	Description
1-1	02K2324	Top/Side Panel
1-2	02K2325	Front Panel
1-3	02K2326	Top Cover
1-4	02K2327	Screw for Top/Side Panel
1-5	02K2329	Screw for Top/Side Panel
1-6	02K2329	Screw for Front Panel
1-7	02K2330	Drive Bay Panel - 2nd & 3rd 5.25-in. Drive
1-8	02K2331	Drive Bay Panel - 1st 5.25-in. Drive

Assembly 2: Machine Type 2138 System Unit - Interior

Asm-Index	FRU Number	Description
2-1	02K2605	Assembly Lower Case (with Power Supply Frame, Driver Frame, Bracket Port, w/o Housing Stands)
2-2	02K2604	Power Supply Frame
2-NS	02K2334	Screw for Power Supply Frame
2-3	01K4200	Bracket Port
2-4	02K2334	Screw for Bracket Port
2-5	02K2335	Assembly Wire LED
2-6	01K4213	Mounting Purse Lock
2-7	01K4192	EMI Core
2-8	02K2606	Housing Stand
2-9	10L6658	System Board V65XA-1 (w/I retention module, EMI grounding, I/O port bracket, hex screws and label)
2-9	10L6657	System Board V65XA-1 (w/I retention module, EMI grounding, I/O port bracket, hex screws and label), (China only)
2-NS	02K2334	Screw for System Board
2-10	02K2563	Intel Pentium II 266 w/I ECC
2-10	02K2564	Intel Pentium II 300 w/I ECC
2-NS	02K2345	Flash ROM
2-11	02K2566	Processor Fan Sink
2-12	01K4278	Backup Battery (CR2032)
2-13	02K2288	DIMM 16MB w/o EEPROM
2-13	02K2289	DIMM 32MB w/o EEPROM
2-14		Modem Card, see page 7-21 to 7-23
2-15	02K2562	Power Supply 200W
2-16	12J6877	Power Switch and Cable
2-NS	01K4259	Screw for Power Switch
2-17	02K2634	Power LED 3-pin to 2-pin Conversion Cable

Assembly 3: Machine Type 2138 FDD, HDD Drive
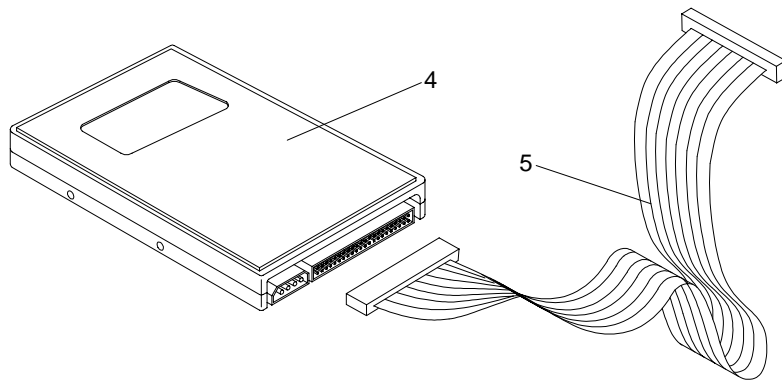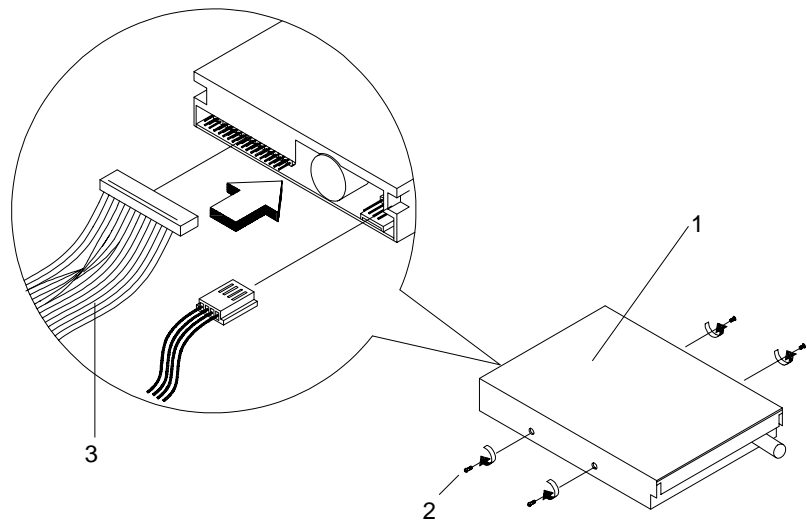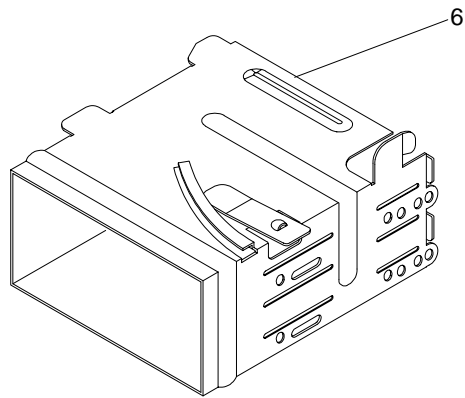
Asm-Index	FRU Number	Description
3-1	02K2299	Assembly 1.44MB Diskette Drive
3-2	01K4259	Screw for Diskette Drive
3-3	02K2603	Diskette Drive Cable
3-4	10L6630	4.0GB Hard Disk Drive, 3/5-in.
3-4	02K2561	8.0GB Hard Disk Drive, 3.5-in.
3-4	10L6649	6.0GB Hard Disk Drive, 5.25-in.
3-4	10L6645	8.0GB Hard Disk Drive, 5.25-in.
3-5	01K4224	Hard Disk Drive Cable
3-NS	01K4260	Mounting Screw for 3.5-in. Hard Disk Drive
3-6	02K2607	3.5-in. Drive Frame

