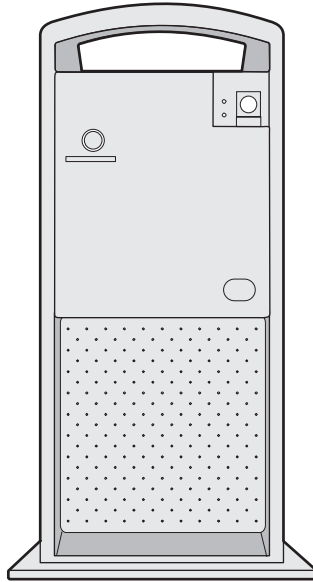




Hardware Maintenance Service for Service Level A

Machine Type 2161
and IBM Monitors



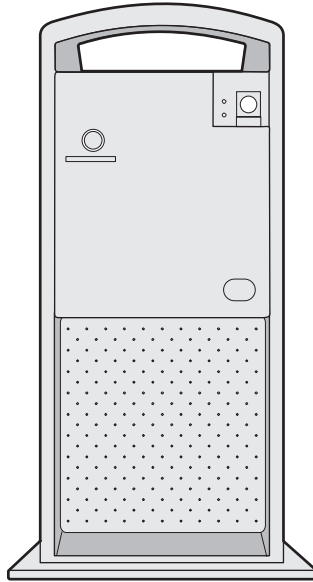
2161

Aptiva



Hardware Maintenance Service for Service Level A

Machine Type 2161
and IBM Monitors



2161

Aptiva

First Edition (January 1997)

The following paragraph does not apply to any state or country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. References to IBM products, programs, or services do not imply that IBM intends to make them available outside the United States.

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

For copies of publications related to this product, call toll free 1-800-IBM-7282 in the Continental U.S.A. In Alaska, call 1-414-633-8108. In Canada, call toll free 1-800-465-7999. In British Columbia, call toll free 112-800-465-1234.

© Copyright International Business Machines Corporation 1997. All rights reserved.

Note to U.S. Government Users — Documentation related to restricted rights — Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

Contents

Notices	vii
Voltage Supply Switch Settings	vii
Positionnement du sélecteur de tension	viii
Safety Information	ix
Safety Notices (Multi-Lingual Translations)	x
Laser Compliance Statement	xiv
Federal Communications Commission (FCC) Notice	xvii
Canadian Department of Communications Compliance Statement	xviii
Trademarks	xxi
Preface	xxiii
General Information	1-1
Chapter Description	1-2
Diagnostic Information	1-2
Diagnostic Aids	1-3
Repair Information	1-4
Parts/Test Point Locations	1-4
Safety Inspection Guide	1-4
Parts Catalog	1-4
Part Number Index	1-5
Appendix: Model Configurations and FRU Part Numbers	1-5
Product Description	1-6
Hardware Interfaces	1-10
Refresh Rates and Monitor Frequencies	1-11
Power-On Password, CMOS Reset	1-12
Flash (BIOS) Update Procedure	1-13
Setup Utility	1-14
Using the Setup Utility	1-14
Making Changes with the Setup Utility	1-16
Using Rapid Resume Manager	1-22
Rapid Resume Manager Features	1-22
Rapid Resume Connectors	1-23
POST Error History	1-24
System Memory	1-25
DIMM Identification	1-25
Specifications	1-26
Operating Requirements	1-28
Special Tools	1-28
Check Procedures	2-1

Start	2-2
Index of Symptoms, Messages, Error Codes, or Beeps	2-9
Power Supply	2-32
Memory	2-35
Keyboard	2-37
Mouse	2-39
Diagnostics and Utilities Device Presence Test	2-40
Factory-Installed Drive Devices	2-43
Diagnostics for Factory-Installed Drive Devices	2-46
Diagnostics for Factory-Installed Riser Card and Sound Card	2-49
33.6 Kbps DSVD Factory-Installed Modem Adapter	2-55
Monitor	2-59
Undetermined Problem	2-63
Diagnostic Aids	3-1
Introduction	3-2
Power-On Self Test	3-2
Diagnostics and Utilities CD	3-3
Creating a Diagnostics Bootable Diskette	3-4
Diagnostic Test Programs	3-6
Error Messages	3-7
Return Codes	3-7
Using the Advanced Diagnostic Test Programs	3-8
Program Navigation	3-8
Viewing the Test Groups	3-10
Scripting	3-10
Changing Logical Unit Numbers	3-11
Test Group Specifications	3-11
Stopping the Tests	3-13
Formatting Diskettes	3-13
Hard Disk Drive Boot Error	3-14
File Editor	3-14
File Edit Function Key Usage	3-14
Diagnostics Control Keys	3-16
Display Self Test	3-17
Repair Information	4-1
Removals and Replacements—Machine Type 2161	4-2
2005—Cover	4-3
2020—3.5-In. Bays	4-4
2025—5.25-In. Bays	4-6
2030—Hard Disk Drives	4-7
2035—Adapter Cards	4-9
2040—Power Supply	4-10

2045—Riser Card	4-11
2050—Memory (DIMM)	4-12
2055—Cache Memory	4-13
2060—Processor Removal	4-14
2080—Lithium Battery	4-15
2085—Indicator LED and Cable	4-16
2090—System Board	4-17
Handling ESD-Sensitive Parts	4-18
Home Director	4-19
Software Installation Procedure	4-23
Parts/Test Point Locations	5-1
System Board Layout	5-2
System Board Locations	5-3
System Bus Clock	5-4
Processor Speed	5-4
Core/Bus Frequency Ratio Settings	5-5
Power Supply Cable Connector Specifications	5-6
Sound Card	5-8
Modem Card	5-9
Hard Disk Drive Jumper Settings	5-10
CD-ROM Drive Jumper Settings	5-13
Zip Drive	5-14
Detachable Monitor I/O Signal Cable Connector Test Points	5-15
System Board Connector Specifications	5-16
Safety Inspection Guide	6-1
Parts Catalog	7-1
Assemblies (Service Level A)	7-2
Catalog Section	7-3
Assembly 1: Machine Type 2161 System Unit - Exterior (SL-A)	7-3
Assembly 2: Machine Type 2161 System Unit - Interior (SL-A)	7-4
Assembly 3: Diskette, Hard Disk Drives, and Internal Zip Drive	7-7
Assembly 4: CD-ROM Drive, Sound and Modem Cards	7-9
Assembly 5: Monitor and Power Cord (Linecord)	7-12
Assembly 6: Keyboard and Mouse	7-15
Assembly 7: Software	7-17
Part Number Index	8-1
Appendix A. Online Support Information	A-1
Appendix B. Model/Monitor Configurations and FRU Part Numbers	B-1

Index X-1

Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only IBM's product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any of IBM's intellectual property rights or other legally protectable rights may be used instead of the IBM product, program, or service. Evaluation and verification of operation in conjunction with other products, programs, or services, except those expressly designated by IBM, are the user's responsibility.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the IBM Director of Commercial Relations, IBM Corporation, Purchase, NY 10577.

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 115
200–240 V	230 V or 230

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. (You may need a small screwdriver.)

Positionnement du sélecteur de tension

Votre Aptiva IBM *peut* comporter des sélecteurs de tension qui doivent être positionnés correctement en fonction de la tension adéquate. Si votre écran ou votre unité centrale sont équipés d'un sélecteur de tension, vérifiez-en le positionnement en procédant de la manière suivante :

1. Le tableau ci-dessous permet de déterminer le positionnement correct du ou des sélecteurs de tension :

Tensions	Positionnement du sélecteur de tension
100–127 V	115 V ou 115
200–240 V	230 V ou 230

2. Repérez le ou les sélecteurs de tension situés à l'arrière de votre écran ou de votre unité centrale. S'ils sont positionnés de façon :
 - Correcte, démarrez la configuration de votre Aptiva IBM.
 - Incorrecte, modifiez leur position. (Vous pouvez vous aider d'un petit tournevis.)

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, remova a pilha (se instalada) e, em seguida, desconecte todos os cabos de interligação.

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

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

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

A helyszínen cserélhető egységek eltávolítása előtt kapcsolja ki a számítógépet, húzza ki a konnektorból a hálózati csatlakozót, majd távolítsa el az összekötő kábeleket is.

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

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

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

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

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 ignição ou explosão da mesma.

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

Elle présente des risques d'incendie, d'explosion ou de brûlures graves. Ne la rechargez pas, ne retirez pas son connecteur polarisé et ne la démontez pas. Ne l'exposez pas à une température 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 Systematterie ist eine Lithiumatterie. 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 Continued

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

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

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

Litiové batérie môžu spôsobiť požiar, explóziu alebo vzplanutie. Nenabíjajte, neodstraňujte polarizované konektory, nerozoberajte, neohrievajte nad 100 C, nespáľujte, alebo vystavujte obsah článkov vode.

La batería de repuesto es una batería 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

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

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

CAUTION:

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

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

凡未在这里指明的任何控制用法、调整、行为，
都会导致严重后果。

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

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

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

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

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

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

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

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

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

DANGER:

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

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

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

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

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

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

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

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

Keď je laserová jednotka otvorená. Vyhnite sa priamemu
pohľadu a nehládte priamo s optickými nástrojmi do lúča
a vyhnite sa priamemu vystaveniu lúčov.

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

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.

Avis de conformité aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe B d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Règlement sur le brouillage radioélectrique établi par le ministère des Communications du Canada.

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.

Étiquette d'homologation du ministère des Communications du Canada

AVIS : L'étiquette du ministère des Communications du Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Le ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunications. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêchent pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par le fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause d'un mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Attention

L'utilisateur ne doit pas tenter de faire ces raccordements lui-même, il doit avoir recours à un service d'inspection des installations électriques ou à un électricien, selon le cas.

Load Number (LN): The load number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the load of all the devices does not exceed 100. The load number of the built-in modem is 10.

Indice de charge (IC): L'INDICE DE CHARGE (IC) assigné à chaque dispositif terminal indique, pour éviter toute surcharge, le pourcentage de la charge totale qui peut être raccordé à un circuit téléphonique bouclé utilisé par ce dispositif. L'extrémité du circuit bouclé peut consister en n'importe quelle combinaison de dispositifs pourvu que la somme des INDICES DE CHARGE de l'ensemble des dispositifs ne dépasse pas 100. L'indice de charge du modem intégré est de 10.

Trademarks

The following terms are trademarks or service marks of IBM Corporation in the United States and other countries.

Aptiva	OS/2
AT	Personal System/2
HelpCenter	PS/1
Home Director	PS/2
IBM	Rapid Resume
Operating System/2	SurePath

The following terms are trademarks or service marks of other companies as follows:

America Online	America Online, Inc.
APM	Astek International Ltd.
ATI	ATI Technologies, Inc.
CompuServe	CompuServe Incorporated
Intel	Intel Corporation
Microsoft	Microsoft Corporation
MS	Microsoft Corporation
OverDrive	Intel Corporation
Pentium	Intel Corporation
QAPLus/PRO	DiagSoft, Inc.
Sound Blaster	Creative Labs, Inc.
Triplett	Triplett Corporation
VESA	Video Electronics Standards Association
VL-Bus	Video Electronics Standards Association
Windows	Microsoft Corporation
Zip	Iomega Corporation

UNIX is a registered trademark in the United States and other countries licensed exclusively through X/Open Company Limited.

Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation.

Other company, product, and service names used in this publication may be trademarks or service marks of others.

Preface

This manual is intended to be used as a stand-alone document to service this 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 failing Field Replaceable Unit (FRU).

“Diagnostic Aids” explains the diagnostic aids that are available for troubleshooting problems on the system unit.

“Repair Information” contains the procedures for removing FRUs.

“Parts/Test Point Locations” contains illustrations of the locations of the major parts 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, “Online Support Information” contains online support information.

“Part Number Index” contains part numbers listed in numerical order.

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

General Information

Chapter Description	1-2
Diagnostic Information	1-2
Diagnostic Aids	1-3
Repair Information	1-4
Parts/Test Point Locations	1-4
Safety Inspection Guide	1-4
Parts Catalog	1-4
Part Number Index	1-5
Appendix: Model Configurations and FRU Part Numbers	1-5
Product Description	1-6
Hardware Interfaces	1-10
Refresh Rates and Monitor Frequencies	1-11
Power-On Password, CMOS Reset	1-12
Flash (BIOS) Update Procedure	1-13
Setup Utility	1-14
Using the Setup Utility	1-14
Making Changes with the Setup Utility	1-16
Using Rapid Resume Manager	1-22
Rapid Resume Manager Features	1-22
Rapid Resume Connectors	1-23
POST Error History	1-24
System Memory	1-25
DIMM Identification	1-25
Specifications	1-26
Operating Requirements	1-28
Special Tools	1-28

Chapter Description

This chapter contains general information about the contents of this manual, product descriptions, and other information useful when servicing the product.

Diagnostic Information

The diagnostic information contains the check procedures you use to diagnose and isolate product failures. Diagnostic information consists of:

Start:

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

Symptoms, Messages, Error Codes, and Beeps:

The Index of Symptoms, Messages, Error Codes, or Beeps lists symptoms and their probable causes, and directs you to the applicable check procedures to help you resolve the machine failure. The index also lists which FRU is the likely cause of the problem.

Check Procedures:

When the Start check procedure sends you to a specific check procedure or the Index of Symptoms, Messages, Error Codes, or Beeps, turn to that section and perform the steps as instructed. If there are any notes or instructions at the top of the page, read them before you start the procedure.

Carefully read each step of the check procedure and perform the appropriate action as instructed. If you do not remember the location of a specific part or test point, or if you do not remember an adjustment or removal procedure, see the chapter with that information. Always return to the check procedure after you do this. In some cases, you are sent to other check procedures to find the failure.

Diagnostic Aids:

The Diagnostic Aids chapter contains additional information to help you diagnose a failure of a specific part. A Diagnostics and Utilities CD, that comes with this book, is used to run diagnostic programs to test IBM components of the system. Instructions are included in this chapter on how to create a bootable diagnostics diskette. How to use the Advanced Diagnostic test programs is also included in this chapter.

Using the 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.

Measuring Voltages: Many 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 for the ground reference. Attach the black meter (ground) lead to frame ground, except where specified otherwise.

Diagnostic Aids

This chapter contains information outside the check procedures to help you diagnose a failure of a specific part. 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. You should become familiar with the POST and be able to determine if the machine performed all the steps.

POST: The normal POST is initiated automatically each time the system unit is powered on (when Rapid Resume is enabled, a shorter version of POST is initiated—see “Rapid Resume” on page 1-18). The POST is a series of system checks and initializations that verify the correct operation of the base system. Two classifications of malfunctions might be detected during the POST: critical and noncritical.

Critical malfunctions prevent the system from operating at all, or could cause incorrect results that are apparent to the user. Examples of critical errors include processor or interrupt controller malfunctions. If a critical error is detected during the POST, an attempt is made to indicate the error, and all testing halts.

Noncritical malfunctions cause incorrect results that might not be apparent to the user. An example of a noncritical error is a memory module failure. If a noncritical error occurs, an error code is displayed, and the testing is stopped. Testing can be continued on a noncritical error by pressing the **Esc** key.

After a successful POST (one in which no critical errors were detected), a single short beep is generated. The system attempts to load an operating system. The system can be customized for different start (boot) methods.

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

Note: Remember that the POST does not test all areas, but only those that allow the system to operate well enough to run the Diagnostics and Utilities program.

Repair Information

This chapter contains removal and replacement instructions.

Parts/Test Point Locations

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 and dual in-line package (DIP) switch settings for modems, and jumper settings for the hard disk drive, CD-ROM (compact disc-read-only memory) drive, and sound adapter card.

Safety Inspection Guide

This chapter contains guidelines to help you identify possible safety concerns. Use this information to inspect a machine for safety problems before putting the machine under a Maintenance Agreement.

Parts Catalog

This catalog includes figures, part numbers, and part names. It also contains detailed system board descriptions.

Part Number Index

This chapter contains part numbers listed in numerical order.

Appendix: Model Configurations and FRU Part Numbers

This appendix contains tables, listed by country, of models and FRU part numbers. Refer to this when ordering FRUs or to determine the part number of the system board or DIMM installed in the machine you are servicing.

Product Description

This manual contains service information for the **Service Level A (SL-A)** models of the Type 2161 IBM Aptiva Personal Computer, worldwide.

- The Machine Type 2161 contains slots for seven adapter cards and bays for six input/output devices (drives).

For FRU parts information, see the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" on page B-1.

VESA Local Bus Note: The VESA local bus connector generally conforms to the Video Electronics Standards Association (VESA) VL-Bus Specification 2.0 (32 bit). Local bus adapter cards vary in degree of adherence to this standard. Therefore, IBM cannot guarantee that all available local bus option cards will perform according to manufacturer's claims.

The Type 2161 will support Internal or External video, but not both simultaneously.

Security: Power-on password. See "Power-On Password, CMOS Reset" on page 1-12.

System Board: One system board is available for the Aptiva Type 2161 computer. See "System Board Layout" on page 5-2 for system board jumper and connector locations.

The Type 2161 system board supports Pentium processors and has the following features:

- Socket 7-ZIF connector for P54C or P55C processor. You must remove the old processor to install an upgrade processor.
- 16 KB internal cache memory, and also supports an optional 256 KB or 512 KB external cache module.
- 2 MB Video DRAM soldered on the system board.

An additional 2 MB of video memory can be installed for a total of 4 MB of video memory. The 2 MB of video memory upgrade must have the following specifications:

- 2 MB SGRAM ATI for 3D Rage 2
 - 83 MHz (-12 ns) or 100 MHz (-10 ns)
 - 3.3 V dc
 - Dual (2X27 headers with 0.1-inch pin pitch and 2.65-inch header separation).
- Two, 168-pin Gold, EDO, Unbuffered, Synchronous Dynamic Random Access Memory (SDRAM) DIMM module sockets.

Depending on model, 16 MB or 32 MB of system memory is supplied. Maximum system board memory is 64 MB.

- Ports: serial, USB (Universal Serial Bus), parallel, keyboard, mouse, and video.
 - Connectors for:
 - PCI/ISA riser card (2x106-pin)
 - VESA Video Feature (2x20 un-shrouded)
 - Input power (12-pin)
 - AT diskette drives (34-pin)
 - Two 40-pin IDE drive controllers: a primary local bus IDE that supports two hard disk drives and a secondary IDE that supports a CD-ROM drive and one hard disk drive, or two hard disk drives.
- Note:** The IDE connectors can each support two drives of Modes 0-4. Mode 0, 1, 2, 3, 4, etc. are the progressive industry levels for IDE.
- Power-on switch 2-wire connector and a power supply auxiliary control 3-wire connector for Rapid Resume features.
 - Wake Up on Ring connector for Rapid Resume automatic wake-up features.
 - Lithium battery.

Processors

One of the following processors can be installed:

- Pentium P54C-133 MHz¹ internal; 66 MHz external
- Pentium P55C-166 MHz internal; 66 MHz external
- Pentium P55C-200 MHz internal; 66 MHz external

Modem Adapter Card

The following Data/FAX/Voice/Speech modem support is available:

- 33600 bps data
- 14400 bps send and receive FAX

¹ MHz denotes internal clock speed of the microprocessor only; other factors also affect application performance.

Power Supplies (with Rapid Resume Features)

- The power supply is a 145-W switchable high/low voltage power supply with a variable fan speed and a connector for a detachable grounded 3-wire power cord. The power cable has four DASD connectors: one mini power connector and three standard 4-pin connectors. The power supply also has a non-switched appliance outlet connector.
- For some countries outside the United States, the power supply might have five standard 4-pin connectors and one mini power connector, for a total of six DASD connectors.
- To support the Rapid Resume feature, all power supplies have a 3-wire auxiliary control cable that connects to the system board. There is no on/off switch cable assembly for the power supplies.

Cables

All models contain one cable for hard disk drives and one cable for diskette drives. A momentary power switch and cable assembly that connects to the system board, a Wake Up on Ring modem cable, and a voice modem cable are also included.

Diskette Drive—AT-type

All models except Japan models contain a 3.5-in. 1.44 MB slimline diskette drive.

Japan models support 3.5-in. 1.2 MB mode 3 diskette drive.

Multimedia

- 5.25-in. high-performance, 8-16X CAV (Constant Angular Velocity) CD-ROM IDE/AT drive that can read data and play audio from standard and mini CD-ROM and audio compact discs (audio CDs). It is compatible with industry-standard multimedia requirements.

Note: CAV CD-ROM drives run at a constant speed. This causes eight-speed reading at the disk hub and sixteen-speed reading at the disk edge.

- An audio cable.
- Sound adapter card.
- A CD-ROM drive system interface cable.
- One pair of external speakers (model 10 or model 20).
- Sub Woofer (on some models).
- Speaker power cable.
- Microphone.
- Joystick (on some models).

Hard Disk Drive

The hard disk drive is a 3.5-in. slimline IDE AT drive with “look-ahead” cache memory and a minimum of 14 ms average access time. Access time varies by the hard disk drive and the hard disk drive manufacturer.

Monitors

- SVGA (Super Video Graphics Array) Monitors include:
 - .28-mm dot pitch, digital/borderless.
 - Power switch.
 - Up to nine user controls: contrast, brightness, horizontal control, vertical control, horizontal size, vertical size, pin cushion, and trapezoid. Colorpoint adjust on some models.
 - Connector for a detachable grounded 3-wire power cord.
 - 1.5-m (4.9-ft) or 1.8-m (5.8-ft) attached signal cable.
 - Most models have auto-sensing power input for 100 V ac to 240 V ac. Some models are single voltage input or have manual switches to select power input (110 V ac or 220 V ac).
- SVGA Multi-Scanning Monitors include:
 - .28-mm dot pitch multi-scanning, non-interlaced VGA, 800x600 and 1024x768 modes.
 - Power switch. Some models are rated as Power Saver monitors that reduce power consumption when Rapid Resume is enabled. See “Parts Catalog” on page 7-1 for FRU part numbers.
 - Up to seven user controls: horizontal position, vertical position, brightness, contrast, horizontal size, and vertical size. Side pincushion and trapezoidal control on some models.
 - Connector for a detachable grounded 3-wire power cord.
 - 1.5-m (4.9-ft) attached signal cable (detachable on some models).
 - Single voltage input.

Keyboard

101-key, 102-key, or 104-key rubber dome or buckling-spring enhanced keyboard with 1.8-m (6-foot) cable.

Mouse

Mouse with 1.8-m (6-foot) cable

Hardware Interfaces

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

Table 1-1. Hardware Interfaces

Item	Interface
Hard disk drives	IDE mode 4 local bus interface (American National Standards Institute–ANSI)
Input/output (I/O) adapter cards	Adapters that are IBM AT-ISA compatible and operate at 8 MHz. PCI local bus adapter cards and Plug and Play adapter cards are supported.
Diskette drives	AT diskette interface
Video	For refresh rates and monitor frequency settings, see “Refresh Rates and Monitor Frequencies” on page 1-11. Physical interface is compatible with the IBM Personal System/2 (PS/2) VGA interface.
Serial	9-pin connector with RS232D electrical interface
USB	Universal Serial Bus. High speed serial bus designed for USB protocol.
Parallel	Bidirectional. ECP bidirectional and EPP bidirectional interfaces are supported.
Pointing device	IBM PS/2-compatible mouse
Keyboard device	IBM PS/2-compatible enhanced keyboard
CD-ROM drive	AT IDE, extended architecture (XA) enabled drive
Joystick	Industry-standard device

Refresh Rates and Monitor Frequencies

The following table lists the maximum vertical refresh rates for the Type 2161 system board that contains a ATI-MACH64 video chip with 2 MB of video DRAM.

Type 2161 System Board with a ATI-MACH64 Video Chip with 2 MB DRAM				
Resolution →	640x480	800x600	1024x768	1280x1024
Color ↓				
256	120 Hz.	120 Hz.	120 Hz.	85 Hz.
64,000	120 Hz.	120 Hz.	120 Hz.	N/A
16,000,000	120 Hz.	120 Hz.	N/A	N/A

Power-On Password, CMOS Reset

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 unit 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 CMOS/Power on password jumper by referring to "System Board Layout" on page 5-2, then follow these steps.

1. Power-off the system unit.
2. Unplug the power cable from the electrical outlet.

Attention: Do not attempt these steps with the power cord plugged into the electrical outlet. The power supply maintains +5 V dc of auxiliary power when the power switch is powered off. System damage might result if the power cord is not unplugged during testing or repair.

3. Locate the CMOS/power on password jumper, JP6, on the system board.
4. Move the jumper from pins 1-2 to pins 2-3 to erase the password. See "System Board Layout" on page 5-2.
5. The system detects the change and the password, time, and date are erased from memory. Rapid Resume settings are also deleted. (See "Rapid Resume" on page 1-18.)
6. Move the jumper from pins 2-3 to pins 1-2 for normal operation.
7. Plug the power cable into the electrical outlet and power-on the system unit.
8. Run the Setup Utility to restore the configuration settings. Press **Esc** to save with the password disabled.
9. When you are finished servicing the machine, run the Setup Utility to restore the configuration settings. (You must reset the time, date, and any Rapid Resume settings. See "Rapid Resume" on page 1-18.)

Notes:

1. To reinstall the password, the user must enter a password in the Setup Utility.
2. Disabling the power on password reconfigures the system. Run the Setup Utility to clear any 16X errors.
3. To determine if the machine you are servicing has the Rapid Resume feature enabled, run the Setup Utility and check to see if Rapid Resume is enabled. See "Starting the Setup Utility" on page 1-14.

Flash (BIOS) Update Procedure**Attention**

The system board Flash Enable jumper, JP4, default position is set to *enabled*. If the following flash procedure does not work, verify that the Flash Enable jumper is set to the *enabled* position. See Flash program jumpers by referring to "System Board Layout" on page 5-2.

Also, check the Flash diskette for a README file and if present, review it for any model-specific information.

1. Power-off the computer.
2. Insert the Flash diskette into diskette drive A.
3. Power-on the computer.
4. Follow the instructions on the screen to complete the flash (BIOS) update procedure.

Setup Utility

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

Using the Setup Utility

You might need to use the Setup Utility in the following situations:


- If you add or replace a hardware option (such as a diskette drive, hard disk drive, or memory module), and you want to verify or make a change.
- To verify a change after removing a hardware option.
- If you get an error code and message.

You can also use the Setup Utility to:

- Check the computer's hardware features. For example, you can use this program to check the amount of memory or the size of the hard disk in the computer.
- Change the computer's serial and parallel port settings, and the parallel port mode.
- Set up or change a password on the computer.
- Change the date and time on the computer.
- Reduce the amount of energy the computer uses by setting up the computer's Rapid Resume features.
- Determine which Plug and Play adapter cards you want configured by system BIOS.

Starting the Setup Utility

The Setup Utility displays screens that let you view information about how the computer is set up (called the configuration), or change certain information on the computer. There are two ways to display the Setup Utility screen:

- When you power the computer on, this symbol appears:  Press **F1** while the symbol is displayed to get the Setup Utility screen.

- If you have an error, the computer shows a popup window with an error code and description. Press **Enter** to get the Setup Utility screen (see Figure 1-1 on page 1-16).

The Setup Utility screens display the type of information shown here. The actual screens on the computer might look slightly different, but they operate the same way.

Here are the keys you use to move through and make changes to the Setup Utility screens.

Keys	Function
↑ ↓	Use these arrow keys to highlight an option.
← →	Use these arrow keys to make a selection and change an option.
F1	Help. Press this key if you want more information about an option or using the screen.
F2	General Help. Press this key if you want general information about the computer features.
Page Down	Press this key to see the next page (screen).
Page Up	Press this key to go to the previous page (screen).
	<ul style="list-style-type: none">• Brackets [] show you which options can be changed on the screen.• The * symbol on the screen shows you that an option has been changed.

Now that you know how to work with the Setup Utility screens, read on to learn about the options you can change on the screen.

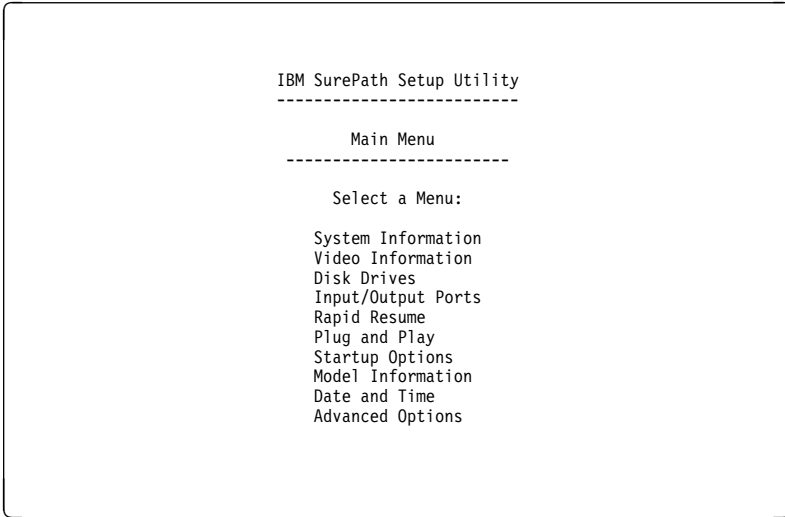


Figure 1-1. Setup Utility Screen

Making Changes with the Setup Utility

You can change only some of the information that appears on the Setup Utility screen. The information you can change is always enclosed in brackets like this: **[Disabled]**. The entries on the screen that you cannot change provide useful information about the computer and its hardware. For example, if the mouse is not working or installed incorrectly, the entry will show if it is disabled or not installed.

