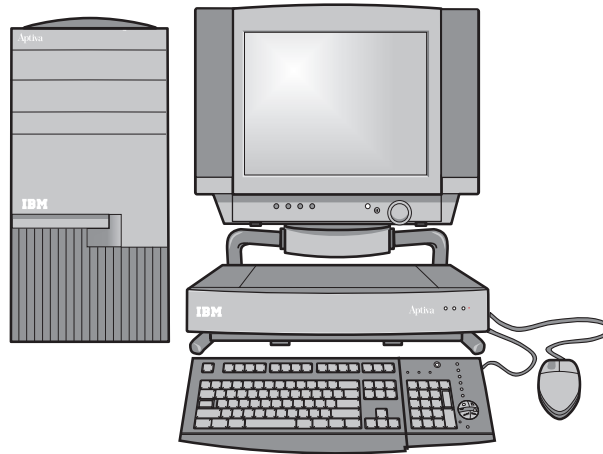


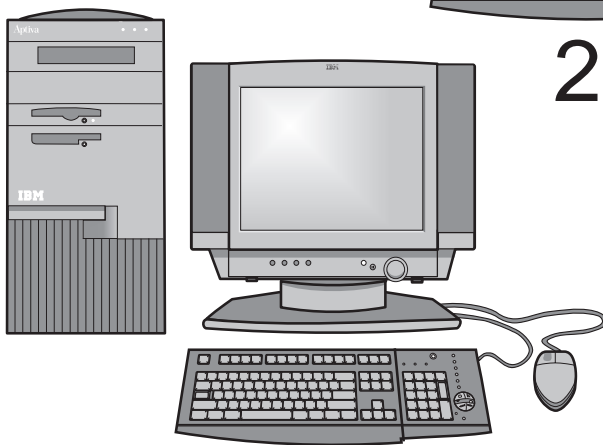
Hardware Maintenance Service for Service Level A



Machine Types 2140 and 2142
and IBM Monitors



2142



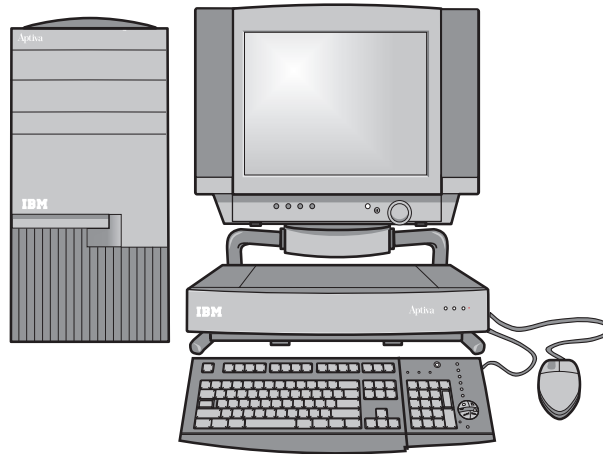
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Aptiva

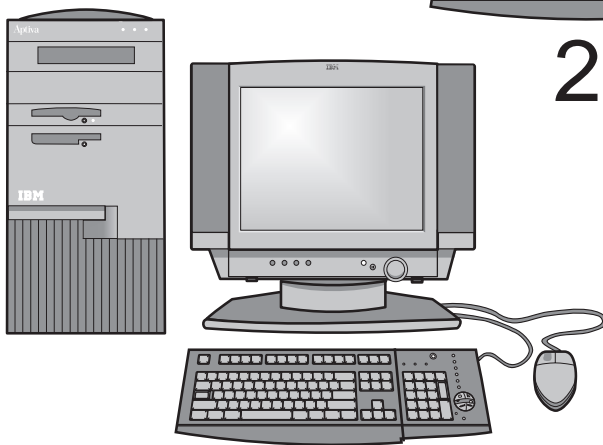
Hardware Maintenance Service for Service Level A



Machine Types 2140 and 2142
and IBM Monitors



2142



2140

Aptiva

Second Edition (January 1998)

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Voltage Supply Switch Settings

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

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

Voltage Supply Range	Voltage Switch Setting
100–127 V	115 V or 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.

B minden FRU eltávolítását megelőzően a számítógépet, figyelje ki a vezetékeket a dugaszoló aljzatokról, távolítsa el az elemet (ha arról működik a készülék), majd csatlakoztatja a többi csatlakoztatott kábelt.

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 odstránením ľubovoľného náhradného diela vypnite počítač, odpojte napájacie káble z elektrických zásuviek, odpojte batériu (ak je inštalovaná), potom odpojte prepojujúce 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 lítium elemek tüzet, robbanást vagy komoly égési sérüléseket okozhatnak. Nem szabad újratölteni, polarizált csatlakozójából eltávolítani, szétszedni, 100°C (212°F) feletti hőmérsékletre felhevíteni, elégetni, vagy az elem cellájának tartalmát nedvesség hatására kitenni. Az elem megsemmisítésének a helyi rendelkezések és szabályzatok alapján kell történnie. Csak a tartozékok listájában meghatározott típusú elemeket használja. Nem megfelelő elem használata esetén az elem felhevülhet és szétrobbanhat.

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.

Li batéria môže zapríčiniť požiar, výbuch alebo ťažké popáleniny. Batériu nanabíjajte neodstráňte polarizované konektory, nerozoberajte, nezohrievajte nad 100°C (212°F), nespôlňte ju alebo nepokladajte články batérie do vody. Zbavte sa batérie podľa požadovaných lokálnych predpisov a pravidiel. Použite iba v-rozcom odporúčanú batériu. Použitie nevhodnej batérie môže spôsobiť vznik požiaru alebo výbuchu batérie.

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 lúčom.

**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

IBM Aptiva Type 2140, 2142

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.

Responsible Party:

International Business Machines Corporation
Old Orchard Road
Armonk, NY 10504
Telephone: 1-919-543-2193

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.

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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

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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.

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 Power Management is enabled, a shorter version of POST is initiated—see “Power Management” on page 1-21). 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, and no beep 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 settings for the hard disk drive, CD/DVD-ROM drive, and Zip drive.

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)** model of the IBM Aptiva Personal Computer, worldwide.

The Machine Type 2140 and Machine Type 2142 are minitower systems containing slots for six adapter cards and bays for six input/output devices (drives)

The Machine Type 2142 comes with the Media Console which contains the diskette drive, CD/DVD-ROM drive, Zip drive (model dependent), keyboard and mouse ports, and operator controls.

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 2140 and 2142 will support Internal or External video, but not both simultaneously.

Security: Power-on password. See "Power-On Password, CMOS Reset" on page 1-14.

System Boards: Two system boards are available: Type A-1 and Type A-2. See "System Board Layout—Type A-1" on page 5-2 and "System Board Layout—Type A-2" on page 5-5 for system board jumper and connector locations.

The Type A-1 system board supports the Pentium processor with MMX and has the following features:

Pentium MMX socket 7-ZIF connector. You must remove the old processor to install an upgrade processor.

32 KB internal cache memory, with 512 KB external cache soldered onto the system board. Cache is not upgradeable.

Trident, on board, 9750 DVD 64-bit GUI video and 3-D Accelerator with 2 MB SGRAM video memory, upgradeable to 4 MB with a 2 MB SODIMM SGRAM upgrade module.

Three, 168-pin Gold DIMM memory module sockets support these memory modules:

- 8 MB, 16 MB, 32 MB, 64 MB or 128 MB DIMM modules.
- 60 ns Gold SDRAM

Maximum system board memory is 384 MB.

See Appendix B, “Model/Monitor Configurations and FRU Part Numbers” on page B-1 for memory configuration. Refer to “System Memory” on page 1-27.

Ports: parallel, serial, mouse, keyboard, USB(two), video, MIDI/Joystick, audio out/in/mic.

Connectors for:

- PCI/ISA adapter cards
- VESA Video Feature Bus (2x13 un-shrouded header)¹
- Internal VGA display (2x7 shrouded header)
- 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/DVD-ROM drive and one hard disk drive, or two hard disk drives.
- Power light-emitting diode (LED)/hard disk LED (4-pin)

Power-on switch 2-wire connector and a power supply auxiliary control 3-wire connector for Power Management features.

Lithium battery.

¹ See “VESA Local Bus Note” on page 1-6.

The Type A-2 system board supports Pentium II processors and has the following features:

512 KB internal cache memory. Cache is not upgradeable.

ATI- Rage Pro video and 3-D Accelerator with 2 MB SGRAM video memory, upgradeable to 4 MB with a 2 MB SODIMM SGRAM upgrade module.

Three, 168-pin Gold DIMM memory module sockets support these memory modules:

- 8 MB, 16 MB, 32 MB, 64 MB, or 128 MB DIMM modules.
- 60 ns Gold SDRAM

Maximum system board memory is 384 MB.

Ports: parallel, serial, mouse, keyboard, USB(two), video, MIDI/Joystick, audio out/in/mic. mouse, and video.

Connectors for:

- PCI/ISA riser card (212-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/DVD-ROM drive and one hard disk drive, or two hard disk drives.

Power light-emitting diode (LED)/hard disk LED (4-pin)

Power-on switch 2-wire connector and a power supply auxiliary control 3-wire connector for Power Management features.

Lithium battery.

Processors

One of the following processors can be installed on the Type A-1 system board:

- Pentium Pentium MMX-166 MHz²
- Pentium Pentium MMX-200 MHz
- Pentium Pentium MMX-233 MHz

² MHz measures only processor internal clock speed, not application performance. Many factors affect application performance.

One of the following processors can be installed on the Type A-2 system board:

- Pentium II-233 MHz
- Pentium II-266 MHz
- Pentium II-300 MHz
- Pentium II-333 MHz

Power Supplies (with Power Management Features)

The power supply is a 200-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 Power Management 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 and a voice modem cable are also included.

Diskette Drive—AT-type

All models contain a 3.5-in. 1.44 MB slimline diskette drive. Some models come with a 100 MB internal Zip drive.

Multimedia

Depending on model, 24X Max or 32X Max CD-ROM,³ or DVD-ROM IDE/AT drive.

An audio cable

A CD/DVD-ROM drive system interface cable.

Microphone and speaker (integrated with monitor).

³ 24X Max or 32X Max CD-ROM drives run at a constant speed. This causes a data transfer rate of ten-speed (fourteen-speed for 32X) reading at the disk hub and twenty four-speed (thirty two-speed for 32X) reading at the disk edge.

One pair of external subwoofers (on some models).
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 maximum of 14 ms average access time. Access time varies by the hard disk drive and the hard disk drive manufacturer.

Monitors

MM55 (Type 2116)

- 15 inch FST CRT with a viewable image size of 13.6 inches (347 mm) with a 0.28mm dot pitch.
- Integrated speakers (not powered, requires system amplifier).
- Power switch/volume control.
- OSD (On Screen Display).
 - Video - contrast, brightness, horizontal size, horizontal position, vertical size, vertical position, pincushion, trapezoid, parallelogram, rotation (tilt), color temperature, display current horizontal and vertical signal frequency, degauss, recall factory settings.
 - Audio - balance, bass, treble, fade.
 - All audio function dependent on system unit.
- External headphone, microphone, and USB connectors.
- 2.1 meter interface cable.
- Power management (system dependent).
- Connector for detachable grounded 3-wire power cord.
- Auto-sensing power supply 88-264 VAC 50/60Hz.

MM75 (Type 2128)

- 17 inch FST CRT with a viewable image size of 15.7 inches (399 mm) with a 0.28mm dot pitch.
- Integrated speakers (not powered, requires system amplifier).
- Power switch/volume control.
- OSD (On Screen Display).
 - Video - contrast, brightness, horizontal size, horizontal position, vertical size, vertical position, pincushion, trapezoid, parallelogram, rotation (tilt), color temperature, display current horizontal and vertical signal frequency, degauss, recall factory settings.
 - Audio - balance, bass, treble, fade.

- All audio function dependent on system unit.
- External headphone, microphone, and USB connectors.
- 2.1 meter interface cable.
- Power management (system dependent).
- Connector for detachable grounded 3-wire power cord.
- Auto-sensing power supply 88-264 VAC 50/60Hz.

Keyboard

Aptiva EZ button keyboard with 1.8-m (6-foot) cable

Mouse

ScrollPoint 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.

<i>Table 1-1. Hardware Interfaces</i>	
Item	Interface
Hard disk drives	IDE 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 1-13. 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/DVD-ROM drive	AT IDE, extended architecture (XA) enabled drive
Sound adapter card	MM3: Sound Blaster (Creative Labs, Inc.) MM4: Aria 16 (Prometheus Products, Inc.) Mwave: Combination Modem/Sound Card
Joystick	Industry-standard device

Refresh Rates and Monitor Frequencies

This section provides the refresh rates and monitor frequencies for Type A-1 and Type A-2 system boards.

Refresh Rates and Monitor Frequencies—Type A-1

The following table lists the maximum vertical refresh rates for the Type A-1 system board, which contains a Trident 9750 video chip with 2 MB video memory

<i>Table 1-2. Vertical Refresh Rates (Hz)</i>				
Type A-1 System Board with a Trident 9750 Video Chip with 2 MB DRAM				
Resolution →	640x480	800x600	1024x768	1280x1024
Color ↓				
256	85 Hz.	85 Hz.	85 Hz.	60 Hz.
64,000	85 Hz.	85 Hz.	85 Hz.	60 Hz.
16,000,000	85 Hz.	85 Hz.	85 Hz.	60 Hz.

Refresh Rates and Monitor Frequencies—Type A-2

The following table lists the maximum vertical refresh rates for the Type A-2 system board, which contains a ATI-Rage Pro video chip with 2 MB DRAM.

<i>Table 1-3. Maximum Vertical Refresh Rates (Hz)</i>				
Type A-2 System Board with a ATI-Rage Pro Video Chip with 2 MB DRAM				
Resolution →	640x480	800x600	1024x768	1280x1024
Color ↓				
256	85 Hz.	85 Hz.	85 Hz.	75 Hz.
64,000	85 Hz.	85 Hz.	85 Hz.	75 Hz.
16,000,000	85 Hz.	85 Hz.	85 Hz.	75 Hz.

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 jumper by referring to “System Board Layout—Type A-1” on page 5-2 and “System Board Layout—Type A-2” on page 5-5, 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.

3. Locate the power on password jumper on the system board.

System Board Type	Jumper
System Board Type A-1	Password Jumper JP6
System Board Type A-2	Password Jumper JP3

4. Move the jumper from pins 1-2 to pins 2-3 to erase the password. See “System Board Layout—Type A-1” on page 5-2 and “System Board Layout—Type A-2” on page 5-5.
5. The system detects the change and the password, time, and date are erased from memory. Power Management settings are also deleted. (See “Power Management” on page 1-21.)
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 Power Management settings. See “Power Management” on page 1-21.)