Assembly 4: Machine Type 2138 CD-ROM/DVD, Modem Card

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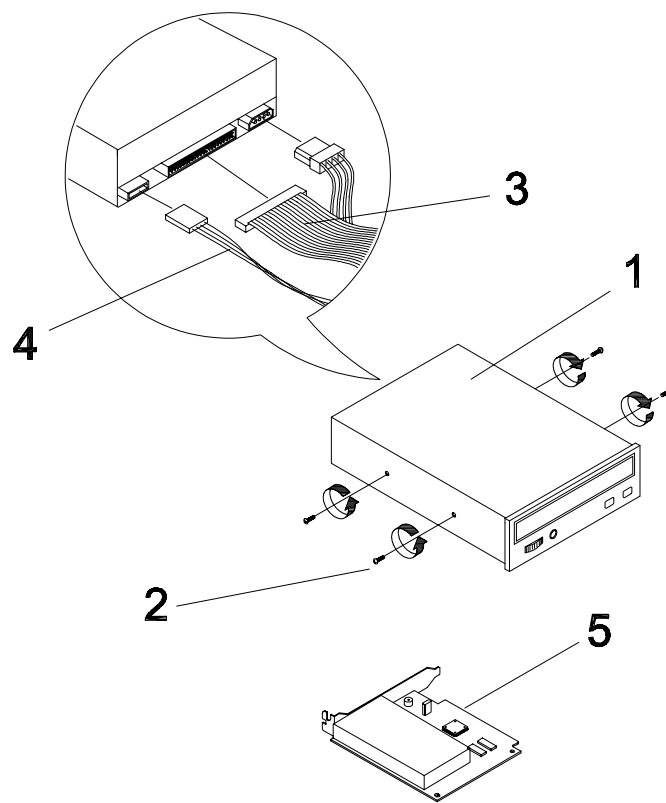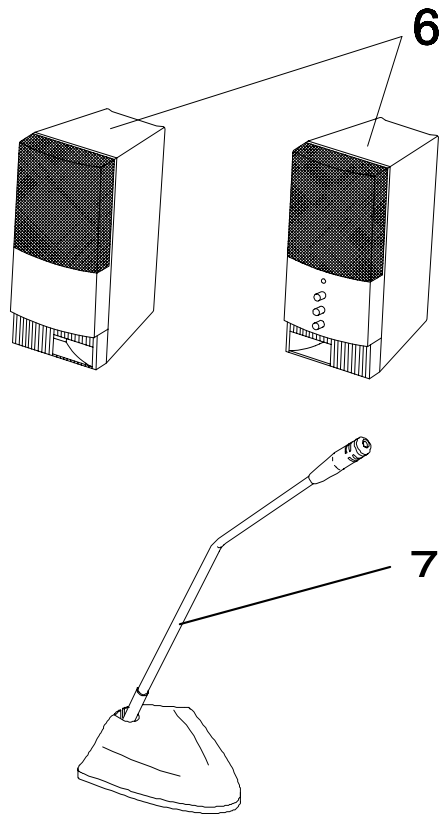
Asm-Index	FRU Number	Description
4-1	10J6647	CD-ROM (24X)
4-2	01K4259	Mounting Screw for CD-ROM
4-3	01K4224	CD-ROM IDE Cable
4-4	02K2339	CD-ROM Drive Audio Cable
4-4	02K2575	DVD II
4-5	02K2294	Modem, CIS 56K -D/F/V (JP)
4-5	02K2639	Modem, CIS 56K - D/F/V (US,CA,TW)
4-5	10L6633	Modem, GVC 56 - D/F (US,CA)

Asm-Index	FRU Number	Description
4-5	02K2632	Modem, GVC 56K - D/F (UK,GE,SW,DK,NO,FI,BD,BF,FR)
4-5	02K2587	Modem, GVC 56K - D/F (SG,SF)
4-5	02K2633	Modem, GVC 56K - D/F (IT)
4-5	02K2610	Modem, GVC 56K - D/F (SP)
4-5	02K2640	Modem, GVC 56K -D/F/V (CN)
4-6	02K0322	Speaker, Jazz, 3W
4-NS	02K2312	Speaker Adapter, 3W, UL/CSA
4-NS	02K2313	Speaker Adapter, 3W, BS
4-NS	02K2314	Speaker Adapter, 3W, TUV/CE
4-7	01K4191	Microphone, Unidirectional, Jazz
4-7	02K2320	Microphone, Noise Cancelling, Andrea
4-7	10L6656	Microphone, Noise Cancelling, NC-8, Andrea

Assembly 5: Machine Type 2138 Monitor and Power Cord

Asm-Index	FRU Number	Description
5-1	02K2350	Monitor 14-in. with stand (54KHz, 13.1-in. viewable screen size)
5-1	02K2353	Monitor 15-in. with stand (54KHz, 13.6-in. viewable screen size)
5-1	12J6903	Monitor 17-in. with stand (72KHz, US, 15.7-in. viewable screen size)
5-2	02K2347	Monitor Stand for 14/15-in.
5-2	02K2328	Monitor Stand for 17-in.
5-NS	06J7900	Power Cord, CSA/UL
5-NS	01K4198	Power Cord, 10A/125V (UK)
5-NS	01K4196	Power Code, 10A/250V (CE)
5-NS	10L6651	Power Cord, Volex 10A/250V (AU)
5-NS	02K2300	Power Cord, T-mark 10A/250V (JP)
5-NS	02K2648	Power Cord w/I adapter, TA-Hsing T-mark 10A/250V (JP)
5-NS	02K2296	Power Cord Adapter, 10A/250V (JP)

Assembly 6: Machine Type 2138 Keyboard and Mouse

Asm-Index	FRU Number	Description
6-1	07H0666	Keyboard-104 (CE)
6-1	07H0668	Keyboard-104 (CF)
6-1	07H0680	Keyboard-105 (FR)
6-1	07H0681	Keyboard-105 (GE)
6-1	07H0701	Keyboard-105 (UK)
6-1	07H0679	Keyboard (ND)
6-1	07H0697	Keyboard (SW/FI)
6-1	07H0678	Keyboard (DK)
6-1	07H0688	Keyboard (NO)
6-1	07H0687	Keyboard (IT)
6-1	07H0670	Keyboard (LS)
6-1	07H0675	Keyboard (BD)
6-1	07H0674	Keyboard (BF)
6-1	07H0704	Keyboard (JP)
6-1	07H0705	Keyboard (TW/HK)
6-1	07H0690	Keyboard (SP)
6-1	07H0698	Keyboard (SF)
6-2	01K4263	Mouse

Assembly 7: Machine Type 2138 Software

Asm-Index	FRU Number	Description
7-		Application CD Pack, Voice Type 3.0 Kit, Lotus SmartSuite 97, MS Win95 Pack and Aptiva Customized I.E. 4.0 Aptiva owners and servicers will need to call their local IBM HelpCenter to order the above software