Here are the options available on the Setup Utility screens:

System Information: This screen provides a summary of the computer features. (This is an *information only* screen and cannot be changed.)

Video Information: This option displays the name of the video controller and the video memory installed on the system board. The system is shipped with 2 MB of video memory installed. An additional 2 MB of video memory can be installed for a maximum of 4 MB. For more information on monitors, monitor frequencies, and refresh rates, see “Hardware Interfaces” on page 1-10.

Disk Drives: This screen provides information about the installed diskette drives, hard disk drives, and CD-ROM installed in the computer. Hard Disk Drive 1 on this screen is the hard disk that came with the computer.

If you add or change a drive, you must select the correct drive type on this screen. If you are adding a hard disk or CD-ROM to the computer, see “System Board Layout” on page 5-2. If both a CD-ROM drive and a hard disk drive are installed, the jumpers on the hard disk drive must be set to master for the hard drive to appear as Drive 3 on the Setup Utility screen. The CD-ROM must be set as the slave device. It will appear as Drive 4 on the screen.

If a hard disk is the only drive attached to the secondary hard disk drive connector, it appears as Drive 3 on the Setup Utility screen. If two hard disks are attached to this connector, they appear as Drives 3 and 4 on the screen.

Input/Output Ports: This screen allows you to you change the serial and parallel port addresses. Mouse and keyboard information is also provided on this screen.

The computer has one serial port and one parallel port. Each port has a special address (identifying location) assigned to it. If you add any additional serial or parallel port adapters, make sure that each port has a different address.

- The serial port default address is 2F8-IRQ3.
- The parallel port default address is 3BCh.

Other serial and parallel port addresses are available. However, if you change an address on this screen, you might also need to make changes to the software. For instructions on changing the software, see the user’s guide or online information supplied with the software.

The Parallel Port Mode allows you to change the mode of the parallel port. The standard mode for the parallel port is the Compatible mode. You can increase the efficiency of the parallel port by using Enhanced modes with supporting hardware.

Note: The Enhanced modes use recent technology and are only supported by newer hardware (such as a printer).

If you change the mode of the parallel port, you might need to make changes to the supported hardware and its software.

Rapid Resume: This screen provides information about the Rapid Resume features. Rapid Resume is an exclusive IBM energy-saving feature with many useful options. See “Using Rapid Resume Manager” on page 1-22 for more information.

Rapid Resume can:

- Save the current state of the computer when you power it off. Any applications or programs open when the computer is powered off will be open when the computer is powered back on.
- Automatically power off the computer when you have not used the mouse, keyboard, or hard disk for an amount of time you select. If you have an energy-saving monitor, it will also power off.
- Put the computer in a Standby mode to conserve energy when you have not used the mouse, keyboard, or hard disk for an amount of time you select.
- Reduce the time the computer takes to start up.
- Automatically power-on the computer when the phone rings so that the computer can receive a fax (Wake Up on Ring).
- Automatically power-on the computer at a date and time you choose (Wake Up on Alarm).

The following are the Rapid Resume options you can change:

APM BIOS Mode: The Basic Input/Output System (BIOS) is the machine language that runs the computer. The APM BIOS Mode option shows you the advanced power management (APM) mode that the operating system’s APM driver should use when it communicates with BIOS. For Microsoft Windows 95, APM BIOS Mode should be set to 32-Bit Protected.

Note: If you are using the OS/2 operating system, select 16-Bit Protected for the APM BIOS Mode.

Rapid Resume: This screen lets you turn Rapid Resume on (**Enabled**) or off (**Disabled**).

Note: APM BIOS must be enabled before enabling Rapid Resume.

Automatic Power Off is the option that allows you to set the amount of time that will pass before the computer powers off automatically. For example: **30 minutes** means that if the mouse, keyboard, or hard disk are not used for 30 minutes, the computer powers off automatically. Only energy-saving monitors will power off automatically with Rapid Resume.

The current state of the computer is saved before the computer powers off. Any applications or programs open when the computer powers off will be open when you power the computer back on.

Initialize Adapter Cards is the option that indicates whether the adapter cards are restarted (initialized) when you power-on the computer.

Standby Timer is the option that allows you to set the amount of time that will pass before the computer starts conserving energy. For example: **15 minutes** means that if the mouse, keyboard, and hard disk drive are not used for 15 minutes, the monitor goes blank and the hard disk drive in the computer starts using less power.

Note: Only energy-saving monitors power down during standby.

If you are using the Automatic Power Off feature, the time you set for Standby must be less than the time you set for Automatic Power Off. Otherwise, the computer will power off before it enters Standby.

Standby Snapshot is the option that allows you to have the state of the computer saved when it enters Standby. If the electricity goes out or the computer is powered off while in Standby, the computer resumes at the saved state when you power it back on. Any applications or programs open when the computer shut down will be open when the power returns.

Monitor mode is an option might or might not appear depending on the type of processor installed in the computer. If you see this option, you can change the power mode used to blank the monitor during Standby. If you have an energy-saving monitor, the VESA DPMS setting powers the monitor back on fastest.

Note: Only energy-saving monitors will power down during Standby.

Halt CPU when Idle is the option that allows you to halt the CPU during Standby. This conserves power without affecting the operation of the computer.

Wake Up on Ring is the option that allows you to have the computer power on automatically when the phone rings. This is useful if you have a fax modem and use the computer to receive faxes. To use this feature, you must have an internal modem that supports Wake Up on Ring, or an external modem connected to serial port A on the back of the computer.

Note: With Wake Up on Ring, the computer might power-on automatically when you dial out on a rotary or pulse telephone. If this occurs, disable the

Wake Up on Ring feature and use it only when you know you will have incoming fax communications.

Indicator is a Wake Up on Ring feature that makes the power light blink at a constant rate to indicate that the computer answered the phone one or more times. The Indicator resets when you power the computer on.

Wake Up on Alarm is the option that allows you to have the computer power-on automatically at a date and time you specify. Choose the date and time in the Alarm Date and Alarm Time fields. If you select Daily Event, you can set the Alarm Time, but not the Date.

Alarm Date and Time are options that allow you to set the date and time you want the computer to power-on automatically. Enter the date in the format shown on the screen.

Type the time in 24-hour format. For example:

12 midnight is **00:00**

12 noon is **12:00**

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

Plug and Play: This screen provides information about the Plug and Play features. The screen includes the Auto Configure Cards option, and a list of all Plug and Play adapter cards installed in the computer.

Auto Configure Cards is an option that allows you the choice of:

- All Plug and Play adapter cards configured by system BIOS
- Only Plug and Play adapter cards required to boot the system configured by system BIOS

If you have a Plug and Play operating system, the computer might function better if only the Plug and Play adapter cards required to boot the system are configured by system BIOS. If you choose to have only the adapter cards required to boot the system configured by system BIOS, use the operating system's Plug and Play utilities to configure the other Plug and Play cards.

Plug and Play Adapter Cards is the option that lists all the Plug and Play cards you have installed in the system unit.

Note: Only the newest operating systems support Plug and Play adapter cards. See the documentation supplied with the operating system to determine if it supports Plug and Play adapter cards.

Startup Options: This screen provides information about the computer power-on (startup) sequence. When you power the computer on, it looks for the operating system files. Use the Startup Sequence option to tell the computer where to look for these files. The computer can search for these files on a diskette, an adapter card, a network, or a hard disk.

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

Model Information: This screen provides model number, serial number, BIOS version level number, and BIOS manufacturing date.

Date and Time: This screen allows you to change the date and time on the computer. The changes take effect immediately. Type the date in the format shown on the screen.

Type the time in 24-hour format. For example:

12 midnight is **00:00**

12 noon is **12:00**

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

Advanced Options: This screen provides the following features that the computer supports.

- Security options (power on password, diskette drive, keyboard)

Power On Password is the option that allows you to create a power on password to restrict the use of the computer. Each time the computer is powered on, you must enter this password before you can use the computer. A password can be up to seven characters long (letters, numbers, or both). Once you create the password, be sure to write it down and put it in a secure place.

Diskette Drive Access allows you to enable or disable the diskette drive access.

Operate without Keyboard allows you the enable or disable the keyboard.

Operate without Diskette Drive(s) allows you to enable or disable the diskette drive.

- Cache options (cache size, cache state)

This option shows the amount of internal cache memory in the computer's processor. You cannot add internal cache memory to the computer.

Cache memory is special buffer storage that holds frequently used instructions and data, and works faster than main storage. With cache memory installed, the applications and programs run faster. You can disable cache memory to slow down the computer.

- ROM shadowing

This feature provides memory boundary information.

- Memory options

This feature provides standard and EDO feature information.

- PCI card options

This feature allows you to enable or disable card bus mastering.

Using Rapid Resume Manager

The IBM Aptiva is supplied with special software called Rapid Resume Manager that makes using the computer easier and more economical.

Rapid Resume Manager Features

The Rapid Resume Manager has the following features:

Rapid Resume: Remembers all open or running applications when you power-off the computer. The next time you power-on the computer, the programs and files will open just as you left them. The Automatic Power Off option saves energy by turning the computer off after it has not been used for a period of time that you set.

Standby: Lets the computer use less energy after it has been inactive for a period of time that you set.

Scheduler: Turns on the computer for an activity that you specify, such as sending a fax.

Wake Up on Ring: Turns on the computer when the phone rings to let you receive a fax. Wake Up on Ring can also be controlled through serial port A. System jumper JP12 is used to enable or disable Wake Up on Ring control over any device connected to serial port A. See "System Board Layout" on page 5-2.

The following table describes the way the computer will normally operate when one of the Rapid Resume Manager features is enabled. See the online Aptiva Index for step-by-step instructions for enabling Rapid Resume Manager features.

Table 1-3. Rapid Resume Manager Normal Operation

What Happens	Explanation
Task List appears after turning on the computer.	This is a normal feature of Rapid Resume. Use the Task List to return to an application or disable the Task List in the Rapid Resume options window.
Delay before mouse works.	This is normal for the Standby feature of Rapid Resume. It might take a few seconds.
Computer waits before turning off.	This is normal. In some cases, it can take up to several seconds before Rapid Resume saves the data and turns off the machine.
Can't start the computer from diskette if Rapid Resume is enabled.	After you power-on the computer, press Ctrl+Alt+Del when you see the Rapid Resume screen. There might be a slight delay before the computer restarts.
Computer comes on when the phone rings.	This is a normal feature of Wake Up on Ring. Disable Wake Up on Ring in Rapid Resume Manager or in the Setup Utility.
Computer comes on when you haven't pushed the on/off button.	This is a normal feature of Scheduler. If you don't want this to happen, disable Scheduler in Rapid Resume Manager or Wake Up on Alarm in the Setup Utility.
System unit power indicator light is blinking, but system unit is turned off.	This is a normal feature of Wake Up on Ring enabled with the Ring Indicator option selected. A fax might be waiting.


Rapid Resume Connectors

The Rapid Resume feature connectors on the system board are one 3-pin latched connector for the power supply and one 2-pin latched connector for the power switch and cable assembly. To remove the latched connector, press in the latch using the tip of a screwdriver to release the connector. See "System Board Layout" on page 5-2 for connector locations.

Attention: Do not attempt repairs with the power cord plugged into the electrical outlet. The power supply maintains +5 V dc of auxiliary power when the power switch is turned off. System damage might result if the power cord is not unplugged during repair.

POST Error History

The computer automatically keeps a history of the last three POST errors. You can access the POST Error History by pressing **F9** while the POST

Configuration icon  appears. The POST Error History shows the last three error codes in a list, with the most recent error code added to the bottom of the list, as shown in Figure 1-2.

Most recent error
code is listed
at bottom

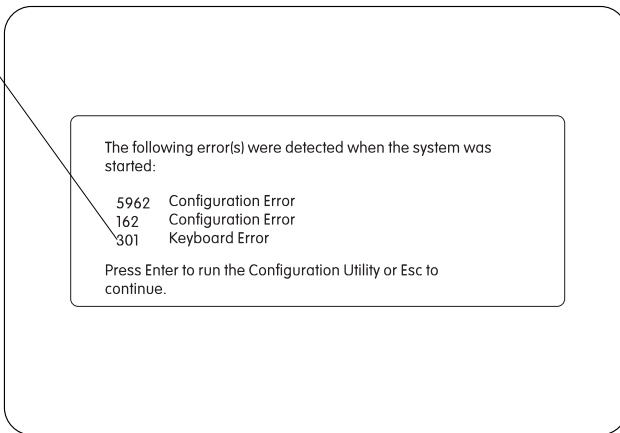


Figure 1-2. POST Error History

Note: The POST Error History is emptied whenever the password is reset from the system board or the battery runs out of power. If Rapid Resume is enabled, press **F9** when the memory count and POST Configuration icon appear.

System Memory

The Aptiva Type 2161 has two sockets for 168-pin, Gold, SDRAM (Synchronous Dynamic Random Access Memory) DIMM modules.

DIMM Identification

168-pin memory DIMMs can usually be identified by the information on the chip modules. (for example, **2Mx64, SDRAM**). To determine the DIMM capacity from the above example, divide 64 bits by 8 bytes and multiply that answer by 2M, hence, DIMM = 16 MB. DIMMs that are not clearly labeled cannot be identified other than by part number. Consult the DIMM manufacturer documentation to identify DIMMs.

Specifications

Size:

- Machine Type 2161 system unit
 - Width: 241 mm (9.50 in.)
 - Depth: 438 mm (17.25 in.)
 - Height: 432 mm (17.00 in.)
- Monitor
 - Width: 378 mm (14.9 in.)
 - Depth: 403 mm (15.9 in.)
 - Height: 418 mm (16.5 in.) with tilt/swivel stand

Weight:

- Machine Type 2161 system unit
 - 11.8 kg (26 lb)
- Monitor
 - 14.5 kg (32 lb)

Environment:

- Temperature, system unit and monitor
 - Power on: 10° to 35°C (50° to 95°F)
 - Power off: 10° to 40°C (50° to 104°F)
- Humidity, system unit and monitor
 - Power on: 8% to 80%
 - Power off: 8% to 80%
- Maximum altitude: 2134 m (7000 ft)

Heat output:

- Machine Type 2161 system unit
 - Typical (as shipped): 170 Btu/hr
 - Maximum load: 700 Btu/hr
- Monitors
 - Typical: 323 Btu/hr
 - Maximum Load: 375 Btu/hr

Electrical:

- Input voltage for system unit and monitor (sinewave input is required)

Low Range

Nominal: 100 V ac to 127 V ac

Maximum: 90 V ac to 132 V ac

High Range

Nominal: 200 V ac to 240 V ac

Maximum: 180 V ac to 259 V ac

Operating Requirements

All machines have two power on switches: one on the system unit and one on the display (if the display was shipped with the model). Some high voltage machines (180–259 V ac) might have a power cord from the display to the system unit and a non-switched appliance connector.

High voltage Northern and Southern Hemisphere SVGA displays might come with a voltage selector switch, allowing selection of voltage of either 110 V ac or 220 V ac. This switch must be in the 220 V ac position when the machine is plugged into a 220 V ac electrical outlet.

When the system unit is powered off for 10 seconds or more and then powered on, the power supply generates a “power good” signal that resets the system logic.

Note: Whether or not Rapid Resume is enabled, the on/off switch on the system unit **does not** completely power-off the power supply. Also, the appliance outlet connector is always powered on when the system unit is plugged into an electrical outlet. See “Rapid Resume” on page 1-18 for more information.

A Note About Energy Saver Monitors

- Monitors rated as “Energy Saver” models use less than 30 W when operating in the energy-saving mode or when the system unit is powered off.
- To extend monitor life, the monitor should be powered off at the end of each day.

Special Tools

The following special tools are required to service this system:

- A meter similar to the Triplett Model 310 (P/N 9900167)
- Wrap plug, P/N 72X8546
- Video memory removal tool, P/N 9900764

Check Procedures

Start	2-2
Index of Symptoms, Messages, Error Codes, or Beeps	2-9
Power Supply	2-32
Memory	2-35
Keyboard	2-37
Mouse	2-39
Diagnostics and Utilities Device Presence Test	2-40
Factory-Installed Drive Devices	2-43
Diagnostics for Factory-Installed Drive Devices	2-46
Diagnostics for Factory-Installed Riser Card and Sound Card	2-49
33.6 Kbps DSVD Factory-Installed Modem Adapter	2-55
Monitor	2-59
Undetermined Problem	2-63

Start

This is the entry point for all check procedures. The check procedures use failure symptoms, POST error codes, or beeps to help determine the failing field replaceable unit (FRU). Follow the suggested check procedures or use the Diagnostics and Utilities CD to determine the problem FRU.

The Diagnostics and Utilities program comes on one CD supplied with this book. Use only this CD for the Type 2161 IBM Aptiva Personal Computers.

The Diagnostics and Utilities program is intended to test only IBM products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

All voltages in the check procedures are positive unless otherwise shown. And, use frame ground for all voltage checks unless otherwise specified.

Note: If the check procedures instruct you to replace a FRU and the error message remains the same, 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 preloaded software. Refer to "Software Installation Procedure" on page 4-23 to reinstall the original software. Be sure to reload the software on the primary hard disk drive (drive C) when replacing it.

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

Ask the customer to back up any additional software from the hard disk drive before you take any action.

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.

Note: If you have been directed here from another check procedure and were instructed to replace the system board, and that does not correct the problem, reinstall the original system board and go through "Start" again.

POST Error Codes: A POST error code can occur in three ways:

1. Under the System Memory count at the upper-left corner of the screen.
Note: A memory error can appear without the memory count as a 203 address error.
2. After two beeps, followed by an error code and/or explanatory message.
3. As a sequence of beeps with no other messages or error codes displayed.

Note: It might take a minute or more for the system to respond with error messages or beeps.

If you have an XX62 error with no other error codes, run the Setup Utility (see “Using the Setup Utility” on page 1-14) and note any flagged options. Note the XX62 error or flagged option and try to add it from the Configuration/Setup Utility screen. If the option cannot be added, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9 for additional help.

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

How to Use Error Messages: Use the messages, error codes, and beep combinations that occur to diagnose failures. If more than one failure occurs, diagnose the first failure first. The cause of the first failure can result in false messages, error codes, or beeps. If you did not receive any messages, error codes, or beeps, see if the symptom is listed in “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.

001

To begin this check, note the following:

- To disable or reset the power-on password, see “Power-On Password, CMOS Reset” on page 1-12.
- 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 whenever removing or replacing FRUs.
- Remove all adapter cards from the riser card, except for the factory-installed modem adapter card and sound card, and any other IBM Aptiva factory-installed adapter cards.

Note: Do not remove the riser card. The system generates multiple error codes when the riser card is removed and the system is powered on.
(Step **001** continues)

(continued)

001 (continued)

- Remove all telephone cables from the modem.
- Disconnect any drives except:
 - 3.5-in. diskette drive
 - Hard disk drive (some machines can have up to 4 hard disk drives installed.)
 - IBM Aptiva factory-installed devices (such as a CD-ROM drive).
- Ensure all power cords and cables are connected properly.
- Ensure the monitor brightness and contrast controls are not turned down.
- Ensure the sound volume control is not turned down and the speakers are powered on.
- Power-on the system unit.

Note: Some monitors have a detachable system I/O signal cable between the monitor and the system unit. In either case, check the power cord or cable before replacing the unit. See “Detachable Monitor I/O Signal Cable Connector Test Points” on page 5-15 for pin identification.

High voltage Northern and Southern Hemisphere monitors might come with a voltage selector (110 V–220 V) switch. The 145-W power supply might have a voltage selector (110 V–220 V) switch. Match the switch to the line voltage.

- Ensure correct monitor refresh rate. See “Refresh Rates and Monitor Frequencies” on page 1-11.
- Note any symptoms, messages, error codes, or beeps.
- Make sure there are no diskettes or CDs in the drives.
- For Home Director checkout, see “Home Director” on page 4-19.

DOES THE SYSTEM COMPLETE POST WITH ONE SHORT BEEP AND DOES AN IBM APTIVA SOFTWARE SCREEN APPEAR?

Note: If Rapid Resume is enabled, answer this question “No.”

Yes No

002

- If Rapid Resume is enabled, you must disable Rapid Resume in the Setup Utility, and enable it again upon completion of service.

To disable Rapid Resume without changing the customer settings:

1. Make sure the customer saves and closes any open files.
2. Power-off, then power-on the system unit.

(Step **002** continues)

002 (continued)

3. Press **F1** while the POST Configuration icon is displayed.
4. In the Setup Utility Main Menu, select Rapid Resume and press **Enter**.
5. Write down the present setting of the APM BIOS Mode (top line of screen) and press the ← key, if needed, to select Disable in the **APM BIOS Mode** field.

Note:

Disabling the **APM BIOS Mode** will disable Rapid Resume without changing other customer APM settings.

6. Press **Esc** to exit the Rapid Resume menu.
7. Press **Esc** again to exit the screen.
8. Press **Enter** to save the changes and exit the Setup Utility.
9. Rapid Resume is now disabled.

When service is complete, restore the **APM BIOS Mode** to its original setting.

1. Power-on the system unit.
2. Press **F1** while the POST Configuration icon is displayed.
3. In the Setup Utility, select Rapid Resume and press **Enter**.
4. Press the ← key, if needed, to select Enable in the **APM BIOS Mode** field.
5. Press **Esc** to exit the Rapid Resume menu.
6. Press **Esc** again to exit the screen.
7. Press **Enter** to save the changes and exit the Setup Utility.

The system is now returned to the **APM BIOS Mode** customer setting.

- Go to Step 005.

003

Insert the Diagnostics and Utilities CD in the CD-ROM drive.

DOES THE SYSTEM LOAD THE ADVANCED DIAGNOSTIC PROGRAM FROM THE CD-ROM DRIVE WHEN POWERED OFF AND THEN ON?

Yes No

004

- Go to “Factory-Installed Drive Devices” on page 2-43.

005

(From step 002)

(Step **005** continues)

(continued)

005 (continued)

DO ANY MESSAGES, ERROR CODES, OR SYMPTOMS APPEAR?

Yes No

006

- Go to Step 008.

007

- Go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.
-

008

(From step 006)

- If not already inserted, place the Diagnostics and Utilities CD in the CD-ROM drive.
- Power-off the system unit.
- Power-on the system unit, and check for the following responses:

1. One short beep
2. Readable instructions or Main Menu

DID THE SYSTEM PRODUCE THE BEEP AND READABLE SCREEN?

Yes No

009

- Go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.

010

- If the keyboard responds incorrectly, go to “Keyboard” on page 2-37.
 - If the monitor shows problems, such as jittering, shifting, or being out of focus, go to “Monitor” on page 2-59 and run the Diagnostics and Utilities tests.
 - If a message or error code is displayed, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.
- Select **Advanced Diagnostics** on the menu.
 - Select **System Info** on the menu.
 - Select **Hardware Config** on the menu.
 - Compare the Hardware Configuration Report screen with the actual devices installed in the system unit.

(Step 010 continues)

010 (continued)

Note: If necessary, remove the cover and visually compare the devices installed in the system unit to those shown in the Hardware Configuration Report.

DOES THE HARDWARE CONFIGURATION REPORT CORRECTLY IDENTIFY THE DEVICES INSTALLED IN THE SYSTEM UNIT?

Yes No

011

- The Hardware Configuration Report shows only those devices supported by the Diagnostics and Utilities CD and only factory-installed devices for the model you are servicing.
- 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" on page B-1 to determine the factory-installed devices in the model you are servicing.)
- If a factory-installed drive device or adapter card is not listed in the Hardware Configuration Report, go to either "Diagnostics for Factory-Installed Drive Devices" on page 2-46 or "Diagnostics for Factory-Installed Riser Card and Sound Card" on page 2-49.

012

- Select **Diagnostics Menu** from the menu.
- Select **Easy Test Diagnostics** from the menu.

DOES THE EASY TEST DIAGNOSTICS FINISH WITHOUT ERROR CODES?

Yes No

013

- 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.
- Make note of any messages, error codes, beeps, or new symptoms. Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-9.

014

- The Easy Test Diagnostics did not detect a failure. If the system still displays a failure:

(Step **014** continues)

(continued)

014 (continued)

- Check all adapter card jumper settings.
 - Check all adapter card switch settings.
 - Check all adapter card cables and connectors for proper installation.
 - Make sure all of the above are set correctly and show the correct voltages and continuity. Replace any defective cables or adapter cards. See “Power Supply” on page 2-32 and “System Board Layout” on page 5-2.
- Run the **Easy Test Diagnostics** again.
 - If an error or other symptom is displayed, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.
 - If no error can be detected or the symptom is intermittent, go to “Undetermined Problem” on page 2-63.
-

Index of Symptoms, Messages, Error Codes, or Beeps

Table 2-1 on page 2-10 lists failure symptoms and 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 2-2. This index can also be used to help you decide which FRUs to have available when servicing a system.

If you are unable to correct the problem using this index, go to “Undetermined Problem” on page 2-63.

Notes:

1. If an error message and incorrect audio response occur, diagnose the error message first.
2. If you cannot run the Diagnostics and Utilities 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 the first part of this index.
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” on page 2-32 and “System Board Layout” on page 5-2)

In Table 2-1 on page 2-10, an **X** in an error code can be any number. If you are unable to correct the problem using this index, go to “Undetermined Problem” on page 2-63.