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 Power Management feature enabled, run the Setup Utility and check to see if Power Management is enabled (Suspend Timer not off and APM Connection Enabled).

Flash (BIOS) Update Procedure

Attention

The system board Flash Enable jumper 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—Type A-1” on page 5-2 and “System Board Layout—Type A-2” on page 5-5.

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.

Amplifier Card BIOS

Type 2140, 2142 computers come with either a Tier 1 or Tier 2 amplifier card.

Tier 1 amplifier card has one speaker output jack

Tier 2 amplifier card has two output jacks; one for the speakers and one for the sub woofer.

When replacing a system board, the BIOS setting on the new system board must match the amplifier card that is installed in the computer.

New A-1 and A-2 system boards for Type 2140, 2142 are coded for the Tier 1 amplifier card. If the computer you are servicing has a Tier 1 amplifier card, no BIOS coding is necessary.

If you order a new system board for a 2140, 2142 that has a Tier 2 amplifier card, the amplifier card BIOS must be set to match the Tier 2 amplifier card.

Amplifier Card BIOS Setting

Attention

The Amplifier BIOS update procedure must be run from a **Safe Mode Command Prompt**.

Care must be taken to make certain that the BIOS setting matches the actual amplifier card (Tier 1, Tier 2) installed. The sound system will not function properly with the incorrect setting.

1. Determine the amplifier card installed. From the rear of the computer, there will either be:
 - One mini DIN connector (speaker), Tier 1,
-- or --
 - Two mini DIN connectors (speakers and sub woofer), Tier 2.
2. Determine the system BIOS setting for the amplifier card.
Reboot the computer to a **Safe Mode Command Prompt**.
 - a. Select **Start** from the lower left desktop.
 - b. Select **Restart The Computer**, then Select **Enter**.
 - c. When **Starting Windows 95** displays at top left corner of screen, depress **F8**.
 - d. Select **Safe Mode Command Prompt Only** from the menu.
 - e. At the C: prompt, type **DEBUG** and press the **Enter** key.

- f. At the dash “-” prompt, Type **d fffa:0** , then press the **Enter** key.
 - g. The right side of the screen will display the Serial Number (**23AXXX**), Tier audio card, **TIERx_AUDIO**, and system model number (**214X**).
 - h. The “x” in the **TIERx_AUDIO** denotes the Tier card the computer is set to use.
3. If the amplifier card installed matches the type listed in step 2, no action is required.
 4. If the amplifier card installed **does not** match the type listed in step 2, you must run the appropriate update to match the amplifier card to the system board.

Updating Amplifier Card BIOS

To update the amplifier card BIOS:

1. Insert the Diagnostics and Utilities CD in the CD/DVD-ROM drive.
2. Power-off, then power-on the system unit.
3. When the **Aptiva Diagnostics and Utilities Menu** appears, depress the **Zero** key to select the DOS screen. The A drive prompt will appear.
4. Select the CD/DVD-ROM drive (the CD/DVD-ROM drive default is G:).
5. At the G: prompt, type:

CD\DISK\CRYSTAL\CLYDE\RCAND15\INSTALL\DISK0

then press the **Enter** key.

6. If a Tier 1 amplifier card is installed in the computer, type **TIER1.BAT** at the DOS command prompt.
7. If a Tier 2 amplifier card is installed in the computer, type **TIER2.BAT** at the DOS command prompt.
8. If the system monitor is not a Type 2116 (MM55) or Type 2128 (MM75), type **TIER0.BAT** at the DOS command prompt.

Attention

Type 2140, 2142 computers are designed for use with the MM55 or MM75 monitors only. The use of a different monitor might cause sound and functionality problems.

9. Remove the Diagnostics and Utilities CD from the CD/DVD-ROM drive and restart the computer.
10. Go to “Amplifier Card BIOS Setting” on page 1-16 to verify the setting matches the amplifier card installed in the computer.

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 Power Management 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 on the computer, press **F1** when the IBM APTIVA logo appears.

- 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 1-20).

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).

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.

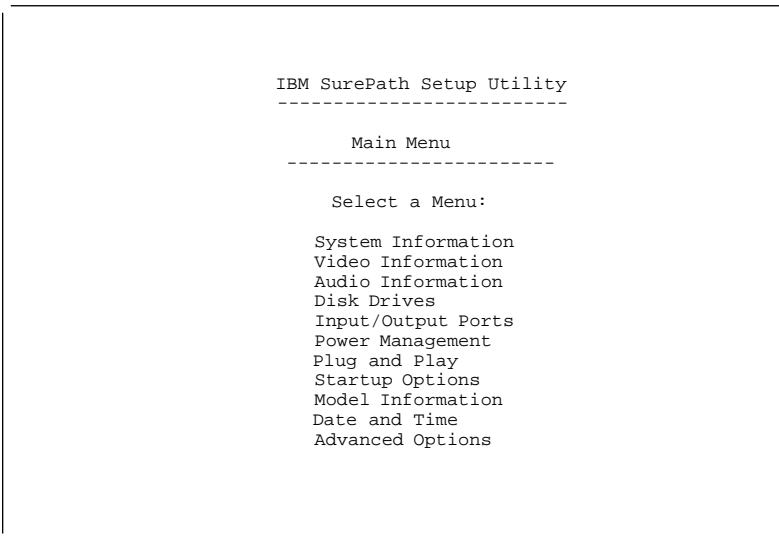


Figure 1-1. Setup Utility Screen

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 screen provides information about the installed video controller. For more information on monitors, monitor frequencies, and refresh rates, see “Hardware Interfaces” on page 1-12.

Disk Drives: This screen provides information about the installed diskette drives, hard disk drives, and CD/DVD-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/DVD-ROM to the computer, see “System Board Layout—Type A-1” on page 5-2 and “System Board Layout—Type A-2” on page 5-5. If both a CD/DVD-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/DVD-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 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 A 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.

Power Management: This screen provides information about the Power Management features. Power Management puts the computer in a low power state when the suspend function is invoked in the operating system. See “Using Power Management Utilities” on page 1-24 for more information.

Power Management can:

Put the computer in a Suspend mode to conserve energy when you have not used the mouse, keyboard, or hard disk for an amount of time you select.

Automatically Resume the computer when the phone rings so that the computer can receive a fax or take a message.

Automatically power-on and power-off the computer when using Home Director.

The following are the Power Management options you can change:

- Suspend Timer
- Check Keyboard and Mouse Activity
- Check Disk Drive 1 and 2 Activity
- Check Disk Drive 3 and 4 Activity
- Check Diskette Drive Activity
- Check Serial Port Activity
- Check Parallel Port Activity
- Check Modem Activity
- APM Connection

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 :
12 noon is 12:
1 p.m. is 13:

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 Power Management Utilities

Power Management Utilities are accessed from the Access Aptiva screen in Windows 95.

To access Power Management Utilities:

Click on **Start** from the Desktop

Select **Access Aptiva**

Select **Control**

Under Access Aptiva - Control, select either:

Conserve Energy (Suspend)

- or -

Schedule Events to Occur (Scheduler)

Power Management Utility Features

The Power Management Utilities have the following features:

Suspend: The Suspend feature will conserve energy when the computer is inactive for a particular period of time. You can select the period of time or select 'Off' to disable the Suspend option.

Scheduler: The Scheduler program automatically starts an event at anytime, even if the computer is suspended.

The following table describes the way the computer will normally operate when one of the Power Management Utility features is enabled.

<i>Table 1-4. Power Management Utility Normal Operation</i>	
What Happens	Explanation
Delay before mouse works.	This is normal for the Suspend feature of Power Management. It might take a few seconds.
Computer wakes up when the phone rings.	This is a normal feature of the - Wake Up When the Telephone Rings feature. This can be disabled in the Control Panel, Power Utility.
Computer wakes up when you haven't pushed the on/off button.	This is a normal feature of Scheduler. If you don't want this to happen, close the Scheduler application.

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** when the IBM APTIVA logo 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.

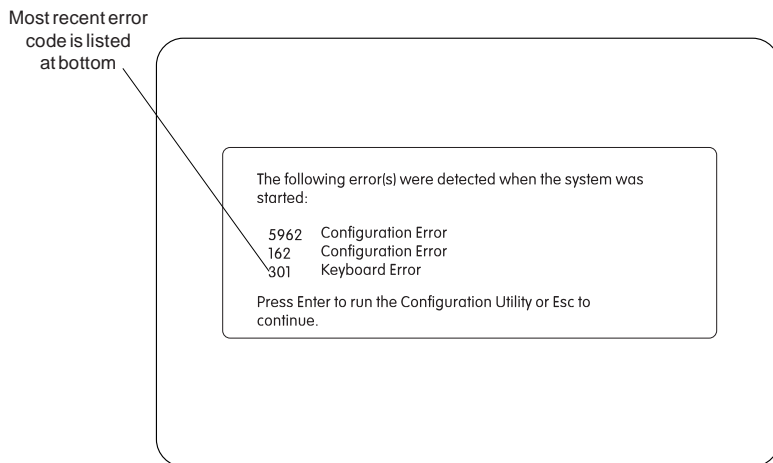


Figure 1-2. POST Error History

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

System Memory

Both Type A-1 and Type A-2 system boards support 168-Pin 60 ns, Gold, SDRAM, 64 bit Dual Inline Memory Module, (DIMM).

Maximum memory supported by Type A-1 and Type A-2 system boards is 384 MB.

DIMM Identification

168-pin memory DIMMs can usually be identified by the information on the chip modules. (for example, 2Mx64, 6 ns, EDO). 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. 1Mx32 is Non parity and 1Mx36 is Parity. 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 2140 system unit

- Width: 362 mm (14.25 in.)
- Depth: 444 mm (17.50 in.)
- Height: 127 mm (5.00 in.)

Machine Type 2142 system unit

- Width: 241 mm (9.50 in.)
- Depth: 438 mm (17.25 in.)
- Height: 432 mm (17.00 in.)

Monitor

- MM55 (Type 2116)
 - Width: 466 mm (18.3 in.)
 - Depth: 410 mm (16.1 in.)
 - Height: 390 mm (15.4 in.) with tilt/swivel stand
- MM75 (Type 2128)
 - Width: 520 mm (20.5 in.)
 - Depth: 441 mm (17.4 in.)
 - Height: 423 mm (16.7 in.) with tilt/swivel stand

Weight:

Machine Type 2140 system unit

- 9 kg (20 lb)
- If CD/DVD-ROM drive installed, 10 kg (22 lb)

Machine Type 2142 system unit

- 10.9 kg (24 lb)
- If CD/DVD-ROM drive installed, 11.8 kg (26 lb)

Monitor

- M55 (Type 2116)
 - 14.5 kg (32 lb)
- M75 (Type 2128)
 - 20.5 kg (45.1 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 2140 system unit

- Typical (as shipped): 170 Btu/hr
- Maximum load: 700 Btu/hr

Machine Type 2142 system unit

- Typical (as shipped): 170 Btu/hr
- Maximum load: 700 Btu/hr

Monitors

- MM55 (Type 2116): 310 Btu/hr (maximum)
- MM75 (Type 2128): 340 Btu/hr (maximum)

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 (Media Console for Type 2142) and one on the display. 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.

MM55 (Type 2116) and MM75 (Type 2168) monitors have universal auto sensing power supplies.

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 Power Management 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 “Power Management” on page 1-21 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 Triplet 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	2-34
Memory	2-37
Keyboard	2-39
Mouse	2-42
Diagnostics and Utilities Device Presence Test	2-43
Media Console Drive Devices	2-46
Factory-Installed Drive Devices	2-47
33.6 Kbps and 56 Kbps DSVD Modem Adapters	2-50
Monitor	2-53
Undetermined Problem	2-56

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 all Type 2140 and Type 2142 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 4-20 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.

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.
2. After one or more 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 error codes occur for:

- Disk Drives
- I/O Devices
- Plug and Play Devices

Go first to the Setup Utility to assure devices are installed.

If you have an XX62 error with no other error codes, run the Setup Utility (see “Using the Setup Utility” on page 1-18) 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 1-14.
- Disconnect all external cables and devices including speakers and microphone from the system unit, except for the keyboard, mouse, and monitor.

(Step **001** continues)

(continued)

001 (continued)

- Power-off the system unit whenever removing or replacing FRUs.
- Remove all adapter cards, except for the factory-installed modem adapter card and any IBM Aptiva factory-installed adapter cards.
- 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 3 hard disk drives plus a CD/DVD-ROM drive installed.)
 - IBM Aptiva factory-installed devices (such as a CD/DVD-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 connected.
- 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.

- Ensure correct monitor refresh rate. See “Refresh Rates and Monitor Frequencies” on page 1-13.
- Note any symptoms, messages, error codes, or beeps.
- Make sure there are no diskettes or CDs in the drives.
- For Home Automation checkout, see “Home Director” on page 4-17.

DOES THE SYSTEM COMPLETE POST WITH NO ERRORS AND DOES AN IBM APTIVA SOFTWARE SCREEN APPEAR?

Note: If Suspend Timer is enabled, answer this question “No.”

Yes No

002

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

To disable Suspend Timer:

1. Make sure the customer saves and closes any open files.
2. Power-off, then power-on the system unit.
3. Press **F1** while the POST Configuration icon is displayed.
4. In the Setup Utility Main Menu, select Power Management and press **Enter**.

(Step **002** continues)

002 (continued)

5. Press the ← key, if needed, to Disable the Suspend Timer
6. Press **Esc** to exit the Power Management menu.
7. Press **Esc** again to exit the screen.
8. Press **Enter** to save the changes and exit the Setup Utility.
9. Suspend Timer is now disabled.

When service is complete, restore the Suspend Timer 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 Power Management and press **Enter**.
4. Press the ← key, if needed, to select Enable in the Suspend Timer field.
5. Press **Esc** to exit the Power Management 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 original Suspend Timer customer setting.

– Go to Step 005.

003

Insert the Diagnostics and Utilities CD for machine Type 2140, 2142 in the CD/DVD-ROM drive.

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

Yes No

004

– Go to “Factory-Installed Drive Devices” on page 2-47.

005

(From step 002)

DO ANY MESSAGES, ERROR CODES, OR SYMPTOMS APPEAR?

Yes No

006

– Go to Step 008 on page 2-6.

(continued)

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/DVD-ROM drive.
- Power-off the system unit.
- Power-on the system unit, and check for the following responses:
 1. Readable instructions or Main Menu

DID THE SYSTEM PRODUCE THE 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 2-39.