Appendix A. FRU Number Index for Machine Type 2137

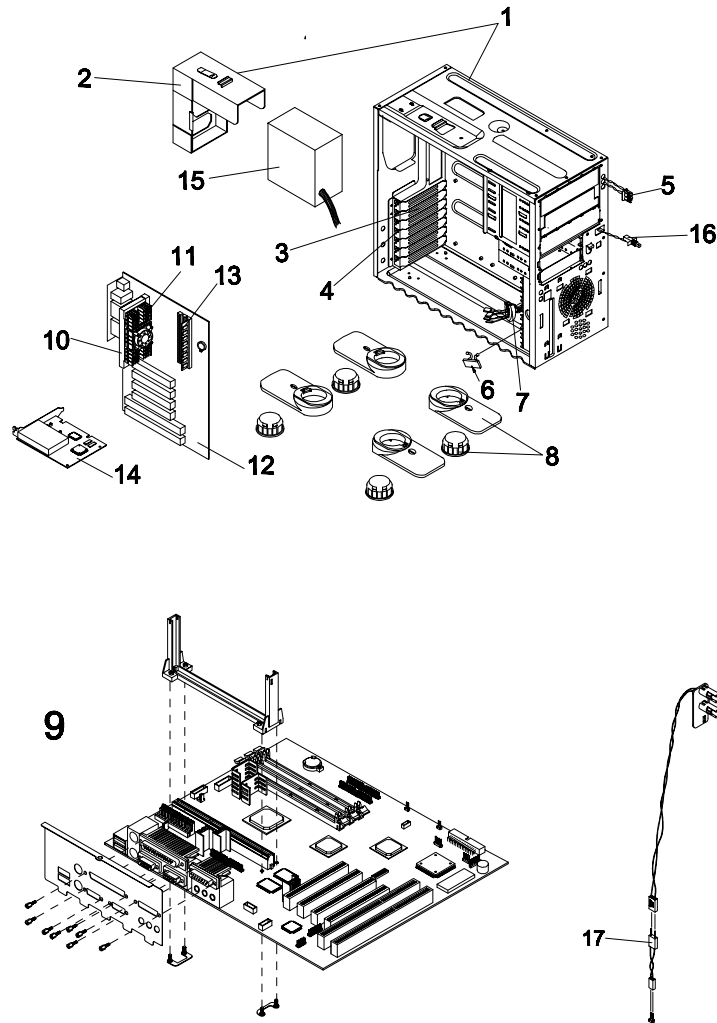| FRU Number	Asm-Index	Page	FRU Number	Asm-Index	Page
01K4191	4-10	7-11	02K2288	2-13	7-6
01K4192	2-7	7-5	02K2289	2-13	7-6
01K4196	5-NS	7-12	02K2294	4-5	7-11
01K4198	5-NS	7-12	02k2295	4-5	7-11
01K4200	2-3	7-5	02K2296	5-NS	7-13
01K4201	3-6	7-8	02K2297	2-15	7-6
01K4202	3-7	7-8	02K2298	2-15	7-6
01K4213	2-6	7-5	02K2299	3-1	7-8
01K4224	4-3	7-11	02K2300	5-NS	7-13
01K4224	3-5	7-8	02K2303	4-5	7-11
01K4259	4-2	7-11	02K2304	4-5	7-11
01K4259	3-NS	7-8	02K2305	4-5	7-11
01K4259	3-2	7-8	02K2307	4-5	7-11
01K4259	2-NS	7-6	02K2308	4-6	7-11
01K4260	3-NS	7-8	02K2311	4-9	7-11
01K4263	6-2	7-14	02K2312	4-NS	7-11
01K4278	2-12	7-6	02K2313	4-NS	7-11
02K0321	4-8	7-11	02K2314	4-NS	7-11
02K0322	4-8	7-11	02K2315	4-NS	7-11
02K2263	3-4	7-8	02K2319	4-NS	7-11
02K2269	2-11	7-6	02K2320	4-10	7-11
02K2271	2-10	7-6	02K2323	2-11	7-6
02K2273	2-10	7-6	02K2324	1-1	7-4
02K2275	2-10	7-6	02K2325	1-2	7-4
02K2276	2-10	7-6	02K2326	1-3	7-4
02K2277	2-10	7-6	02K2327	1-4	7-4
02K2278	3-4	7-8	02K2328	5-2	7-12
02K2287	2-13	7-6	02K2329	1-5	7-4

FRU Number	Asm-Index	Page	FRU Number	Asm-Index	Page
02K2329	1-6	7-4	03K0330	3-4	7-8
02K2330	1-7	7-4	03K0345	2-10	7-6
02K2331	1-8	7-4	03K0346	2-10	7-6
02K2332	2-1	7-5	03K0347	2-10	7-6
02K2333	2-2	7-5	06J7900	5-NS	7-12
02K2334	2-NS	7-6	07H0666	6-1	7-14
02K2334	2-NS	7-5	07H0668	6-1	7-14
02K2334	2-4	7-5	07H0670	6-1	7-14
02K2335	2-5	7-5	07H0674	6-1	7-14
02K2336	4-7	7-11	07H0675	6-1	7-14
02K2337	2-8	7-5	07H0678	6-1	7-14
02K2339	4-4	7-11	07H0679	6-1	7-14
02K2342	3-3	7-8	07H0680	6-1	7-14
02K2345	2-NS	7-6	07H0681	6-1	7-14
02K2347	5-2	7-12	07H0687	6-1	7-14
02K2350	5-1	7-12	07H0688	6-1	7-14
02K2353	5-1	7-12	07H0697	6-1	7-14
02K2355	5-1	7-12	07H0701	6-1	7-14
02K2359	5-1	7-12	07H0704	6-1	7-14
02K2362	5-1	7-12	07H0705	6-1	7-14
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02K2551	2-9	7-5	10L6627	3-4	7-8
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02K2580	4-5	7-11	10L6630	3-4	7-8
02K2581	4-5	7-11	10L6632	2-10	7-6
02K2582	4-5	7-11	10L6650	4-NS	7-11
02K2583	4-5	7-11	10L6651	5-NS	7-12
02K2626	2-17	7-7	10L6653	2-9	7-6
02K2627	2-17	7-7	10L6657	2-9	7-6
02K2630	4-5	7-11	10L6663	2-10	7-6

FRU Number Index for Machine Type 2138

FRU Number	Asm-Index	Page	FRU Number	Asm-Index	Page
01K4191	4-7	7-24	02K2326	1-3	7-16
01K4192	2-7	7-18	02K2327	1-4	7-16
01K4196	5-NS	7-24	02K2328	5-2	7-24
01K4198	5-NS	7-24	02K2329	1-5	7-16
01K4200	2-3	7-18	02K2329	1-6	7-16
01K4213	2-6	7-18	02K2330	1-7	7-16
01K4224	3-5	7-20	02K2331	1-8	7-16
01K4224	4-3	7-22	02K2334	2-NS	7-18
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01K4263	6-2	7-25	02K2345	2-NS	7-18
01K4278	2-12	7-18	02K2347	5-2	7-24
02K0322	4-6	7-23	02K2350	5-1	7-24
02K2288	2-13	7-18	02K2353	5-1	7-24
02K2289	2-13	7-18	02K2561	3-4	7-20
02K2294	4-5	7-22	02K2562	2-15	7-18
02K2296	5-NS	7-24	02K2563	2-10	7-18
02K2299	3-1	7-20	02K2564	2-10	7-18
02K2300	5-NS	7-24	02K2566	2-11	7-18
02K2312	4-NS	7-23	02K2575	4-4	7-22
02K2313	4-NS	7-23	02K2587	4-5	7-23
02K2314	4-NS	7-23	02K2603	3-3	7-20
02K2320	4-7	7-24	02K2604	2-2	7-18
02K2324	1-1	7-16	02K2605	2-1	7-18
02K2325	1-2	7-16	02K2606	2-8	7-18