If you observe:	Go to:
Symptoms that are not beeps or error codes	Page 2-10
Beeps in any combination	Page 2-24
Error codes displayed on the screen	Page 2-27

Table 2-1 (Page 1 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
<p>Note: To diagnose a problem, first find the symptom, message, error code, 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.</p>	
<p>Symptoms</p>	
<p>Address Exceeds the Size of Your Memory. An invalid memory address was entered. Diagnostics Tests display this message during the Locate Bad Chips option.</p>	<p>Memory DIMM System Board</p>
<p>Arithmetic Functions Failed. An error was detected during the CPU Test.</p>	<p>Processor System Board</p>
<p>Audio software program invoked but no sound comes out of speakers, or sound comes out of one speaker only.</p>	<p>“Diagnostics for Factory-Installed Riser Card and Sound Card” on page 2-49. Sound adapter card connection and cables Sound adapter card volume control Sound adapter card</p>
<p>Audio software program does not initiate in software but CD-ROM drive works normally.</p>	<p>“Diagnostics for Factory-Installed Riser Card and Sound Card” on page 2-49. Sound adapter card</p>
<p>Base Memory Test Failed. An error was detected in base memory.</p>	<p>Memory DIMM System Board</p>
<p>Blinking cursor only and machine not working normally.</p>	<p>“Factory-Installed Drive Devices” on page 2-43. Diskette drive connection/cable diskette drive System board</p>
<p>Boot Sector Unreadable. A boot sector read error was detected on the hard disk drive.</p>	<p>Hard Disk Drive Hard Disk Drive Cable System Board</p>
<p>Bus Noise Test Failed. RAM Test detected an error in the memory bus.</p>	<p>Memory DIMM System Board</p>

Table 2-1 (Page 2 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
<p>Butterfly Cylinder Access Test Failed. Hard Disk Drive Test detected mismatch between the data read and the data stored on the drive.</p>	<p>Hard Disk Drive Hard Disk Drive Cable System Board</p>
<p>Cannot finish diagnostic test.</p>	<p>“Diagnostics and Utilities Device Presence Test” on page 2-40.</p>
<p>CD-ROM drive LED came on and stayed on more than 20 seconds before shutting off. Software asks to install disc. Software displays a Reading CD error.</p>	<p>CD is not inserted properly. CD is damaged. CD has dirt or foreign material on it.</p>
<p>CD-ROM drive LED comes on when inserting a disc but no CD-ROM drive icon appears in the File Manager as Drive D.</p>	<p>“Factory-Installed Drive Devices” on page 2-43. CD-ROM drive connections/cables/jumpers CD-ROM drive</p>
<p>CD-ROM drive LED does not come on when inserting a disc in the drive when the system is powered on and the CD-ROM drive power connector has the correct voltage.</p>	<p>“Diagnostics for Factory-Installed Riser Card and Sound Card” on page 2-49. CD-ROM drive</p>
<p>CD-ROM drive LED does not come on but CD-ROM drive works normally.</p>	<p>CD-ROM drive</p>
<p>CD-ROM drive does not load or eject when the system is powered on, the LED light is off, and the eject button is pressed and held.</p>	<p>“Factory-Installed Drive Devices” on page 2-43. CD-ROM drive system connection/cable CD-ROM drive Power supply</p>

Table 2-1 (Page 3 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
<p>CD-ROM drive does not read data files and no error codes or messages are displayed.</p> <p>Cannot read from Drive G. Retry loading CD message is displayed with disc loaded in CD-ROM drive.</p> <p>Sound adapter card works properly.</p>	<p>“Diagnostics for Factory-Installed Drive Devices” on page 2-46.</p> <p>Check with a known good disc and correct level of software.</p> <p>CD-ROM drive</p>
<p>CD-ROM drive does not play an audio disc. Sound adapter card works properly. CD-ROM drive reads data files.</p>	<p>“Diagnostics for Factory-Installed Drive Devices” on page 2-46.</p> <p>Audio cable on CD-ROM drive is not connected to sound adapter card. Check the audio cable from the CD-ROM drive to the sound card. If music can be heard through headphones plugged into the sound adapter card jack, replace the CD-ROM drive.</p>
<p>Clock Stopped. Real-time clock has stopped working.</p>	<p>Battery System Board</p>
<p>CMOS Clock Test Failed Time and Date Settings for CMOS and DOS do not Match.</p>	<p>Battery System Board</p>
<p>Communication problem. Modem function does not work properly.</p>	<p>Modem Wake Up on Ring connection/cable Modem card Riser Card System Board</p>
<p>Controller Diagnostic Test Failed. An error was detected while testing the Hard Disk Controller (Adapter).</p>	<p>Hard Disk Drive System Board</p>
<p>Cylinder 0 errors. Test detected an error reading the first cylinder of the hard disk drive.</p>	<p>Hard Disk Drive System Board</p>

Table 2-1 (Page 4 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Device is Not Ready Ready the Device... or Press Any Key	Ensure the device is powered on. Replace failing device Device Adapter (if installed) System Board
Diskette drive indicator LED remains on or does not light when drive is active.	Diskette drive connection/cable Diskette drive System board
3.5-in. diskette drive does not work.	“Factory-Installed Drive Devices” on page 2-43. Diskette drive Diskette drive connection/cable System board
Disk Error Encountered Opening Output File Press Any Key To Continue.	Hard Disk Drive System Board
DMA #X Failed Main Components Test detected an error while testing the DMA controller.	System Board
DMA Page Register Failed DMA page register error	System Board
Drive (x) Media (y) Mismatch FAT ID mismatch with installed drive.	Check diskette and diskette drive capacity. Diskette Drive System Board
Error in video buffer. Bad bits. Video memory test error.	Video Adapter System Board Monitor
Extended Memory Test Failed. Extended memory error.	Memory DIMM System Board
FAX/voice modem function has no sound output. (Data files are received normally; sound or sound adapter card works correctly.)	Check cable connections on Modem card. Modem card or sound card Riser Card System Board
FAX function does not receive data files.	Modem card Riser Card System Board

Table 2-1 (Page 5 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU																				
FAX/voice function has no sound output. (Data files are received normally; sound adapter card does not produce sound or cannot be activated in software.)	<p>“Diagnostics for Factory-Installed Riser Card and Sound Card” on page 2-49.</p> <p>Modem card or sound card Riser Card System Board</p>																				
Floppy Drive Failed. Diskette drive(s) failed.	<p>Diskette Drive System Board Diskette Drive Cable</p>																				
Hard disk or power-on indicator LED does not light but machine functions normally otherwise.	<p>Check J25 voltages, with power-on:</p> <table border="1" data-bbox="485 591 812 753"> <thead> <tr> <th data-bbox="485 591 522 613">J25</th> <th data-bbox="485 618 522 641">Pin</th> <th data-bbox="485 646 522 669">Normal</th> <th data-bbox="485 673 522 696">Hard Disk</th> </tr> </thead> <tbody> <tr> <td data-bbox="485 701 522 724"></td> <td data-bbox="485 701 522 724">1</td> <td data-bbox="485 701 522 724">+5 V dc</td> <td data-bbox="485 701 522 724">0 V dc</td> </tr> <tr> <td data-bbox="485 729 522 751"></td> <td data-bbox="485 729 522 751">2</td> <td data-bbox="485 729 522 751">+5 V dc</td> <td data-bbox="485 729 522 751">+5 V dc</td> </tr> <tr> <td data-bbox="485 756 522 779"></td> <td data-bbox="485 756 522 779">3</td> <td data-bbox="485 756 522 779">+5 V dc</td> <td data-bbox="485 756 522 779">+5 V dc</td> </tr> <tr> <td data-bbox="485 784 522 807"></td> <td data-bbox="485 784 522 807">4</td> <td data-bbox="485 784 522 807">0 V dc</td> <td data-bbox="485 784 522 807">0 V dc</td> </tr> </tbody> </table> <p>Pins 1, 2 = Hard Disk Drive Pins 3, 4 = Power-on LED</p> <p>LED connection/cable assembly System board</p>	J25	Pin	Normal	Hard Disk		1	+5 V dc	0 V dc		2	+5 V dc	+5 V dc		3	+5 V dc	+5 V dc		4	0 V dc	0 V dc
J25	Pin	Normal	Hard Disk																		
	1	+5 V dc	0 V dc																		
	2	+5 V dc	+5 V dc																		
	3	+5 V dc	+5 V dc																		
	4	0 V dc	0 V dc																		
Hard Drives Failed. Hard Disk Drive test error.	<p>Hard Disk Drive System Board</p>																				
Home Director failures	<p>“Home Director” on page 4-19</p>																				
Incorrect DOS version.	<p>Ensure you are using DOS version 3.0 or higher and DOS application is compatible with DOS version.</p>																				
INT Mask Register Failed. INT Mask Register error.	<p>Processor System Board</p>																				
Insert a CD message icon appears when a known good Diagnostics and Utilities CD is inserted in the CD-ROM drive.	<p>Ensure the hard disk drive and CD-ROM drive are not disabled in the startup sequence in the Setup Utility.</p> <p>Hard disk drive preloaded software CD-ROM drive connection/cable CD-ROM drive System board</p>																				

Table 2-1 (Page 6 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Intensity or color varies from left to right of characters and color bars.	"Monitor" on page 2-59. System board
Invalid Date Clock/DOS date mismatch.	Battery System Board
Invalid Format - Bad Track error message appears when trying to format a known-good diskette.	Diskette drive connection/cable Diskette drive System board
Incorrect memory size shown or repeated during POST.	"Memory" on page 2-35.
Invalid Time Clock/DOS time mismatch. Back-up clock and DOS time of day settings do not match.	Battery System Board
I/O devices cannot be added to configuration.	Diskette drive Diskette drive connection/cable CD-ROM drive CD-ROM drive connection/cable
Joystick does not respond at all.	<ol style="list-style-type: none"> 1. Ensure the joystick is plugged completely into the joystick/MIDI adapter plug on the sound adapter card and secured with the screws on the adapter plug. 2. Verify that the software application used with the joystick has joystick support. 3. Ensure the joystick is enabled in the software application. This might require entering keystrokes or a configuration utility in the software application. <p>If the above steps find no problem, see the "Joystick does not work correctly" symptom below.</p>

Table 2-1 (Page 7 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
<p>Joystick does not work correctly (installation is correct—see above symptom).</p>	<ol style="list-style-type: none"> 1. Disable the joystick in the software application. 2. Enable the mouse as the input device in the software application. 3. If the mouse works in the software application, replace the joystick. If the symptom remains, replace the sound adapter card. 4. If the mouse does not work, check the software application troubleshooting information provided by the manufacturer.
<p>Linear Cylinder Access Test Failed. Hard disk drive error.</p>	<p>Hard Disk Drive Hard Disk Drive Cable System Board</p>
<p>Logic Function Failed. CPU Logic test error.</p>	<p>Processor System Board</p>
<p>Loopback Error COM Port Test or Parallel Port error. A wrap plug must be installed to successfully complete these tests.</p>	<p>System Board Wrap Plug</p>
<p>Machine works but fails to go into Rapid Resume mode when configuration is set with Standby mode enabled or Rapid Resume mode enabled.</p>	<p>Software application was fully activated before on/off switch was pushed. Try operating Rapid Resume from Microsoft Windows 95 Program Manager panel.</p>
<p>Main Components Failed. System board error.</p>	<p>System Board Processor</p>
<p>Memory test cannot run at this location in memory. Not enough free memory available to start the memory test.</p>	<p>Memory DIMM System Board</p>
<p>Missing QAPlus/PRO Files(s). One or more diagnostic support files are missing.</p>	<p>Diagnostic CD</p>

Table 2-1 (Page 8 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Monitor problem: <ul style="list-style-type: none"> • Incorrect colors • No high intensity • Missing, broken, or incorrect characters • Blank monitor (dark) • Blank monitor (bright) • Distorted image • Unreadable monitor • Other monitor problems 	"Monitor" on page 2-59. I/O monitor signal connection/cable Monitor System board
Monitor changing colors.	"Monitor" on page 2-59
Monitor problem not listed above (including blank or illegible monitor).	"Monitor" on page 2-59 System board
No beep during POST but computer works correctly. (System board speaker/beeper bad.)	System board
Non-system disk or disk error message appears with a known-good Advanced Diagnostics diskette.	Diskette drive connection/cable Diskette drive System board
No Loop-Back Plug. Skipping External loopback test. No wrap plug installed.	Install wrap plug on the serial port, rerun test. System Board
No system power, or fan not running.	"Power Supply" on page 2-32. Power switch assembly Power supply System board
Not ready. Printer not on-line or not ready.	Ready Printer Printer Printer Cable System Board
No 'type-amatic' repeat. At least one repeat key must be tested during this test or an error will occur. Type-amatic test error.	Keyboard System Board

Table 2-1 (Page 9 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Not used by any standard device. IRQ is not currently being used by a non-standard device.	System Board
Numeric Proc Failed. NPU test error.	Processor System Board
Parallel Port Failed. Test Report Summary message.	System Board
Parallel port or serial port failure (system board port).	"Diagnostics and Utilities Device Presence Test" on page 2-40. Test using a wrap plug while running Diagnostics and Utilities. Cable/connections System board
Pass (N): ** Errors ** Drive (X) Failed. Diskette drive read/write test error.	Diskette Drive System Board Diskette Drive Cable
Pass (N) Drive Not Ready. Diskette drive door is open or defective.	Ensure diskette drive is ready. Diskette Drive System Board Diskette Drive Cable
Pass (N): Drive (X) Write Protected or Unformatted.	Insert a non-write protected, formatted diskette into the diskette drive; then rerun the test. Diskette Drive System Board Diskette Drive Cable
Pass (N): Unknown Media Drive (X). Diskette Drive Test error.	Diskette Diskette Drive System Board Diskette Drive Cable
Place Hi-density Media in Drive. Media/drive mismatch.	Diskette Diskette Drive System Board Diskette Drive Cable

Table 2-1 (Page 10 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Printer Failed. Printer powered-on and ready?	Printer Printer Cable System Board
Printer Fault. Printer powered on and ready?	Printer Printer Cable System Board
Printer Not Selected. Ensure the printer is powered on and ready.	Printer Printer Cable System Board
Printer problems.	Refer to the service manual for the printer.
Processor fan does not run when the power supply fan runs.	With power-on, check the processor fan connector J1 on system board for +12 V dc. Processor fan System board
Processor speed seems slower.	"Memory" on page 2-35. Cache memory System board
Program loads from the hard disk with a known-good CD in the CD-ROM drive or diagnostics diskette in the first 3.5-inch diskette drive (and CD-ROM drive or diskette drive is enabled in the Setup Utility).	"Factory-Installed Drive Devices" on page 2-43. CD-ROM Drive Diskette Drive System Board Power Supply
Program or File Not Found Press Any Key Diagnostics cannot find the USER(N).COM file.	Diagnostic CD or diskette CD-ROM Drive or Diskette Drive System Board
Program Too Big To Fit In Memory. Too many Terminate and Stay Resident programs in memory.	Reboot the system from the Diagnostic CD.

Table 2-1 (Page 11 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
QAPLUS/PRO Cannot Be Re-run Because Of Error In Relocating Program. Diagnostics failed to relocate the Diagnostics Test programs so the memory space it resides in was not tested.	Diagnostic CD Memory DIMM System Board
RAM Memory Error in Block n. Bad bits n. Memory error.	Memory DIMM System Board
RAM Test Failed. Memory error.	Memory DIMM System Board
Read error on cylinder n. Hard disk drive format error.	Hard Disk Drive System Board
Read Errors Diskette drive read error.	Diskette Diskette Drive System Board Diskette Drive Cable
Real-time clock is inaccurate.	Time set incorrectly by user. RTC battery (if less than 2.8 V dc) System Board
Receive Error. Serial Port loopback test error.	Serial Port Cable System Board
Refresh Failure. Diagnostics Test detected an error while testing the DMA controller's RAM refresh cycle.	Memory DIMM System Board
RTC Interrupt Failure. Diagnostics Test cannot detect the Real-Time clock interrupt.	System Board
Serial Chip Error. COM Port error, general.	Serial Port Cable System Board
Serial Compare Error. COM Port error, information transmitted is not the same as information received.	Serial Port Cable System Board

Table 2-1 (Page 12 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Serial Time-out Error. COM Port error, time interval is too long between transmitted and received data.	Serial Port Cable System Board
Serious Memory Error — Diags Cannot Continue. Memory Test error.	Memory DIMM System Board
Some or all keys on keyboard do not work.	“Keyboard” on page 2-37. Keyboard Keyboard connection/cable System Board
Serial or parallel port device failure (adapter port).	“Factory-Installed Drive Devices” on page 2-43 Test using a wrap plug while running Diagnostics and Utilities. Before testing, ensure serial port A is set to address 3F8 or 3E8, whichever is not used by the modem card (modem settings: COMM1=3F8, COMM2=3E8). Set serial port B to address 2F8 or 2E8. Device Cable/connections Alternate adapter System Board Riser Card
Sorry You Need A Mouse. Mouse or mouse driver was not detected.	Mouse System Board
Sound adapter card, or factory-installed adapter card software gives a Microsoft Windows 95 error message after POST configuration. Hardware problem occurred.	“Diagnostics for Factory-Installed Riser Card and Sound Card” on page 2-49 Sound card or adapter card connection/cable Sound card or adapter card

Table 2-1 (Page 13 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
<p>System fails to load the Diagnostics and Utilities software System preloaded software works correctly.</p>	<p>Make sure the CD-ROM drive or diskette drive is included in the Setup Utility startup sequence. "Factory-Installed Drive Devices" on page 2-43 CD-ROM drive connection/cable CD-ROM drive Diskette drive connection/cable Diskette drive System Board</p>
<p>System Hangs. Go to "Undetermined Problem" on page 2-63.</p>	<p>Any device Any adapter System Board</p>
<p>System unit does not turn off with power switch. (System unit must be unplugged from electrical outlet to completely turn off.)</p>	<p>"Power Supply" on page 2-32 Power switch assembly System Board</p>
<p>The Address Exceeds The Size Of Your Memory. An invalid memory address was entered. The Diagnostics Tests display this message during the Locate Bad Chips option under the interact menu if an invalid memory address was entered at the "Enter Memory Address Of Bad Chip" prompt.</p>	<p>Enter correct address Memory DIMM System Board</p>
<p>That Number is Out Of Range. An invalid bit number was entered. Diagnostics Tests display this message during the Locate Bad Chips option.</p>	<p>Enter the correct number. Memory DIMM System Board</p>
<p>Too Many Errors - Test Aborted. Too many errors, the Diagnostics Test cannot continue.</p>	<p>Processor System Board</p>
<p>Transmit Error. Internal or external serial port loopback test failure.</p>	<p>Serial Port Cable System Board</p>

Table 2-1 (Page 14 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Video Adapter Failed. Test Result Summary, displayed if "Fail" was at the Quit/Fail/Pass menu of any video test.	System Board Monitor
Wake Up on Ring feature fails to power-on system when enabled in Setup Utility.	Modem Wake Up on Ring jumper connection/cable Modem card System Board
When you try to enable or disable Rapid Resume, Rapid Resume configuration screen is not available.	System Board
Write error on cylinder n. Hard disk drive write error.	Hard Disk Drive
Write Errors. Diskette drive write error.	Diskette Diskette Drive System Board Diskette Drive Cable
Write Protected or Unformatted Diskette is Write Protected or not formatted.	Insert a non-write protected, formatted diskette into the diskette drive; then rerun the test. Diskette Drive System Board Diskette Drive Cable
You Cannot Delete the Motherboard. "Remove Board" option was selected. The Diagnostics Tests display this message during the Locate Bad Chips option.	Make the correct selection. Memory DIMM System Board Processor
Any other problem.	"Undetermined Problem" on page 2-63.

Table 2-1 (Page 15 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Beeps	
<p>Note: The system has an error if you hear one or more beeps in a row before POST is completed.</p>	
<p>Important</p>	
<p>In the following Beep Code Index, the numbers indicate the sequence and number of beeps. For example, a "2-3-2" beep code symptom (a burst of two beeps, three beeps, then a burst of two beeps) indicates a memory DIMM problem. (Continue with the Symptom-to-FRU index below for other beep/no-beep symptoms.)</p>	
<p>No beep and:</p> <ul style="list-style-type: none"> • Blank or unreadable monitor • Blinking cursor 	<p>"Power Supply" on page 2-32.</p>
<p>Repeating short beeps.</p>	<p>"Keyboard" on page 2-37 Keyboard (sticking key) Keyboard connection/cable System Board</p>
<p>4</p>	<p>Video adapter System Board</p>
<p>1-1-2 CPU test</p>	<p>Processor</p>
<p>1-1-3 CMOS read/write error</p>	<p>Run the Setup Utility. System Board</p>
<p>1-1-4 ROM BIOS check error</p>	<p>System Board</p>
<p>1-2-1 Programmable interval timer</p>	<p>System Board</p>
<p>1-2-X DMA error</p>	<p>System Board</p>
<p>1-2-4 RAM error</p>	<p>"Memory" on page 2-35. System Board</p>
<p>1-3-4 DMA register test</p>	<p>System board</p>

Table 2-1 (Page 16 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
1-3-X	“Memory” on page 2-35. Ensure DIMMs are seated correctly. DIMMs System board
1-4-1	System Board
1-4-2	System Board
1-4-3 Failsafe timer	System Board
1-4-4 NMI port	“Keyboard” on page 2-37. System board
1-4-X An error was detected in the first 64 KB of RAM.	“Memory” on page 2-35. System Board
2-1-1, 2-1-2	CMOS failure Run the Setup Utility. System Board
2-1-3 Screen initialization failed.	Video adapter System Board Monitor
2-1-4 Screen memory test failed.	“Memory” on page 2-35. System Board
2-2-1 Screen retrace test detected an error.	Video adapter System Board Monitor
2-2-2 POST is searching for video ROM.	Video adapter System Board
2-2-3 Screen believed to be operable	Video adapter System Board Monitor
3-1-1 Timer failed.	System Board
3-1-2 Interval timer failed.	System Board
3-1-3 RAM test failure	“Memory” on page 2-35. System Board

Table 2-1 (Page 17 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
3-1-4 Time-of-day clock failed	System Board
3-2-1 Serial port test failed	System Board
3-2-2 Parallel port test failed	System Board
3-2-3 Math Co-processor failure	Processor
3-3-1 Memory	"Memory" on page 2-35. System Board
3-3-2 Keyboard controller failed	"Keyboard" on page 2-37. System Board
Continuous beep.	System Board
Any other beeps.	"Undetermined Problem" on page 2-63.

Table 2-1 (Page 18 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Error Codes	
101 - Timer interrupt failure or continuous beep.	System Board
102 - Timer failure or continuous beep.	System Board
106 - Diskette controller error or continuous beep.	System Board
110 - System board parity error.	"Memory" on page 2-35. DIMMs System Board
111 - I/O channel parity error.	"Memory" on page 2-35. Riser Card System Board
114 - External ROM checksum error.	"Diagnostics for Factory-Installed Riser Card and Sound Card" on page 2-49. Adapter Card Riser Card System Board
12X - Processor error.	Run the Setup Utility; see "POST Error Codes" on page 2-3. Processor System Board
151 - Real-time clock error.	Set date and time. Run the Setup Utility; see "POST Error Codes" on page 2-3. CMOS clock/battery (if less than 2.8 V dc) System Board
161 - Low CMOS battery.	CMOS clock/battery (if less than 2.8 V dc) Run the Setup Utility; see "POST Error Codes" on page 2-3. System Board

Table 2-1 (Page 19 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
162 - CMOS configuration error.	CMOS clock/battery (if less than 2.8 V dc) Run the Setup Utility; see "POST Error Codes" on page 2-3. System Board
163 - Invalid Time and/or date	Set date and time. Run the Setup Utility; see "POST Error Codes" on page 2-3. CMOS clock/battery (if less than 2.8 V dc) System Board
164 - Memory size error.	"Memory" on page 2-35. Check DIMM installation and parity settings. Run the Setup Utility. See "POST Error Codes" on page 2-3. DIMMs I/O channel memory System Board
201 - Memory error.	"Memory" on page 2-35. DIMMs I/O channel memory System Board
229 - External cache memory test error.	"Memory" on page 2-35. Cache memory System Board
262 - DRAM parity configuration error.	"Memory" on page 2-35. Run the Setup Utility; see "POST Error Codes" on page 2-3. DIMMs System Board
264 - External cache memory size error.	"Memory" on page 2-35. Cache tag address module and RAM System Board

Table 2-1 (Page 20 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
305 - System board non-replaceable fuse can be blown by a defective keyboard, keyboard cable, or mouse. If you suspect one of these FRUs, replace it when you replace the system board.	<p>“Keyboard” on page 2-37.</p> <p>Keyboard Keyboard connection/cable Mouse System Board</p>
3XX - Keyboard error.	<p>“Keyboard” on page 2-37.</p> <p>Keyboard connection Keyboard System Board</p>
6XX - Diskette drive error.	<p>“Factory-Installed Drive Devices” on page 2-43. “Diagnostics and Utilities Device Presence Test” on page 2-40.</p> <p>Diskette drive connection/cable Diskette drive System Board</p>
762 - Math Co-processor error.	<p>“Diagnostics and Utilities Device Presence Test” on page 2-40.</p> <p>Upgrade processor (check Setup Utility, and system board settings).</p> <p>System Board</p>
962 - Parallel port conflict.	<p>Test using a wrap plug while running Diagnostics and Utilities.</p> <p>“Diagnostics and Utilities Device Presence Test” on page 2-40.</p> <p>Parallel port System Board</p>
1162 - Serial port conflict.	<p>Test using a wrap plug while running Diagnostics and Utilities.</p> <p>“Diagnostics and Utilities Device Presence Test” on page 2-40.</p> <p>Serial adapter Riser Card System Board</p>

Table 2-1 (Page 21 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
<p>1762 - Hard disk configuration error.</p>	<p>Hard disk drive connection/cable/jumpers.</p> <p>If an upgrade processor is installed, check that the proper speed has been set (switches and Setup Utility). Speed should be a multiple of the original processor speed.</p> <p>Hard disk drive size set correctly in Setup Utility.</p> <p>Hard disk drive System Board</p>
<p>On the system board: 1780 - Hard Disk Drive 0 1781 - Hard Disk Drive 1 1782 - Hard Disk Drive 2 or CD-ROM drive 1783 - Hard Disk Drive 3 or CD-ROM drive if Hard Disk Drive 2 installed</p>	<p>Hard disk drive connection/cable/jumpers.</p> <p>If an upgrade processor is installed, check that the proper speed has been set (switches and Setup Utility). Speed should be a multiple of the original processor speed.</p> <p>Hard disk drive size set correctly in Setup Utility.</p> <p>Hard disk drive System Board</p>
<p>180X - PCI or Plug and Play adapter card resource error.</p>	<p>A PCI or Plug and Play adapter card has requested memory resources that are not available.</p> <ol style="list-style-type: none"> 1. Choose ISA Legacy Resources from the Setup Utility main menu, and make sure the resource settings for ISA legacy adapter cards are correct. If the resource settings are not correct, change the settings. 2. If all resources are being used by ISA legacy adapter cards, you might need to remove an ISA card to make memory available to the PCI or Plug and Play adapter card.
<p>2401 - Video POST error.</p>	<p>"Monitor" on page 2-59.</p> <p>Optional video memory. System Board Monitor</p>

Table 2-1 (Page 22 of 22). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
2462 - Video configuration error.	<p>“Monitor” on page 2-59.</p> <p>Optional video memory. System Board Monitor</p>
5803 - Keyboard error.	<p>“Keyboard” on page 2-37.</p> <p>Keyboard connection Keyboard System Board</p>
5806 - Diskette drive error.	<p>“Factory-Installed Drive Devices” on page 2-43.</p> <p>Diskette drive connection/cable Diskette drive System Board</p>
5859 - Configuration error.	<p>“Factory-Installed Drive Devices” on page 2-43.</p> <p>CD-ROM drive connections/cables/jumpers CD-ROM drive Power supply</p>
5886 - Pointing device error.	<p>“Mouse” on page 2-39.</p>
5962 - CD-ROM configuration error (sound adapter card driver works correctly).	<p>“Factory-Installed Drive Devices” on page 2-43.</p> <p>CD-ROM drive connections/cables/jumpers CD-ROM drive Power supply System Board</p>
8601 - Pointing device interface error.	<p>“Mouse” on page 2-39. System Board</p>
19990301 - Hard disk boot failed	<p>Run Setup Utility Hard disk drive</p>
19990305 - INT 18H boot failed	<p>Run Setup Utility Hard disk drive</p>
Any other error codes.	<p>“Undetermined Problem” on page 2-63.</p>

Power Supply

001

- Check all drive and power supply connections for proper installation.
- Power-off the system unit.
- Check 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 for the correct voltage.
- Power-on the system unit.

DOES THE POWER SUPPLY FAN RUN?

Yes No

002

- Go to Step 004.

003

- Go to Step 009 on page 2-34.
-

004

(From step 002)

- 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.
- Locate the power supply on/off cable connector (three-wire connector) and make a connection (jumper) between the black wire and the center pin. See “Power Supply Cable Connector Specifications” on page 5-6.
- Reconnect the power cord.

DOES THE POWER SUPPLY FAN RUN?

Yes No

005

- Replace the power supply.

006

(From step 010)

- With the power supply powered on and the fan running, check the voltages at the power supply connectors for the system board and all drive connectors, as shown in the following figures.

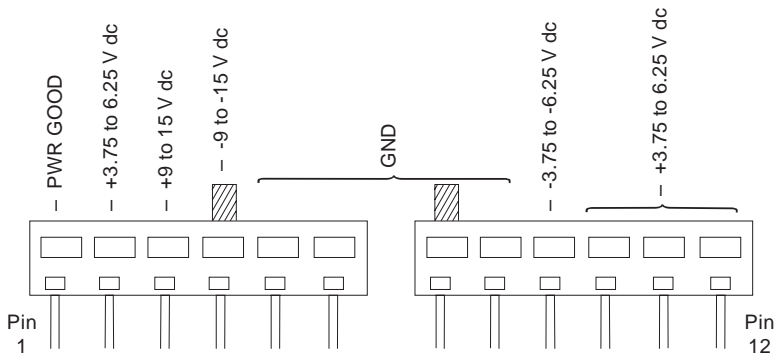


Figure 2-1. System Board Power Supply Connectors (Bottom View)

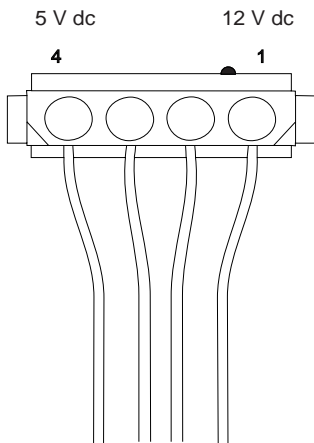


Figure 2-2. Hard Drive or CD-ROM End of Power Cable

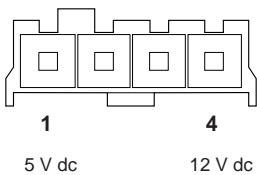


Figure 2-3. 3.5-In. Diskette Drive End of Power Cable

(Step 006 continues)

(continued)

006 (continued)

ARE THE VOLTAGES CORRECT AND DOES THE FAN RUN?

Yes No

007

Replace the power supply.

008

- The power supply is working normally. (If you suspect the on/off switch cable assembly, see Step 009.) If the fan continues to run when all connectors are plugged back in, go to “Undetermined Problem” on page 2-63. If the fan stops running when a drive connector is plugged back in, go to “Factory-Installed Drive Devices” on page 2-43.
-

009

(From steps 003 and 008)

DOES THE SYSTEM UNIT FAIL TO SHUT OFF WHEN THE ON/OFF SWITCH IS PRESSED?

Yes No

010

Go to Step 006 on page 2-32.

011

- You might have a failing on/off switch cable assembly.
- Disconnect the on/off switch cable assembly connector from the system board connector and take an ohm reading.

DO YOU HAVE AN OHM READING WHEN THE SWITCH IS PRESSED AND AN OPEN READING WHEN THE SWITCH IS RELEASED?

Yes No

012

- Replace the on/off switch cable assembly.