If the monitor shows problems, such as jittering, shifting, or being out of focus, go to “Monitor” on page 2-53 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 **Hardware Info** on the menu.
- Select **System Configuration** on the menu.
- Compare the System 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 System Configuration Report.

(Step 010 continues)

010 (continued)

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

Yes No

011

- The System 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 System Configuration Report, return to "Start" on page 2-2 and test the device. If the device can not be tested, replace the device, then the system board.

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:

Check all adapter card jumper settings.

Check all adapter card switch settings.

(Step 014 continues)

(continued)

014 (continued)

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 2-34, "System Board Layout—Type A-1" on page 5-2, and "System Board Layout—Type A-2" on page 5-5.

- 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 2-56.
-

Index of Symptoms, Messages, Error Codes, or Beeps

Table 2-1 on page 2-11 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 2-56.

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 2-34, “System Board Layout—Type A-1” on page 5-2, and “System Board Layout—Type A-2” on page 5-5)
5. Certain models come with a DVD-ROM drive instead of a CD-ROM drive. Diagnose the DVD-ROM drive models the same as the CD-ROM drive models.
6. Type 2142 comes with the Media Console which controls the keyboard, mouse, diskette drive and CD/DVD-ROM drive. Diagnose the Media Console first, before replacing the system board for problems with the keyboard, mouse, diskette, or CD/DVD-ROM drive. Depending on service procedures, replace either the Media Console FRU items or the Media Console.

In Table 2-1 on page 2-11, 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 2-56.

If you observe:	Go to:
Symptoms that are not beeps or error codes	Page 2-11
Beeps in any combination	Page 2-25
Error codes displayed on the screen	Page 2-27

Table 2-1 (Page 1 of 23). 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>Enter the correct address. Memory Module 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.</p>	<p>Audio amplifier card cable, jumpers Sound volume control Speakers System board</p>
<p>Audio software program does not initiate in software but CD/DVD-ROM drive works normally.</p>	<p>System board</p>
<p>Base Memory Test Failed. An error was detected in base memory.</p>	<p>Memory Module System Board</p>
<p>Blinking cursor only and machine not working normally.</p>	<p>“Factory-Installed Drive Devices” on page 2-47. 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 Module System Board</p>

Table 2-1 (Page 2 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Butterfly Cylinder Access Test Failed. Hard Disk Drive Test detected mismatch between the data read and the data stored on the drive.	Hard Disk Drive Hard Disk Drive Cable System Board
Cannot finish diagnostic test.	"Diagnostics and Utilities Device Presence Test" on page 2-43.
3.5-in. diskette drive does not work.	"Factory-Installed Drive Devices" on page 2-47. Diskette drive connection/cable Diskette drive System board
CD/DVD-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.	CD is not inserted properly. CD is damaged. CD has dirt or foreign material on it.
CD/DVD-ROM drive LED comes on when inserting a disc but no CD/DVD-ROM drive icon appears in the 'My Computer' or 'Explorer' as Drive D.	"Factory-Installed Drive Devices" on page 2-47. CD/DVD-ROM drive connections, cables, or jumpers CD/DVD-ROM drive
CD/DVD-ROM drive LED does not come on when inserting a disc in the drive when the system is powered on and the CD/DVD-ROM drive power connector has the correct voltage.	CD/DVD-ROM drive
CD/DVD-ROM drive LED does not come on but CD/DVD-ROM drive works normally.	CD/DVD-ROM drive
CD/DVD-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.	"Factory-Installed Drive Devices" on page 2-47. CD/DVD-ROM drive system connection/cable CD/DVD-ROM drive Power supply

Table 2-1 (Page 3 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
<p>CD/DVD-ROM drive does not read data files and no error codes or messages are displayed.</p> <p>Cannot read from Drive E. Retry loading CD message is displayed with disc loaded in CD/DVD-ROM drive.</p> <p>Sound adapter card works properly.</p>	<p>Check with a known good disc and correct level of software.</p> <p>CD/DVD-ROM drive</p>
<p>CD/DVD-ROM drive does not play an audio disc. Sound function works properly. CD/DVD-ROM drive reads data files.</p>	<p>Check the audio cable on CD/DVD-ROM drive to the system board. If music can be heard through headphones plugged into the audio out jack on the system board, replace the CD/DVD-ROM drive.</p>
<p>Clock Stopped. Real-time clock has stopped working.</p>	<p>RTC Battery System Board</p>
<p>CMOS Clock Test Failed Time and Date Settings for CMOS and DOS do not Match.</p>	<p>RTC Battery System Board</p>
<p>Communication problem. Modem function does not work properly.</p>	<p>"33.6 Kbps and 56 Kbps DSVD Modem Adapters" on page 2-50.</p> <p>Modem 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>
<p>Device is Not Ready Ready the Device... or Press Any Key</p>	<p>Ensure the device is powered on. Replace failing device Device Adapter (if installed) System Board</p>

Table 2-1 (Page 4 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Diskette drive indicator LED remains on or does not light when drive is active.	Diskette drive connection/cable Diskette drive 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 Display
Extended Memory Test Failed. Extended memory error.	Memory Module System Board
Modem function has no sound output. (Data files are received normally; sound or sound function works correctly.)	Check jumper settings and cable connections on system board "33.6 Kbps and 56 Kbps DSVD Modem Adapters" on page 2-50. System Board
FAX function does not receive data files.	"33.6 Kbps and 56 Kbps DSVD Modem Adapters" on page 2-50. System Board
FAX/voice function has no sound output. (Data files are received normally; sound function does not produce sound or cannot be activated in software.)	Audio amplifier card Cables, connectors System Board
Floppy Drive Failed. Diskette drive(s) failed.	Diskette Drive System Board Diskette Drive Cable

Table 2-1 (Page 5 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU																					
General Function Failed. Remove one adapter at a time until the symptom goes away.	Any Adapter System Board																					
Hard disk or power-on indicator LED does not light but machine functions normally otherwise.	<p>Check J38(A-1), or J22(A-2) voltages, with power-on:</p> <table border="1"> <thead> <tr> <th>J38/J22 Pin</th> <th>Normal</th> <th>Hard Disk Running</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0 V dc</td> <td></td> </tr> <tr> <td>2</td> <td>0 V dc</td> <td></td> </tr> <tr> <td>3</td> <td>+5 V dc</td> <td>0 V dc</td> </tr> <tr> <td>4</td> <td>+5 V dc</td> <td></td> </tr> <tr> <td>5</td> <td>+5 V dc</td> <td></td> </tr> <tr> <td>6</td> <td>0 V dc</td> <td></td> </tr> </tbody> </table> <p>Pins 3,4 = Hard Disk Drive Pins 2,4 = Power-on LED</p> <p>LED connection/cable assembly System board</p>	J38/J22 Pin	Normal	Hard Disk Running	1	0 V dc		2	0 V dc		3	+5 V dc	0 V dc	4	+5 V dc		5	+5 V dc		6	0 V dc	
J38/J22 Pin	Normal	Hard Disk Running																				
1	0 V dc																					
2	0 V dc																					
3	+5 V dc	0 V dc																				
4	+5 V dc																					
5	+5 V dc																					
6	0 V dc																					
Hard Drives Failed. Hard Disk Drive test error.	Hard Disk Drive System Board																					
Home Automation failures	"Home Director" on page 4-17																					
Incorrect DOS version.	Ensure you are using DOS version 3.0 or higher.																					
INT Mask Register Failed. INT Mask Register error.	Processor System Board																					
Insert a CD message icon appears when a known good Diagnostics and Utilities CD is inserted in the CD/DVD-ROM drive.	<p>Ensure the hard disk drive and CD/DVD-ROM drive are not disabled in the startup sequence in the Setup Utility.</p> <p>Hard disk drive preloaded software CD/DVD-ROM drive connection/cable CD/DVD-ROM drive System board</p>																					
Intensity or color varies from left to right of characters and color bars.	"Monitor" on page 2-53. System board																					
Invalid Date Clock/DOS date mismatch.	RTC Battery System Board																					

Table 2-1 (Page 6 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
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 2-37.
Invalid Time Clock/DOS time mismatch. Back-up clock and DOS time of day settings do not match.	RTC Battery System Board
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 system board 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>
Joystick does not work correctly (installation is correct—see above symptom).	<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 system board. 4. If the mouse does not work, check the software application troubleshooting information provided by the manufacturer.

Table 2-1 (Page 7 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Linear Cylinder Access Test Failed. Hard disk drive error.	Hard Disk Drive Hard Disk Drive Cable System Board
Logic Function Failed. CPU Logic test error.	Processor System Board
Loopback Error COM Port Test or Parallel Port error. A wrap plug must be installed to successfully complete these tests.	System Board Wrap Plug
Machine works but fails to go into Power Management mode when configuration is set with Standby mode enabled or Rapid Resume mode enabled.	Software application was fully activated before on/off switch was pushed. Try operating Power Management from Microsoft Windows 95 Program Manager panel.
Main Components Failed. System board error.	System Board Processor
Memory test cannot run at this location in memory. Not enough free memory available to start the memory test.	Memory Module System Board
Missing PC-Doctor Files(s). One or more diagnostic support files are missing.	Diagnostic CD
Monitor problem: Incorrect colors No high intensity Missing, broken, or incorrect characters Blank monitor (dark) Blank monitor (bright) Distorted image Unreadable monitor Other monitor problems	"Monitor" on page 2-53. I/O monitor signal connection/cable Monitor System board
Monitor changing colors.	"Monitor" on page 2-53

Table 2-1 (Page 8 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Monitor problem not listed above (including blank or illegible monitor).	"Monitor" on page 2-53 System board
No beep during POST.	Normal condition. There are no beeps during POST. Any beep indicates an error.
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 2-34. 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
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

Table 2-1 (Page 9 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Parallel port or serial port failure (system board port).	<p>"Diagnostics and Utilities Device Presence Test" on page 2-43.</p> <p>Test using a wrap plug while running Diagnostics and Utilities.</p> <p>Cable/connections System board</p>
Pass (N): ** Errors ** Drive (X) Failed. Diskette drive read/write test error.	<p>Diskette Drive System Board Diskette Drive Cable</p>
Pass (N) Drive Not Ready. Diskette drive door is open or defective.	<p>Ensure diskette drive is ready.</p> <p>Diskette Drive System Board Diskette Drive Cable</p>
Pass (N): Drive (X) Write Protected or Unformatted.	<p>Insert a non-write protected, formatted diskette into the diskette drive; then rerun the test.</p> <p>Diskette Drive System Board Diskette Drive Cable</p>
Pass (N): Unknown Media Drive (X). Diskette Drive Test error.	<p>Diskette Diskette Drive System Board Diskette Drive Cable</p>
Place Hi-density Media in Drive. Media/drive mismatch.	<p>Diskette Diskette Drive System Board Diskette Drive Cable</p>
Printer Failed. Printer powered-on and ready?	<p>Printer Printer Cable System Board</p>
Printer Fault. Printer powered on and ready?	<p>Printer Printer Cable System Board</p>
Printer Not Selected. Ensure the printer is powered on and ready.	<p>Printer Printer Cable System Board</p>
Printer problems.	<p>Refer to the service manual for the printer.</p>

Table 2-1 (Page 10 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
System fan does not run when the power supply fan runs.	With power-on, check the system fan connector J1 on Type A-1 system board and connector J16 on Type A-2 system board for +12 V dc. Processor fan System board
Processor speed seems slower.	"Memory" on page 2-37. Cache memory System board
Program loads from the hard disk with a known-good CD in the CD/DVD-ROM drive or diagnostics diskette in the first 3.5-inch diskette drive (and CD/DVD-ROM drive or diskette drive is enabled in the Setup Utility).	"Factory-Installed Drive Devices" on page 2-47. CD/DVD-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/DVD-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.
System unit does not turn off with power switch. (System unit must be unplugged from electrical outlet to completely turn off.)	"Power Supply" on page 2-34 Power switch assembly System Board
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 Module System Board

Table 2-1 (Page 11 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
RAM Memory Error in Block n. Bad bits n. Memory error.	Memory Module System Board
RAM Test Failed. Memory error.	Memory Module 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 Module 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
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 Module System Board

Table 2-1 (Page 12 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Some or all keys on keyboard do not work.	"Keyboard" on page 2-39. Keyboard Keyboard connection/cable Media Console (Type 2142) System Board
Serial or parallel port device failure (adapter port).	"Factory-Installed Drive Devices" on page 2-47 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
Sorry You Need A Mouse. Mouse or mouse driver was not detected.	Mouse System Board
Factory-installed adapter card software gives a Microsoft Windows 95 error message after POST configuration. Hardware problem occurred.	Adapter connection/cable Adapter jumper settings Adapter card
System fails to load the Diagnostics and Utilities software System preloaded software works correctly.	Make sure the CD/DVD-ROM drive or diskette drive is included in the Setup Utility startup sequence. "Factory-Installed Drive Devices" on page 2-47 CD/DVD-ROM drive connection/cable CD/DVD-ROM drive Diskette drive connection/cable Diskette drive System Board
System Hangs. Go to "Undetermined Problem" on page 2-56.	Any device Any adapter System Board

Table 2-1 (Page 13 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
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.	Enter correct address Memory Module System Board
That Number is Out Of Range. An invalid bit number was entered. Diagnostics Tests display this message during the Locate Bad Chips option.	Enter the correct number. Memory Module System Board
Too Many Errors - Test Aborted. Too many errors, the Diagnostics Test cannot continue.	Processor System Board
Transmit Error. Internal or external serial port loopback test failure.	Serial Port Cable System Board
Video Adapter Failed. Test Result Summary, displayed if "Fail" was at the Quit/Fail/Pass menu of any video test.	Video Adapter System Board Display
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

Table 2-1 (Page 14 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
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 Module System Board Processor
Any other problem.	"Undetermined Problem" on page 2-56.