FRU Number	Asm-Index	Page	FRU Number	Asm-Index	Page
02K2607	3-6	7-20	07H0688	6-1	7-25
02K2609	2-9	7-18	07H0690	6-1	7-25
02K2610	4-5	7-23	07H0697	6-1	7-25
02K2632	4-5	7-23	07H0698	6-1	7-25
02K2633	4-5	7-23	07H0701	6-1	7-25
02K2634	2-17	7-18	07H0704	6-1	7-25
02K2639	4-5	7-22	07H0705	6-1	7-25
02K2640	4-5	7-23	10L6630	3-4	7-20
02K2648	5-NS	7-24	10L6633	4-5	7-22
06J7900	5-NS	7-24	10L6645	3-14	7-20
07H0666	6-1	7-25	10L6647	4-1	7-22
07H0668	6-1	7-25	10L6649	3-4	7-20
07H0670	6-1	7-25	10L6651	5-NS	7-24
07H0674	6-1	7-25	10L6656	4-7	7-24
07H0675	6-1	7-25	12J6877	2-16	7-18
07H0678	6-1	7-25	12J6903	5-1	7-24
07H0679	6-1	7-25	12J6907	4-1	7-22
07H0680	6-1	7-25	12J6909	4-1	7-22
07H0681	6-1	7-25			
07H0687	6-1	7-25			

Appendix B. Online Support Information

This section describes online technical support services available to help repair the Aptiva computer.

This section covers:

- IBM PC Company Bulletin Board Service (BBS)

- IBM PC Company Fax-Back Service

- IBM Online HelpCenter on Prodigy, America Online, CompuServe

- IBM useful sites on the World Wide Web (WWW)

Online technical support offers convenient and valuable information when you need it. IBM offers support areas on several online services where you can work with IBM technicians for solutions to your questions, download key files, and access database information for the Aptiva computer.

The IBM PC Company offers online resources including several Internet World Wide Web sites, the IBM Online HelpCenter support areas, a Fax-Back service, and a Bulletin Board Service.

The IBM PC Company BBS telephone number is (919) 517-0001. (U.S. and Canada only). The BBS contains a valuable file library with drivers, software updates, product information, and other file updates. To access the BBS, set your modem for **eight data bits, one stop bit, and no parity bit.**

The IBM PC Company Automated Fax-Back System offers a variety of IBM computer-related articles. To access this service, call 800-IBM-3395. The Fax-Back system file library can also be accessed through the PC Company BBS.

Aptiva technical support is offered through the IBM Online HelpCenters on the Prodigy Service, America Online, and through the IBM support forums on CompuServe.

IBM online support areas on all of the services can assist with your technical questions. These areas offer message boards monitored by IBM technicians, databases of computer-related solutions, and file libraries.

World-wide users can access the IBM Aptiva support forums on CompuServe. CompuServe users can use the Go word: APTIVA to reach the Aptiva support forum. For information about CompuServe, call (800) 848-8990 (U.S. and Canada only).

To reach the IBM Online HelpCenter on Prodigy, use the jumpword: **IBM**. For information about Prodigy, please call (800) 776-3449 (U.S. and Canada only). You can reach the IBM Online HelpCenter on America Online using keyword: **IBM Connection**. For information about America Online, please call

(800) 827-6364 (U.S. and Canada only). Prodigy and America Online have limited international availability.

To access the IBM PC Company Internet sites, you will need to acquire Internet access. Please check with your local Internet provider for more information. (Members of Prodigy, AOL, and CompuServe can reach these sites through the Internet capabilities of the services.)

Here are useful IBM Internet addresses for Aptiva information:

http://www.pcco.ibm.com

      IBM PC Company Home Page on the World Wide Web

http://www.pc.ibm.com/us/ibmhome

      Aptiva Home Page

http://www3.pc.ibm.com/support

      Aptiva Product Specifications and Support

http://www.pc.ibm.com/files.html

      IBM PC Company Searchable File Library

Appendix C. Model/Monitor Configurations and FRU Part Numbers

The models described in this appendix are Service Level A (SL-A) machines. Only factory-installed part are listed.

If the machine you are serving has Service Level A on the label, but you cannot find it listed in this appendix, call your local IBM Aptiva Servicer Bulletin Board for updated model information.

Note: *The FRU no. in ( ) is substitution parts.*

2137 Model/Monitor Configurations and FRU Part Numbers for Canada Geography

Model	E03	E05	E06	E07	E08
Country/ Language	CE	CE	CF	CE	CF
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2273	02K2273	02K2273	02K2277	02K2277
Memory	02K2288	02K2287/ 02K2288	02K2287/ 02K2288	02K2289	02K2289
Hard Drive	03K0330	10L6628	10L6628	10L6629	10L6629
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	12J6908	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2295	02K2295	02K2295	02K2295	02K2295
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	--	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for Canada Geography

Model	E15	E25	E35	E45	E1F
Country/ Language	CE	CE	CE	CE	CF
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	03K0346	03K0347	03K0347	02K2271	03K0346
Memory	02K2287/ 02K2288	02K2289	02K2288/ 02K2289	02K2288/ 02K2289	02K2287/ 02K2288
Hard Drive	10L6628	10L6629	10L6631	10L6631	10L6628
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2295	02K2295	02K2295	02K2295	02K2295
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for Canada Geography

Model	E2F	E3F	E4F	E26	E46
Country/ Language	CF	CF	CF	CE	CE
System Board	10L6653	10L6653	10L6653	02K2551	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	03K0347	03K0347	02K2271	02K2277	12J6886
Memory	02K2289	02K2288/ 02K2289	02K2288/ 02K2289	02K2289	02K2289
Hard Drive	10L6629	10L6631	10L6631	10L6629	10L6630
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2295	02K2295	02K2295	10L6633	10L6633
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	--	--

2137 Model/Monitor Configurations and FRU Part Numbers for Canada Geography

Model	E2C	E4C	E56	E84	E5C
Country/ Language	CF	CF	CE	CE	CF
System Board	02K2551	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2277	12J6886	12J6886	10L6632	12J6886
Memory	02K2289	02K2289	02K2289 / 02K2288	02K2289 / 02K2288	02K2289 / 02K2288
Hard Drive	10L6629	10L6630	10L6630	10L6630	10L6630
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	10L6633	10L6633	10L6633	10L6633	10L6633
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	--	--	--	--	--

2137 Model/Monitor Configurations and FRU Part Numbers for Canada Geography

Model	E8F
Country/ Language	CF
System Board	10L6653
Power Supply	02K2297
Processor	10L6632
Memory	02K2289 / 02K2288
Hard Drive	10L6630
Diskette Drive	02K2299
CD-ROM	10L6647
Modem Card	10L6633
Speaker	02K0322
Sub-woofer	--
Monitor	--

2137 Model/Monitor Configurations and FRU Part Numbers for US Geography

Model	E14	E16	E24	E34
Country/ Language	US	US	US	US
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	02K2273	02K2275	02K2276	02K2277
Memory	02K2288	02K2288	02K2287/ 02K2288	02K2289
Hard Drive	03K0330	03K0330	03K0330	10L6631
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	12J6908	12J6908	12J6908	10L6647
Modem Card	02K2295	02K2295	02K2295	02K2295
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	--	--	--	--