013

- Replace the system board.
-

Memory

Note: When removing or installing a DIMM, run the Setup Utility (and set the date and time) to clear any XX62 errors. See "POST Error Codes" on page 2-3.

001

- Insert the Diagnostics and Utilities CD into the CD-ROM drive.
- Power-off the system unit.
- Ensure DIMMs are seated correctly.
- Power-on the system unit.
- Note any messages, error codes, or symptoms. Disregard 164 errors (memory size).

DID YOU RECEIVE A 201 POST ERROR?

Yes No

002

DID YOU RECEIVE A 229 ERROR?

Yes No

003

Go to Step 006 on page 2-36.

004

- Replace the system board cache memory with a known good module.
 - Replace the system board.
-

005

- Follow the screen instructions to run the Memory tests.
 - If you cannot run the memory test or the test does not find a problem, use the following procedure to find the failure.
 - Replace each DIMM, one at a time, with a known-good DIMM of the same size and type.
 - If the problem goes away, the last DIMM replaced is defective. If all DIMMs have been replaced and the problem remains, replace the system board.
-

(continued)

006

(From step 003)

– Follow the screen instructions to run the Memory tests.

DID THE MEMORY TESTS COMPLETE WITHOUT AN ERROR?

Yes No

007

- Replace each DIMM, one at a time, with a known-good DIMM of the same size and type.
- If the problem goes away, the last DIMM replaced is defective. If all DIMMs have been replaced and the problem remains, replace the system board.

008

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

Keyboard

001

A failing mouse can show up as a keyboard failure.

- Power-off the system unit.
- Disconnect the mouse from the system unit.
- Power-on the system unit.

DID THE SYMPTOM REMAIN?

Yes No

002

Replace the failing mouse.

003

- Power-off the system unit.
- Reinstall the mouse.
- Ensure the keyboard cable is fully inserted into the system unit.
- Remove any foreign objects that might interfere with the mechanical operation of the keybuttons.
- Power-on the system unit.

DID YOU RECEIVE A 3XX POST ERROR?

Yes No

004

Go to “Start” on page 2-2.

005

- Power-off the system unit.
- Disconnect the keyboard cable from the system unit.
- Power-on the system unit.
- Check the voltage at the keyboard cable connector on the system board, shown in Figure 2-4 on page 2-38, after the POST.

(continued)

Note: Measure voltages with respect to Ground (Pin 3).

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

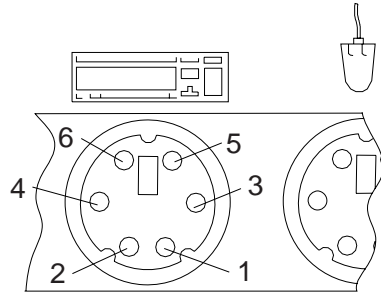


Figure 2-4. Keyboard Connector Voltage Check

ARE THE VOLTAGES CORRECT?

Yes **No**

006

Replace the system board.

007

Replace the keyboard. If the symptom remains, replace the system board.

Mouse

Note: A sticking keybutton can cause the mouse to operate incorrectly. If you suspect this, go to “Keyboard” on page 2-37.

001

- Insert the Diagnostics and Utilities CD into the CD-ROM drive.
- Power-off the system unit.
- Make sure the mouse ball turns freely.
- Power-on the system unit.
- Make a note of any error messages, then press **Esc**.
- Select **Advanced Diagnostics** from the Main Menu.
- Select **Diagnostics** from the Main Menu.
- Select **Module Tests** from the menu.
- Select **Pointer Device** from the menu.
- Follow the prompts and perform the test.

DO THE MOUSE DIAGNOSTIC TESTS RUN WITHOUT ERRORS?

Yes No

002

- If you receive an 8601 error, replace the mouse.
- If the symptom remains, replace the system board.

003

- The system unit is operating normally.
 - If the symptom remains, replace the mouse.
-

Diagnostics and Utilities Device Presence Test

001

DO ANY MESSAGES, ERROR CODES, BEEPS, OR SYMPTOMS APPEAR?

Yes No

002

Go to Step 004.

003

Go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9. If directed here from the Index, go to Step 006.

004

(From step 002)

- Insert the Diagnostics and Utilities CD into the CD-ROM drive.
- Power-off the system unit and wait 10 seconds.
- Power-on the system unit, and check for the following responses:
 1. One short beep
 2. Main Menu screen

DID THE SYSTEM PRODUCE THE BEEP AND MAIN MENU SCREEN?

Yes No

005

- Go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.

006

(From page 2-43)

(From step 003)

- Select **Advanced Diagnostics** on the menu.
- Select **System Info** on the menu.
- Select **Hardware Config** on the menu.
- Compare the Hardware Configuration Report screen with the actual devices installed in the system unit.

Note: If necessary, remove the cover and visually compare the devices installed in the system unit to those shown in the Hardware Configuration Report.

DOES THE HARDWARE CONFIGURATION REPORT CORRECTLY IDENTIFY THE DEVICES INSTALLED IN THE SYSTEM UNIT?

Yes No

007

- The Hardware Configuration Report shows only those devices supported by the Diagnostics and Utilities CD and only factory-installed devices for the model you are servicing.
- 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" on page B-1 to determine the factory-installed devices in the model you are servicing.)
- If a factory-installed drive device or adapter card is not listed in the Hardware Configuration Report, go to either "Diagnostics for Factory-Installed Drive Devices" on page 2-46 or "Diagnostics for Factory-Installed Riser Card and Sound Card" on page 2-49.

008

- Select **Diagnostics Menu** from the Main Menu.
- Select **Easy Test Diagnostics** from the Diagnostics Menu.

DOES THE EASY TEST FINISH WITHOUT ERROR CODES?

Yes No

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.
- Make note of any messages, error codes, beeps, or new symptoms. Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-9.

010

- The Easy Test Diagnostics did not detect a failure. If the system still display a failure:
 - Check all adapter card jumper settings.
 - Check all adapter card switch settings.
 - Check all adapter card cables and connectors for proper installation.
 - Make sure all of the above are set correctly and show the correct voltages and continuity. Replace any defective cables or adapter cards. See "Power Supply" on page 2-32 and "System Board Layout"

(continued)

on page 5-2.

- Run the **Easy Test Diagnostics** test again.
 - If an error or other symptom is displayed, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.
 - If no error can be detected or the symptom is intermittent, go to “Undetermined Problem” on page 2-63.
-

Factory-Installed Drive 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. Note 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 the Setup Utility has the startup sequence set with **Diskette**, **CD-ROM**, and **Hard Disk** enabled.

Insert the Diagnostics and Utilities CD in the CD-ROM drive. Refer to Step 006 on page 2-40 to check Hardware Configuration.

If the number of diskette drives shown in the Installed Devices list is not correct:

1. Check the installation of the drive ribbon cable to the system board.
2. Check the voltages to the diskette drive with the power on (see "Power Supply" on page 2-32).
3. Try to correct the drive setting in the **(SETUP)** option in the Setup Utility.
4. Run the "Diagnostics and Utilities Device Presence Test" on page 2-40.

If you can correct the Installed Devices list, but cannot complete the Diagnostics and Utilities test for that device, replace FRUs, in the following order, until the problem goes away:

1. Diskette drive cable (if continuity check fails)
2. Diskette drive
3. System board

If the number of hard disk drives, CD-ROM, or Zip drives shown in the Installed Devices list is not correct:

1. Check the installation of the drive ribbon cable to the system board. Be sure that Hard Disk Drive 1 and Hard Disk Drive 2 in the Setup Utility are connected to the primary hard disk drive connector J5 on the system board.
2. Check the hard disk drive jumper settings (see "Parts/Test Point Locations" on page 5-1).
3. Check the voltages to the disk drive power connectors with the power on (see "Power Supply" on page 2-32).

(continued)

4. Try to correct the drive setting in the **3 (SETUP)** option in the Setup Utility.
5. Run the “Diagnostics and Utilities Device Presence Test” on page 2-40 for hard disk drives and CD-ROM drive.
6. Restart the system and check the Setup Utility.
7. In the Setup Utility, check that the correct drive size is set for the flagged drive shown in the Installed Devices list.
 - If any drive is flagged as **Not Installed**, check the signal and power cable for that drive.
 - If the first drive is flagged as **Not Installed**, replace the primary drive.
 - If all drives are flagged as **Not Installed**, replace the primary drive.
 - If any drive (other than the first drive) is flagged as **Not Installed**, replace that drive.

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

8. If an upgrade processor is installed, make sure that the processor speed shown is correct.

Note: The CD-ROM must be the last device installed and jumpers set correctly to be listed in the Setup Utility. See “Hard Disk Drive Jumper Settings” on page 5-10 for factory-installed drive device jumper settings and “CD-ROM Drive Jumper Settings” on page 5-13.

The CD-ROM drive is jumpered as master on the system board secondary hard disk connector.

Also ensure the CD-ROM cable is installed in connector J6 on the system board. See “System Board Layout” on page 5-2.

If any other adapter or device is flagged as Not Installed, run the Setup program.

Check to see if any adapter or device is set to a conflicting address with any other adapter or device. Also be sure that any adapter or device missing from the list is not set to **Disabled**.

Note: If you cannot add a missing adapter or device to the list, the diagnostic code for the missing adapter or device is not on the diagnostic CD. Run the diagnostics provided with that device.

Zip Drive

The factory installed Zip drive operates in the same manner as a hard drive. The Zip drive, in the Setup Utility, will display as a hard disk drive with a capacity of 100 MB.

The Zip drive is jumpered as the slave drive. See “Zip Drive” on page 5-14 for jumper settings. The following drive initialization information must be entered in the CMOS **only** when configuring the Zip drive as the boot drive.

- Cylinders = 512
- Heads = 12
- Sectors per Track = 32

Refer to “Diagnostics for Factory-Installed Drive Devices” on page 2-46 to check the factory-installed diskette, hard disk, CD-ROM, and Zip drives.

Diagnostics for Factory-Installed Drive Devices

Use these procedures as a general check of any factory-installed drive devices including diskette, hard disk, CD-ROM, and Zip drive.

Note: While performing this check, you might 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 provided with the computer.

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

001

- Insert the Diagnostics and Utilities CD into the CD-ROM drive.
- Power-off the system unit and wait 10 seconds.
- Power-on the system unit.
- If any new symptom appears, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.
- From the Aptiva Diagnostics and Utilities Menu, select Advanced Diagnostics.
- Select Diagnostics, then Modules.
- Run the diagnostics on the failing drive.

DID THE TEST RUN ERROR FREE?

Yes No

002

- Ensure all drive device cables are connected properly.
- Ensure the power connector has the correct voltage (see “Power Supply” on page 2-32).
- Check continuity of the drive device system cable, and replace if necessary.
- Replace the drive device.

003

(From step 005)

- Remove the Diagnostics and Utilities CD from the CD-ROM drive.
- Power-off the system unit and wait 10 seconds.
- Power-on the system unit.
- Wait until POST is completed.

(Step **003** continues)

003 (continued)

IS (device) not ready--(A)abort or (R)etry DISPLAYED WHILE SOFTWARE IS LOADING?

Yes No

004

Go to Step 009 on page 2-48.

005

- If a **(device) not ready--(A)abort or (R)etry** message appears, press **A** to cancel the message and continue.
- The Windows 95 desktop should appear. (If you make the wrong selection in Microsoft Windows 95, return to Step 003 on page 2-46 and try again.)
- In the Windows 95 desktop, double-click on the My Computer icon.
- With the My Computer icon open, verify that the drive device you wish to check is in the window with the other drives.

IS THE DRIVE DEVICE LISTED AS ONE OF THE INSTALLED DRIVES?

Yes No

006

- Ensure all drive device cables are connected properly.
- Ensure the power connector has the correct voltage (see "Power Supply" on page 2-32).
- Check continuity of the drive device system cable, and replace if necessary.
- Replace the drive device.

007

- Install a known good media in the drive.
- Click on the drive icon at the top of the File Manager window.

DOES THE FILE MANAGER PANEL CHANGE TO LIST THE CONTENTS OF THE DRIVE?

Yes No

008

Note: If the message **No files found** for the CD-ROM drive is displayed, you might have an audio CD installed. Be sure you are using a CD-ROM disc, not an audio CD.

(Step 008 continues)

(continued)

008 (continued)

- If clicking sounds are heard coming from the drive, replace the media and try again.
- Check continuity of the drive system cable, and replace if necessary.
- Replace the drive.

009

(From step 004)

- With power on, press the drive **Eject** button to eject the media.

DID THE DRIVE EJECT THE MEDIA?

Yes No

010

- For the Zip drive, use a paper clip to hook the manual eject lever, then pull gently until the Zip disk ejects. After the disk is ejected, return the eject lever to its original position.
- For the CD-ROM drive, insert and push a pin (such as a straightened paper clip) into the manual eject hole in front of the CD-ROM drive to release the CD.
- Replace the drive.

011

- The drive should be operating normally.
 - If any new symptom appears, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.
-

Diagnostics for Factory-Installed Riser Card and Sound Card

Note: While performing this check, you might 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 provided with the computer.

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

This diagnostics test is intended to be used only with factory-installed adapter cards.

001

- Insert the Diagnostics and Utilities CD into the CD-ROM drive.
- Power-off the system unit and wait 10 seconds.
- Power-on the system unit.
- If any new symptom appears, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-9.
- From the Aptiva Diagnostics and Utilities Menu, select Advanced Diagnostics.
- Select Diagnostics, Modules, then User Diagnostics.
- Run the diagnostics on the sound adapter card.

DID THE TEST RUN ERROR FREE?

Yes No

002

- Ensure all adapter cables are connected properly.
- Ensure the power connector has the correct voltage (see "Power Supply" on page 2-32).
- Check continuity of the adapter system cable, and replace if necessary.
- Replace the adapter.

003

- Remove the Diagnostics and Utilities CD.
- Power-off the system unit and wait 10 seconds.
- Power-on the system unit.

(Step **003** continues)

(continued)

003 (continued)

IS A POST ERROR CODE DISPLAYED?

Yes No

004

Go to Step 006.

005

– Go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.

006

(From step 004)

ARE ANY MESSAGES OR ERROR CODES DISPLAYED AFTER POST COMPLETES BUT BEFORE MICROSOFT WINDOWS 95 STARTS?

Note: If POST does not complete, answer this question “No.”

Yes No

007

Go to Step 009.

008

Go to Step 013 on page 2-52.

009

(From step 007)

- Power-off the system unit.
- Disconnect the riser card power connector and all adapter card cables or connectors from the system unit.

Notes:

1. When removing adapter cards, be careful not to change any jumper or switch settings on the card.
2. Do not remove the riser card. The system generates multiple error codes when the riser card is removed and the system is powered on.

– Power-on the system unit.

(Step 009 continues)

009 (continued)

DOES THE SYSTEM UNIT WORK CORRECTLY BY ITSELF?

Yes No

010

Go to "Start" on page 2-2.

011

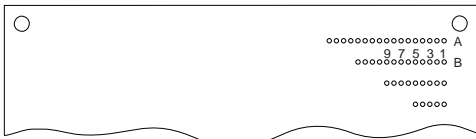
- Power-off the system unit.
- Reconnect (reseat) the riser card.
- Do not install any adapter cards on the riser card.
- Power-on the system unit.
- Check the voltages at pins B3, B5, B7, and B9 on the top of the riser card.

B3 = +5 V dc

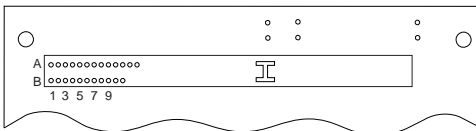
B5 = -5 V dc

B7 = -12 V dc

B9 = +12 V dc



(Pinside)



(Connector side)

Figure 2-5. Riser Cards - Machine Type 2161

ARE THE VOLTAGES CORRECT?

Yes No

012

Replace the riser card.

013

(Step 013 continues)

(continued)

013 (continued)

(From step 008)

- Install the failing factory-installed adapter card in a different slot in the riser card than where originally installed.

DOES THE FEATURE FUNCTION NORMALLY?

Yes No

014

Go to Step 016.

015

Replace the riser card.

016

(From step 014)

- Power-off the system unit.
- Check one adapter card at a time. To do this, install one adapter card in the riser card and power-on the system unit.
- Repeat this with each adapter card if necessary.

IS A WINDOWS 95 DRIVER ERROR DISPLAYED FOR THE INSTALLED ADAPTER CARD?

Yes No

017

Go to Step 019.

018

- Check for proper installation of the adapter card.
 - Check all adapter card jumper positions.
 - Check all cables and connectors on the adapter card for proper installation.
 - Check continuity of any cable attached to the adapter card and replace if necessary.
 - If the problem remains, replace the factory-installed adapter card.
 - If the problem remains with a card that was not factory installed, consult the service information provided by the card manufacturer.
-

019

(From step 017)

(Step **019** continues)

019 (continued)

- Power-off the system unit.
- Reinstall the sound adapter card or adapter card and any cables.
- Power-on the system unit without the Diagnostics and Utilities CD inserted.

Note: This procedure can be used for most factory-installed adapter cards. However, you must select the correct window (see steps 3 and 4 below) to access the feature icon before any test or before testing any feature in step 6.

- Perform the following when the system is running:

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

1. Open Microsoft Windows 95 if not already opened by the system.
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.)

IS THE PREVIEW BUTTON (OR ACTION IN OTHER SOFTWARE) SELECTABLE ON THE SCREEN (SHOWN IN BLACK AND NOT GRAY)?

Yes No

020

- Power-off the system unit.
- Check the sound adapter card for proper installation.
- Replace the sound adapter card.

021

- Select the Preview button from the Sound window.

DO YOU HEAR ANY SOUND FROM THE SYSTEM?

Yes No

022

- Make sure the speaker power cable is plugged into the speaker power connector in back of the system unit.
- Check for 12 V dc at the speaker power connector. If no voltage, check speaker power internal cable continuity with power off and replace if necessary. If voltage not present at the system board

(continued)

connector, see “System Board Layout” on page 5-2, replace the system board.

- Make sure the volume control on the sound adapter card (if any) is not turned low.
- Make sure the speaker sound cable is plugged into the sound adapter card Audio Output jack.
- Check continuity of any cable attached to the adapter card and replace if necessary.
- Make sure the speakers are not damaged. If damaged, replace the speakers.
- Repeat the test in Step 021 on page 2-53.

DID THE SYMPTOM CHANGE?

Yes No

023

Replace the sound adapter card.
– or –
Replace the speakers.

024

- If you hear sound from the speakers, the system is working normally. If you suspect another problem, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.
-

025

- The system is working 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 2-9.
-

33.6 Kbps DSVD Factory-Installed Modem Adapter

Note: The factory-installed modem is a 33.6 Kbps DSVD (Digital Simultaneous Voice and Data) modem with cables for Wake Up on Ring and sound adapter card.

If the factory-installed modem has been replaced with a different internal modem, Wake Up on Ring might not be supported unless the replacement modem has a 2-pin Wake Up on Ring keyed connector. See “Modem Card” on page 5-9.

001

- Insert the Diagnostics and Utilities CD into the CD-ROM drive.
- Power-off the system unit and wait 10 seconds.
- Power-on the system unit.
- If any new symptom appears, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.
- From the Aptiva Diagnostics and Utilities Menu, select Advanced Diagnostics.
- Select Diagnostics, Modules, then User Diagnostics.
- Run the diagnostics on the modem adapter card.

DID ANY TESTS FAIL?

Yes No

002

- Link to a computer service, such as a bulletin board or to another computer.

DID THE MODEM COMMUNICATE?

Yes No

003

- Check the outside phone line by connecting a working telephone to the telephone wall jack. Listen for a dial tone.
- If the phone line is good, replace the modem. If the symptom remains, replace the system board.
- If the phone line is bad, tell the customer to contact the telephone company. The modem does not need replacing.

004

(Step **004** continues)

(continued)

004 (continued)

DOES THE SYSTEM FAIL TO WAKE UP WHEN THE WAKE UP ON RING FEATURE IS ENABLED IN THE CONFIGURATION UTILITY?

Yes No

005

- The Wake Up on Ring feature is working normally. If the symptom remains, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-9.

006

- Power-off the system unit and wait 10 seconds.
- Power-on the system unit and press **F1** while the memory count is running.
- In the Setup Utility, select the Rapid Resume option. (If you cannot access Rapid Resume, replace the system board.)
- If disabled, use the ← key to enable APM BIOS Mode (top line of screen)
- Press the ← key to disable or enable both the Wake Up on Ring and Ring Indicator fields.

CAN THE WAKE UP ON RING FEATURES BE ENABLED IN THE CONFIGURATION UTILITY?

Yes No

007

- Replace the system board.

008

- Check the Wake Up on Ring feature cable from the system board to the modem for continuity. Replace if necessary. See "Modem Card" on page 5-9 and "System Board Layout" on page 5-2.

DOES THE SYSTEM WAKE UP WHEN WAKE UP ON RING IS ENABLED IN THE CONFIGURATION UTILITY?

Yes No

009

- Note:** If the phone lines attached to the modem have experienced a high voltage surge (struck by lightning, for example), first replace the modem and go to Step 001 on page 2-55.

Replace the system board.

010

The modem is functioning correctly.

011

- Power-off the system unit.
- Plug the modem adapter card into a different riser card slot.
- Power-on the system unit.
- Run the modem adapter tests.

DID THE SYMPTOM REMAIN?

Yes No

012

Replace the riser card.

013

DOES THE SYSTEM UNIT WORK NORMALLY EXCEPT FOR THE MODEM?

Yes No

014

Go to "Start" on page 2-2.

015

- Power-off the system unit.
- Remove the modem adapter card from the riser card.
- Reconnect (reseat) the riser card.
- Power-on the system unit.
- Check the voltages at pins B3, B5, B7, and B9 on the top of the riser card.

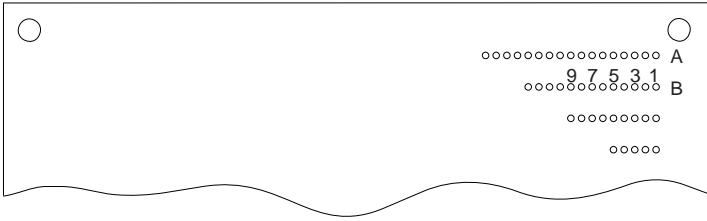
B3 = +5 V dc

B5 = -5 V dc

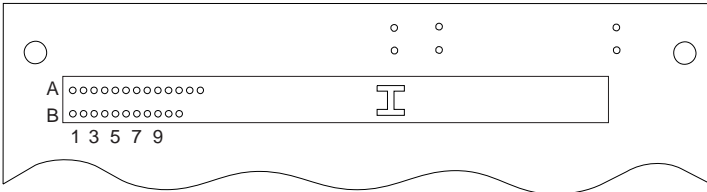
B7 = -12 V dc

B9 = +12 V dc

(continued)



(Pin side)



(Connector side)

Figure 2-6. Riser Cards - Machine Type 2161

ARE THE VOLTAGES CORRECT?

Yes No

016

Replace the riser card. If the symptom remains, replace the system board.

017

Check all jumper and switch settings.

If the symptom remains, replace the modem adapter card.

– or –

Replace the system board.

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.

"G" series monitors are DDC (Display Data Channel)-2B compliant. While Windows 95 comes up, the DDC-2B monitor passes resolution and frequency information to the system. The system interprets the data and sets up the proper refresh rate.

You might be testing a digital monitor with a row of LEDs under the control access door at the front of the monitor. If the monitor type is set to the wrong mode, the screen remains black and the first and last LEDs flash.

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 "Detachable Monitor I/O Signal Cable Connector Test Points" on page 5-15 for pin identification.

High voltage Northern and Southern Hemisphere monitors might come with a voltage selector (110 V–220 V) switch. The 145-W power supply might have a voltage selector (110 V–220 V) switch. Match the switch to the line voltage.

001

- Power-off the system unit and monitor.
- Remove all adapter cards from the riser card.
- Make sure the monitor I/O signal cable is properly connected to the system unit and monitor.
- Make sure the power cords are properly connected to the system unit and monitor, and that the line voltage is correct. See "Power Supply" on page 2-32.
- Make sure the monitor contrast and brightness controls are not turned too low.
- Power-on the monitor, and wait 20 seconds.
- Power-on the system unit.

Note: Because monitor models might differ, review the Display Self Test before attempting to answer the following questions. The test has changed from previous levels. If the monitor was not sold together with the system unit, refer to the service information provided with the monitor.

(Step **001** continues)

(continued)

001 (continued)

- If you are not familiar with the self-test pattern produced by the Display Self Test, refer to steps 3 and 4 of “Display Self Test” on page 3-17 for a description of the self-test pattern.

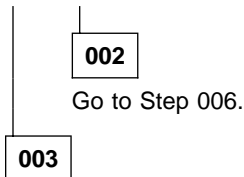
Note: *Do not* run the Display Self Test. Do not unplug the monitor I/O signal cable from the system unit.

DOES THE DISPLAY SELF-TEST PATTERN APPEAR ON THE SCREEN?

MONITORS WITH LEDs: DO THE GREEN LEDs CYCLE FROM LEFT TO RIGHT?

DIGITAL MONITORS WITH A ROW OF LEDs UNDER THE CONTROL ACCESS DOOR: DO THE LEFT AND RIGHT LEDs FLASH?

Yes No

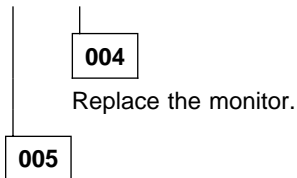


Unplug the monitor I/O signal cable from the system unit.

DID THE DISPLAY SELF-TEST PATTERN REMAIN ON THE SCREEN WITH A LIGHT OR DIM SCREEN (NOT TOTALLY BLACK)?

Note: You might need to perform this test in a dark or dimly lit room.

Yes No



Check the monitor I/O signal cable. Replace if defective.

– or –

Replace the system board.

006

(From step 002)

- Power-off the system unit and monitor.
- Unplug the monitor I/O signal cable from the system unit.
- Power-on the system unit and monitor.

(Step **006** continues)

006 (continued)

- Observe whether the screen lights up and does not remain black. You might have to turn the brightness control all the way up and be in a dark or dimly lit room.
- With G series monitors, the Power-on LED will be yellow or the screen will display vertical color test bars when powered on and **not** plugged into the system unit.

DOES THE SCREEN CHANGE FROM BLACK (WITH MONITOR POWER-OFF) TO A LIGHTER SHADE OR POWER-ON LED IS YELLOW OR SCREEN SHOWS COLOR VERTICAL BARS (WHEN POWER IS ON)?

OR DO THE LEDs CYCLE FROM LEFT TO RIGHT (DIGITAL POWER-ON LED MONITORS ONLY)?

Yes No

007

- Replace the monitor.

008

- Make sure the Diagnostics and Utilities CD is in the CD-ROM drive.
- Power-off the system unit.
- Reconnect any disconnected cables.
- Power-on the system unit.

IS THE SCREEN READABLE?

Note: If the screen shows a blinking cursor with no memory count running, answer this question “No.”

Yes No

009

- Power-off the system unit.
- Remove the hard disk drive system cable.
- Power-on the system unit.

IS THE SCREEN READABLE?

Yes No

010

- Refer to the IBM Monitor Hardware Maintenance Manual for further information. Otherwise, replace the monitor. If the symptom remains, replace the system board.

(continued)

011

- Go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.
-

012

- Press **Esc**.
- Select **Diagnostics** from the Main Menu.
- Select **Module Tests** from the menu.
- Select **Video** from the menu.
- Follow the prompts and perform the video test.

Note: You might have to refine the monitor controls to obtain the best image.

DID THE MONITOR SUCCESSFULLY PASS ALL TESTS?

Yes No

013

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

014

You have successfully completed the video Diagnostics and Utilities tests. If the problem remains, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.

Undetermined Problem

Check the POST Error History

The system board retains the last three POST error codes in a POST Error History saved in CMOS memory. Each time a POST error code is detected at the power-on/power-off cycle, it is added to the bottom of the list in the POST Error History.

Most recent error code is listed at bottom

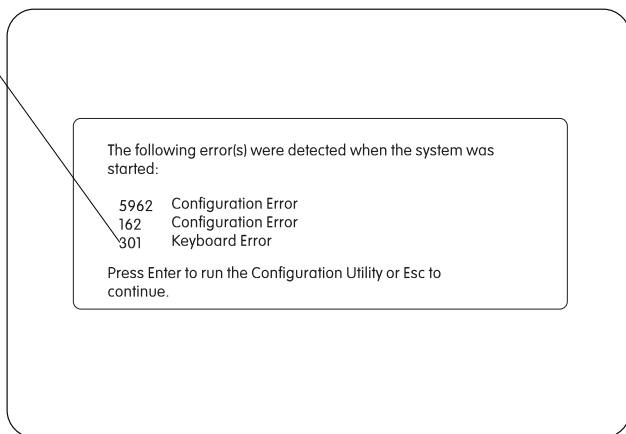



Figure 2-7. POST Error History Example

To view the POST Error History:

Note: The POST Error History can be accessed only during the initial long POST when the POST Configuration icon  appears.