Table 2-1 (Page 15 of 23). 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 any beeps 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 module problem. (Continue with the Symptom-to-FRU index below for other beep/no-beep symptoms.)</p>	
No beep and: Blank or unreadable monitor Blinking cursor	“Power Supply” on page 2-34.
Repeating short beeps.	“Keyboard” on page 2-39 Keyboard (sticking key) Keyboard connection/cable System Board
4	Video adapter System Board
1-1-3 CMOS read/write error.	Run the Setup Utility. System Board
1-1-4 ROM BIOS check error.	System Board
1-2-X DMA error	System Board
1-3-X	“Memory” on page 2-37. Ensure all DIMMs are seated correctly. DIMMs System board
1-4-4	“Keyboard” on page 2-39. System board
1-4-X An error was detected in the first 64 KB of RAM.	“Memory” on page 2-37. System Board
2-1-1, 2-1-2	Run the Setup Utility. System Board

Table 2-1 (Page 16 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
2-1-X The first 64 KB of RAM failed.	"Memory" on page 2-37. System Board
2-2-2	Display adapter, if installed. System Board
2-2-X The first 64 KB of RAM failed.	"Memory" on page 2-37. System Board
2-3-X	"Memory" on page 2-37. System Board
2-4-X	Run the Setup Utility. "Memory" on page 2-37. System Board
3-1-X DMA register failed.	System Board
3-2-4 Keyboard controller failed.	"Keyboard" on page 2-39. System Board
3-3-4 Screen initialization failed.	Display adapter, if installed. System Board Display
3-4-1 Screen retrace test detected an error.	Display adapter, if installed. System Board Display
3-4-2 POST is searching for video ROM.	Display adapter, if installed. System Board
One long and one short beep during POST. Base 640 KB memory error or shadow RAM error	"Memory" on page 2-37. System Board
One long beep and two or three short beeps during POST. (Video error)	Display adapter, if installed. System Board
Three short beeps during POST.	"Memory" on page 2-37. System Board
Continuous beep.	System Board
Any other beeps.	"Undetermined Problem" on page 2-56.

Table 2-1 (Page 17 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
Error Codes	
107 - System board, processor update error. (A-2 system board only)	Flash BIOS System Board
10X - System board error or continuous beep.	System Board
110 - System board parity error.	"Memory" on page 2-37. DIMMs System Board
111 - I/O channel parity error.	"Memory" on page 2-37. I/O channel memory System Board
114 - External ROM checksum error.	Adapter Card System Board
129 - Cache memory error	"Memory" on page 2-37. For A-1 system board: System Board For A-2 system board: Processor
12X - Processor error.	Run the Setup Utility; see "POST Error Codes" on page 2-3. Processor System Board
13X - System board error.	Run the Setup Utility; see "POST Error Codes" on page 2-3. Processor System Board
151 - Real-time clock failure	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 18 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
162 - CMOS RAM 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 - 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
164 - Memory size error.	"Memory" on page 2-37. DIMMs System Board
1XX errors not listed above.	System Board
20X - Memory error	"Memory" on page 2-37. DIMMs System Board
262 - DRAM parity configuration error.	"Memory" on page 2-37. Run the Setup Utility; see "POST Error Codes" on page 2-3. DIMMs System Board
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.	"Keyboard" on page 2-39. Keyboard Keyboard connection/cable Mouse System Board
3XX - Keyboard error.	"Keyboard" on page 2-39. Keyboard connection Keyboard Media Console (Type 2142) System Board

Table 2-1 (Page 19 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
602 - Invalid diskette boot record.	Diskette media Diskette connection/cable Diskette drive
662 - Diskette drive configuration error.	"Factory-Installed Drive Devices" on page 2-47. Diskette drive connection/cable Diskette drive Power supply System Board
6XX - Other configuration errors.	"Factory-Installed Drive Devices" on page 2-47. Diskette drive connection/cable Diskette drive Power supply System Board
7XX - Math coprocessor error.	"Diagnostics and Utilities Device Presence Test" on page 2-43. Upgrade processor (check Setup Utility, and system board settings). System Board
962 - Parallel port conflict.	Test using a wrap plug while running Diagnostics and Utilities. "Diagnostics and Utilities Device Presence Test" on page 2-43. Parallel adapter card, if installed System Board
1162 - Serial port conflict.	Test using a wrap plug while running Diagnostics and Utilities. "Diagnostics and Utilities Device Presence Test" on page 2-43. Serial adapter card, if installed System Board

Table 2-1 (Page 20 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
11XX - Serial port test errors not listed above.	<p>Test using a wrap plug while running Diagnostics and Utilities.</p> <p>“Diagnostics and Utilities Device Presence Test” on page 2-43.</p> <p>Serial adapter card, if installed System Board</p>
<p>On the system board:</p> <p>1780/1790 - Hard Disk Drive 0</p> <p>1781/1791 - Hard Disk Drive 1</p> <p>1782/1792 - Hard Disk Drive 2 or CD/DVD-ROM drive</p> <p>1783/1793 - Hard Disk Drive 3 or CD/DVD-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>
17XX - Hard disk drive error. (All 17XX errors not listed above)	<p>“Factory-Installed Drive Devices” on page 2-47.</p> <p>Hard disk drive jumpers Hard disk drive connection/cable Hard disk drive System Board Power Supply</p>
1800 - PCI Error (IRQ not available).	<p>A PCI adapter card has requested a hardware interrupt that is not available.</p> <ol style="list-style-type: none"> 1. Choose ISA Legacy Resources from the Setup Utility main menu, and make sure the interrupt resources (IRQ) setting for ISA legacy adapter cards are correct. If the interrupt resources settings are not correct, change the settings. See “Using the Setup Utility” on page 1-18. 2. If all interrupts are being used by ISA legacy adapter cards, you might need to remove an ISA card to make memory available to the PCI adapter card.

Table 2-1 (Page 21 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
1801 - PCI Error (ROM not available).	<p>A PCI 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 memory resources settings for ISA legacy adapter cards are correct. If the memory resources settings are not correct, change the settings. 2. If all memory resources are being used by ISA legacy adapter cards, you might need to remove an ISA card to make memory available to the PCI adapter card.
1802 - PCI Error (I/O address not available).	<p>A PCI adapter card has requested an I/O address that is not available, or the PCI adapter card might be defective.</p> <p>Choose ISA Legacy Resources from the Setup Utility main menu, and make sure the I/O port resources settings for ISA legacy adapter cards are correct. If the I/O port resources settings are not correct, change the settings.</p> <p>If the I/O port resources settings are correct, the PCI adapter card might be defective.</p>
1803 - PCI Error (memory above 1 MB not available).	<p>A PCI adapter card has requested a memory address that is not available, or the PCI adapter card might be defective.</p> <p>Choose ISA Legacy Resources from the Setup Utility main menu, and make sure the memory resources settings for ISA legacy adapter cards are correct. If the memory resources settings are not correct, change them.</p> <p>If the memory resources settings are correct, the PCI adapter card might be defective.</p>

Table 2-1 (Page 22 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
1804 - PCI Error (memory below 1 MB not available).	<p>A PCI adapter card has requested a memory address that is not available.</p> <ol style="list-style-type: none"> 1. Choose ISA Legacy Resources from the Setup Utility main menu, and make sure the memory resources settings for ISA legacy adapter cards are correct. If the settings are not correct, change the settings. 2. If all memory resources are being used by ISA legacy adapter cards, you might need to remove an ISA card to make memory available to the PCI adapter card.
1805 - PCI Error (ROM error).	<p>Remove the PCI adapter card. Restart the computer without the card installed. If the computer restarts without an error, reinstall the card and restart the computer again. If the error reoccurs, the adapter card might be defective.</p>
1806 - No more DMA channels available	Too many adapters installed.
2401 - Monitor changing colors.	Monitor
2462 - Video configuration error	Video memory, if installed System Board
24XX - Video/monitor error.	<p>"Monitor" on page 2-53</p> <p>Optional video memory System Board Monitor</p>
5801 - Media Console error	<p>Check Media Console cable Replace Media Console</p>
5803 - Keyboard error attached to Media Console	<p>"Keyboard" on page 2-39. Keyboard</p>
5806 - Diskette error attached to Media Console	<p>Check Diskette cable Diskette</p>
5859 - CD/DVD-ROM error attached to Media Console	<p>Check CD/DVD-ROM drive cable CD/DVD-ROM Drive</p>
5862 - Host Card error	Host Card

Table 2-1 (Page 23 of 23). POST and Diagnostics and Utilities Index for Symptoms, Messages, Error Codes, or Beeps

Symptoms, Messages, Error Codes, or Beeps	Action/FRU
5886 - Pointing device attached to Media Console	Check Pointing device cable Pointing device
5962 - CD/DVD-ROM configuration error (sound adapter card driver works correctly).	“Factory-Installed Drive Devices” on page 2-47 CD/DVD-ROM drive connections,cables, and jumpers CD/DVD-ROM drive Power supply System Board
86XX - Pointing device error or mouse does not work.	“Mouse” on page 2-42. Pointing device connection/cable Pointing device System Board
I999030X - Hard disk reset/boot failed	Possible hard disk drive problem. See “Hard Disk Drive Boot Error” on page 3-10.
Any other error codes.	“Undetermined Problem” on page 2-56.

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 2-36.
-

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 and white wires.
- Reconnect the power cord.

DOES THE POWER SUPPLY FAN RUN?

Yes No

005

- Replace the power supply.

006

(From step 010)

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

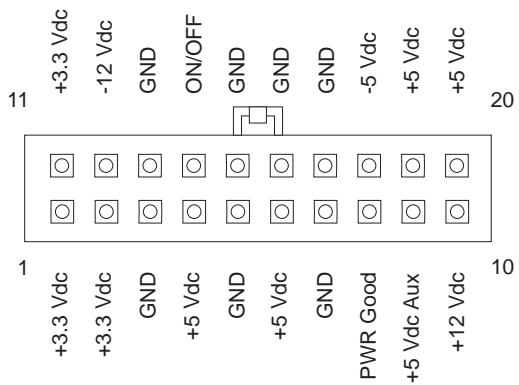


Figure 2-1. System Board Power Supply Connectors (Bottom View)

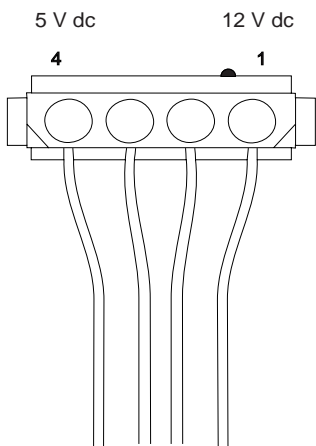


Figure 2-2. Hard Drive or CD/DVD-ROM End of Power Cable

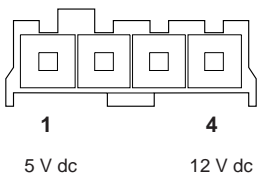


Figure 2-3. 3.5-In. Diskette Drive End of Power Cable

(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 2-56. If the fan stops running when a drive connector is plugged back in, go to “Factory-Installed Drive Devices” on page 2-47.
-

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 2-34.

011

- You might have a failing on/off switch cable assembly.
- Disconnect the on/off switch cable assembly connector from the power supply 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: SDRAM DIMM memory for Type 2140 and Type 2142 is automatically detected and configured. If memory is added, the system will use the added memory. However, if memory is removed or a DIMM becomes defective a POST error 164 might occur.

Maximum system memory for Type 2140 and Type 2142 is 384 MB.

001

- Insert the Diagnostics and Utilities CD into the CD/DVD-ROM Drive.
- Power-off the system unit.
- Ensure all DIMMs are seated correctly.
- Power-on the system unit.
- Note any messages, error codes, or symptoms.

DID YOU RECEIVE A 201 or 203 POST ERROR?

Yes No

002

DID YOU RECEIVE A 129 ERROR?

Yes No

003

Go to Step 006 on page 2-38.

004

- 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 DIMM's have been replaced and the problem remains, replace the system board.
-

006

(Step **006** continues)

(continued)

006 (continued)
(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 and System board tests multiple times.
-

Keyboard

001

A failing mouse can show up as a keyboard failure.

- Power-off the system unit.
- (Type 2140) Disconnect the mouse from the system unit.
- (Type 2142) Disconnect the mouse from the Media Console.
- Power-on the system unit.

DID THE SYMPTOM REMAIN?

Yes No

002

Replace the failing mouse.

003

- Power-off the system unit and wait 10 seconds.
- Reinstall the mouse.
- Ensure the keyboard cable is fully inserted into the system unit (Type 2140) or Media Console (Type 2142).
- Remove any foreign objects that might interfere with the mechanical operation of the keybuttons.
- Power-on the system unit.

DID YOU RECEIVE A 3XX OR A 5803 POST ERROR?

Yes No

004

Go to Step 008 on page 2-40.

005

- For (Type 2140), go to Step 008 on page 2-40.
- For (Type 2142):
 - Power-off the system unit and wait 10 seconds.
 - Disconnect the keyboard cable and the mouse cable from the Media Console.
 - Connect the keyboard cable and mouse cable to the system board at the rear of the tower.
 - Power-on the system unit.

(Step **005** continues)

(continued)

005 (continued)

DID THE SYMPTOM CHANGE?

Yes No

006

Go to Step 008.

007

- Check the Media Console cable for continuity. See “Media Console Cable” on page 5-16 for pin locations.
 - Depending on service procedures, replace the keyboard, Media Console host card, Media Console client card, Media Console cable, or Media Console.
 - If the symptom remains, replace the system board.
-

008

- Power-off the system unit.
- Disconnect the keyboard cable connector from the system board (Type 2140) or from the Media Console (Type 2142).
- Power-on the system unit.
- Check the voltage at the keyboard cable connector on the system board or the Media Console as shown in Figure 2-4, after the POST.

Note: Measure voltages with respect to Ground (Pin 3). These measurements are for the system board (Type 2140) and for the Media Console keyboard connector (Type 2142).

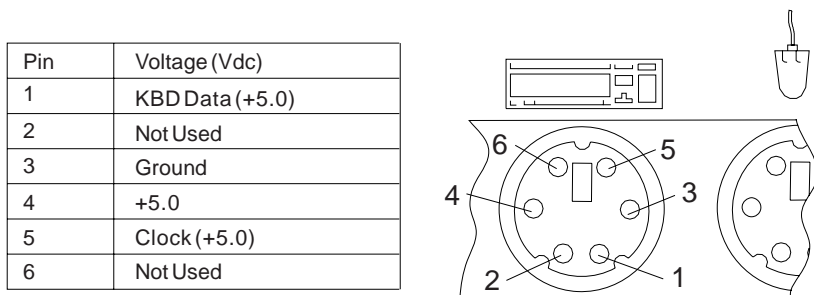


Figure 2-4. Keyboard Connector Voltage Check

(Step 008 continues)

008 (continued)

ARE THE VOLTAGES CORRECT?

Yes No

009

Replace the system board.

010

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 2-39.

001

- Check the mouse connection and reseal the cable in the correct plug.
- Insert the Diagnostics and Utilities CD into the CD/DVD-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 **Interactive Test** from the Main Menu.
- Select **Mouse** from the menu.
- Perform the mouse test.

DO THE MOUSE DIAGNOSTIC TESTS RUN WITHOUT ERRORS?