2137 Model/Monitor Configurations and FRU Part Numbers for US Geography

Model	E26	E46	E56	E84
Country/ Language	US	US	US	US
System Board	02K2551	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	02K2277	12J6886	12J6886	10L6632
Memory	02K2289	02K2289	02K2289 / 02K2288	02K2289 / 02K2288
Hard Drive	10L6629	10L6630	10L6630	10L6630
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647
Modem Card	10L6633	10L6633	10L6633	10L6633
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	--	--	--	--

2137 Model/Monitor Configurations and FRU Part Numbers for Latin America Geography

Model	ED1	ED2	ED3	ED4
Country/ Language	LA	LA	LA	LA
System Board	02K2551	10L6653	02K2551	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	02K2277	12J6886	02K2277	12J6886
Memory	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6629	10L6630	10L6629	10L6630
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647
Modem Card	10L6633	10L6633	10L6633	10L6633
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	--	--	--	--

2137 Model/Monitor Configurations and FRU Part Numbers for Japan Geography

Model	E17	E27	E37	E47
Country/ Language	Japan	Japan	Japan	Japan
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2298	02K2298	02K2298	02K2298
Processor	02K2275	02K2275	02K2276	02K2277
Memory	02K2289	02K2289	02K2289	02K2289
Hard Drive	03K0330	03K0330	10L6629	10L6630
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2294	02K2294	02K2294	02K2294
Speaker	02K0321	02K0321	02K0321	02K0321
Sub-woofer	--	--	--	--
Monitor	02K2359	02K2363	02K2363	02K2363

2137 Model/Monitor Configurations and FRU Part Numbers for Japan Geography

Model	E1A	E2A	E4A	E57
Country/ Language	Japan	Japan	Japan	Japan
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2298	02K2298	02K2298	02K2298
Processor	02K2277	02K2277	12J6886	10L6632
Memory	02K2289	02K2289	02K2289	02K2289 02K2288
Hard Drive	10L6629	10L6629	10L6630	10L6630
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2294	02K2294	02K2294	02K2294
Speaker	02K0321	02K0321	02K0321	02K0321
Sub-woofer	--	--	--	--
Monitor	02K2359	02K2363	02K2363	--

2137 Model/Monitor Configurations and FRU Part Numbers for China Geography

Model	EV1	EV3
Country/ Language	China	China
System Board	10L6659	10L6659
Power Supply	02K2297	02K2297
Processor	02K2277	12J6886
Memory	02K2288	02K2289
Hard Drive	10L6627	10L6629
Diskette Drive	02K2299	02K2299
CD-ROM	10L6647	10L6647
Modem Card	02K2640	02K2640
Speaker	02K0321	02K0321
Sub-woofer	--	--
Monitor	--	--

2137 Model/Monitor Configurations and FRU Part Numbers for Taiwan Geography

Model	EG1TW	EG3TW
Country/ Language	Taiwan	Taiwan
System Board	10L6653	10L6653
Power Supply	02K2297	02K2297
Processor	02K2277	12J6886
Memory	02K2288	02K2289
Hard Drive	10L6627	10L6629
Diskette Drive	02K2299	02K2299
CD-ROM	10L6647	10L6647
Modem Card	02K2639	02K2639
Speaker	02K0321	02K0321
Sub-woofer	--	--
Monitor	10L6615	10L6615

2137 Model/Monitor Configurations and FRU Part Numbers for HK Geography

Model	G1HK	G3HK
Country/ Language	HK	HK
System Board	10L6659	10L6659
Power Supply	02K2297	02K2297
Processor	02K2277	12J6886
Memory	02K2288	02K2289
Hard Drive	10L6627	10L6629
Diskette Drive	02k2299	02k2299
CD-ROM	10L6647	10L6647
Modem Card	02K2295	02K2295
Speaker	02K0321	02K0321
Sub-woofer	--	--
Monitor	--	--

2137 Model/Monitor Configurations and FRU Part Numbers for AP-South Geography

Model	EQ1	EQ2	EQ3	EQ4
Country/ Language	Australia	Australia	Australia	Australia
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2562	02K2562	02K2562	02K2562
Processor	02K2277	12J6886	10L6632	10L6632
Memory	02K2289	02K2289	02K2289 / 02K2288	02K2289 / 02K2288
Hard Drive	10L6629	10L6630	10L6630	10L6630
Diskette Drive	02k2299	02k2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2630	02K2630	02K2630	02K2630
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	02K2355	02K2355	02K2355	02K2362

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E02)

Model	E02	E02	E02	E02
Country/ Language	UK	FR	SP	ND
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	02K2273	02K2273	02K2273	02K2273
Memory	02K2288	02K2288	02K2288	02K2288
Hard Drive	03K0330	03K0330	03K0330	03K0330
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2304	12J6873	--
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	02K2350	02K2350	02K2350	02K2350

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E04)

Model	E04	E04	E04	E04
Country/ Language	UK	ND	FI	SW
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	01K4274	01K4274	01K4274	01K4274
Memory	02K2288	02K2288	02K2288	02K2288
Hard Drive	03K0330	03K0330	03K0330	03K0330
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2303	02K2303	02K2303
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E10)

Model	E10	E10	E10	E10
Country/ Language	UK	FR	SP	ND
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	02K2273	02K2273	02K2273	02K2273
Memory	02K2288	02K2288	02K2288	02K2288
Hard Drive	03K0330	03K0330	03K0330	03K0330
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	12J6908	12J6908	12J6908	12J6908
Modem Card	--	--	--	--
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	02K2350	02K2350	02K2350	02K2350

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E10)

Model	E10	E10
Country/ Language	BD	BF
System Board	10L6653	10L6653
Power Supply	02K2297	02K2297
Processor	02K2273	02K2273
Memory	02K2288	02K2288
Hard Drive	03K0330	03K0330
Diskette Drive	02K2299	02K2299
CD-ROM	12J6908	12J6908
Modem Card	--	--
Speaker	02K0322	02K0322
Sub-woofer	--	--
Monitor	02K2350	02K2350

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E11)

Model	E11	E11	E11	E11
Country/ Language	DK	NO	FI	SW
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	02K2273	02K2273	02K2273	02K2273
Memory	02K2288	02K2288	02K2288	02K2288
Hard Drive	03K0330	03K0330	03K0330	03K0330
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	12J6908	12J6908	12J6908	12J6908
Modem Card	--	--	--	--
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E12)

Model	E12	E12	E12	E12	E12
Country/ Language	UK	FR	GE	SP	IT
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	03K0345	03K0345	03K0345	03K0345	03K0345
Memory	02K2288	02K2288	02K2288	02K2288	02K2288
Hard Drive	03K0330	03K0330	03K0330	03K0330	03K0330
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2304	02K2307	12J6873	02K2305
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2350	02K2350	02K2350	02K2350	02K2350

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E12)

Model	E12	E12	E12	E12	E12
Country/ Language	DK	ND	NO	FI	SW
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	03K0345	03K0345	03K0345	03K0345	03K0345
Memory	02K2288	02K2288	02K2288	02K2288	02K2288
Hard Drive	03K0330	03K0330	03K0330	03K0330	03K0330
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2303	02K2303	02K2303	02K2303
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2350	02K2350	02K2350	02K2350	02K2350