- Press **F9** while the POST Configuration icon appears.
- If any POST errors are recorded, the POST Error History is displayed with the most-recent error shown at the bottom of the list.

To check for the error again, repeat the above steps to add the error to the list once more. You should see the same POST error code listed in the last two lines of the POST Error History.

To print a copy of the screen to an attached printer, press **Print Screen**.

If an error code is present, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9. If no error code is present, continue with this check.

(continued)

Check the power supply voltages (see “Power Supply” on page 2-32). 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.
 - Check all adapter card jumper positions.
 - Check all adapter card switch settings.
 - Check all device jumper positions.
 - Check all cables and connectors for proper installation.

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

3. Remove or disconnect the following, one at a time:
 - a. Non-IBM devices
 - b. External devices
 - c. Sound adapter card
 - d. Any adapters
 - e. Modem card
 - f. Riser card
 - g. Zip Drive, if installed
 - h. CD-ROM drive
 - i. Diskette drive
 - j. Hard disk drive
 - k. DIMMs

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 2-9 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.

Note: If you are unable to find a check procedure that corresponds to the device or error code, you either have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

If all devices and adapters have been removed, and the problem remains:

1. Remove all cables from connectors on the system board except the power supply and switch cables. See “System Board Layout” on page 5-2 for connector locations.

2. Remove all DIMMs from sockets.
3. Power-on the system unit and listen for any beeps.
4. If there are beeps, replace the system board and use the current processor on the FRU system board.
5. If there are no beeps, replace the processor and use the current system board.
6. If there are still no beeps, replace the current system board and use the FRU processor obtained in step 5.

Diagnostic Aids

Introduction	3-2
Power-On Self Test	3-2
Diagnostics and Utilities CD	3-3
Creating a Diagnostics Bootable Diskette	3-4
Diagnostic Test Programs	3-6
Error Messages	3-7
Return Codes	3-7
Using the Advanced Diagnostic Test Programs	3-8
Program Navigation	3-8
Viewing the Test Groups	3-10
Scripting	3-10
Changing Logical Unit Numbers	3-11
Test Group Specifications	3-11
Stopping the Tests	3-13
Formatting Diskettes	3-13
Hard Disk Drive Boot Error	3-14
File Editor	3-14
File Edit Function Key Usage	3-14
Diagnostics Control Keys	3-16
Display Self Test	3-17

Introduction

This section explains the diagnostic aids 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. The POST takes up to 120 seconds to complete (with Rapid Resume disabled or not installed), depending on the options installed.

The POST checks the following:

- System board
- Memory
- VGA
- Hard disk drive(s)
- Diskette drive(s)
- Keyboard
- Mouse
- Parallel port
- Serial port(s)
- CD-ROM drive
- Sound adapter card

To start the POST, turn on the monitor and the system unit. The following happens:

1. The POST Configuration icon,  appears at the upper-right corner of the monitor.

Pressing **F1** at this time causes the Setup Utility menu to appear after the POST has completed.

2. A count of the system memory appears at the upper-left corner of the screen.
3. If an error is detected, an error code appears under the system memory count.

Note: A memory error can appear without the memory count as:
XXXXXX XXXX 20X, where the first six Xs = memory address,
the next four Xs = data, and the 20X can be 201 or 203.

4. Successful completion of POST is attained when there are no errors detected in the system.

5. If a critical error is encountered, the system halts.
6. The system attempts to load the operating system as customized. If an operating system is not found, a graphic message (icon) is displayed requesting the user to insert a diskette into drive A and press the F1 key to resume operation.

Diagnostics and Utilities CD

The Diagnostics and Utilities program comes on a CD packaged with this book. The CD is labeled “Diagnostics and Utilities CD.”

The QAPlus/PRO diagnostic programs, developed by DiagSoft for IBM, are the primary method of testing the computer. You can use them to test the IBM components of the system and some external devices. The amount of time required to test all components depends on the number of components. The more optional adapters and devices you have attached to your system, the longer the testing takes.

The Diagnostics and Utilities program is intended to test only IBM products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

To load the Diagnostics and Utilities CD:

Note: Before beginning, ensure that Rapid Resume is disabled in the Setup Utility.

1. Install the Diagnostics and Utilities CD in the CD-ROM drive.
2. Power-off, then power-on the system unit.
3. Do not press **F1** during POST.
4. If any POST errors appear after POST, make a note of the errors and press the **Esc** key.
5. Select an option on the “Aptiva Diagnostics and Utilities Menu.”
6. Follow the instructions that appear on your screen. If an error occurs, go to “Index of Symptoms, Messages, Error Codes, or Beeps” on page 2-9.

Note:

This Service Level A Diagnostics will not support Low Level format.

When performing hard disk diagnostics, the system may go into Standby mode. Depression of any key will bring the system out of standby mode.

Creating a Diagnostics Bootable Diskette

The Diagnostics and Utilities CD allows you to create a bootable advanced diagnostics diskette. This permits the flexibility of loading the diagnostics program from either the CD-ROM drive or the Diskette drive.

Note: Because of the expanded options of the Service Level A Diagnostics CD, the preferred way of running the diagnostics is from the CD. Use the diagnostics on the diskette if the CD-ROM unit is inoperable.

To create a bootable diagnostics diskette:

1. Install the Diagnostics and Utilities CD in the CD-ROM drive.
2. Power-off, then power-on the system unit.
3. Do not press **F1** during POST.
4. When the **Aptiva Diagnostics and Utilities Menu** appears, depress the **zero** key to select the DOS screen. The A: drive prompt will appear.
5. Select the CD drive (the CD drive default is G:).
6. Select the **DIAGNOST** and **IMG** directories by typing:
CD\DIAGNOST\IMG and press **enter**.
7. Install a blank 1.44 KB diskette in diskette drive A.

Note: The diskette does not need to be formatted.

8. Type: **LOADSKF DIAGDISK.DSK B:** and press **enter**. (At this point, the diskette drive is B:).
9. There will appear on the screen a statement that the diskette is about to be overwritten. Make sure the diskette in drive A is the one you want to use, then answer **Y**.

Attention

This procedure will overwrite all data on the diskette in drive A.

10. After the copy is finished, you will have a bootable advanced diagnostics diskette.

To Load the Diagnostics Diskette:

Note: Before beginning, ensure that Rapid Resume is disabled in the Setup Utility. This Service Level A Diagnostics will not support Low Level format.

1. Power-off the system unit.
2. Install the diagnostics diskette in drive A.
3. Power-on the system unit.
4. Do not press **F1** during POST.
5. If any POST errors appear after POST, make a note of the errors and press the **Esc** key.

A message will display on the screen saying that due to disk space constraints, no mouse driver has been included in the diskette. One is available on the Diagnostics and Utilities CD-ROM (MOUSE.COM file).

6. Press any key to manually invoke the advanced diagnostics. The advanced diagnostics will now check out the system.
7. Select an option from the advanced diagnostics **Main Menu**.
8. Follow the instructions that appear on your screen. If an error occurs, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 2-9. This Service Level A Diagnostics will not support Low Level format.

Diagnostic Test Programs

The test programs on the Diagnostics CD include the following features:

Feature	Description
Easy Test Diagnostics	Automatic test of major components of the system.
Advanced Diagnostic Tests	Identifies most problems associated with the following major components: <ul style="list-style-type: none">• System board• Hard disk and Zip drives• Diskette drives• CD-ROM drives• RAM• Serial and parallel ports• Modem adapter• Sound adapter• Video adapter• Printer• Keyboard• Mouse
Flexible Test Control	Allows you to: <ul style="list-style-type: none">• Run groups of tests in batch• Specify parameters to use for each test (for example, video modes, disk cylinders, and port addresses)• Specify the number of passes you want to run (one to continuous)• Log the test results to a text dBase (DBF) format file• Save all test settings for future use• View System Information• View the system's configuration information. (For example, you can view the IRQ/DMA assignments, memory usage, and device drivers)• Select System Utilities• Format a diskette

Error Messages

Messages generated by the software—the operating system or application programs—generally are text messages, but they also can be numeric. The following are the various error messages.

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

Error Message	Description
POST Error Messages	Displayed when POST finds problems with the hardware or detects a change in the hardware configuration.
POST Beep Codes	Sounds emitted from the speaker if POST finds a problem. One beep indicates POST completed successfully. Multiple beeps indicate a problem was found by the POST.
Diagnostic Error Messages	Displayed when a test program finds a problem with a hardware option.
Software Generated Error Messages	Displayed if a problem or conflict is found by an application program, the operating system, or both. For an explanation of these messages, refer to the information supplied with that software package.
Multiple Messages	The first error that occurs can cause additional errors. Follow the suggested action of the first error displayed. In this case, the system displays more than one error message. Always follow the suggested action instructions for the <i>first</i> error message displayed.

Return Codes

For the test programs to properly determine if a test *Passed*, *Failed*, or *Aborted*, the test programs check the error-return code at test completion. To register the test properly in the test log, the test programs must generate one of the following return codes:

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

Using the Advanced Diagnostic Test Programs

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

Program Navigation

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

Using the First Letter of a Menu Choice

Throughout the test programs, pressing the first letter of an option on a menu is the same as moving to that item with the cursor and pressing Enter.

Using the Function Keys

Use the following keys to maneuver throughout the test programs:

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

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

Keys	Action
Tab	Move to test group (or move to parameters)
Spacebar	Toggle modules on/off (or toggle tests on/off)

Keys	Action
F2	View test results log
F10	Local menu
+	Next logical unit number (for example, LUN 1, LUN 2, and so on)
-	Previous logical unit number

Command Line Options

To enter QAPlus/Pro commands:

Note: Before beginning, ensure that Rapid Resume is disabled in the Setup Utility.

1. Install the Diagnostics and Utilities CD in the CD-ROM drive.
2. Power-off, then power-on the system unit.
3. Do not press **F1** during POST.
4. If any POST errors appear after POST, make a note of the errors and press the **Esc** key.
5. When the "Aptiva Diagnostics and Utilities Menu" screen is displayed, type: **zero** for a DOS prompt, then change the DOS prompt to G:
6. Select the **DIAGNOST** directory.
7. Type **QAPRO /NOVP /XXX** (where **/XXX** represents one of the following from the list below) then press Enter.

Command	Action
/B&W	The /B&W command line option forces the program to load in Black and White (Monochrome) mode, which is often more readable on laptop computers.
/LOG=file	The /LOG=file command line option directs the test programs to start using a specified Error Log file.
/INT10	The /INT10 command line option forces the test programs to use the BIOS for screen writes.
/OXXX	The /OXXX command line option, where XXX=test group (for example, MBD/MEM/VID/HDU/FDU/KBD/COM/LPT, and so on), omits the designated test group from testing.
/USRCONFIG=file	The /USERCONFIG=file command line option tells the test programs to look for a user diagnostic configuration file other than the default USERDIAG.CFG.

Command	Action
/SCRIPT =file[,R]	<p>The /SCRIPT=file[,R] command line option with the “,R” runs the selected script. Please see “Scripting” on page 3-10 for a description of scripting.</p> <p>Note: You can use a “-” instead of a “/” as the command line switch.</p>

Viewing the Test Groups

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

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

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

Scripting

Scripting allows you to select specific groups of tests, testing parameters, and options. Your selection is saved for later use as a test *Script*. To set up a test script, first select all the appropriate test groups and specific tests you want to run from the Module Testing section under Diagnostics. You should also select appropriate testing parameters and options. See “Program Navigation” on page 3-8, for instructions to save a test script.

Changing Logical Unit Numbers

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

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

Test Group Specifications

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

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

Module Testing Mode

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

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

To start the Module Testing mode:

1. Start the Diagnostics and Utilities CD.
2. Select **Run Advanced Diagnostics** from the Main Menu.
3. Select **Diagnostics** from the Main Menu.
4. Select **Module Test** from the next menu.
5. Use the up and down arrow keys (↑ and ↓) to move the highlight bar from one selection to the next.

6. Follow the instructions on the screen.

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

Running Selected Module Tests

To run all selected tests for a test group:

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

Note: A diamond appears next to your selection.

Running All Selected Modules

To run all selected test modules:

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

Note: A diamond appears next to your selection.

Changing Selected Tests in Test Groups

To change selected tests in a Test Group:

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

Attention: Items indicated by a directly adjacent “*” (red text on color screens) are destructive tests.

4. Press the spacebar at the highlighted test to toggle between select (indicated by a diamond) and de-select.

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

5. Press **Enter**.

Running an Individual Test

To run an individual test:

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

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

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

Stopping the Tests

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

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

Formatting Diskettes

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

Format A: high density — 1.44 MB

Format A: low density — 720 KB

Format B: high density — 1.44 MB

Format B: low density — 720 KB

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

Hard Disk Drive Boot Error

A hard disk drive boot error (error codes 1996 and I999030X) can be caused by the following:

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

File Editor

The File Editor is an ASCII text editor that uses simple function key commands. To access the File Editor:

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

File Edit Function Key Usage

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

Key	Description
Arrows	Move the cursor to the place in the text where you want to make changes.
Home	Press Home once, to move the cursor to the start of the current line. Press Home twice, to move to the beginning of the file. Press Home three times, to move to the beginning of the file.
End	Press End once, to move the cursor to the end of the current line. Press End twice, to move the cursor to the end of the current screen. Press End three times, to move the end of the file.
F2	Press F2 to be in search mode, You are prompted to enter the search word or words on a reverse highlighted line at the bottom of the File Edit Screen. After typing in the search word, press Enter .
F3	Press F3 to find the next occurrence of a search word.
F4	Press F4 to mark the start of a block of text (if you have not previously marked it). If you previously marked the block of text, pressing this key unmarks the text block.
F5	Press F5 to complete the block marking (started with F4). If you did not previously press F4 to start marking a block of text, F5 is ignored.
F6	Press F6 while the cursor is within the active block to move an active (marked) block of text. Move the cursor to the new location where the active block is to be moved, then press F6 again. If there is no active block of text, F6 is ignored.
F7	To copy an active (marked) block of text to a new location, move the cursor to the new location and then press F7 . If there is no active block of text F7 is ignored.
F8	To delete an active (marked) block of text, move the cursor within the active block and press F8 . If there is no active block of text, F8 is ignored.
F10	Press F10 , to save all changes and exit the file.

Notes:

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

Diagnostics Control Keys

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

Control Keys	When Used	Diagnostics Response
Ctrl+A	Main Menu	Allows you to select test from the sub menus that are highlighted with red letters. Attention: If selected, these test will erase the information stored on the diskette or hard disk drive.
Up and Down Arrow Keys	Main Menu Module Test Menu Test Group Menu	Highlights an item you want to select.
Space Bar	Module Test Menu Test Group Menu	Adds a diamond to the left of the highlighted test. The test will run when Run All Selected is highlighted and the Enter key is pressed. Also removes the diamond to the left of the item. The test will not run when Run All Selected is highlighted and the Enter key is pressed.
Tab Key	Main Menu Module Test Menu	Selects the additional test for the menu you are in.
+/- Keys	Test Group Menu	Selects additional test. The LUN displayed on the top right Test Group Menu shows which test is selected and how and remain (example LUN 1 of 2).

Display Self Test

Be sure the monitor has been turned on for approximately 5 minutes before you start the Display Self Test.

Note: If you are testing a digital power-on LED monitor with a row of LEDs under the access door at the front of the monitor, ignore Step 4a and do Step 4b only. For monitors with an on/off LED only, do only Step 4a.

Run the test as follows:

1. Power-off the system unit and monitor.
2. Disconnect the monitor signal cable from the system unit.
3. Power-on the monitor. Check to see that the power-on LED is lit.

Note: G40 and G50 series monitors have a dual color power-on LED. When powered on and **not** plugged into the system, the power-on LED will show yellow. When the monitor is plugged into the system, the power-on LED will show green.

G70 and higher series monitors display a vertical color bar test pattern when powered on and **not** plugged into the system. When plugged into the system, the color bar pattern disappears and the screen is blank.

4. Turn the brightness and contrast controls to their maximum positions.
 - a. If the monitor has an on/off LED only, the following symptoms indicate the monitor is still good:
 - The monitor screen should get lighter (it should not stay completely black). You might want to check the monitor in a dark or dimly lit room.
 - The monitor screen should show a power-off discharge (a flash of light) when turned off.
 - Note:** If you can see the flash of light but not the lighter screen, you might want to perform Step 4 again in a dark or dimly lit room.
 - b. If the monitor has a row of LEDs next to the control buttons, the following symptom indicates the monitor is still good:
 - The row of LEDs should repeatedly flash (or blink) in sequence from left to right.

Repair Information

Removals and Replacements—Machine Type 2161	4-2
2005—Cover	4-3
2020—3.5-In. Bays	4-4
2025—5.25-In. Bays	4-6
2030—Hard Disk Drives	4-7
2035—Adapter Cards	4-9
2040—Power Supply	4-10
2045—Riser Card	4-11
2050—Memory (DIMM)	4-12
2055—Cache Memory	4-13
2060—Processor Removal	4-14
2080—Lithium Battery	4-15
2085—Indicator LED and Cable	4-16
2090—System Board	4-17
Handling ESD-Sensitive Parts	4-18
Home Director	4-19
Software Installation Procedure	4-23

Removals and Replacements—Machine Type 2161

Note: The Machine Type 2161 might contain drives and devices not illustrated in this book. Follow replacement instructions for the same size device if in doubt. See Appendix B, “Model/Monitor Configurations and FRU Part Numbers” on page B-1 for exact model configurations.

The arrows in the removals and replacements procedures show the direction of movement to remove a field-replaceable unit (FRU), to turn a screw, or 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 pertain to replacement. See “Parts/Test Point Locations” on page 5-1 for internal cable connection and arrangement information.

Before disconnecting any cables, note their locations. Reinstall any new FRUs with cables in the same locations.

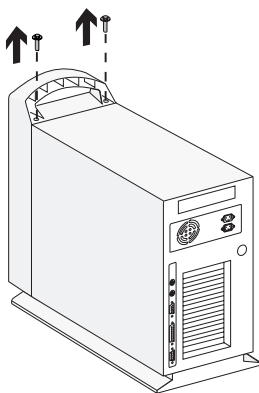
See Safety Notice 1: Translation on page xi

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, DIMMs, 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.

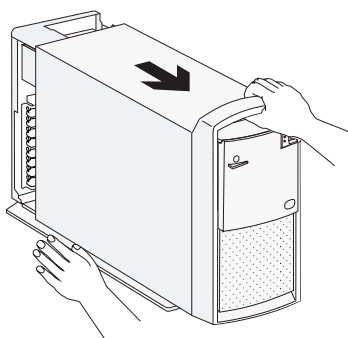
2005—Cover

- Unscrew the two screws behind the front handle.



(Back View)

Figure 4-1. Remove the Screws

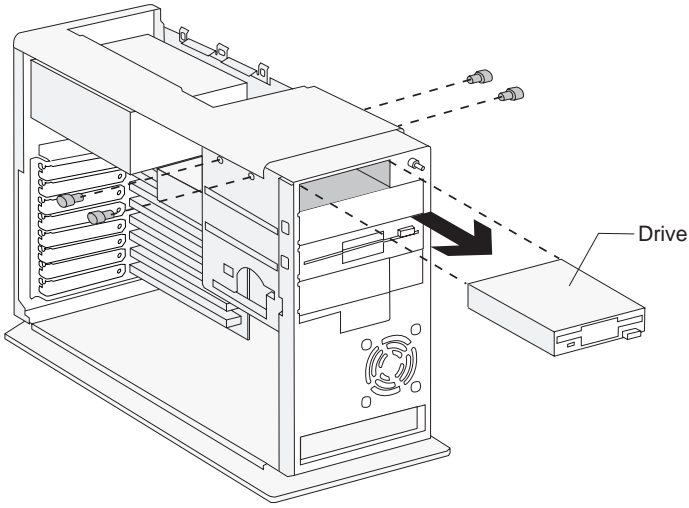


(Front View)

Figure 4-2. Pull Out on the Cover

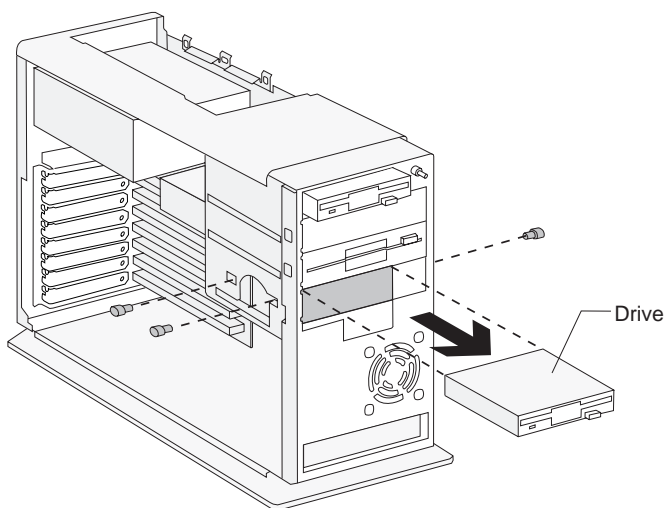
2020—3.5-In. Bays

- Disconnect any cables on the drive.
- Remove the screws.
- Pull out the drive.



(Front View)

Figure 4-3. Bay 1 (3.5-In.)



(Front View)

Figure 4-4. Bay 4 (3.5-In.)

2025—5.25-In. Bays

- Disconnect any cables on the drive.
- Remove the screws.
- Pull out the drive.

When removing a drive, install the new FRU in the same bay.

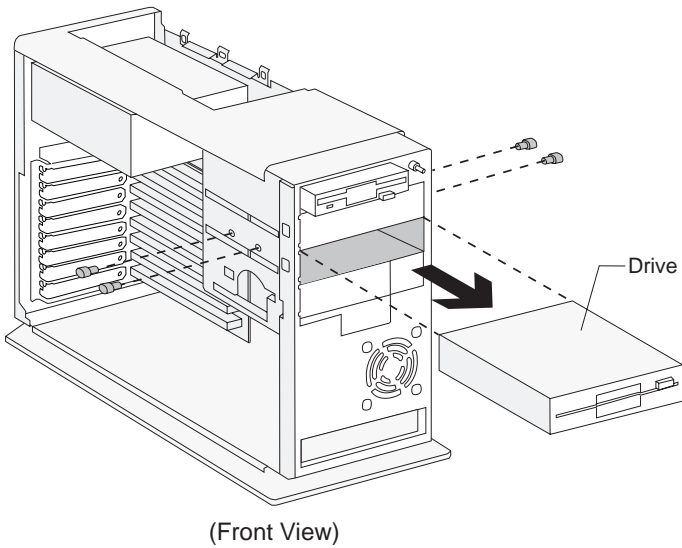


Figure 4-5. Bays 2 and 3 (5.25-In.)

2030—Hard Disk Drives

Bay 5

- Disconnect any cables on the drive.
- Remove the screws.
- Slide the hard disk drive to the rear and tilt to remove.
- Remove the mounting bracket from the old drive and install the bracket on the replacement drive.

Note: Refer to Appendix B, “Model/Monitor Configurations and FRU Part Numbers” on page B-1 and install the correct software.

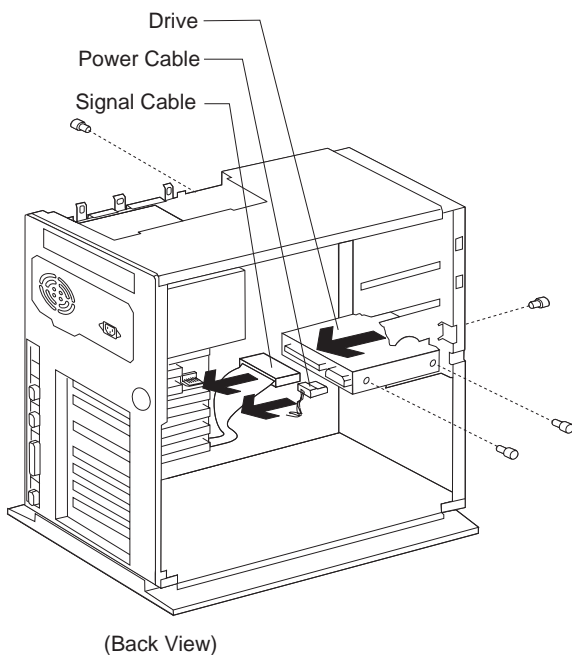
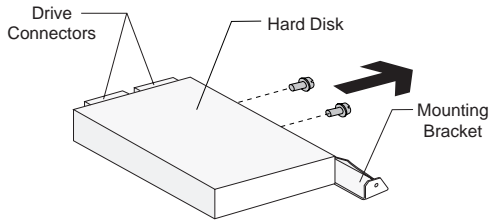


Figure 4-6. Hard Disk Drive—Bay 5

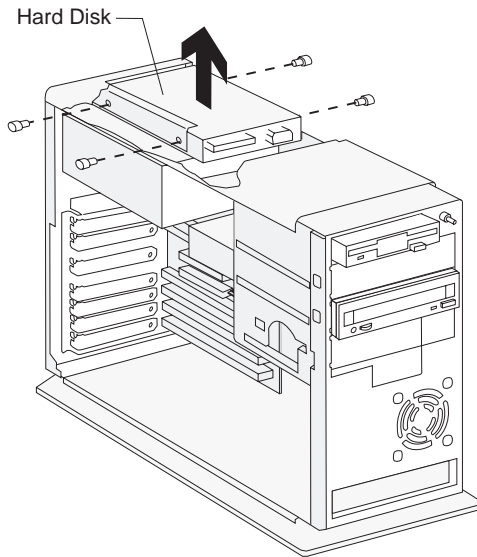


(Front Upside Down View)

Figure 4-7. Mounting Bracket—Bay 5

Bay 6

- Disconnect any cables on the drive.
- Remove the screws.
- Lift out the hard disk drive.



(Front View)

Figure 4-8. Hard Disk Drive—Bay 6

2035—Adapter Cards

Note: Before removing an adapter card, note the location of the adapter card and cables. When removing an adapter card, install the replacement card in the same slot as the one you removed.

- Remove any cables (note location of cables).
- Remove the adapter card mounting screw (1).
- Pull out the adapter card (2).

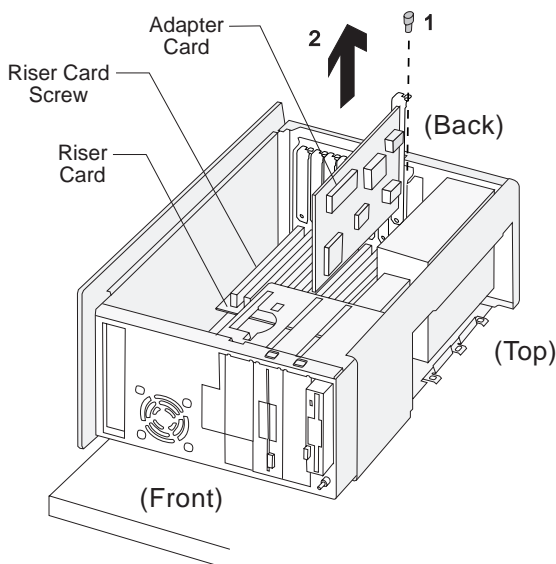


Figure 4-9. Adapter Cards

Note: When reinstalling a modem adapter card, ensure the Wake Up on Ring cable is connected from the 2-pin keyed connector on the modem to Wake Up on Ring connector on the system board. See “System Board Layout” on page 5-2 for locations.

2040—Power Supply

- Disconnect any cables necessary for removal.
- Remove the power supply mounting screws.
- Lift out the power supply.

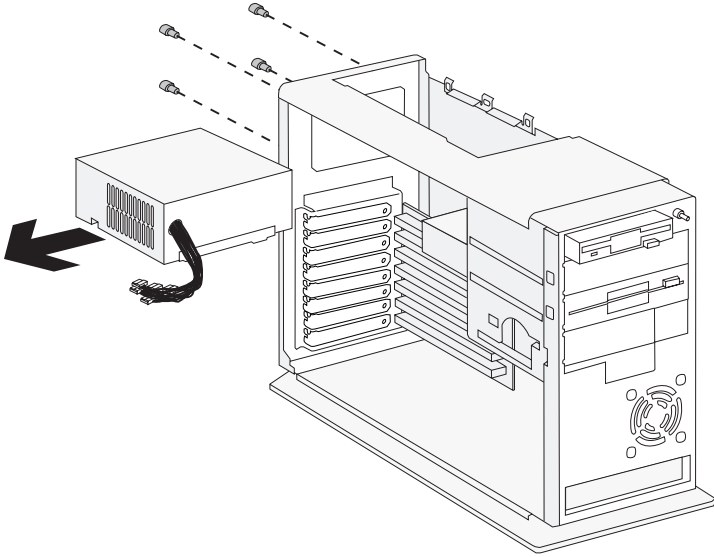


Figure 4-10. Power Supply

2045—Riser Card

- Adapter cards (2035) if applicable.
- Riser card power connector.
- Remove the riser card mounting screw (1).
- Remove the riser card clip (2) if installed.
- Remove the riser card (3).