Yes No

002

- For Type 2140, replace the mouse. If symptoms remain, replace the system board.
- For Type 2142, Power-off the system and connect the keyboard and mouse to the system board. Run the mouse tests again. If symptom remains, replace the mouse. If the mouse tests run without errors while connected to the system board, replace the Media Console client card. Reconnect the keyboard and mouse to the Media Console

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/DVD-ROM drive.
- Power-off the system unit.
- Power-on the system unit, and check for the following responses:

1. Main Menu screen

DID THE SYSTEM PRODUCE THE MAIN MENU SCREEN?

Yes No

005

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

006

(From step 003)

- Select **Advanced Diagnostics** on the menu.
- Select **Hardware Info** on the menu.
- Select **System Config** on the menu.
- Compare the System 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.

(Step 006 continues)

(continued)

006 (continued)

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

Yes No

007

- The System 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 System Configuration Report, return to “Start” on page 2-2 and then go to “Factory-Installed Drive Devices” on page 2-47.

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 2-34, “System Board

Layout—Type A-1” on page 5-2, and “System Board Layout—Type A-2” on page 5-5.

- 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 2-56.
-

Media Console Drive Devices

Problems with the 3.5-in. diskette Drive, the CD/DVD-ROM drive, keyboard, mouse, the On/Off switch, or the hard disk drive LED might be caused by the Media Console.

Multiple error codes can also be the result of a loose Media Console cable or defective host or client cards. If the system unit powers up with some or all of the following POST error codes, the Media Console might be at fault. Depending on service procedures, replace either the Media Console FRU parts or the Media Console unit.

1780	Hard disk error
5803	Keyboard error
5806	Diskette drive error
5886	Pointing device error

If you receive multiple POST codes:

1. Check the installation of the Media Console cable on the host card.
2. Check the installation of the cable from pin J33 on system board A-1 or pin J23 on system board A-2. See "System Board Layout—Type A-2" on page 5-5 for more information.
3. Check the installation of the power connector from the power supply to the host card.

If the problems persist see "Diagnostic Aids" on page 3-1 for more information.

Factory-Installed Drive Devices

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

Attention: The customer might 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/DVD-ROM drive, make sure the Setup Utility has the startup sequence set with `Hard Disk`, `Diskette`, and `CD/DVD-ROM` enabled.

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.
Note: If the drive is installed in the Media Console, check the drive ribbon cable from the system board to the host card and from the drive to the client card. Also check the Media Console cable.
2. Check the voltages to the diskette drive with the power on (see "Power Supply" on page 2-34).
3. Check the installation of the Media Console cable (Type 2142) on the system board.
4. Try to correct the drive setting in the **(SETUP)** option in the Setup Utility.
5. Run the "Diagnostics and Utilities Device Presence Test" on page 2-43.

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
2. Diskette drive cable (if continuity check fails)
3. Media Console host card (Type 2142)
4. Media Console client card (Type 2142)
5. Media Console (Type 2142)
6. System board

If the number of hard disk drives or CD/DVD-ROM 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 J8 on the Type

(continued)

A-1 system board, and J25 on the Type A-2 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 2-34).
4. Try to correct the drive setting in the **3 (SETUP)** option in the Setup Utility.
5. Review the IDE Drive Info under Hardware Info in the Setup Utility.
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 connector and 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/DVD-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.

Also ensure the CD/DVD-ROM cable is installed in connector J30 on the Type A-1 system board and in connector J11 on the Type A-2 system board.

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 Master. 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

33.6 Kbps and 56 Kbps DSVD Modem Adapters

Note: The factory-installed modem is a DSVD (Digital Simultaneous Voice and Data) modem with cables for modem to audio and modem ring detect.

001

- Insert the Diagnostics and Utilities CD into the CD/DVD-ROM drive.
- Power-off the system unit.
- Power-on the system unit.
- Make a note of any error messages, then press **Esc**.
- Select **Advanced Diagnostics** from the Main Menu.
- Select **Interactive Test** from the Main Menu.
- Select **Modem** from the menu.
- Follow the prompts and perform the test.

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)

004 (continued)

DOES THE SYSTEM FAIL TO WAKE UP WHEN THE- 'WAKE UP THE COMPUTER WHEN THE PHONE RINGS' FEATURE IS ENABLED?

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

- Select 'Start' from the Desktop.
- Select 'Settings'.
- Select 'Control Panel'
- Double Click on the 'Power' icon.
- Click on 'Advanced'.
- Click check box 'Wake Up the Computer When the Phone Rings.'

DOES THE SYSTEM WAKE UP WHEN-'WAKE UP THE COMPUTER WHEN THE PHONE RINGS' IS ENABLED?

Yes No

007

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 2-50.

Replace the system board.

008

The modem is functioning correctly.

009

- If the audio tones are incorrect, replace the modem.
- Power-off the system unit.
- Plug the modem adapter card into a different card slot.
- Power-on the system unit.
- Run the modem tests.

(Step 009 continues)

(continued)

009 (continued)

DID THE SYMPTOM REMAIN?

Yes No

010

Replace the system board

011

DOES THE SYSTEM UNIT WORK NORMALLY EXCEPT FOR THE MODEM?

Yes No

012

Go to "Start" on page 2-2.

013

Check modem to audio and modem ring detect cables.
If the symptom remains, replace the modem adapter card.

– or –

Replace the system board.

Monitor

First, review the "Display Self Test" on page 3-12, then follow step 001.

001

- Power-off the system unit and monitor.
- Remove all adapter cards.
- 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 2-34.
- Make sure the monitor contrast and brightness controls are not adjusted 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, you might need to refer to the service information provided with the monitor.

- If you are not familiar with the self-test pattern produced by the Display Self Test, refer to step 4 of "Display Self Test" on page 3-12 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?

Yes No

002

Go to Step 006 on page 2-54.

003

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

DID THE DISPLAY SELF-TEST PATTERN REMAIN ON THE SCREEN

Yes No

004

(Step **004** continues)

(continued)

004 (continued)
Replace the monitor.

005

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.
**DOES THE SCREEN CHANGE FROM BLACK (WITH MONITOR
POWER-OFF) TO THE APPROPRIATE RASTER OR WHITE SCREEN AS
DESCRIBED IN THE DISPLAY SELF TEST?**

Yes No

007

– Replace the monitor.

008

– 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

– Replace the system board

010

– Press **Esc**.
– Select **Diagnostics** from the Main Menu.
– Select **Interactive Tests** from the menu.
– Select **Video** from the menu.

(Step **010** continues)

010 (continued)

– 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**

011

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

012

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.

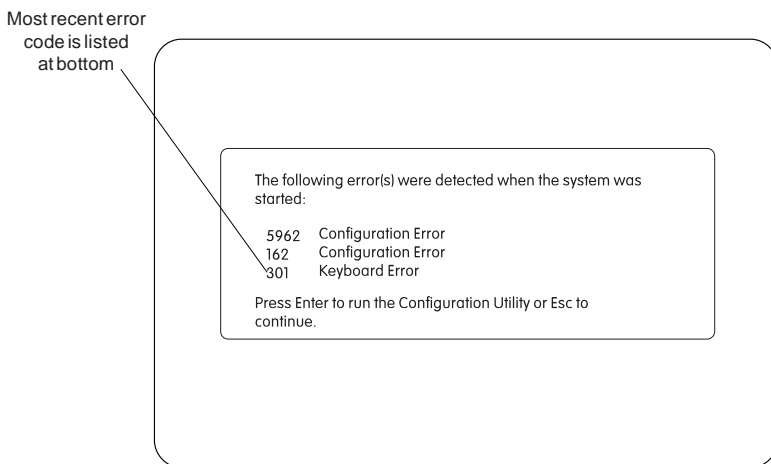


Figure 2-5. POST Error History Example

To view the POST Error History:

Press **F9** when the IBM APTIVA logo 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.

Check the power supply voltages (see “Power Supply” on page 2-34). 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. Any adapters
 - d. Modem card
 - e. DIMMs (Remove all but one DIMM. Swap last DIMM with known good DIMM)
 - f. Zip Drive
 - g. CD/DVD-ROM drive
 - h. Diskette drive
 - i. Hard disk drive
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—Type A-1” on page 5-2 and “System Board Layout—Type A-2” on page 5-5 for connector locations.
2. Remove all but one DIMM from sockets. Replace last DIMM with known good DIMM.
3. Power-on the system unit and listen for any beeps.

(continued)

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 removed in step 5.

Diagnostic Aids

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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 Power Management 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/DVD-ROM drive
- Sound adapter card

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

1. The IBM APTIVA Logo appears on 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 201, where the first six Xs = memory address,
the next four Xs = data.
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 PC-Doctor diagnostic programs, developed by Watergate for IBM, are the primary method of testing the Aptiva Type 2140 and 2142 computers. You can use the diagnostics 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 Aptiva Type 2140 and 2142 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 Suspend Timer is disabled in the Setup Utility.

1. Install the Diagnostics and Utilities CD in the CD/DVD-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. Using the arrow keys, 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:

These 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/DVD-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/DVD-ROM unit is inoperable.

To create a bootable diagnostics diskette:

1. Install the Diagnostics and Utilities CD in the CD/DVD-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 **PCDR** and **IMAGE** directories by typing: **CD\PCDRIMAGE** 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 Suspend Timer 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 (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: System board Sound card functions Hard disk drives Diskette drives CD-ROM/DVD-ROM drives RAM Serial and parallel ports Modem Video chip set Printer Keyboard Mouse
Flexible Test Control	Allows you to: Run groups of tests in batch Specify parameters to use for each test (for example, video modes, disk cylinders, and port addresses) Specify the number of passes you want to run (one to continuous) Save all test settings for future use View System Information View the server's configuration information. (For example, you can view the IRQ/DMA assignments, memory usage, and device drivers) Select System Utilities

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 or more 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.

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. You can also use the mouse pointer to choose an option.

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
Left Arrow (←)	Moves the cursor left
Right Arrow (→)	Moves the cursor right
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.

Command Line Options

To enter PC-Doctor commands:

Note: Before beginning, ensure that Suspend Timer is disabled in the Setup Utility.

1. Install the Diagnostics and Utilities CD in the CD/DVD-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: or the drive letter designated for the CD/DVD-ROM.
6. Type **CD\PCDR** to get the the PCDR directory.
7. Type **PCDR/XX** (where **/XX** represents one of the following from the list below) then press Enter.

Command	Action
/AN	Enables automatic testlog numbering. A sequential number will be added to testlogs automatically. This number is stored in the file PCDR.NUM, which can be edited using the text editor. PC-Doctor will automatically add a testlog number if the file PCDR.NUM exists. To disable this feature, you must delete the PCDR.NUM file.
/BA:xx	Start batch mode testing of overlay number "xx". The overlay number must be in the range of 1- 10. For this switch to be useful, it should be combined with the "/PR:nnnn" switch and possibly also the /EO and /HE switches. At the end of batch mode testing, PC-Doctor returns with an ERRORLEVEL that is set to 0 for no errors, 1 if any tests failed, or 2 if testing was aborted.
/DJ	Direct Joystick I/O. This will force PC-Doctor to read joystick status and position directly from the hardware.
/EO	Log error only. If selected, PC-Doctor will only log tests that produce a FAILED result. You can use this switch to bypass PASSED and N/A test results in order to produce shorter test logs.
/HE	Enables halt-on-errors mode. If PC-Doctor encounters a failed diagnostic test, it asks the user if it should continue or abort testing.

Command	Action
/ID:nnnn	Adds the text string "nnnn" to the top of the test log for identification purposes. If you want to use spaces in the text string, you must encapsulate the entire statement starting with the /ID: in quotes; for example: PCDR /HE "/ID:This string has spaces" /ST
/MS:xx	Runs a batch-mode Maximum System Load Test for "xx" minutes. The number of minutes must be in the range of 2 to 9999. PC-Doctor returns with an ERRORLEVEL that is set to 0 for no errors, 1 if any tests failed, or 2 if testing was aborted.
/NN	Disables checking for network cards. Use this switch if the system hangs while checking for network cards.
/NOMOUSE	Disables the mouse.
/NP	No prompting. Use this switch with the /BA:xx switch to bypass prompting for serial and parallel port loopback tests.
/NS	Disables checking for sound cards.
/NSC	Disables checking for SCSI cards.
/NV	Bypasses virus test.
/PC:xx	Set the pass count to "xx". The number of passes must be in the range of 1 to 9999. PC-Doctor repeats diagnostic tests for the indicated number of passes.
/PR:nnnn	Send test log output to a file "nnnn" or to a device. The name of a file can include a path; for example "C:\TESTLOG.TXT" or a device, "PRN".
/ST	Enables all hardware checking. When this switch is enabled, all equipment that has a known hardware bug will show "failed" after testing. If a hardware bug is found when this switch is enabled, it does not mean the equipment is defective. Rather, the hardware in question might contain a bug which does not hinder its performance.

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.

Cause	Actions
No operating system installed on the boot drive.	Install an operating system on the boot drive.
The boot sector on the start-up drive is corrupted.	The drive must be formatted, do the following: 1. Attempt to access and recover (back-up) the failing hard disk drive. 2. Using the operating systems programs, format the hard disk drive.
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 within the text area and the function keys perform editing functions.
4. When you are done, press **F2** to view file options such as New, Load File, Save, Save As, Print, or Exit. Press **Esc** to go to the previous screen or selection, or to exit the file editor.

The PC-Doctor File Editor is designed to help edit configuration files. The largest file that can be edited is 32000 bytes or 4000 lines whichever limit is met first. Lines can be up to 256 characters long.

The most commonly edited files, AUTOEXEC.BAT and CONFIG.SYS, can be loaded with function keys **F3** and **F4** respectively.

Note:

Always make a backup copy on a self-starting diskette of the AUTOEXEC.BAT and CONFIG.SYS files *before* making any changes. The default text editing mode of the File Editor is the insert mode.

Display Self Test

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

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.
4. If the monitor power-on LED is not lit or flashing, or you do not see one of the indications below, replace the monitor.

For MM55, Type 2116 monitors:

The Red/Green/Blue raster will display.
The Green LED will be on solid.

For MM75, Type 2128 monitors:

The screen will be full white.
The orange LED will be on solid.

Display Under Power Management

With the Monitor connected to the system and the system and monitor is powered on, both MM55 and MM75 monitors display the same Power Management indications.

State	Power Indicator	Screen	Restoring Operation
On	Steady Green	Normal	
Standby	Flashing orange/green	Blank	Press a key or move the mouse
Suspend	Flashing orange/green	Blank	Press a key or move the mouse
Off	Flashing orange	Blank	Press a key or move the mouse

Note:
Restoring operation might have a slight delay before the picture returns.
After the monitor is powered off, audio might still be present from the speakers if the system unit is powered on.