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E13)

Model	E13	E13	E13	E13
Country/ Language	DK	NO	FI	SW
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	03K0345	03K0345	03K0345	03K0345
Memory	02K2288	02K2288	02K2288	02K2288
Hard Drive	03K0330	03K0330	03K0330	03K0330
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2304	02K2307	12J6873
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E18/E19)

Model	E18	E19
Country/ Language	SP	SW
System Board	10L6653	10L6653
Power Supply	02K2297	02K2297
Processor	01K4274	03K0345
Memory	02K2288	02K2289
Hard Drive	03K0330	03K0330
Diskette Drive	02K2299	02K2299
CD-ROM	12J6908	10L6647
Modem Card	12J6873	02K2303
Speaker	02K0322	02K0322
Sub-woofer	--	--
Monitor	02K2350	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E20)

Model	E20	E20	E20	E20
Country/ Language	UK	FR	SP	IT
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	03K0346	03K0346	03K0346	03K0346
Memory	02K2288	02K2288	02K2288	02K2288
Hard Drive	03K0330	03K0330	03K0330	03K0330
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2304	12J6873	02K2305
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E20)

Model	E20	E20	E20	E20	E20
Country/ Language	DK	ND	NO	FI	SW
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	03K0346	03K0346	03K0346	03K0346	03K0346
Memory	02K2288	02K2288	02K2288	02K2288	02K2288
Hard Drive	03K0330	03K0330	03K0330	03K0330	03K0330
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2303	02K2303	02K2303	02K2303
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E20)

Model	E20	E20
Country/ Language	BD	BF
System Board	10L6653	10L6653
Power Supply	02K2297	02K2297
Processor	03K0346	03K0346
Memory	02K2288	02K2288
Hard Drive	03K0330	03K0330
Diskette Drive	02K2299	02K2299
CD-ROM	10L6647	10L6647
Modem Card	02K2303	02K2303
Speaker	02K0322	02K0322
Sub-woofer	--	--
Monitor	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E21-E23)

Model	E21	E21	E22	E23
Country/ Language	SP	IT	ND	SW
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	03K0346	03K0346	03K0347	03K0346
Memory	02K2288	02K2288	02K2288	02K2289
Hard Drive	03K0330	03K0330	03K0330	03K0330
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647
Modem Card	12J6873	02K2305	02K2303	02K2303
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	02K2350	02K2350	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E30)

Model	E30	E30	E30	E30	E30
Country/ Language	UK	FR	SP	IT	DK
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	03K0347	03K0347	03K0347	03K0347	03K0347
Memory	02K2288	02K2288	02K2288	02K2288	02K2288
Hard Drive	10L6631	10L6631	10L6631	10L6631	10L6631
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2304	12J6873	02K2305	02K2303
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	12J6874	02K2311	02K2311	02K2311	02K2311
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E30)

Model	E30	E30	E30	E30	E30
Country/ Language	ND	NO	FI	SW	BD
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	03K0347	03K0347	03K0347	03K0347	03K0347
Memory	02K2288	02K2288	02K2288	02K2288	02K2288
Hard Drive	10L6631	10L6631	10L6631	10L6631	10L6631
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2303	02K2303	02K2303	02K2303
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	02K2311	02K2311	02K2311	02K2311	02K2311
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography-- (E30/E3N/E31)

Model	E30	E3N	E31
Country/ Language	BF	NO	UK
System Board	10L6653	02K2550	10L6653
Power Supply	02K2297	02K2297	02K2297
Processor	03K0347	03K0347	03K0347
Memory	02K2288	02K2288	02K2288
Hard Drive	10L6631	10L6631	03K0330
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2303	02K2303
Speaker	02K0322	02K0322	02K0322
Sub-woofer	02K2311	02K2311	--
Monitor	02K2353	--	02K2350

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E32)

Model	E32	E32	E32	E32	E32
Country/Language	UK	FR	SP	IT	DK
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2271	02K2271	02K2271	02K2271	02K2271
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6631	10L6631	10L6631	10L6631	10L6631
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2304	12J6873	02K2305	02K2303
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	12J6874	02K2311	02K2311	02K2311	02K2311
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E32)

Model	E32	E32	E32	E32	E32
Country/ Language	ND	NO	FI	SW	BD
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2271	02K2271	02K2271	02K2271	02K2271
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6631	10L6631	10L6631	10L6631	10L6631
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2303	02K2303	02K2303	02K2303	02K2303
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	02K2311	02K2311	02K2311	02K2311	02K2311
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography-- (E32/E33/E41/E50)

Model	E32	E33	E41	E50
Country/ Language	BF	UK	GE	DK
System Board	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297
Processor	02K2271	02K2271	03K0346	03K0347
Memory	02K2289	02K2289	02K2288	02K2289
Hard Drive	10L6631	03K0330	03K0330	10L6631
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	12J6908	10L6647
Modem Card	02K2303	02K2303	--	02K2303
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	02K2311	--	--	02K2311
Monitor	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E51)

Model	E51	E51	E51	E51	E51
Country/ Language	UK	FR	ND	IT	SP
System Board	02K2551	02K2551	02K2551	02K2551	02K2551
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2277	02K2277	02K2277	02K2277	02K2277
Memory	02K2288	02K2288	02K2288	02K2288	02K2288
Hard Drive	10L6627	10L6627	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	--	--	--	--	--
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2350	02K2350	02K2350	02K2350	02K2350

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E51)

Model	E51	E51	E51
Country/ Language	BD	BF	DK
System Board	02K2551	02K2551	02K2551
Power Supply	02K2297	02K2297	02K2297
Processor	02K2277	02K2277	02K2277
Memory	02K2288	02K2288	02K2288
Hard Drive	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	--	--	--
Speaker	02K0322	02K0322	02K0322
Sub-woofer	--	--	--
Monitor	02K2350	02K2350	02K2350

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E53)

Model	E53	E53	E53	E53	E53
Country/ Language	UK	FR	SW	ND	IT
System Board	02K2551	02K2551	02K2551	02K2551	02K2551
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2277	02K2277	02K2277	02K2277	02K2277
Memory	02K2288	02K2288	02K2288	02K2288	02K2288
Hard Drive	10L6627	10L6627	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	--	--	--	--	--
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E53)

Model	E53	E53	E53	E53	E53
Country/ Language	SP	DK	FI	NO	SG
System Board	02K2551	02K2551	02K2551	02K2551	02K2551
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2277	02K2277	02K2277	02K2277	02K2277
Memory	02K2288	02K2288	02K2288	02K2288	02K2288
Hard Drive	10L6627	10L6627	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	--	--	--	--	--
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E53)

Model	E53	E53	E53
Country/ Language	SF	BD	BF
System Board	02K2551	02K2551	02K2551
Power Supply	02K2297	02K2297	02K2297
Processor	02K2277	02K2277	02K2277
Memory	02K2288	02K2288	02K2288
Hard Drive	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	--	--	--
Speaker	02K0322	02K0322	02K0322
Sub-woofer	--	--	
Monitor	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E60)