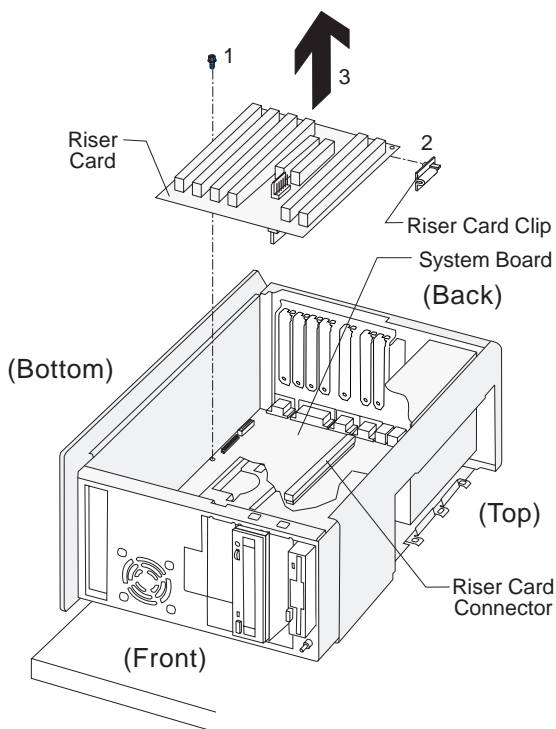


Figure 4-11. Riser Card

2050—Memory (DIMM)

Attention: Memory modules are sensitive to static discharge. See “Handling ESD-Sensitive Parts” on page 4-18.

- Adapter cards (2035) if applicable.
- Riser card (2045).
- Push out on the side clamps to release the module.
- Pull the module up and out to remove.

Note: Run the Setup Utility after adding or removing memory.

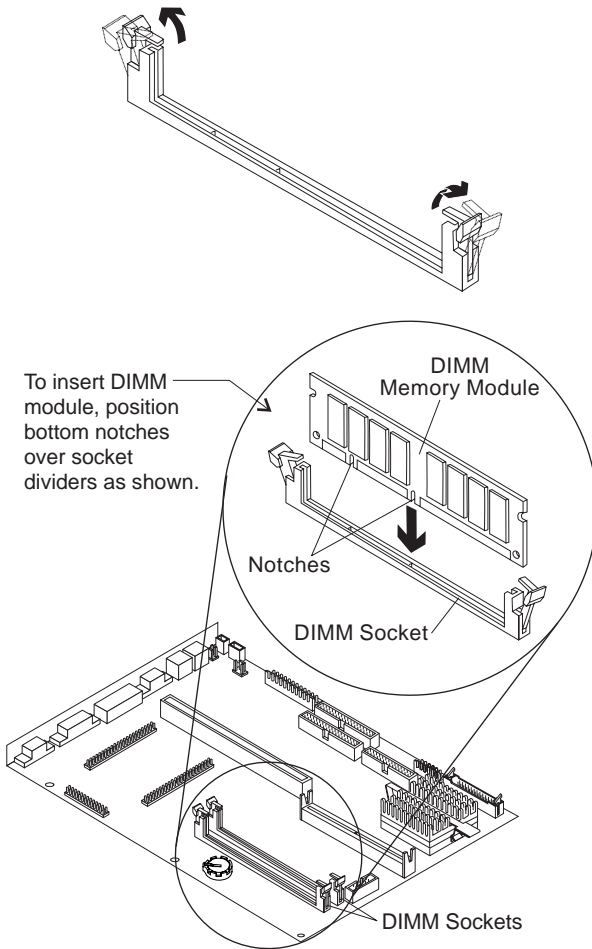


Figure 4-12. Memory DIMM

2055—Cache Memory

Attention: Memory cards are sensitive to static discharge. See “Handling ESD-Sensitive Parts” on page 4-18.

- Adapter cards (2035) if applicable
- Riser card (2045) if applicable

Note: Run the Setup Utility after adding or removing memory.

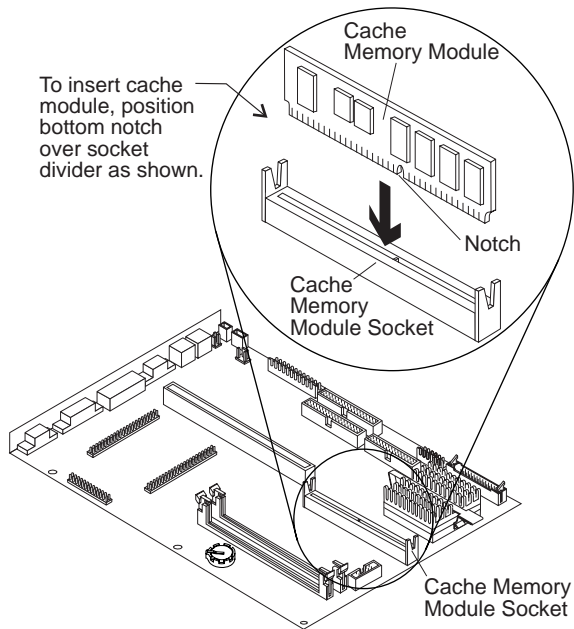


Figure 4-13. Cache Memory

2060—Processor Removal

Attention: Processors are sensitive to static discharge. See “Handling ESD-Sensitive Parts” on page 4-18.

- Adapter cards (2035) if applicable.
- To remove the processor: remove the processor retaining clip, raise the socket lever, remove the old processor, insert the new processor, lower the socket lever firmly, then install the processor retaining clip.
- When installing, be certain the dot on the processor is aligned with the dot in the socket.

Notes:

1. Determine which type of processor you are installing and make sure the jumpers are set correctly. See “System Board Layout” on page 5-2.
2. See page 7-4 for VRM or Shorting Block FRU.
3. Run the Setup Utility after installing a processor.

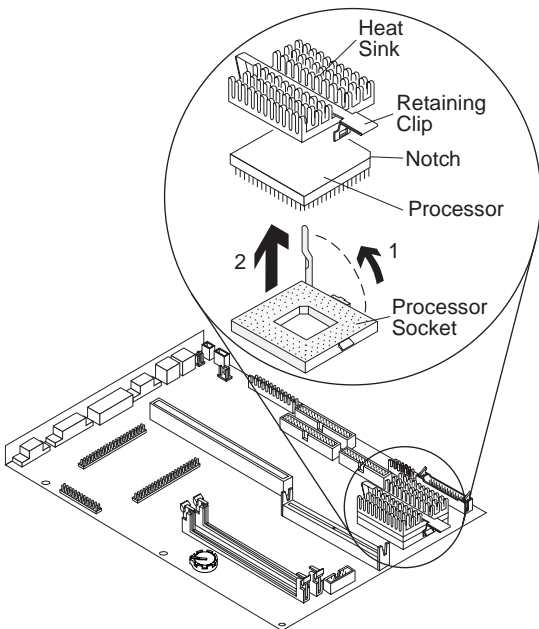


Figure 4-14. Processor removal

2080—Lithium Battery

- Insert the tip of a screwdriver (1) under the clip and raise the clip (2) carefully to remove the battery.

See Safety Notice 2: Translation on page xii

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.

Attention: Be careful when removing the battery. If the retaining clip is broken, the system board must be replaced.

Note: Run the Setup Utility after installing a battery.

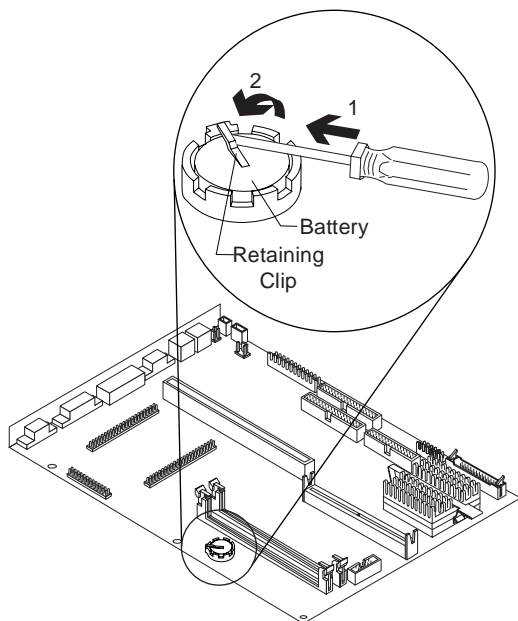
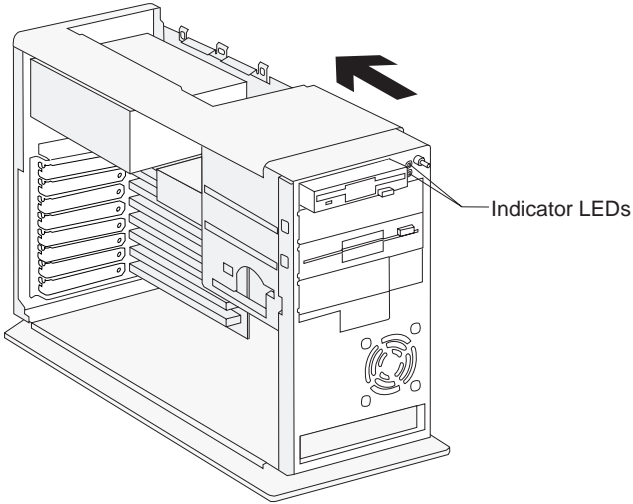


Figure 4-15. Lithium Battery

2085—Indicator LED and Cable

- Push in on the indicator LED and remove from the rear.
- Disconnect the LED and cable from the system board.

See “Parts/Test Point Locations” on page 5-1 for LED and cable locations.

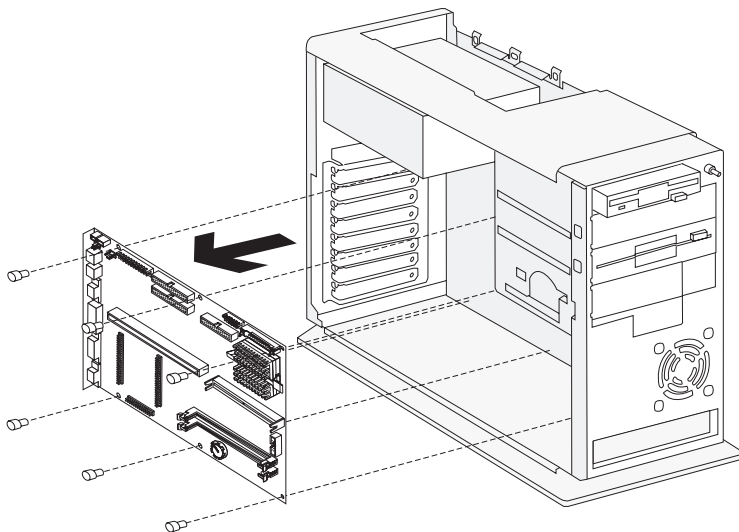


2090—System Board

- Adapter cards (2035).
- Riser card (2045).
- Disconnect any cables necessary for removal.
- Memory (DIMM) (2050).
- Cache memory (2055).
- Processor (2060).

Notes:

1. Be certain to reinstall the processor, DIMMs, cache memory, and VRM or shorting block in the new system board.
2. When reinstalling a new system board, push the board to the rear and place it over the front locating pin prior to installing the screws.
3. Run the Setup Utility after changing the system board.



Handling ESD-Sensitive Parts

Many products use parts that are known to be sensitive to electrostatic discharge (ESD). To prevent damage when you work 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 before removing adapter cards.

- Keep the ESD-sensitive part in its original shipping container (a special ESD bag) until you are ready to install the part into the machine.
- 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 pluggable 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, first put it into its special bag.

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 personnel or customers. 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 while working with ESD-sensitive parts when cold-weather heating is used because low humidity increases static electricity.

Home Director

Home Director Technical Service and Support

Aptiva computers purchased through RadioShack offer Home Automation with the Home Director package.

Because of their years of experience in this area, RadioShack will assist the Aptiva owner with any problems that are encountered with the Home Director on the Aptiva, at no charge.

Should there be a Home Director problem on the Aptiva purchased from RadioShack, call: 1-800-843-7422.

RadioShack's help line is available:

Monday-Friday 9:00AM - 7:00PM Central Time

Saturday 9:00AM - 5:00PM Central Time

Sunday Closed

Home Director support for Aptiva computers purchased from other than RadioShack is through the 1-800-IBM-7917 Home Director help line which is available 24 hours, 365 days.

The base Home Director package includes:

- Home Automation CD
- Serial Interface Module
- Cable
- Lamp Module
- Appliance module

Installation and operating instructions are included with the Home Director package. On-line Help and Troubleshooting Aids are included in the Home Director software.

How Home Director Works

The Serial Interface Module sends commands to the device modules for on-off and Dim control of the connected appliance or lighting through the house AC power wiring. The Aptiva computer, with Home Director Software installed, is used to program and send control data to the device modules via the Serial Interface module. The data interface is RS232 Industry Standard.

Note

Dim control is for incandescent lighting only. Dim control must **not** be used for fluorescent lighting or for appliances.

Home Director Troubleshooting

Refer to the Home Director On-line help information and troubleshooting aids.

Things to Check:

- Make sure the Serial Interface Module is plugged into a working outlet. If the outlet is controlled by a switch, make sure the switch is on.
- **Do not** connect the Serial Interface Module into a surge protector. The surge protector will block signals from the computer to the power lines.
- Make sure the House Code is set correctly in the Home Director software and that the physical modules address code is set.
- Make sure the Serial interface is configured to the correct COM port.
- Make sure the module you are trying to control is fully plugged into the wall outlet and that the switch for the appliance or light you are trying to control is in the on position and it works when directly plugged into a working wall outlet.
- Make sure the device module is **not** plugged into a surge protector.
- Power line noise can cause solid or intermittent failures.

Check these and similar items to see if they are operating when the problem occurs:

- Baby monitors that transmit over the power line
- Blenders
- Electric carving knives
- Electric hair dryers
- Electric motors
- Electric shavers
- Floor scrubbers
- Food processors
- Laser printers
- Mixers
- Vacuum cleaners
- Wireless doorbells that use the power line
- Wireless intercoms in transmit (talk) mode

If the COM port tests correctly and you can not control any modules, unplug the Serial Interface module from the wall outlet for about ten

seconds. Plug the Serial Interface back into the wall outlet and try running the Home Director program again.

- Be aware that voltage distribution in homes is split from the 220 volt power input line. There are two separate 110 volt power lines used in the house. When a signal is sent to a device module, the signal could travel from one 110 volt line, out to the power transformer, then back to the house on the other 110 volt line. If this distance is too long, you might experience intermittent problems. Try plugging the device module in another outlet socket.
- If you suspect a software problem, exit all other software programs and try running the Home Director program again. Conflicts may exist between Home Director and another program. Start the other programs one at a time to determine which program is causing the conflict.
- If you need to reinstall the Home Director software, first backup all the .HOM files and use the uninstall program in the Home Director directory.

Home Director–Voice Type Connection

Some versions of Home Director offer voice navigation and control, called Voice Type Connection.

The first time Home Director is run, the Voice Type Connection is not active. To enable speech:

- Click on the Home Director icon (located in the top left corner of the Home Director title bar).
- Select the 'Talk To Me' menu item to start Voice Type Connection and bring up the SpeechBar.

When 'Talk To Me' is selected the first time, a window will appear suggesting to check the microphone to be sure it is set-up correctly. Click on OK to go to the microphone set-up program.

Note: For optimum performance when using Home Director's Voice Type Connection, the microphone will need to be connected to the computer and settings adjusted.

To set-up the microphone:

- Click the Windows 95 Start button
- Select Programs, then IBM Voice Type, then Microphone Set-up.
- Follow the instructions in the Microphone Set-up Wizard window.

After running the microphone set-up, you will be returned to the Home Director main screen. Click on 'Talk To Me' again to enable Home Director Speech.

Once Speech has been enabled, the SpeechBar will be in the docked state with the Microphone Button in sleep mode (Yellow Microphone icon). Say **Wake Up** to turn the microphone on (Green Microphone icon) and start using your voice to navigate Home Director.

If a speech type error occurs while running Home Director, a message is displayed in the word history area of the SpeechBar indicating the number of the error. An error pop-up window will appear giving a description, cause, and solution for the error. At this time, single click, with the right mouse button, on the SpeechBar to select 'Help on (Error#)' for this same error pop-up window to appear. This menu item is only available when an error occurs.

Restarting Voice Type Connection: Each time Home Director is started, the SpeechBar will appear only if it was running when Home Director was last closed. If SpeechBar was closed the last time Home Director was used, Click on the Home Director icon, then select the 'Talk To Me' menu item to start Voice Type Connection for Home Director to bring up SpeechBar.

Software Installation Procedure

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

Aptiva owners requiring a replacement of the preloaded Software Recovery CD, that was shipped with the system, will need to call their local IBM HelpCenter. If you require a replacement Home Director CD, that was shipped with the system, you will need to call RadioShack or the Home Director help line. See "Home Director" on page 4-19.

To install the original Aptiva software on the hard disk drive, use the procedures supplied with the CD or use the following procedures:

1. Insert the Recovery CD into the CD-ROM drive.
2. Power-off, then power-on the system unit.
3. If Rapid Resume is enabled, press **Ctrl+Alt+Del** while the Rapid Resume logo screen is displayed.
4. 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.
5. Follow the instructions on the display.

Parts/Test Point Locations

System Board Layout	5-2
System Board Locations	5-3
System Bus Clock	5-4
Processor Speed	5-4
Core/Bus Frequency Ratio Settings	5-5
Power Supply Cable Connector Specifications	5-6
Sound Card	5-8
Modem Card	5-9
Hard Disk Drive Jumper Settings	5-10
CD-ROM Drive Jumper Settings	5-13
Zip Drive	5-14
Detachable Monitor I/O Signal Cable Connector Test Points	5-15
System Board Connector Specifications	5-16

System Board Layout

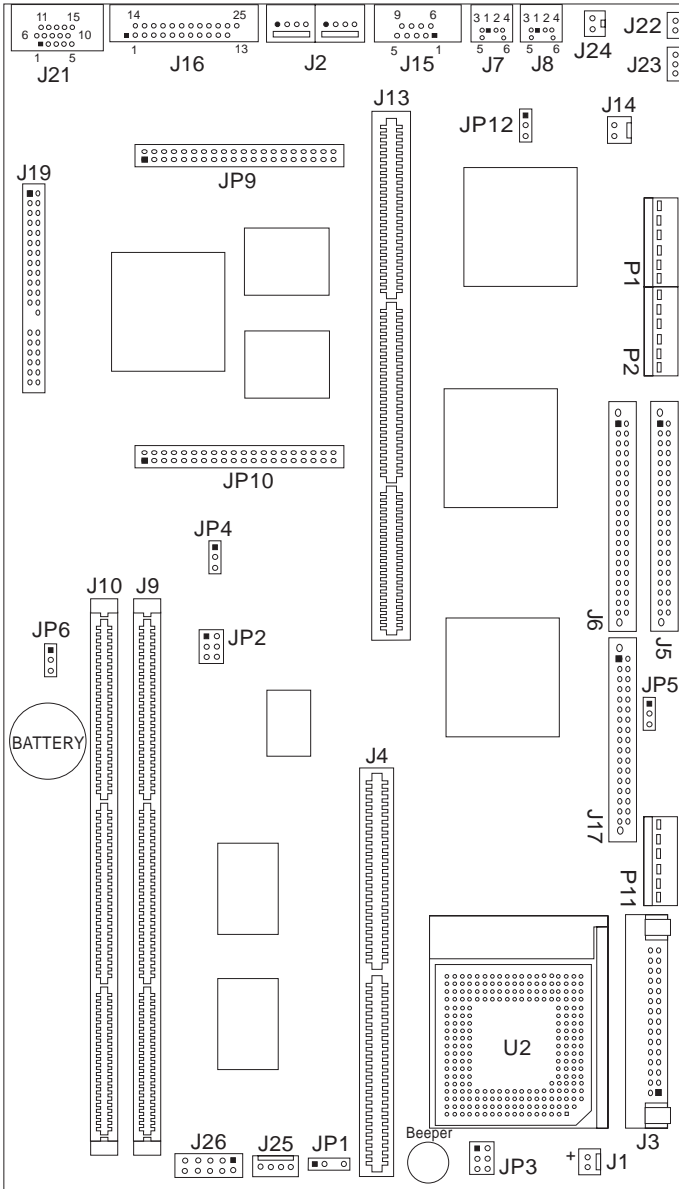


Figure 5-1. System Board

System Board Locations

J1	Fan +12 V dc connector
J2	USB (Universal Serial Bus)
J3	System board voltage regulator connector
J4	Cache connector
J5	Primary Hard Disk IDE (Hard Disk 1, Hard Disk 2)
J6	Secondary Hard Disk IDE (Hard Disk 3 or CD-ROM, Hard Disk 4) (For hard disk drive jumper settings, see page 5-10)
J7	Mouse connector
J8	Keyboard connector
J9	DIMM 168-pin Socket
J10	DIMM 168-pin Socket
J13	Riser Connector—PCI/ISA
J14	External speaker power connector
J15	Serial Port connector
J16	Parallel Port connector
J17	Diskette drive connector
J19	VESA feature connector
J21	Monitor signal connector
J22	Power Supply 2-pin connector (On/off switch)
J23	Power Supply 3-pin connector (Aux 5 V dc)
J24	Wake Up On Ring connector
J25	HDD/Power-on LED connector (HDD: 1-2, Power-on: 3-4)
J26	Media console connector - not used
JP1	External speaker (Internal: 1-2, External: 2-4)
JP2	System board bus clock (see Figure 5-2 on page 5-4)
JP3	Core/Bus frequency ratio (see Figure 5-4 on page 5-5)
JP4	System board flash jumper (Normal: 1-2, Write protect: 2-3)
JP5	Diskette Drive (FDD) write enable (Enable: 1-2, Disable: 2-3)
JP6	CMOS, Power-on Password Reset (Normal: 1-2, Clear: 2-3)
JP9	Video memory upgrade card connector
JP10	Video memory upgrade card connector
JP12	Home Director (Home Director: 1-2, Wakeup On Ring over Serial Port only: 2-3)
P1,P2	Power supply connector
P11	3.3 V dc Power supply connector
U2	Processor

System Bus Clock

The System bus clock jumpers are set to the Type and Model of the Aptiva computer. Other jumper settings are not supported and might cause system failures.

Function	Jumper	75 MHz	66.6 MHz	60 MHz	55 MHz
System Bus Clock	JP2	3-5, 2-4	1-3, 2-4	1-3, 4-6	3-5, 4-6

Figure 5-2. System Bus Clock

Processor Speed

P54C or P55C Processors, MHz	JP2	JP3
133 MHz/66.6 MHz	1-3, 2-4	1-3, 4-6
166 MHz/66.6 MHz	1-3, 2-4	1-3, 2-4
200 MHz/66.6 MHz	1-3, 2-4	3-5, 2-4

Figure 5-3. Processor Speed, MHz

Core/Bus Frequency Ratio Settings

The Core/Bus frequency ratio jumpers are set to the Type and Model of the Aptiva computer. Other jumper settings are not supported and might cause system failures.

Function	Jumper	3:2	2:1	2.5:1	3:1
Core/Bus Frequency Ratio	JP3	3-5, 4-6	1-3, 4-6	1-3, 2-4	3-5, 2-4

Figure 5-4. Core/Bus Frequency Ratio Settings

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 connect pins 2 and 3 on connector J23 (with the switch cable plug disconnected from the connector on the system board).

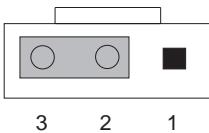


Figure 5-5. Connector J23 on System Board

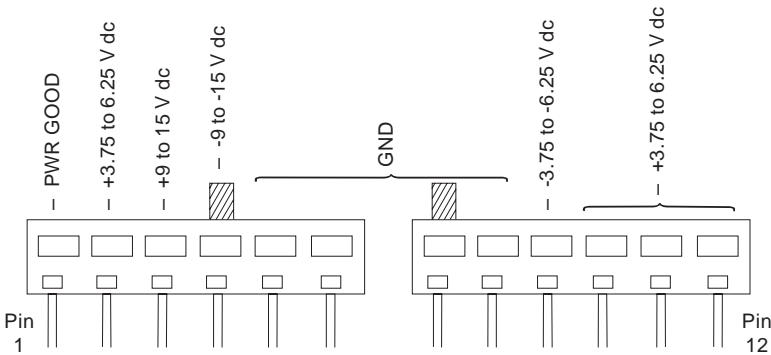


Figure 5-6. System Board Power Supply Connectors (J8 Bottom View)

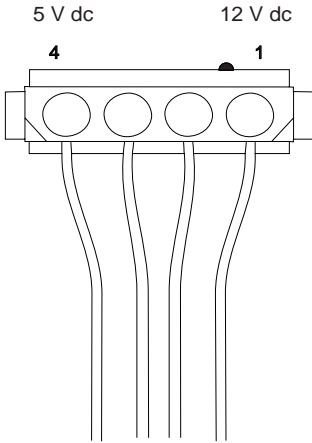


Figure 5-7. Hard Drive or CD-ROM Power Cable Connector

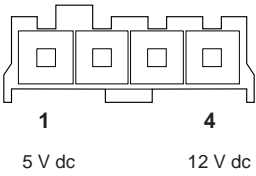


Figure 5-8. 3.5-In. Diskette Drive Power Cable Connector

Sound Card

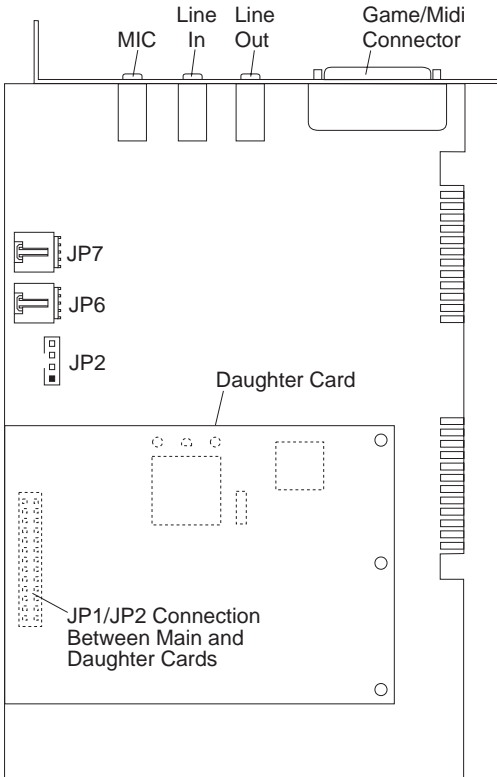


Figure 5-9. Sound Card

Sound Card Connectors

Table 5-1. Sound Card Connectors	
Connector	Description
JP2	CD-ROM connector
JP6	Video Conference connector
JP7	TV Connector

Modem Card

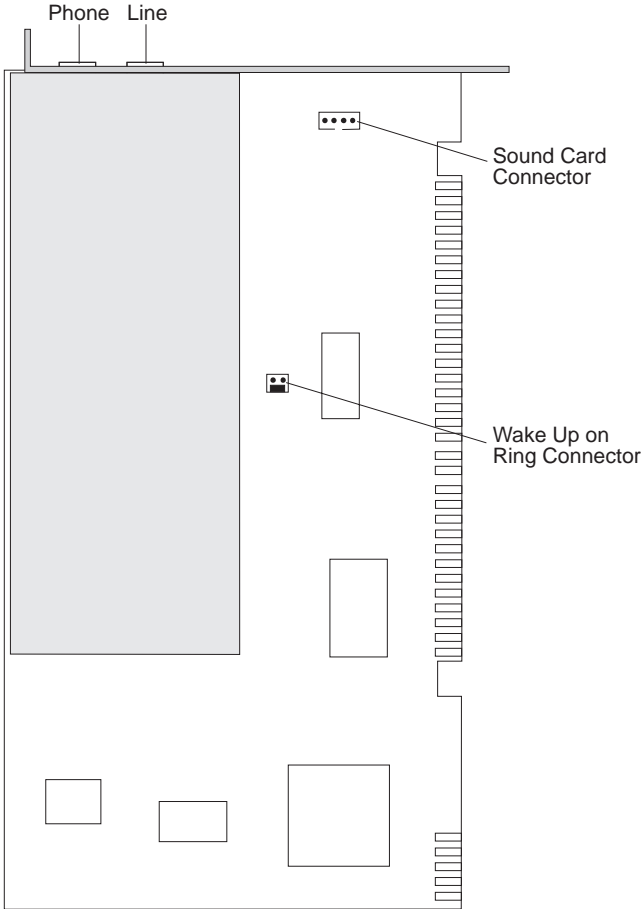


Figure 5-10. 33.6 Kbps DSVD Modem Card

The 33.6 Kbps DSVD (Digital Simultaneous Voice and Data) modem operates FAX at 14.4 Kbps. COM ports, Diagnostics, and more information about the 33.6 Kbps modem is under the Windows 95 Control Panel.

For modem check procedures, see "33.6 Kbps DSVD Factory-Installed Modem Adapter" on page 2-55.