Repair Information

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2010—Cover	4-4
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Removals and Replacements—Machine Type 2140, 2142

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.

Note: Machine Type 2140, 2142 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).

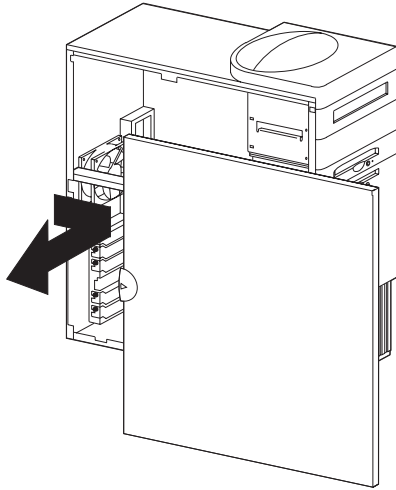
When other FRUs must be removed prior to removing the failing FRU, they are listed at the top of the page. Go to the removal procedure for each FRU listed, remove the FRU, and then continue with the removal of the failing FRU.

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.

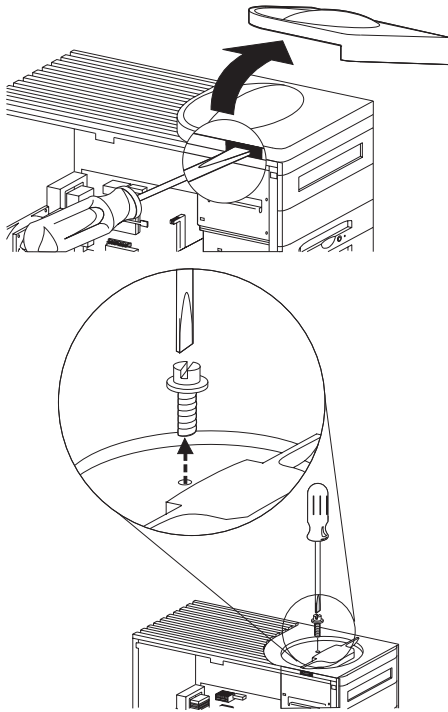
2005—Service Panel

Pull out on the rear tab to release the side service panel



2010—Cover

Do not lift the cover too high as the tabs might break.



2020—3.5-In., 5.25-In. Cage

Disconnect any cables on the drive.
Remove the screw.
Pull out the cage.

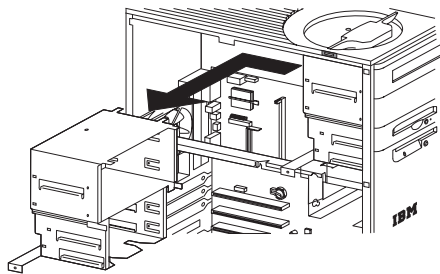
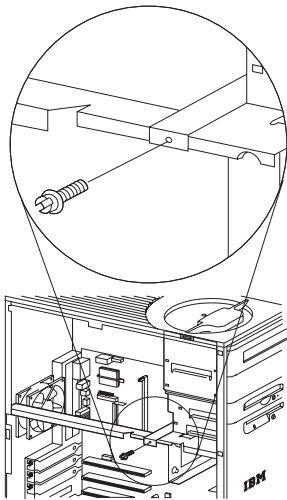


Figure 4-1. 3.5-In., 5.25-In. Cage

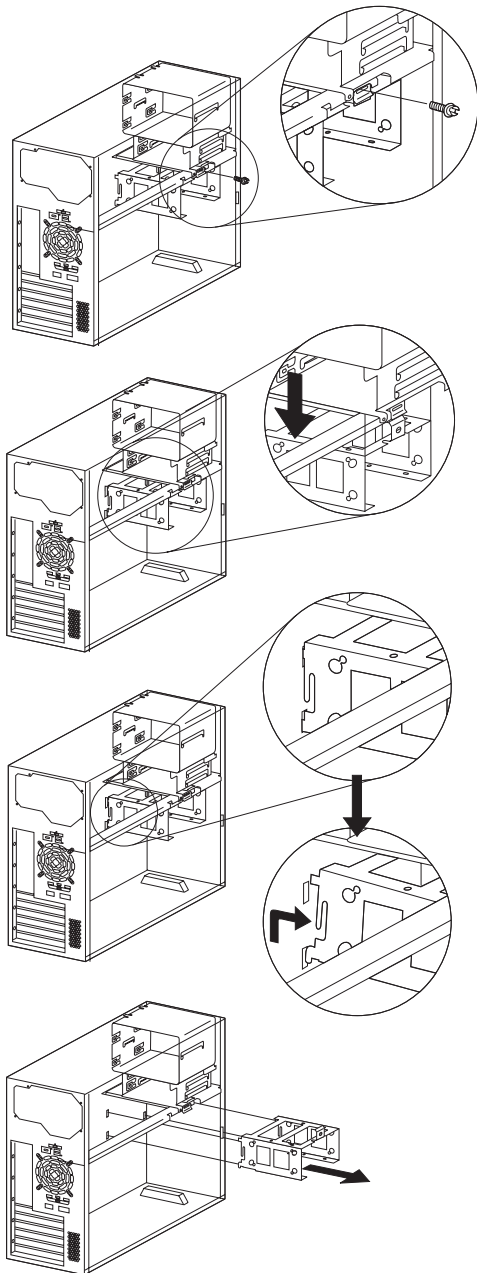


Figure 4-2. 3.5-In. Cage

2030—Media Console

Disconnect the cables from the back of the Media Console.
Remove the back cover.
Disconnect the two signal, two power, CD/DVD, and LED cables.
Pry off the left and right side wings.
Open the Media Console.
Remove the left and right side latch retainers.
Pry the left and right side latches and pull the console up to a vertical position.
Pull the console up to remove.
Remove the 13 bottom cover screws to remove console components.
When installing the console, be sure the console spring is installed and latched on the plastic retainer.

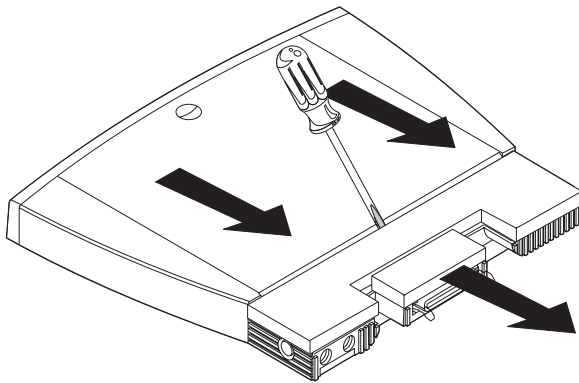


Figure 4-3. Console back cover removal

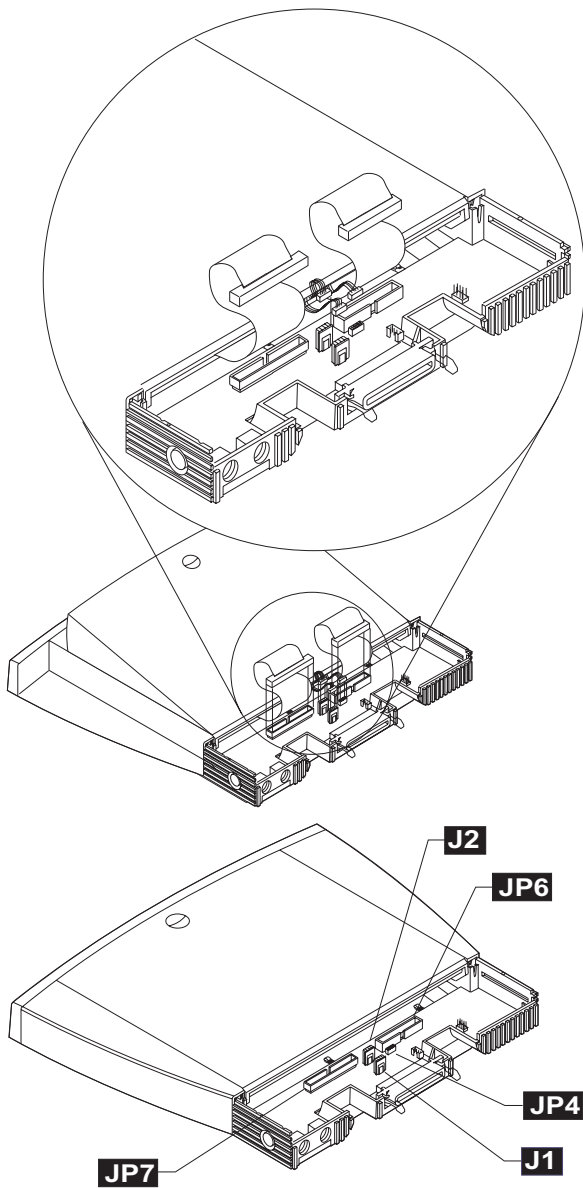


Figure 4-4. Console cable removal

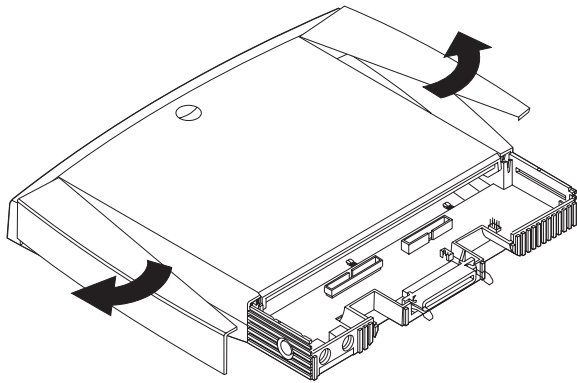


Figure 4-5. Console left and right side covers

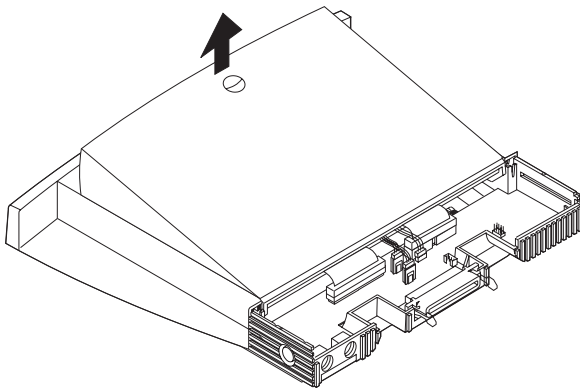


Figure 4-6. Opening the Console

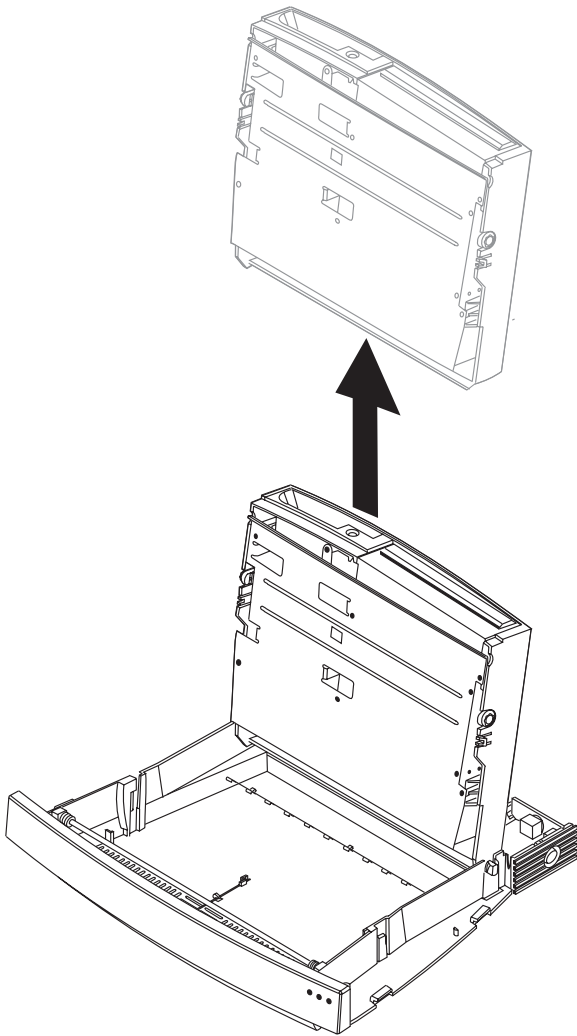


Figure 4-7. Removing the console

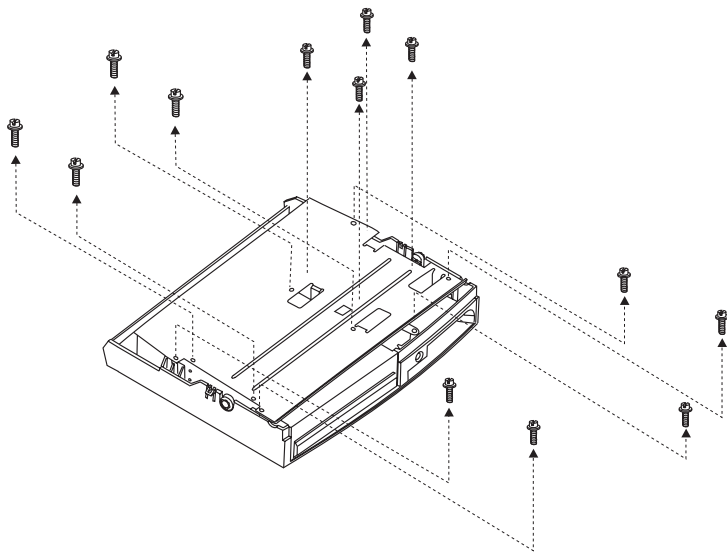


Figure 4-8. Removing the console bottom plate

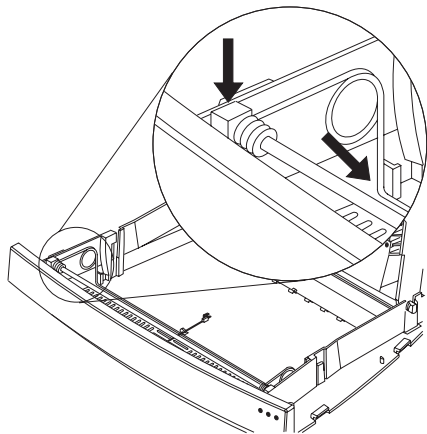


Figure 4-9. Console spring

2040—Power Supply

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

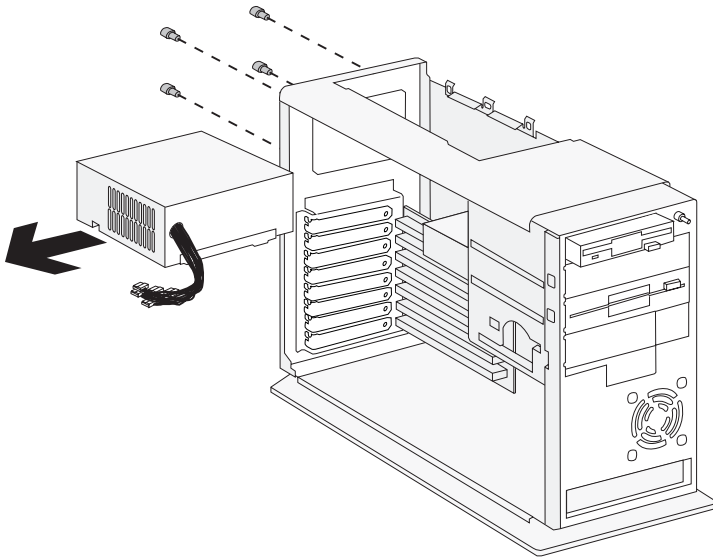


Figure 4-10. Power Supply

2051—Memory (DIMM)

Attention: Memory modules are sensitive to static discharge. See “Handling ESD-Sensitive Parts” on page 4-16.