Model	E60	E60	E60	E60	E60
Country/ Language	UK	FR	SW	ND	SP
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2277	02K2277	02K2277	02K2277	02K2277
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6627	10L6627	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2632	02K2632	02K2610
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E60)

Model	E60	E60
Country/ Language	DK	NO
System Board	10L6653	10L6653
Power Supply	02K2297	02K2297
Processor	02K2277	02K2277
Memory	02K2289	02K2289
Hard Drive	10L6627	10L6627
Diskette Drive	02K2299	02K2299
CD-ROM	10L6647	10L6647
Modem Card	02K2632	02K2632
Speaker	02K0322	02K0322
Sub-woofer	--	--
Monitor	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E61)

Model	E61	E61	E61	E61	E61
Country/ Language	UK	FR	SW	ND	IT
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2271	02K2271	02K2271	02K2271	02K2271
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6627	10L6627	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2632	02K2632	02K2633
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E61)

Model	E61	E61	E61	E61	E61
Country/ Language	SP	DK	FI	NO	SG
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2271	02K2271	02K2271	02K2271	02K2271
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6627	10L6627	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2610	02K2632	02K2632	02K2632	02K2587
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E61)

Model	E61	E61	E61
Country/ Language	SF	BD	BF
System Board	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297
Processor	02K2271	02K2271	02K2271
Memory	02K2289	02K2289	02K2289
Hard Drive	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	02K2587	02K2632	02K2632
Speaker	02K0322	02K0322	02K0322
Sub-woofer	--	--	--
Monitor	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--E62)

Model	E62	E62
Country/ Language	SF	SG
System Board	10L6653	10L6653
Power Supply	02K2297	02K2297
Processor	02K2271	02K2271
Memory	02K2289	02K2289
Hard Drive	10L6631	10L6631
Diskette Drive	02K2299	02K2299
CD-ROM	10L6647	10L6647
Modem Card	02K2306	02K2306
Speaker	02K0322	02K0322
Sub-woofer	02K2311	02K2311
Monitor	12J6904	12J6904

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E63)

Model	E63	E63	E63	E63	E63
Country/ Language	UK	FR	SW	ND	IT
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2271	02K2271	02K2271	02K2271	02K2271
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6627	10L6627	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2632	02K2632	02K2633
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	12J6904	12J6904	12J6904	12J6904	12J6904

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E63)

Model	E63	E63	E63	E63	E63
Country/ Language	SP	DK	FI	NO	SG
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	02K2271	02K2271	02K2271	02K2271	02K2271
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6627	10L6627	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2610	02K2632	02K2632	02K2632	02K2587
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	12J6904	12J6904	12J6904	12J6904	12J6904

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E63)

Model	E63	E63	E63
Country/ Language	SF	BD	BF
System Board	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297
Processor	02K2271	02K2271	02K2271
Memory	02K2289	02K2289	02K2289
Hard Drive	10L6627	10L6627	10L6627
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	02K2587	02K2632	02K2632
Speaker	02K0322	02K0322	02K0322
Sub-woofer	--	--	--
Monitor	12J6904	12J6904	12J6904

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E71)

Model	E71	E71	E71	E71	E71
Country/ Language	UK	FR	SW	ND	IT
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	12J6886	12J6886	12J6886	12J6886	12J6886
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6629	10L6629	10L6629	10L6629	10L6629
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2587	02K2632	02K2632	02K2633
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E71)

Model	E71	E71	E71	E71	E71
Country/ Language	SP	DK	FI	NO	SG
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	12J6886	12J6886	12J6886	12J6886	12J6886
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6629	10L6629	10L6629	10L6629	10L6629
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2610	02K2632	02K2632	02K2632	02K2587
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E71)

Model	E71	E71	E71
Country/ Language	SF	BD	BF
System Board	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297
Processor	12J6886	12J6886	12J6886
Memory	02K2289	02K2289	02K2289
Hard Drive	10L6629	10L6629	10L6629
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	02K2587	02K2632	02K2632
Speaker	02K0322	02K0322	02K0322
Sub-woofer	--	--	--
Monitor	02K2353	02K2353	02K2353

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E73)

Model	E73	E73	E73	E73	E73
Country/Language	UK	FR	SW	ND	IT
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	12J6886	12J6886	12J6886	12J6886	12J6886
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6629	10L6629	10L6629	10L6629	10L6629
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2632	02K2632	02K2633
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	12J6904	12J6904	12J6904	12J6904	12J6904

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E73)

Model	E73	E73	E73	E73	E73
Country/ Language	SP	DK	FI	NO	SG
System Board	10L6653	10L6653	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297	02K2297	02K2297
Processor	12J6886	12J6886	12J6886	12J6886	12J6886
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6629	10L6629	10L6629	10L6629	10L6629
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2610	02K2632	02K2632	02K2632	02K2587
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	12J6904	12J6904	12J6904	12J6904	12J6904

2137 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E73)

Model	E73	E73	E73
Country/ Language	SF	BD	BF
System Board	10L6653	10L6653	10L6653
Power Supply	02K2297	02K2297	02K2297
Processor	12J6886	12J6886	12J6886
Memory	02K2289	02K2289	02K2289
Hard Drive	10L6629	10L6629	10L6629
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	02K2587	02K2632	02K2632
Speaker	02K0322	02K0322	02K0322
Sub-woofer	--	--	--
Monitor	12J6904	12J6904	12J6904

2138 Model/Monitor Configurations and FRU Part Numbers for Canada Geography

Model	E76	E7C	E86	E8C
Country/ Language	Canada	Canada	Canada	Canada
System Board	10L6658	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562	02K2562
Processor	02K2564	02K2564	02K2564	02K2564
Memory	02K2289	02K2289	02K2289	02K2289
Hard Drive	02K2561	02K2561	10L6645	10L6645
Diskette Drive	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	--	--
DVD II	--	--	02K2575	02K2575
Speaker	02K0322	02K0322	02K0322	02K0322
Modem Card	10L6633	10L6633	10L6633	10L6633
Speaker	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--
Monitor	--	--	--	--

2138 Model/Monitor Configurations and FRU Part Numbers for US Geography

Model	E76
Country/ Language	US
System Board	10L6658
Power Supply	02K2562
Processor	02K2564
Memory	02K2289
Hard Drive	02K2561
Diskette Drive	02K2299
CD-ROM	10L6647
DVD II	--
Modem Card	10L6633
Speaker	02K0322
Sub-woofer	--
Monitor	--

2138 Model/Monitor Configurations and FRU Part Numbers for Japan Geography

Model	E48	E58
Country/Language	Japan	Japan
System Board	10L6658	10L6658
Power Supply	02K2298	02K2298
Processor	02K2563	02K2564
Memory	02K2289	02K2289
Hard Drive	10L6630	10L6645
Diskette Drive	02K2299	02K2299
CD-ROM	10L6647	10L6647
Modem Card	02K2294	02K2294
Speaker	02K0321	02K0321
Sub-woofer	--	--
Monitor	--	--