Hard Disk Drive Jumper Settings

Up to four drive devices (hard disk, CD-ROM, or Zip drives) can be installed in the Type 2161 **Service Level A** systems. If any drives do not show in the Installed Devices list in the Setup Utility, ensure the jumper settings and connectors are set as shown here. Refer to “System Board Layout” on page 5-2 for connector location information.

Primary Hard Disk Drive IDE Local Bus Connector

At the primary hard disk drive IDE connector, make sure the first drive installed is set as the master drive (**1** in the following figures).

Note: If a second drive is installed in the primary hard disk drive IDE connector, set the jumpers as the slave drive (**2** in the following figures).

All recovery preloaded software should be installed on the master hard disk drive on the primary connector.

Secondary Hard Disk Drive Connector

If additional drives are connected to the secondary hard disk drive connector, set the first drive connected to this connector as the master drive (**1** in the following figures). If a second drive is connected to the secondary hard disk drive connector, set the jumpers as the slave drive (**2** in the following figures). Ensure all software is set to recognize all installed drives.

The CD-ROM drive is connected to the secondary drive connector at the factory as the master drive. If an additional hard disk drive is connected to the secondary connector, it must be set as the master drive, **1**, and the CD-ROM drive jumpers reset as the slave drive (see “CD-ROM Drive Jumper Settings” on page 5-13).

Note: Check the Setup Utility for correct installation:

- Hard Disk 1** Master drive
- Hard Disk 2** Slave drive (Zip drive with internal Zip drive models)
- Hard Disk 3** Master drive (CD-ROM if other drive not connected to this connector)
- Hard Disk 4** Slave drive (CD-ROM if hard disk or internal Zip drive installed at secondary connector, Hard Disk 3)

For jumper settings, match your hard disk drive to one of the following figures. **1** = Master Drive **2** = Slave Drive.

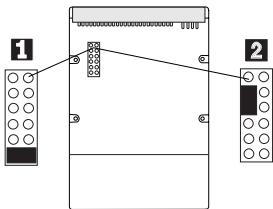


Figure 5-11. 1.6 GB, 2.0 GB Drive

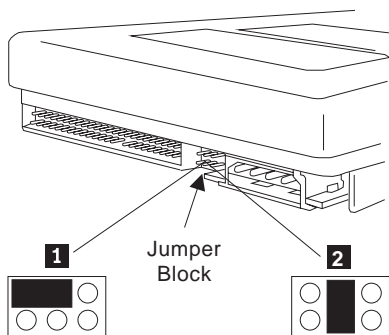


Figure 5-12. 850 MB, 2.0 GB, 2.5 GB Drive

Continued on next page.

For jumper settings, match your hard disk drive to one of the following figures. **1** = Master Drive **2** = Slave Drive.

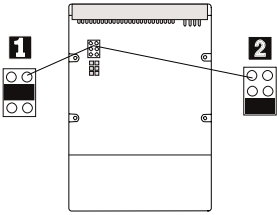


Figure 5-13. 850 MB, 1.2 GB Drive

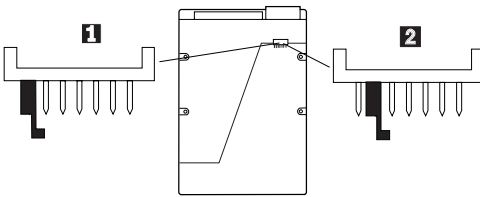


Figure 5-14. 1.6 GB, 3.2 GB Drive

CD-ROM Drive Jumper Settings

The CD-ROM drive is connected to the system board secondary drive connector at the factory and is jumpered as the master drive as shown in figure Figure 5-15. If an additional hard disk drive is connected to the secondary connector, it must be set as the master drive (see **1** in figure 5-11) and the CD-ROM drive jumpers reset as the slave drive as shown in Figure 5-15.

Check the Setup Utility for correct installation.

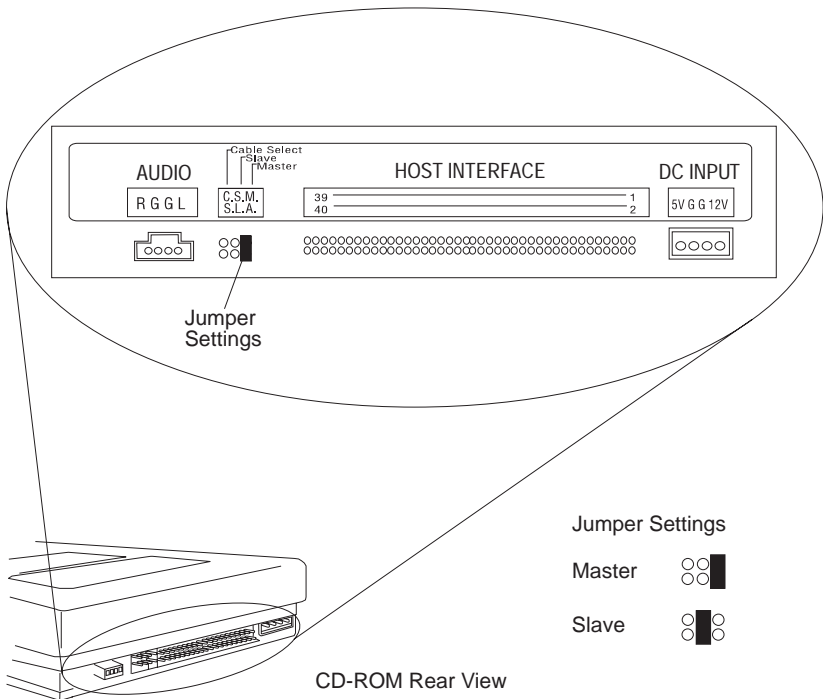


Figure 5-15. CD-ROM Drive Jumper Settings

Zip Drive

The factory installed Zip 100 ATA/IDE drive is connected to the system board Primary drive connector. The Zip drive is a direct access storage device that features removable media having a formatted capacity of 100 MB.

The Zip Drive jumper is set as the slave drive, as shown in Figure 5-16.

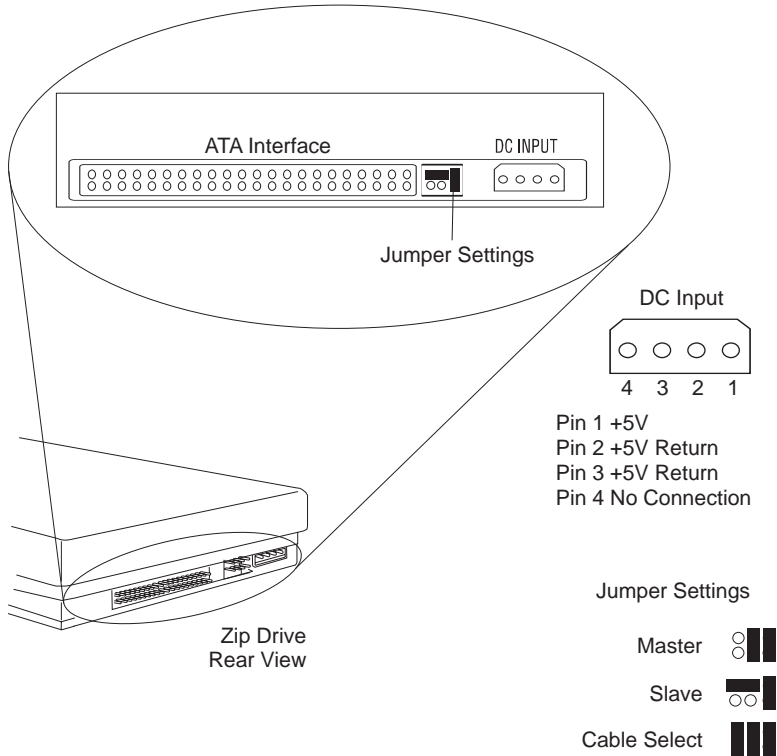
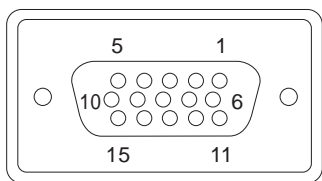
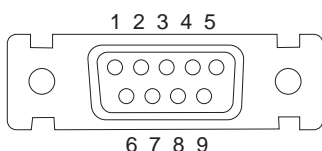


Figure 5-16. Zip Drive Jumper Settings

Detachable Monitor I/O Signal Cable Connector Test Points



System board



Monitor end of cable
(on some models)

Figure 5-17. Detachable Monitor I/O Signal Cable Connectors

Test each connector between the following pins:

System Pin	Monitor Pin
1	1
2	2
3	3
13	4
14	5
6	6
7	7
8	8
10	9
11	9

System Board Connector Specifications

Refer to “System Board Layout” on page 5-2 for connector identification and location information.

Monitor/Signal

Pin	Signal Name	I/O
1	Red Video	O
2	Green Video	O
3	Blue Video	O
4	Monitor ID Bit 2	I
5	Synch Ground	
6	Red Ground	
7	Green Ground	

Pin	Signal Name	I/O
8	Blue Ground	
9	+5 V dc	
10	Synch Ground	
11	Monitor ID Bit 0	I
12	SDA	I
13	Horizontal Synch	O
14	Vertical Synch	O
15	SCL	I

Parallel Port

Pin	Signal Name	I/O
1	Strobe	O
2	Data Bit 0	I/O
3	Data Bit 1	I/O
4	Data Bit 2	I/O
5	Data Bit 3	I/O
6	Data Bit 4	I/O
7	Data Bit 5	I/O
8	Data Bit 6	I/O
9	Data Bit 7	I/O
10	Acknowledge	I
11	Busy	I
12	Paper Empty	I
13	Select	O

Pin	Signal Name	I/O
14	Auto Feed	N/A
15	Error	I
16	Initialize	O
17	Select (In)	O
18	Ground	Power
19	Ground	Power
20	Ground	Power
21	Ground	Power
22	Ground	Power
23	Ground	Power
24	Ground	Power
25	Ground	Power

Serial Port

Pin	Signal Name	I/O
1	Data Carrier Detect	I
2	Receive Data	I
3	Transmit Data	O
4	Data Terminal Ready	O
5	Signal Ground	
6	Data Set Ready	I
7	Request To Send	O
8	Clear To Send	I
9	Ring Indicator	I

Mouse

Pin	Signal Name	I/O
1	Mouse Data	I/O
2	No Connection	
3	Ground	Power
4	+5 V dc	Power
5	Mouse Clock	I/O
6	No Connection	

Keyboard

Pin	Signal Name	I/O
1	Data	I/O
2	Mouse Data	
3	Ground	Power
4	+5 V dc	Power
5	Clock	I/O
6	Mouse Clock	

USB (Universal Serial Bus)

Pin	Signal Name
1	+5 V dc
2	-Data
3	+Data
4	GND

On/Off Switch Connector

Pin	Signal Name
1	AUX5
2	Switch

Modem Wake Up on Ring Detect Connector

Pin	Signal Name
1	EXT_WAKEUP
2	Ground

Speaker Connector

Pin	Signal Name
1, 2	Internal beeper
2, 4	External speaker

Power Cable Connector

Pin	Signal Name
1	Power Good (+5 V dc)
2	+5 V dc
3	+12 V dc
4	-12 V dc
5	Ground
6	Ground

Pin	Signal Name
7	Ground
8	Ground
9	-5 V dc
10	+5 V dc
11	+5 V dc
12	+5 V dc

Power Cable Connector 3.3 V dc

Pin	Signal Name
1	3.3 V dc
2	3.3 V dc
3	3.3 V dc

Pin	Signal Name
4	Ground
5	Ground
6	Ground

Diskette Cable Connector

Pin	Signal Name	I/O
1	Ground	
2	Density Select	O
3	No Connection	
4	No Connection	
5	Ground	
6	No Connection	
7	Ground	
8	Index	I
9	Ground	
10	Motor Enable 0	O
11	Ground	
12	Drive Select 1	O
13	Ground	
14	Drive Select 0	O
15	Ground	
16	Motor Enable 1	O
17	Ground	

Pin	Signal Name	I/O
18	Direction	O
19	Ground	
20	Step	O
21	Ground	
22	Write Data	I
23	Ground	
24	Write Enable	O
25	Ground	
26	Track 0	I
27	Ground	
28	Write Protect	I
29	Ground	
30	Read Data	I
31	Ground	
32	Select Head 1	O
33	Ground	
34	Diskette Change	I

Note: The diskette drive signal cable for drive A has a twist for the Drive Select and Motor Enable signals.

Hard Disk Cable Connectors

Pin	Signal Name	I/O
1	Host Reset	O
2	Ground	
3	Host Data 7	I/O
4	Host Data 8	I/O
5	Host Data 6	I/O
6	Host Data 9	I/O
7	Host Data 5	I/O
8	Host Data 10	I/O
9	Host Data 4	I/O
10	Host Data 11	I/O
11	Host Data 3	I/O
12	Host Data 12	I/O
13	Host Data 2	I/O
14	Host Data 13	I/O
15	Host Data 1	I/O
16	Host Data 14	I/O
17	Host Data 0	I/O
18	Host Data 15	I/O
19	Ground	Power
20	No Connection	

Pin	Signal Name	I/O
21	No Connection	
22	Ground	
23	Host IOW	O
24	Ground	Power
25	Host IOR	O
26	Ground	Power
27	I/O Channel Ready	I
28	No Connection	
29	No Connection	
30	Ground	Power
31	Host IRQ	I
32	No Connection	
33	Host A1	O
34	No Connection	
35	Host A0	O
36	Host A2	O
37	Host CS0	O
38	Host CS1	O
39	<i>ACTIVE</i>	I
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

How to Use This Parts Catalog

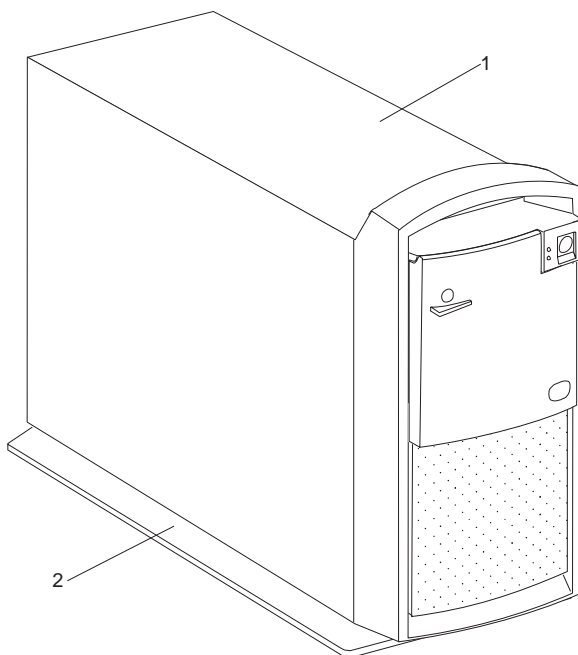
- **SIMILAR ASSEMBLIES:** If two assemblies contain a majority of identical parts, they are broken down on the same list. Common parts are shown by one index number. Parts peculiar to one or the other of the assemblies are listed separately and identified by description.
 - **AR:** (As Required) in the Units column indicates that the quantity is not the same for all machines.
 - **NP:** (Non-Procurable) in the Units column indicates that the part is non-procurable and that the individual parts or the next higher assembly should be ordered.
 - **NR:** (Not Recommended) in the Units column indicates that the part is procurable but not recommended for field replacement, and that the next higher assembly should be ordered.
 - **NS:** (Not Shown)
 - **R:** (Restricted) in the Units column indicates that the part has a restricted availability.
 - **EMEA:** indicates that the part is used in models intended for Europe, the Middle East, and Africa (EMEA).
- Note:** See the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" on page B-1 for model specifications.

Assemblies (Service Level A)

Catalog Section	7-3
Assembly 1: Machine Type 2161 System Unit - Exterior (SL-A) . . .	7-3
Assembly 2: Machine Type 2161 System Unit - Interior (SL-A) . . .	7-4
Assembly 3: Diskette, Hard Disk Drives, and Internal Zip Drive . . .	7-7
Assembly 4: CD-ROM Drive, Sound and Modem Cards	7-9
Assembly 5: Monitor and Power Cord (Linecord)	7-12
Assembly 6: Keyboard and Mouse	7-15
Assembly 7: Software	7-17

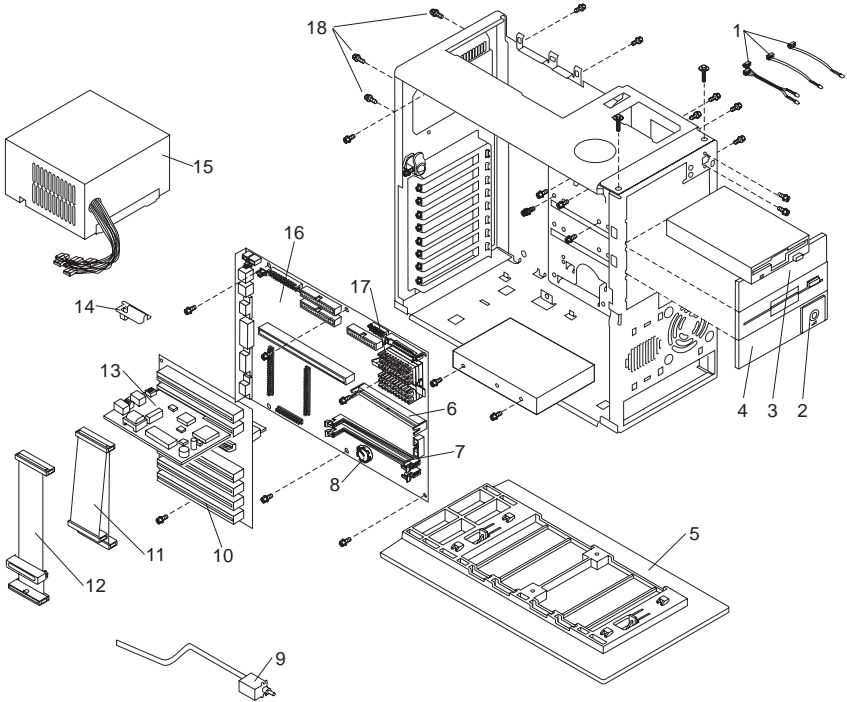
Catalog Section

Assembly 1: Machine Type 2161 System Unit - Exterior (SL-A)



Asm-Index	Part Number	Units	Description
1-1			Top Cover Assembly (Does not include system base — see Interior (SL-A) on page 7-4
-1	42H0343	1	Machine Type 2161 Top Cover (includes logo and labels)
-NS	42H0348	1	Pull-Down Door
-NS	60G1995	1	Top Cover Mounting Screws
-2	34G1861	1	Pedestal
-NS	10H3080	1	Feet(4)

Assembly 2: Machine Type 2161 System Unit - Interior (SL-A)

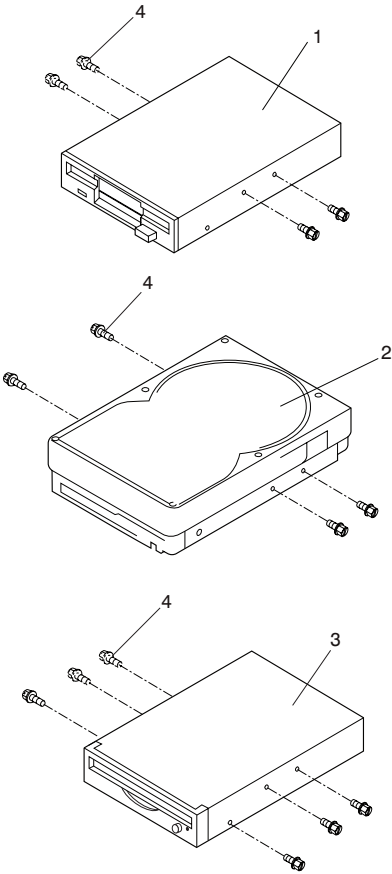


Asm- Index	Part Number	Units	Description
2-1			System Board Note: See the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" on page B-1 for model specifications. All system board FRUs are shipped without processor, cache memory module, shorting block/regulator module, or DIMM. When replacing a system board, remove all FRUs from the original system board and install them on the new system board.
-1	93F2388	1	LED Indicator Cable (Hard Disk)
-1	93F2389	1	LED Indicator Cable (Power)
-1	13H8078	1	DUAL LED Indicator Cable (Power/HD)
-2	42H0347	1	Blank Audio Panel
-3	42H0345	1	5.25-in. Bay Blank Bezel
-4	42H0344	1	3.5-in. Bay Blank Bezel
-NS	76H1585	1	ZIP Drive Blank Bezel
-5	34G1861	1	Pedestal
-6	07H1150	1	L2 Cache, 256 MB
-7	76H6915	1	DIMM, 16 MB, SDRAM
-7	76H6916	1	DIMM, 32 MB, SDRAM
-8	93F0063	1	Lithium Battery (CR2032)
-9	60G2258	1	Power Switch and Cable
-10	12H2025	1	Riser Card, ISA/PCI
-11	60G2254	1	CD-ROM/Hard Disk Drive Cable
-12	75H8905	1	Diskette Drive Cable
-NS	76H1777	1	Hard Disk Drive Ribbon Cable
-NS	41H7819	1	Wake Up On Ring Cable
-NS	10H2924	1	CD-ROM Audio Cable (Model C9S)
-13		1	Modem Card, see page 7-9. Sound Card, see page 7-9.
-14	60G2077	1	Bracket, Riser Card Support
-15	75H8483	1	Power Supply (3.52 V dc) (145-W LV/HV Switch-selectable)
-15	55H6630	1	Power Supply (3.3 V dc) Japan

Assembly 2: (continued)

			(145-W LV/HV Switch-selectable Japan only)
-16	93H2477	1	System Board, Type 2161
-17	06H8228	1	P54C-133 MHz Processor
-17	42H4865	1	P55C-166 MHz Processor
-17	42H4866	1	P55C-200 MHz Processor
-NS	06H1796	1	Processor Fan
-NS	07H1687	1	Shorting block (P54C only)
-NS	76H3658	1	Voltage Regulator Module (P55C only)
-NS	93F0067	1	Jumper, 2 position (Packet of 4)
-18	93F0041	1	Packet (Mounting Screws)

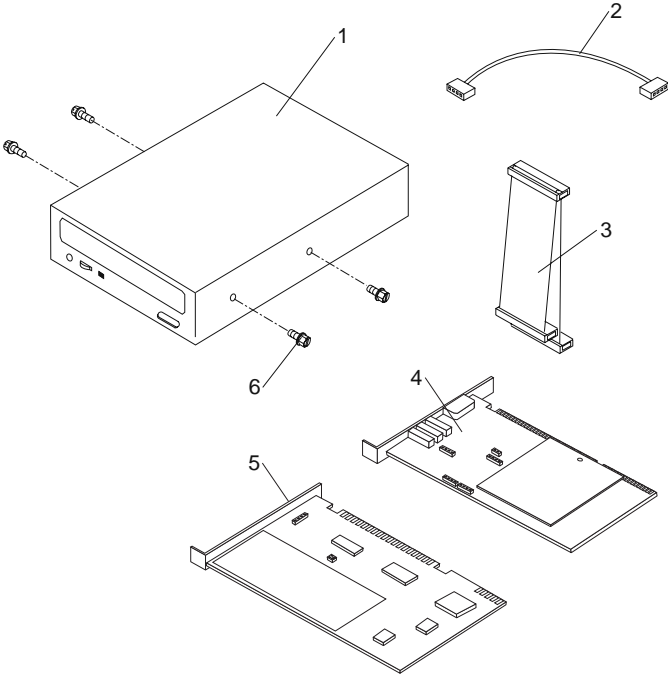
Assembly 3: Diskette, Hard Disk Drives, and Internal Zip Drive



Assembly 3: (continued)

Asm- Index	Part Number	Units	Description
3-1	93F2361	1	3.5-in. 2 Mode 1.44 MB Diskette Drive
-1	41H7675	1	3.5-in. 3 Mode 1.2 MB Diskette Drive
-2	75H7498	1	2.0 GB Hard Disk Drive
-2	76H4608	1	3.1 GB Hard Disk Drive
-2	76H5820	1	4.2 GB Hard Disk Drive
			<p>Note: When referring to hard-disk-drive capacity, MB means 1 000 000 bytes; total user-accessible capacity may vary depending on operating environment.</p> <p>When referring to hard-disk-drive capacity, GB means 1 000 000 000 bytes; total user-accessible capacity may vary depending on operating environment</p> <p>Note: See the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" on page B-1 for model specifications.</p>
-3	76H3226	1	Internal Zip Drive, 100 MB
-4	93F0041	1	Packet (Mounting Screws)

Assembly 4: CD-ROM Drive, Sound and Modem Cards

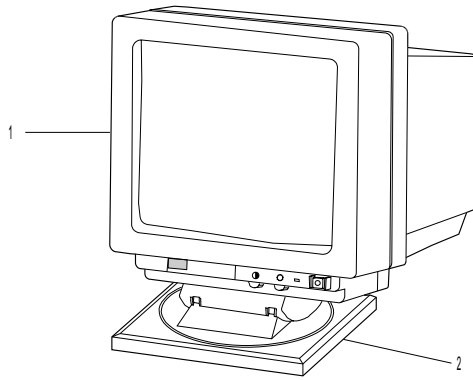


Assembly 4: (continued)

Asm- Index	Part Number	Units	Description
4-1	76H6101	1	CD-ROM Drive (16X CAV)
-2	10H2924	1	CD-ROM Drive Audio Cable (Model C9S)
-3	60G2254	1	CD-ROM/Hard Disk Cable
-NS	41H7819	1	Wake Up On Ring Cable
-4	55H7240	1	Sound card
			Note: See the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" on page B-1 for model specifications.
-5	76H6947	1	Modem Card, 36.6 Kbps (Belgium)
-5	76H6247	1	Modem Card, 36.6 Kbps (France)
-5	76H6253	1	Modem Card, 36.6 Kbps (Germany)
-5	76H6249	1	Modem Card, 36.6 Kbps (Italy)
-5	76H1760	1	Modem Card, 36.6 Kbps (Japan)
-5	76H6949	1	Modem Card, 36.6 Kbps (Portugal)
-5	76H6945	1	Modem Card, 36.6 Kbps (Spain)
-5	76H6251	1	Modem Card, 36.6 Kbps (Switzerland, Austria)
-5	76H1758	1	Modem Card, 36.6 Kbps (UK, NL, SWE, DK, NOR, FIN, IRE)
-5	76H1762	1	Modem Card, 36.6 Kbps (US/LA/BR)
-NS	76H1617	1	Modem/Audio Cable
-NS	41H7820	1	Modem Splitter
-NS	43G3398	1	Modem Cable (EMEA)
-NS	60H6045	1	Telephone Adapter (Austria)
-NS	60H6046	1	Telephone Adapter (Belgium)
-NS	60H6047	1	Telephone Adapter (Denmark)
-NS	60H6043	1	Telephone Adapter (Eire)
-NS	60H6048	1	Telephone Adapter (Finland)
-NS	60H6049	1	Telephone Adapter (France)
-NS	60H6050	1	Telephone Adapter (Germany)
-NS	60H6052	1	Telephone Adapter (Italy)
-NS	60H6053	1	Telephone Adapter (Netherlands)
-NS	60H6048	1	Telephone Adapter (Norway)
-NS	60H6047	1	Telephone Adapter (Portugal)
-NS	60H6043	1	Telephone Adapter (Spain)

-NS	60H6054	1	Telephone Adapter (Sweden)
-NS	60H6055	1	Telephone Adapter (Switzerland)
-NS	60H6051	1	Telephone Adapter (UK)
-NS	75H9292	1	Internal Speaker Cable
-NS	07H1686	1	DC Power Cable, Speaker
-NS	07H1627	2	Speaker, Model 10
-NS	76H1684	2	Speaker Grill, Model 10
-NS	07H1629	2	Speaker, Model 20
-NS	76H1686	2	Speaker Grill, Model 20
-NS	76H4764	2	Speaker, Sub-Woofer, Model 30
-NS	76H4762	2	Speaker, Sub-Woofer, Model 31, EMEA 230V
-NS	04H6905	2	Sub-Woofer A.C. Power Cable (UK)
-NS	04H6906	2	Sub-Woofer A.C. Power Cable (Europe)
-NS	76H1572	1	Joystick
-NS	60G2272	1	Microphone
-NS	76H6978	1	Head Set
-NS	12J3988	1	Y adapter (Head Set)
-8	93F0041	1	Packet (Mounting Screws)

Assembly 5: Monitor and Power Cord (Linecord)