Push out on the side clamps to release the module.
Pull the module up to remove.

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

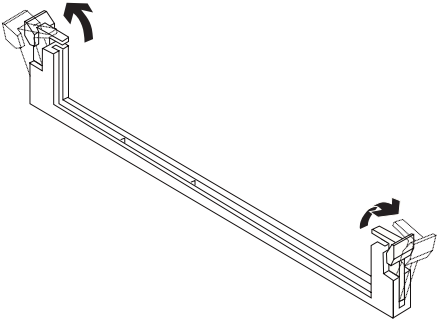


Figure 4-11. Memory DIMM

2080—Lithium Battery

Adapter cards if applicable.

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.

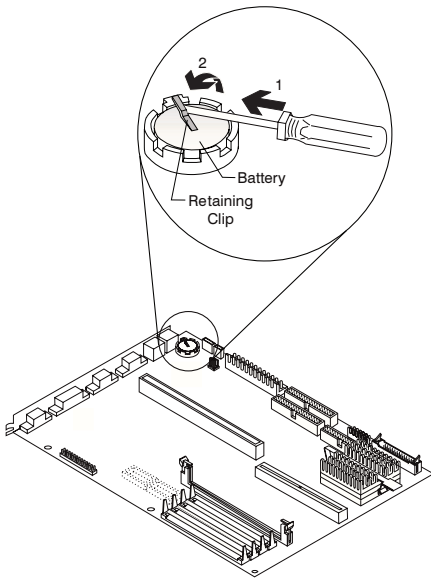


Figure 4-12. Lithium Battery

2090—System Board

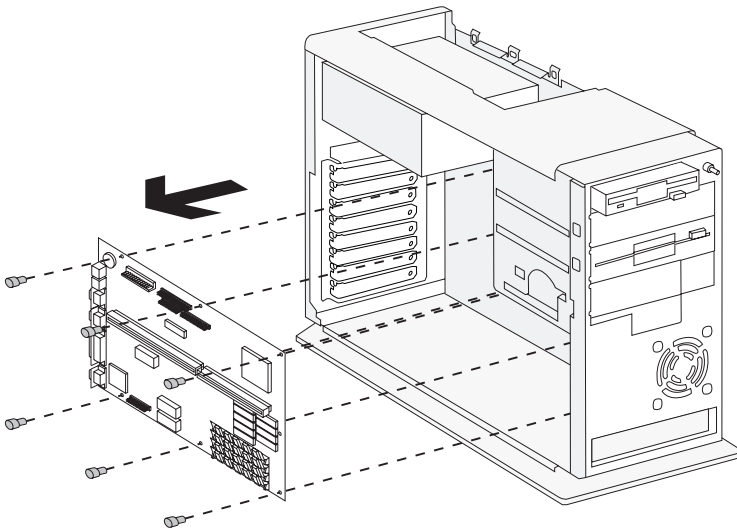
Adapter cards if applicable.

Disconnect any cables necessary for removal.

Memory (DIMM) (2051) if applicable.

Notes:

1. Be certain to reinstall the processor and DIMMs, in the new system board if applicable.
2. The amplifier card BIOS in the system board must match the amplifier card installed in the computer. See “Amplifier Card BIOS” on page 1-16.
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.

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. (Response times might vary).

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 Serial Interface module plugs into a standard electrical outlet and connects to the Aptiva computer via the serial interface on the back of the system unit with the supplied serial cable.

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 matches the software setting. 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 plugged directly 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 will 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.

Software Installation Procedure

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

Aptiva owners and servicers will need to call their local IBM HelpCenter to order the preloaded Software Recovery, Diagnostics and Utilities, or Home Automation CD.

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/DVD-ROM drive.
2. Power-off, then power-on the system unit.
3. If Power Management is enabled, press **Ctrl+Alt+Del** while the Power Management 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—Type A-1	5-2
System Board Locations—Type A-1	5-3
Pentium MMX Processor Speed—Type A-1	5-4
System Board Layout—Type A-2	5-5
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Processor Bus Factor—Type A-2	5-7
Factory-Installed Modem Card	5-8
Hard Disk Drive Jumper Settings	5-10
CD/DVD-ROM Drive Jumper Settings	5-13
Zip Drive	5-14
Detachable Monitor I/O Signal Cable Connector Test Points	5-15
Media Console Cable	5-16
System Board Connector Specifications	5-17

System Board Layout—Type A-1

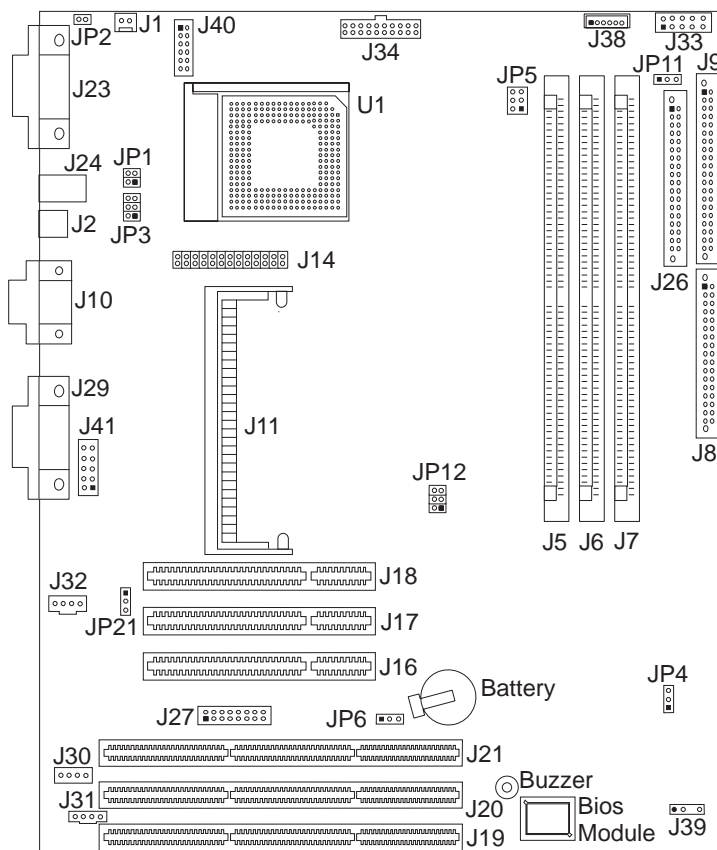


Figure 5-1. System Board Type A-1

Attention

The amplifier card BIOS in the system board must match the amplifier card installed in the computer. See “Amplifier Card BIOS” on page 1-16.

System Board Locations—Type A-1

J1	Fan connector
J2	USB connectors (top=USB1; bottom=USB0)
J3	Internal VGA connector
J5	DIMM connector (Bank 2)
J6	DIMM connector (Bank 1)
J7	DIMM connector (Bank 0)
J8	Primary Hard Disk IDE (Hard Disk 1, Hard Disk 2)
J9	Secondary Hard Disk IDE (Hard Disk 3 or CD/DVD-ROM, Hard Disk 4) (For hard disk drive jumper settings, see page 5-10)
J10	Monitor signal connector
J11	SO-DIMM socket (video upgrade)
J14	VESA video feature connector
J16	PCI 3 connector
J17	PCI 2 connector
J18	PCI 1 connector
J19	ISA 3 connector
J20	ISA 2 connector
J21	ISA 1 connector
J23	Parallel/Serial Port connector (top=parallel; bottom=serial)
J24	Mouse/Keyboard connector (top=mouse; bottom=keyboard)
J26	Diskette drive connector
J27	AC-3 connector
J29	Multimedia connectors (top=MIDI/Joystick; bottom=audio out,in,mic)
J30	CD/DVD-ROM audio connector
J31	TV-In connector
J32	Modem audio-In connector
J33	Media Console connector (Type 2142 only)
J34	Power connector
J38	Power/hard disk LED connector
J39	External speaker jumper/connector (Normal: 1-2)
J41	Audio amplifier connector
JP1	Processor type (Normal: 1-3, 2-4)
JP2	Processor type (Normal: short)
JP3	Core/Bus Frequency Ratio (See Figure 5-2 on page 5-4)
JP4	Internal VGA (Normal: 1-2)
JP5	Internal VGA Clock and INTA# Select (Normal: 1-3, 2-4)
JP6	CMOS, Power-on Password Reset (Normal: 1-2, Clear: 2-3)
JP11	Diskette Write (Enable: 1-2, Disable: 2-3)
JP12	CPU BUS Frequency (Normal: 1-2, 3-4)
JP21	CS4610 Interrupt (Normal: 1-2)
U1	Processor

Pentium MMX Processor Speed—Type A-1

The Processor speed jumpers are set to the manufacture Type and Model of the Aptiva computer. Changing jumper settings are not supported and might cause system failures.

Pentium MMX	Jumper	166 MHz	200 MHz	233 MHz
Processor Speed MHz	JP3 JP12	1-3, 2-4 1-2, 3-4	3-5, 2-4 1-2, 3-4	3-5, 4-6 1-2, 3-4

Figure 5-2. Pentium MMX Processor Speed—Type A-1

System Board Layout—Type A-2

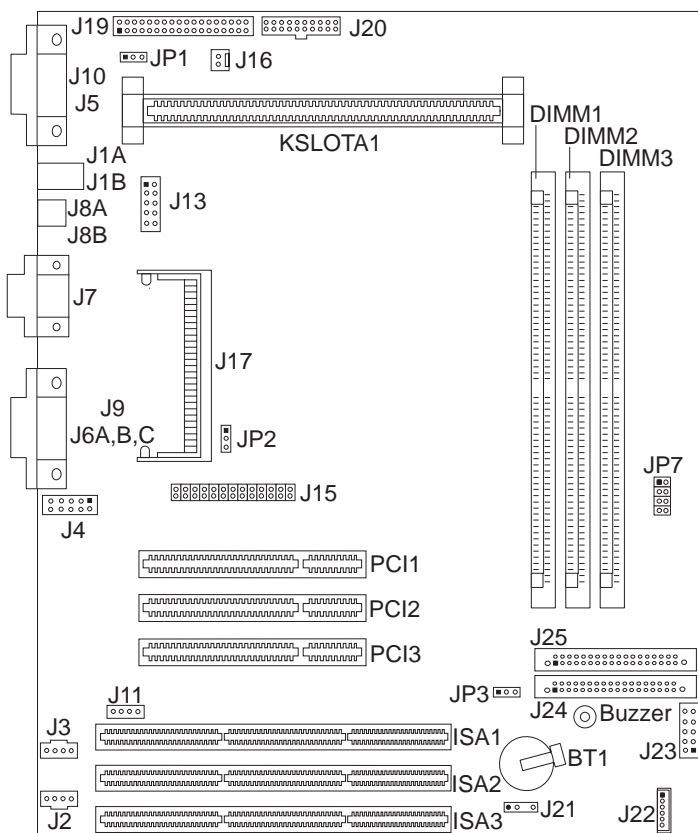


Figure 5-3. System Board Type A-2

Attention

The amplifier card BIOS in the system board must match the amplifier card installed in the computer. See “Amplifier Card BIOS” on page 1-16.

System Board Locations—Type A-2

BT1	Battery
DIMM1	DIMM connector (Bank 1)
DIMM2	DIMM connector (Bank 2)
DIMM3	DIMM connector (Bank 3)
ISA1	ISA 1 connector
ISA2	ISA 2 connector
ISA3	ISA 3 connector
J1A/J1B	Mouse/Keyboard connector (top=mouse; bottom=keyboard)
J2	Modem audio-In connector
J3	TV Audio-In connector
J4	Audio amplifier connector
J5	Serial port connector (bottom connector)
J6A/B/C	Audio out/in, mic
J7	Monitor connector
J8A/B	USB connector (top=USB1, bottom=USB0)
J9	MIDI/Joystick connector (top)
J10	Parallel connector (top)
J11	CD/DVD-ROM audio in connector
J13	TV out connector
J14	AC-3 connector
J15	Video feature connector
J16	Fan connector
J17	SO-DIMM socket (video upgrade)
J19	Diskette drive connector
J20	Power connector
J21	Buzzer, on board (Enable: 1-2, Disable: 2-3)
J22	Power switch, Power LED, Hard disk LED connector
J23	Media Console connector (Type 2142 only)
J24	Secondary IDE connector
J25	Primary IDE connector (For hard disk drive jumper settings, see page 5-10)
JP1	Diskette Write (Enable: 1-2, Disable: 2-3)
JP2	On-Board Video Enable (Normal: 2-3, Disable: 1-2)
JP3	CMOS, Power-on Password Reset (Normal: 2-3, Clear: 1-2)
JP7	Processor Bus Factor (See Figure 5-4 on page 5-7.)
PCI1	PCI 1 connector
PCI2	PCI 2 connector
PCI3	PCI 3 connector
KSLOTA1	Processor

Processor Bus Factor—Type A-2

The Processor speed jumpers are set to the manufacture Type and Model of the Aptiva computer. Changing jumper settings are not supported and might cause system failures.