2138 Model/Monitor Configurations and FRU Part Numbers for China Geography

Model	EV5
Country/ Language	CHN
System Board	10L6657
Power Supply	02K2562
Processor	02K2563
Memory	02K2289
Hard Drive	10L6630
Diskette Drive	02K2299
CD-ROM	10L6647
Modem Card	02K2640
Speaker	02K0322
Sub-woofer	--
Monitor	--

2138 Model/Monitor Configurations and FRU Part Numbers for Taiwan Geography

Model	EG6TW
Country/Language	TW
System Board	10L6658
Power Supply	02K2562
Processor	02K2564
Memory	02K2289
Hard Drive	10L6649
Diskette Drive	02K2299
CD-ROM	10L6647
Modem Card	02K2639
Speaker	02K0322
Sub-woofer	--
Monitor	--

2138 Model/Monitor Configurations and FRU Part Numbers for HK Geography

Model	EG6HK
Country/ Language	HK
System Board	10L6657
Power Supply	02K2562
Processor	02K2564
Memory	02K2289
Hard Drive	10L6649
Diskette Drive	02K2299
CD-ROM	10L6647
Modem Card	02K2295
Speaker	02K0322
Sub-woofer	--
Monitor	--

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E80)

Model	E80	E80	E80	E80	E80
Country/ Language	UK	FR	SP	IT	DK
System Board	10L6658	10L6658	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562	02K2562	02K2562
Processor	02k2563	02k2563	02k2563	02k2563	02k2563
Memory	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288
Hard Drive	10L6630	10L6630	10L6630	10L6630	10L6630
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2610	02K2633	02K2632
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E80)

Model	E80	E80	E80	E80	E80
Country/ Language	ND	NO	FI	SW	SF
System Board	10L6658	10L6658	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562	02K2562	02K2562
Processor	02k2563	02k2563	02k2563	02k2563	02k2563
Memory	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288
Hard Drive	10L6630	10L6630	10L6630	10L6630	10L6630
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2632	02K2632	02K2587
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E80)

Model	E80	E80	E80
Country/ Language	SG	BF	BD
System Board	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562
Processor	02k2563	02k2563	02k2563
Memory	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288
Hard Drive	10L6630	10L6630	10L6630
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	02K2587	02K2632	02K2632
Speaker	02K0322	02K0322	02K0322
Sub-woofer	--	--	--
Monitor	02K2353	02K2353	02K2353

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E81)

Model	E81	E81	E81	E81	E81
Country/ Language	UK	FR	SP	IT	DK
System Board	10L6658	10L6658	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562	02K2562	02K2562
Processor	02k2563	02k2563	02k2563	02k2563	02k2563
Memory	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288
Hard Drive	10L6630	10L6630	10L6630	10L6630	10L6630
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2610	02K2633	02K2632
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	12J6904	12J6904	12J6904	12J6904	12J6904

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E81)

Model	E81	E81	E81	E81	E81
Country/ Language	ND	NO	FI	SW	SF
System Board	10L6658	10L6658	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562	02K2562	02K2562
Processor	02k2563	02k2563	02k2563	02k2563	02k2563
Memory	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288
Hard Drive	10L6630	10L6630	10L6630	10L6630	10L6630
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2632	02K2632	02K2587
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	12J6904	12J6904	12J6904	12J6904	12J6904

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E81)

Model	E81	E81	E81
Country/ Language	SG	BF	BD
System Board	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562
Processor	02k2563	02k2563	02k2563
Memory	02K2289 02K2288	02K2289 02K2288	02K2289 02K2288
Hard Drive	10L6630	10L6630	10L6630
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	02K2587	02K2632	02K2632
Speaker	02K0322	02K0322	02K0322
Sub-woofer	--	--	--
Monitor	12J6904	12J6904	12J6904

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E82)

Model	E82	E82	E82	E82	E82
Country/ Language	UK	FR	SP	IT	DK
System Board	10L6658	10L6658	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562	02K2562	02K2562
Processor	02k2564	02k2564	02k2564	02k2564	02k2564
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6645	10L6645	10L6645	10L6645	10L6645
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2610	02K2633	02K2632
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E82)

Model	E82	E82	E82	E82	E82
Country/ Language	ND	NO	FI	SW	SF
System Board	10L6658	10L6658	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562	02K2562	02K2562
Processor	02k2564	02k2564	02k2564	02k2564	02k2564
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6645	10L6645	10L6645	10L6645	10L6645
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2632	02K2632	02K2587
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	02K2353	02K2353	02K2353	02K2353	02K2353

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E82)

Model	E82	E82	E82
Country/ Language	SG	BF	BD
System Board	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562
Processor	02k2564	02k2564	02k2564
Memory	02K2289	02K2289	02K2289
Hard Drive	10L6645	10L6645	10L6645
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	02K2587	02K2632	02K2632
Speaker	02K0322	02K0322	02K0322
Sub-woofer	--	--	--
Monitor	02k2353	02k2353	02k2353

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E83)

Model	E83	E83	E83	E83	E83
Country/ Language	UK	FR	SP	IT	DK
System Board	10L6658	10L6658	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562	02K2562	02K2562
Processor	02k2564	02k2564	02k2564	02k2564	02k2564
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6645	10L6645	10L6645	10L6645	10L6645
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2610	02K2633	02K2632
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	12J6904	12J6904	12J6904	12J6904	12J6904

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E83)

Model	E83	E83	E83	E83	E83
Country/ Language	ND	NO	FI	SW	SF
System Board	10L6658	10L6658	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562	02K2562	02K2562
Processor	02k2564	02k2564	02k2564	02k2564	02k2564
Memory	02K2289	02K2289	02K2289	02K2289	02K2289
Hard Drive	10L6645	10L6645	10L6645	10L6645	10L6645
Diskette Drive	02K2299	02K2299	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647	10L6647	10L6647
Modem Card	02K2632	02K2632	02K2632	02K2632	02K2587
Speaker	02K0322	02K0322	02K0322	02K0322	02K0322
Sub-woofer	--	--	--	--	--
Monitor	12J6904	12J6904	12J6904	12J6904	12J6904

2138 Model/Monitor Configurations and FRU Part Numbers for EMEA Geography--(E83)

Model	E83	E83	E83
Country/ Language	SG	BF	BD
System Board	10L6658	10L6658	10L6658
Power Supply	02K2562	02K2562	02K2562
Processor	02k2564	02k2564	02k2564
Memory	02K2289	02K2289	02K2289
Hard Drive	10L6645	10L6645	10L6645
Diskette Drive	02K2299	02K2299	02K2299
CD-ROM	10L6647	10L6647	10L6647
Modem Card	02K2587	02K2632	02K2632
Speaker	02K0322	02K0322	02K0322
Sub-woofer	--	--	--
Monitor	12J6904	12J6904	12J6904

Index

2

A

B

C

D

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