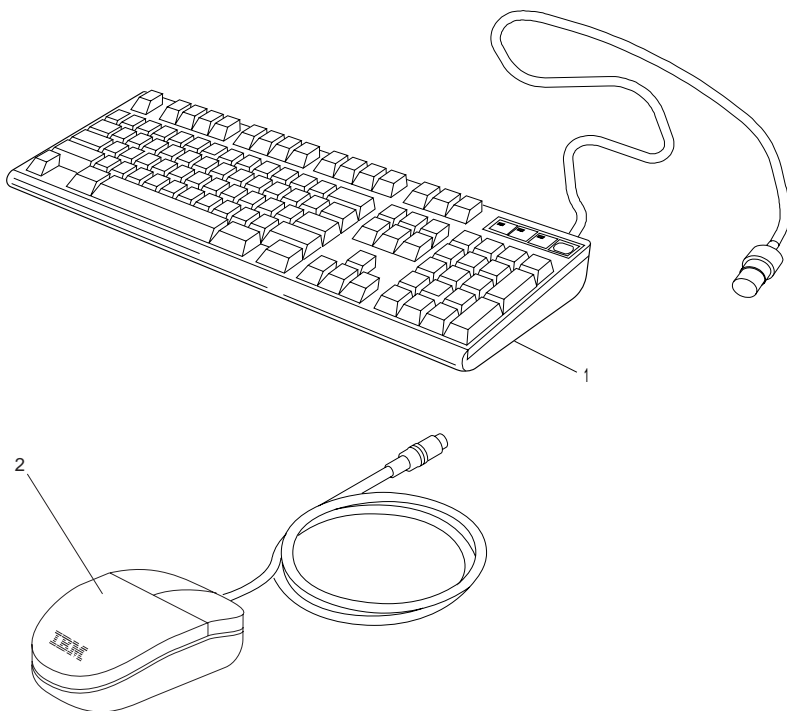
Asm-Index	Part Number	Units	Description
5-1 -2			<p>Monitor (includes I/O cable) Stand (included with monitor) EQ = Equatorial NH = Northern hemisphere SH = Southern hemisphere LV = Low Voltage HV = High Voltage UV = Universal Voltage (auto-sense)</p> <p>See the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" on page B-1 for model specifications.</p> <p>For monitors sold separately from IBM Aptiva system units, see the service information provided with the monitor. EMEA uses Express Repair for Monitors.</p> <p>14-Inch Monitor - Type 6542 (12.3-Inch diagonal viewing area) (P1438-G40) SVGA Monitor</p>
-1	96G3108	1	- .28, 100/240 V 50/60 Hz, NH/UV
-1	96G3109	1	- .28, 100/240 V 50/60 Hz, EQ/UV

			14-Inch Monitor - Type 6542 (13.0-Inch diagonal viewing area) (P1458-G41) SVGA Multi-Synch Monitor
-1	96G3110	1	- .28, 100/127 V 50/60 Hz, NH/LV
-1	96G3111	1	- .28, 200/240 V 50/60 Hz, NH/HV
-1	96G3112	1	- .28, 100/240 V 50/60 Hz, NH/UV
-1	96G3114	1	- .28, 100/240 V 50/60 Hz, EQ/UV
-1	96G3113	1	- .28, 100/240 V 50/60 Hz, SH/UV
			15-Inch Monitor - Type 6543 (13.4-Inch diagonal viewing area) (P1558-G50) SVGA Multi-Synch Monitor
-1	96G3115	1	- .28, 100/127 V 50/60 Hz, NH/LV
-1	96G3116	1	- .28, 200/240 V 50/60 Hz, NH/HV
-1	96G3117	1	- .28, 100/240 V 50/60 Hz, NH/UV
-1	96G3120	1	- .28, 100/240 V 50/60 Hz, NH/UV
-1	96G3119	1	- .28, 100/240 V 50/60 Hz, EQ/UV
-1	96G3118	1	- .28, 100/240 V 50/60 Hz, SH/UV
			17-Inch Monitor - Type 6543 (15.7-Inch diagonal viewing area) (P1558-G70) SVGA Multi-Synch Monitor
-1	96G3121	1	- .28, 100/240 V 50/60 Hz, NH/UV
-1	96G3124	1	- .28, 100/240 V 50/60 Hz, NH/UV
-1	96G3123	1	- .28, 100/240 V 50/60 Hz, EQ/UV
-1	96G3122	1	- .28, 100/240 V 50/60 Hz, SH/UV
			Power Cord (linecord) for monitor and system unit
-	14F0032	1	- Arabic countries
-	93F2365	1	- Australia
-	13F9978	1	- Belgium (Dutch)
-	13F9978	1	- Belgium (French)
-	93F2366	1	- Brazil
-	13F9978	1	- Bulgaria
-	93F2364	1	- Canada (English)
-	93F2364	1	- Canada (French)
-	13F9978	1	- Czech Republic
-	13F9996	1	- Denmark
-	13F9978	1	- Finland
-	13F9978	1	- France
-	13F9978	1	- Germany

Assembly 5: (continued)

–	13F9978	1	- Greece
–	13F9978	1	- Hungary
–	14F0086	1	- Israel
–	14F0068	1	- Italy
–	93F2366	1	- Latin America (Spanish)
–	13F9978	1	- Netherlands
–	93F2365	1	- New Zealand
–	13F9978	1	- Norway
–	13F9978	1	- Poland
–	13F9978	1	- Portugal
–	13F9978	1	- Romania
–	13F9978	1	- Russia
–	13F9978	1	- Serbia
–	13F9978	1	- Slovakia
–	14F0014	1	- South Africa
–	13F9978	1	- Spain
–	13F9978	1	- Sweden
–	14F0050	1	- Switzerland (French)
–	14F0050	1	- Switzerland (German)
–	14F0050	1	- Switzerland (Italian)
–	13F9978	1	- Turkey
–	14F0032	1	- UK/Ireland
–	93F2364	1	- U.S.
–	13F9978	1	- Yugoslavia/Latvia
			Power cords for the following countries are controlled in those countries.
			Bangladesh, Brunei, China, Hong Kong, Indonesia, Macau, Malaysia, Myanmar, Philippines, Singapore, Sri Lanka, Thailand

Assembly 6: Keyboard and Mouse

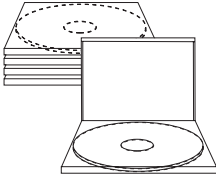


Asm-Index	Part Number	Units	Description
6-1			Keyboard (104-Key)
-1	07H0673	1	- Arabic
-1	07H0675	1	- Belgium/Dutch
-1	07H0674	1	- Belgium/French
-1	07H0676	1	- Bulgarian
-1	07H0672	1	- Brazil/Portugal
-1	07H0668	1	- Canada (French)
-1	07H0677	1	- Czech
-1	07H0678	1	- Danish
-1	07H0679	1	- Dutch
-1	07H0680	1	- French
-1	07H0681	1	- German
-1	07H0683	1	- Greek
-1	07H0684	1	- Hebrew

Assembly 6: (continued)

-1	07H0685	1	- Hungarian
-1	07H0687	1	- Italy
-1	07H0670	1	- Latin America
-1	07H0688	1	- Norwegian
-1	07H0689	1	- Polish
-1	07H0690	1	- Portuguese
-1	07H0691	1	- Romania
-1	07H0693	1	- Russian
-1	07H0692	1	- Russian/Cyrillic
-1	07H0695	1	- Slovak
-1	07H0696	1	- Spanish
-1	07H0697	1	- Swedish/Finnish
-1	07H0698	1	- Swiss-French/German
-1	07H0699	1	- Turkish
-1	07H0701	1	- UK English
-1	07H0703	1	- U.S. English (ISO 9995 Compliant)
-1	07H0666	1	- U.S./Canada
-1	07H0702	1	- Yugoslavia/Latvia
-2	76H5080	1	Mouse
-NS	07H0664	1	Ball and Clip for Mouse

Assembly 7: Software



CD-ROM

Asm-Index	Part Number	Units	Description
7- -			<p>Preloaded Software Recovery CD Diagnostics and Utilities CD</p> <p>Aptiva owners need to call their local IBM HelpCenter to order a replacement of the preloaded Software Recovery CD.</p> <p>Aptiva owners and servicers need to call their local IBM HelpCenter to order a replacement of the Diagnostics and Utilities CD.</p>

Part Number Index

Part Number	Asm-Index	Page	Part Number	Asm-Index	Page
04H6905	4-NS	7-11	07H1629	4-NS	7-11
04H6906	4-NS	7-11	07H1686	4-NS	7-11
06H1796	2-NS	7-6	07H1687	2-NS	7-6
06H8228	2-17	7-6	10H2924	2-NS	7-5
07H0664	6-NS	7-16		4-2	7-10
07H0666	6-1	7-16	10H3080	1-NS	7-3
07H0668	6-1	7-15	12H2025	2-10	7-5
07H0670	6-1	7-16	12J3988	4-NS	7-11
07H0672	6-1	7-15	13F9978	5-	7-13
07H0673	6-1	7-15		5-	7-13
07H0674	6-1	7-15		5-	7-13
07H0675	6-1	7-15		5-	7-13
07H0676	6-1	7-15		5-	7-13
07H0677	6-1	7-15		5-	7-13
07H0678	6-1	7-15		5-	7-13
07H0679	6-1	7-15		5-	7-14
07H0680	6-1	7-15		5-	7-14
07H0681	6-1	7-15		5-	7-14
07H0683	6-1	7-15		5-	7-14
07H0684	6-1	7-15		5-	7-14
07H0685	6-1	7-16		5-	7-14
07H0687	6-1	7-16		5-	7-14
07H0688	6-1	7-16		5-	7-14
07H0689	6-1	7-16		5-	7-14
07H0690	6-1	7-16		5-	7-14
07H0691	6-1	7-16		5-	7-14
07H0692	6-1	7-16		5-	7-14
07H0693	6-1	7-16		5-	7-14
07H0695	6-1	7-16		5-	7-14
07H0696	6-1	7-16	13F9996	5-	7-13
07H0697	6-1	7-16	13H8078	2-1	7-5
07H0698	6-1	7-16	14F0014	5-	7-14
07H0699	6-1	7-16	14F0032	5-	7-13
07H0701	6-1	7-16		5-	7-14
07H0702	6-1	7-16	14F0050	5-	7-14
07H0703	6-1	7-16		5-	7-14
07H1150	2-6	7-5		5-	7-14
07H1627	4-NS	7-11	14F0068	5-	7-14

Part Number	Asm-Index	Page	Part Number	Asm-Index	Page
14F0086	5-	7-14	75H9292	4-NS	7-11
34G1861	1-2	7-3	76H1572	4-NS	7-11
	2-5	7-5	76H1585	2-NS	7-5
41H7675	3-1	7-8	76H1617	4-NS	7-10
41H7819	2-NS	7-5	76H1684	4-NS	7-11
	4-NS	7-10	76H1686	4-NS	7-11
41H7820	4-NS	7-10	76H1758	4-5	7-10
42H0343	1-1	7-3	76H1760	4-5	7-10
42H0344	2-4	7-5	76H1762	4-5	7-10
42H0345	2-3	7-5	76H1777	2-NS	7-5
42H0347	2-2	7-5	76H3226	3-3	7-8
42H0348	1-NS	7-3	76H3658	2-NS	7-6
42H4865	2-17	7-6	76H4608	3-2	7-8
42H4866	2-17	7-6	76H4762	4-NS	7-11
43G3398	4-NS	7-10	76H4764	4-NS	7-11
55H6630	2-15	7-5	76H5080	6-2	7-16
55H7240	4-4	7-10	76H5820	3-2	7-8
60G1995	1-NS	7-3	76H6101	4-1	7-10
60G2077	2-14	7-5	76H6247	4-5	7-10
60G2254	2-11	7-5	76H6249	4-5	7-10
	4-3	7-10	76H6251	4-5	7-10
60G2258	2-9	7-5	76H6253	4-5	7-10
60G2272	4-NS	7-11	76H6915	2-7	7-5
60H6043	4-NS	7-10	76H6916	2-7	7-5
	4-NS	7-10	76H6945	4-5	7-10
60H6045	4-NS	7-10	76H6947	4-5	7-10
60H6046	4-NS	7-10	76H6949	4-5	7-10
60H6047	4-NS	7-10	76H6978	4-NS	7-11
	4-NS	7-10	93F0041	2-18	7-6
60H6048	4-NS	7-10		3-4	7-8
	4-NS	7-10		4-8	7-11
60H6049	4-NS	7-10	93F0063	2-8	7-5
60H6050	4-NS	7-10	93F0067	2-NS	7-6
60H6051	4-NS	7-11	93F2361	3-1	7-8
60H6052	4-NS	7-10	93F2364	5-	7-13
60H6053	4-NS	7-10		5-	7-13
60H6054	4-NS	7-10		5-	7-14
60H6055	4-NS	7-10	93F2365	5-	7-13
75H7498	3-2	7-8		5-	7-14
75H8483	2-15	7-5	93F2366	5-	7-13
75H8905	2-12	7-5		5-	7-14

Part Number	Asm- Index	Page
93F2388	2-1	7-5
93F2389	2-1	7-5
93H2477	2-16	7-6
96G3108	5-1	7-12
96G3109	5-1	7-12
96G3110	5-1	7-13
96G3111	5-1	7-13
96G3112	5-1	7-13
96G3113	5-1	7-13
96G3114	5-1	7-13
96G3115	5-1	7-13
96G3116	5-1	7-13
96G3117	5-1	7-13
96G3118	5-1	7-13
96G3119	5-1	7-13
96G3120	5-1	7-13
96G3121	5-1	7-13
96G3122	5-1	7-13
96G3123	5-1	7-13
96G3124	5-1	7-13

Appendix A. 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.pcco.ibm.com/support.html>

IBM PC Company Support Page on the World Wide Web

<http://www.pc.ibm.com/aptiva/index.html>

Aptiva Home Page

<http://www.pc.ibm.com/files.html>

IBM PC Company Searchable File Library

<http://www.pc.ibm.com/aptiva/help/help.html>

Aptiva - Frequently Asked Questions, Answer Bank, Forum, and Product Specifications

Appendix B. Model/Monitor Configurations and FRU Part Numbers

The models described in this Appendix are Type 2161 **Service Level A (SL-A)** machines. Only factory-installed parts are listed.

If the machine you are servicing 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 (in the U.S., call 1-919-248-3540).

Tables B-2 through B-6 outline by model the FRUs that may be ordered by the part number indicated. You can find the Machine Type 2161 and Model (-XXX) on the front of the system unit.

To determine the correct FRU to install, go to the appropriate country table listed below. Then, look across the top of the country table for the FRU you want to replace. The part number to order is listed by model. For descriptions of system boards and parts, see "Parts Catalog" on page 7-1.

For IBM monitors sold separately from IBM Aptiva system units, see Table B-6 on page B-7.

Table	Page
U.S. and Canada Machine Type 2161 (SL-A)	B-2
Asia-Pacific-North Machine Type 2161 (SL-A)	B-3
Asia-Pacific-South Machine Type 2161 (SL-A)	B-4
EMEA Machine Type 2161 (SL-A)	B-5
Latin America Machine Type 2161 (SL-A)	B-6
Monitor-to-FRU Index	B-7

Table B-1. U.S. and Canada Machine Type 2161 (Factory-Installed Parts).

Model	System Board	Processor	Memory	Hard Drive	Monitor	CD-ROM	Sound	Modem	Power Supply
C8E	93H2477	42H4865	76H6915	76H4608	N/A	76H6101	55H7240	76H1762	75H8483
C8H	93H2477	42H4865	76H6915	76H4608	N/A	76H6101	55H7240	76H1762	75H8483
C8P	93H2477	42H4865	76H6916	75H7498	N/A	76H6101	55H7240	76H1762	75H8483
C8X	93H2477	42H4865	76H6915	76H4608	N/A	76H6101	55H7240	76H1762	75H8483
C9E	93H2477	42H4866	76H6916	76H4608	N/A	76H6101	55H7240	76H1762	75H8483
C9P	93H2477	42H4866	76H6916	76H4608	N/A	76H6101	55H7240	76H1762	75H8483
C9S	93H2477	42H4866	76H6916	76H4608	N/A	76H6101	55H7240	76H1762	75H8483
C9X	93H2477	42H4866	76H6916	76H4608	N/A	76H6101	55H7240	76H1762	75H8483

Notes:

1. CXX Models = U.S.A. and Canada-English. FXX Models = Canada-French.
2. N/A = Not included in model.
3. For software, see page 7-17.
4. For monitor frequencies, see Table B-6 on page B-7.

Table B-2. Asia-Pacific-North Machine Type 2161 (Factory-Installed Parts)

Model	System Board	Processor	Memory	Hard Drive	Monitor	CD-ROM	Sound	Modem	Power Supply
L81, M81	93H2477	42H4865	76H6915	76H4608	N/A	76H6101	55H7240	76H1758	75H8483
L91, M91	93H2477	42H4866	76H6915	76H5820	N/A	76H6101	55H7240	76H1758	75H8483
T81	93H2477	42H4865	76H6916	76H4608	See 7-15.	76H6101	55H7240	76H1760	55H6630
T84	93H2477	42H4865	76H6916	76H4608	N/A	76H6101	55H7240	76H1760	55H6630
T85	93H2477	42H4865	76H6916	76H4608	See 7-15.	76H6101	55H7240	76H1760	55H6630
T94	93H2477	42H4866	76H6916	76H5820	N/A	76H6101	55H7240	76H1760	55H6630
T95	93H2477	42H4866	76H6916	76H5820	See 7-15.	76H6101	55H7240	76H1760	55H6630

Notes:

1. LXX Models = Hong Kong.
2. MXX Models = Taiwan.
3. TXX Models = Japan.
4. N/A = Not included in model.
5. For software, see page 7-17.
6. For monitor frequencies, see Table B-6 on page B-7.

Table B-3. Asia-Pacific-South Machine Type 2161 (Factory-Installed Parts)

Model	System Board	Processor	Memory	Hard Drive	Monitor	CD-ROM	Sound	Modem	Power Supply
D84, E84, F84	93H2477	42H4865	76H6915	76H4608	N/A	76H6101	55H7240	76H1758	75H8483
D95, E95, F95	93H2477	42H4866	76H6915	76H4608	N/A	76H6101	55H7240	76H1758	75H8483

Notes:

1. DXX Models = Asean (which includes Singapore, Indonesia, Malaysia, India, Vietnam, and Thailand).
2. EXX Models = Australia.
3. FXX Models = New Zealand.
4. N/A = Not included in model.
5. For software, see page 7-17.
6. For monitor frequencies, see Table B-6 on page B-7.

Table B-4. EMEA Machine Type 2161 (Factory-Installed Parts).

Model	System Board	Processor	Memory	Hard Drive	Monitor	CD-ROM	Sound	Modem	Power Supply
460	93H2477	42H4865	76H6915	75H7498	Express- Repair	76H6101	55H7240	See 7-9.	75H8483
461	93H2477	42H4865	76H6915	76H4608	Express- Repair	76H6101	55H7240	See 7-9.	75H8483
471	93H2477	42H4866	76H6915	76H5820	Express- Repair	76H6101	55H7240	See 7-9.	75H8483

Notes:

1. N/A = Not included in model.
2. For software, see page 7-17.
3. For monitor frequencies, see Table B-6 on page B-7.

Table B-5. Latin America Machine Type 2161 (Factory-Installed Parts)

Model	System Board	Processor	Memory	Hard Drive	Monitor	CD-ROM	Sound	Modem	Power Supply
G34, H34, J34	93H2477	06H8228	76H6915	75H7498	See 7-15.	76H6101	55H7240	76H1758	75H8483
G82, H82, J82	93H2477	42H4865	76H6915	76H4608	See 7-15.	76H6101	55H7240	76H1758	75H8483

Notes:

1. GXX Models = Argentina, Paraguay, Uruguay.
2. HXX Models = Latin America.
3. JXX Models = Brazil.
4. N/A = Not included in model.
5. For software, see page 7-17.
6. For monitor frequencies, see Table B-6 on page B-7.

Table B-6 applies only to monitors sold with **Service Level A** computers. The monitor part number can be found on the back of the monitor.

See “Assembly 6: Keyboard and Mouse” on page 7-15 for FRU part numbers.

<i>Table B-6 (Page 1 of 2). Monitor-to-FRU Index and Monitor Frequency Settings</i>		
Monitor Part Number	FRU Number	Monitor Frequency (KHz)
96G2007	96G2008	37.9
96G1572	96G3108 Express-Rpr	37.9
96G1578	96G3109	37.9
96G1569	96G3110	56.0
96G1570	96G3111	56.0
96G1567	96G3112	56.0
96G1571	96G3113	56.0
96G2875	96G3114	56.0
96G1573	96G3115	56.9
96G1574	96G3116 Express-Rpr	56.9
96G1579	96G3117	56.9
96G1575	96G3118	56.9
96G1576	96G3119	56.9
96G1581	96G3120	56.9
96G1870	96G3121 Express-Rpr	64.0
96G1871	96G3122	64.0
96G1892	96G3123	64.0
96G1893	96G3124	64.0
69H8990		64.0
69H8991		64.0
Note: Express-Rpr is the EMEA Central Repair Service Center.		

Index

Numerics

- 2161 (SL-A) 1-6
- 3.3 V dc power connector 5-18
- 3.5-in. diskette drive check 2-43
- 3.5-in. drive, removing 4-4
- 33.6 Kbps DSVD factory-installed modem adapter check 2-55
- 5.25-in. diskette drive, removing 4-6

A

- adapter card check 2-49
- adapter cards, removing 4-9
- advanced diagnostics diskette 3-4
- advanced diagnostics tests 3-8
- ANSI interface 1-10
- Asia-Pacific-North models, table B-3
- Asia-Pacific-South models, table B-4
- auto configure adapter cards 1-20

B

- battery, on system board 4-15
- beep codes 2-24
- bulletin board service, BBS A-1

C

- cache memory, removing 4-13
- Canada models, table B-2
- Canadian Department of Communications Statement xviii
- CD-ROM drive 1-8
- CD-ROM jumper settings 5-13
- check procedures
 - 33.6 Kbps DSVD modem adapter check 2-55
 - adapter card check 2-49
 - CD-ROM check 2-46
 - device presence check 2-40

check procedures (*continued*)

- installed devices check 2-43
- keyboard check 2-37
- memory check 2-35
- monitor check 2-59
- mouse check 2-39
- power check 2-32
- riser card check 2-49
- sound card check 2-49
- undetermined problem check 2-63
- CompuServe online support A-1
- connectors
 - diskette 5-18
 - hard disks 5-19
 - keyboard 5-17
 - modem wake up on ring 5-17
 - monitor I/O signal cable 5-15
 - monitor/signal 5-16
 - mouse 5-17
 - parallel port 5-16
 - power 5-18
 - rapid resume 5-17
 - serial ports 5-17
 - speaker 5-17
 - switch 5-17
- core/bus frequency ratio settings 5-5
- creating a bootable advanced diagnostic diskette 3-4
- creating a diagnostic diskette 3-4

D

- device presence check 2-40
- diagnostic menus
 - select a test 3-6
- diagnostic procedures 2-1
- diagnostic programs
 - select a test 3-6
- diagnostic return codes 3-7
- diagnostic test programs 3-6
- diagnostics and utilities 3-3

- diagnostics and utilities CD 7-17
- diagnostics error messages 3-7
- diagnostics programs, QAPLus/PRO 3-3
- diagnostics test groups 3-10
- digital modem 5-9
- DIMM description 1-25
- DIMM identification 1-25
- DIMM, install, remove 4-12
- diskette connector 5-18
- diskette drive 1-8
- diskette drive, 5.25-in., removing 4-6
- diskettes, formatting 3-13
- display (monitor) self test 3-17
- displays
 - See monitors (displays)
- drive device check 2-46

E

- error codes 2-27
- error history, POST 1-24
- error messages 3-7
- ESD-sensitive parts, handling 4-18

F

- fax-back service A-1
- field replaceable units (FRUs) 7-1
- formatting diskettes 3-13
- FRUs 7-1

G

- general information 1-1

H

- handling ESD-sensitive parts 4-18
- hard disk connectors 5-19
- hard disk drive 1-9
- hard disk drive check 2-43
- hard disk drive jumper settings 5-10
- hard disk drive, removing 4-7, 4-8
- hardware configuration
 - changes 1-14—1-20

- hardware interfaces 1-10
 - I/O adapter cards 1-10
 - monitors 1-10
 - parallel 1-10
 - serial 1-10
 - USB 1-10
- history, POST errors 1-24
- Home Director 4-19
- Home Director technical service and support 4-19

I

- I/O adapter cards, interfaces 1-10
- IBM-Online HelpCenter A-1
- icon 3-2
- IDE connector 5-10
- index of symptoms, messages, error codes, or beeps 2-9
- indicator LED and cable, removing 4-16
- installed devices check 2-43

K

- keyboard 1-9
- keyboard check 2-37
- keyboard connector 5-17

L

- Latin America models, table B-6
- layout
 - See system board layout
- lithium battery, removing 4-15
- load number xx
- loading the advanced diagnostics diskette. 3-4
- loading the diagnostics and utilities CD-ROM 3-3
- locations, system board 5-3

M

- machine type - (SL-A) 1-6

MAPs

See check procedures

memory check 2-35
memory, system 1-25
message index 2-9
microphone 1-8
model configurations
 Asia-Pacific-North models B-3
 Asia-Pacific-South models B-4
 EMEA models B-5
 Latin America models B-6
 monitor-to-FRU B-7
 U.S. and Canada models B-2
models, list of B-1
modem adapter card 1-7
modem adapter, 33.6 Kbps DSVD 2-55
modem jumpers 5-9
modem wake up on ring connector 5-17
monitor check 2-59
monitor connector test points 5-15
monitor I/O signal cable 5-15
monitor-to-FRU table B-7
monitor/signal connector 5-16
monitors (displays)
 SVGA 1-9
monitors sold separately 7-12, B-7
monitors, interface 1-10
mouse 1-9
mouse check 2-39
mouse connector 5-17
multimedia 1-8

N

notices vii

O

online support information A-1
operating requirements 1-28
ordering FRUs B-1

P

P54C-133 MHz processor 1-7
P55C-166 MHz processor 1-7
P55C-200 MHz processor 1-7
parallel port connector 5-16
parallel, interface 1-10
part numbers, software FRUs 7-17
parts catalog 7-1
parts/test point locations 5-1
plug and play adapter cards 1-20
plug and play screen 1-20
positionnement du sélecteur de tension viii
POST 1-3, 3-2
POST error codes 2-3
POST error history 1-24, 2-63
 printing 2-63
 viewing 2-63
power check 2-32
power connector 5-18
power supply 1-8
power supply specifications 5-6
power supply, removing 4-10
power-on password, CMOS reset 1-12
power-on self test 3-2
preloaded software recovery CD 7-17
primary hard disk drive connector (IDE) 5-10
processor speed
 processor speed jumpers 5-4
processor upgrade, removing 4-14
processors
 P54C-133 MHz 1-7
 P55C-166 MHz 1-7
 P55C-200 MHz 1-7
product description 1-6

Q

QAPLus diagnostic diskette 3-4
QAPLus/PRO diagnostics 3-3

R

- RAM 1-25
- rapid resume manager 1-22
- recovery software installation 4-23
- refresh rates and monitor frequencies 1-11
- removing parts
 - machine type 2161 4-2
 - 3.5-in. bays 4-4
 - 5.25-in. bays 4-6
 - adapter cards 4-9
 - battery 4-15
 - cache 4-13
 - cover 4-3
 - DIMMs 4-12
 - hard disk drive 4-7
 - LED and cable 4-16
 - power supply 4-10
 - processor 4-14
 - processor removal 4-14
 - riser card 4-11
 - system board 4-17
- repair information 4-2
- repair, Home Director 4-19
- replacement parts B-1
- replacements 4-2
- return codes, diagnostic 3-7
- riser card
 - voltages 2-57

S

- safety information ix
- safety inspection guide 6-1
- safety notice translations x
- secondary hard disk drive connector 5-10
- serial port connector 5-17
- serial, interface 1-10
- setup utility 1-14—1-20
- software installation 4-23
- software recovery CD 7-17
- sound adapter card 1-8
- sound card 5-8

- sound card (*continued*)
 - connectors, sound card 5-8
 - sound card connectors 5-8
- speaker connector 5-17
- speakers 1-8
- specifications 1-26
- starting diagnostics 2-2
- SVGA 1-9
- SVGA multi-scanning 1-9
- switch connector 5-17
- symptoms, messages, error codes, or beeps index 2-9
- system board layout 5-2
- system board, removing 4-17
- system bus clock
 - processor system jumpers 5-4

T

- test groups, diagnostics 3-10
- test programs, diagnostics 3-8
- testing, QAPIus/PRO 3-3
- tools, special 1-28
- trademarks xxi

U

- U.S. models, table B-2
- undetermined problem check 2-63
- upgrade processor, removing 4-14
- using the advanced diagnostics 3-8

V

- VESA local bus
 - local bus connector 1-7
 - notice 1-6
 - riser card 7-5
- voltage supply switch settings vii
- voltages, power supply 5-6

W

- Wake Up on Ring modem connector 2-55

world wide web, WWW A-1

Z

Zip drive check 2-43

Zip drive jumper settings 5-14



Printed in U.S.A.

International Business Machines Corporation
Old Orchard Road,
Armonk, New York 10504

Part Number: 84H8106
Form Number: S84H-8106-00
01/97

S84H-8106-00