Pentium II	Jumper	233 MHz	266 MHz
Processor Speed MHz	JP7	1-2, 5-6	1-2, 3-4 7-8

Figure 5-4. Pentium II Processor Speed—Type A-2

Factory-Installed Modem Card

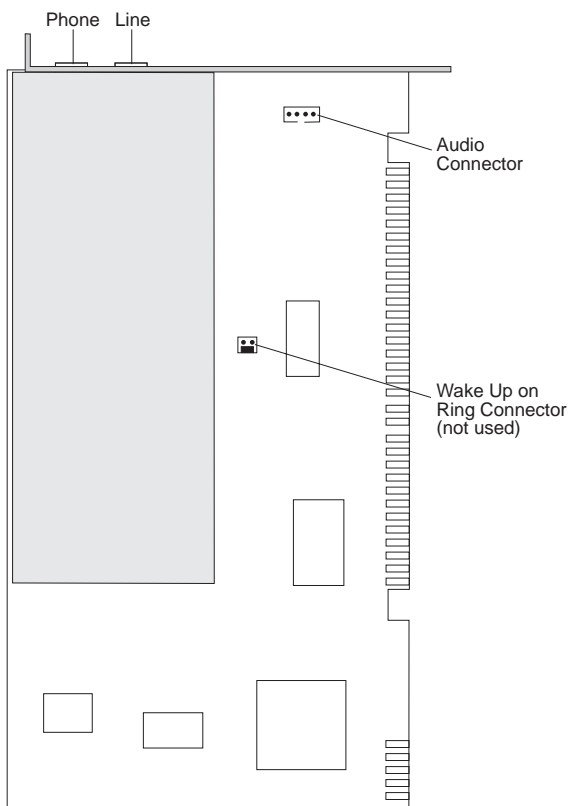


Figure 5-5. 33.6 Kbps Modem Card

The 33.6 Kbps 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.

The factory installed modem can be tested with the Advanced Diagnostics CD. See "Diagnostics and Utilities CD" on page 3-3.

Note: 33.6 Kbps modems enable transfer speeds over the phone network of up to 33.6 Kbps. Actual speeds depend on many factors and are often less than the maximum possible.

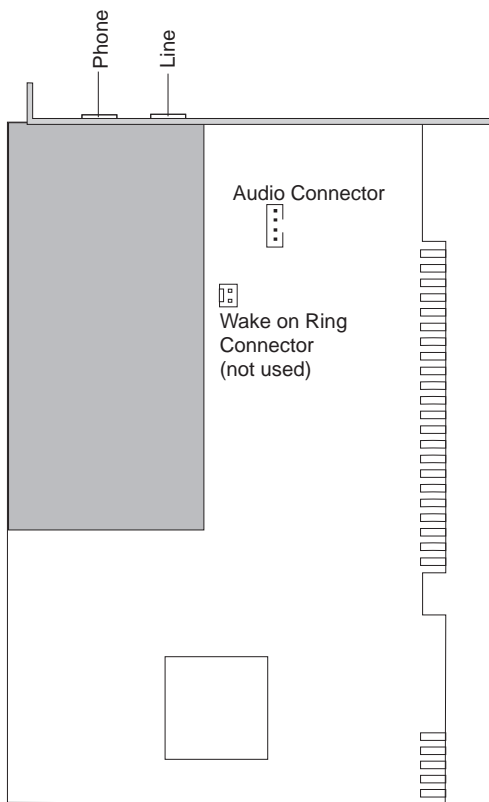


Figure 5-6. 56 Kbps Modem Card

The 56 Kbps modem is controlled by the Windows 95 Control Panel. Online modem help is in the 56 Kbps Modem selection in the Program window, from the Start icon.

The factory installed modem can be tested with the Advanced Diagnostics CD. See "Diagnostics and Utilities CD" on page 3-3.

Note:

56 Kbps modems for EMEA models are 56 Kbps Upgradeable.

K56 Flex modems are designed to be capable of receiving data at up to 56 Kbps from a K56 Flex compatible service provider, and transmitting data at up to 33.6 Kbps. Public networks currently limit maximum download speeds to about 53 Kbps. Actual speeds depend on many factors and are often less than the maximum possible.

Hard Disk Drive Jumper Settings

Up to four drive devices (hard disk, CD/DVD-ROM, or Zip drives) can be installed in **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—Type A-1” on page 5-2 and “System Board Layout—Type A-2” on page 5-5 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, it must be attached to the secondary 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. If an additional hard disk drive is connected to the secondary connector, it must be set as the master drive, 1, and the CD/DVD-ROM drive jumpers reset as the slave drive (see “CD/DVD-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
Hard Disk 3	Master drive (CD/DVD-ROM if other drive not connected to this connector. Also, Zip drive with internal Zip drive models)
Hard Disk 4	Slave drive (CD/DVD-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.

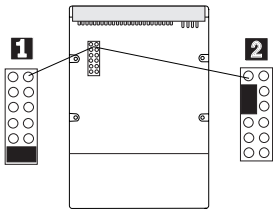


Figure 5-7. Maxtor Hard Disk Drives

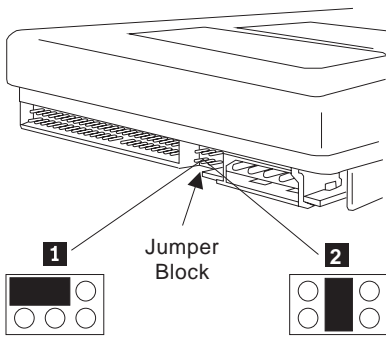


Figure 5-8. Western Digital Hard Disk Drives

Continued on next page.

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

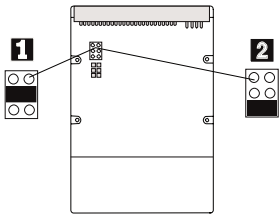


Figure 5-9. Quantum Hard Disk Drives

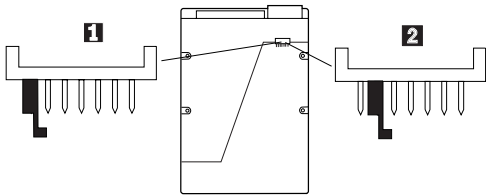


Figure 5-10. IBM Hard Disk Drives

CD/DVD-ROM Drive Jumper Settings

The CD/DVD-ROM drives are connected to the system board secondary drive connector at the factory. CD/DVD-ROM drive jumpers are set as the master drive, as shown in Figure 5-11. If an additional hard disk drive is connected to the secondary connector, it must be set as the master drive (see 1 in figure 5-7) and the CD/DVD-ROM drive jumpers reset as the slave drive as shown in Figure 5-11.

Note: For models that have a factory-installed Zip drive, the Zip drive is jumpered as slave and the CD/DVD-ROM drive is jumpered as master. See “Zip Drive” on page 5-14

Check the Setup Utility for correct installation.

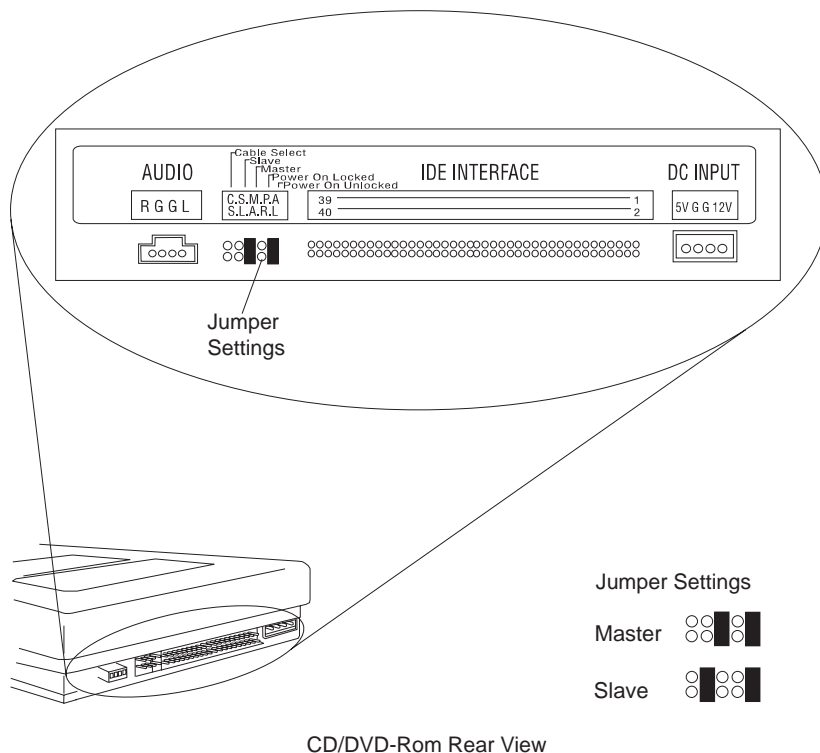


Figure 5-11. CD/DVD-ROM Drive Jumper Settings

Zip Drive

The factory installed Zip 100 ATAPI drive is connected to the system board secondary 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 5-12.

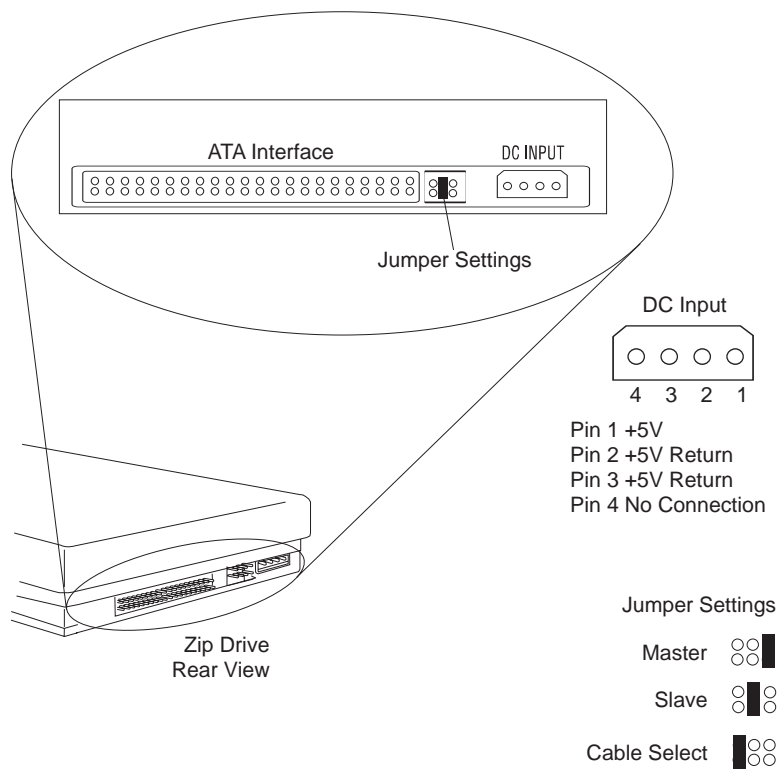
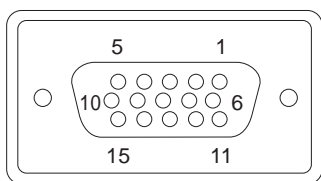
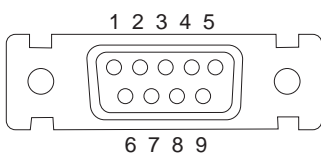


Figure 5-12. Zip Drive Jumper Settings

Detachable Monitor I/O Signal Cable Connector Test Points



System board



Monitor end of cable
(on some models)

Figure 5-13. 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

Media Console Cable

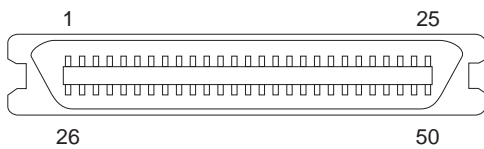


Figure 5-14. Media Console Cable Connector

Table 5-1. Media Console Pin Numbering			
Pin	Signal	Pin	Signal
1	DATA15	26	CD_AUDIO_L
2	DATA14	27	CD_AUDIO_LGND
3	DATA13	28	CD_AUDIO_R
4	DATA12	29	CD_AUDIO_RGND
5	DATA11	30	+12V_DROP
6	DATA10	31	+12V_DROP
7	DATA_9	32	+12V_DROP
8	DATA8	33	+12VDC
9	ADR_EN	34	+12VDC
10	DAT_EN#	35	+12VDC
11	R/W#	36	GND
12	IRQ_STRB#	37	GND
13	TC_BUF	38	GND
14	DRQA#	39	GND
15	DRQB#	40	GND
16	DRQC#	41	GND
17	HDD_IORDY	42	GND
18	DATA7	43	GND
19	DATA6	44	GND
20	DATA5	45	GND
21	DATA4	46	GND
22	DATA3	47	SPARE
23	DATA3	48	PWR_LED_ANODE
24	DATA1	49	AUX5
25	DATA0	50	ON_PULSE

System Board Connector Specifications

Refer to “System Board Layout—Type A-1” on page 5-2 and “System Board Layout—Type A-2” on page 5-5 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	Sync Ground	
6	Red Ground	
7	Green Ground	

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

Power Management Power

Pin	Signal Name
1	AUX5
2	POWER_CNTRL
3	Ground

On/Off Switch Connector

Pin	Signal Name
1	AUX5
2	Switch

Modem Wake Up on Ring Detect Connector

Pin	Signal Name
1	AUX5
2	Key (not populated)
3	EXT_WAKEUP
4	Ground

Speaker Connector

Pin	Signal Name
1, 2	Disabled
3, 4	Enabled

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	\overline{ACTIVE}	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).

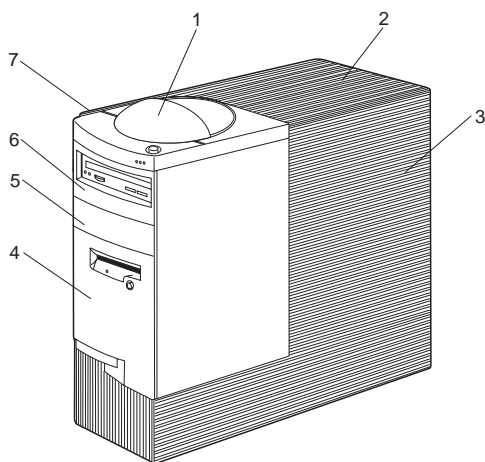
Note: See the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" on page B-1 for model specifications.

Assemblies (Service Level A)

Catalog Section	7-3
Assembly 1: Machine Type 2140 System Unit - Exterior (SL-A)	7-3
Assembly 2: Machine Type 2140 System Unit - Interior (SL-A)	7-4
Assembly 3: Machine Type 2142 System Unit - Exterior (SL-A)	7-7
Assembly 4: Machine Type 2142 System Unit - Interior (SL-A)	7-8
Assembly 5: Diskette, Hard Disk Drives, and Zip Drive	7-11
Assembly 6: Media Console (Type 2142)	7-13
Assembly 7: CD/DVD-ROM Drive, Modem, and TV Cards	7-15
Assembly 8: Monitor and Power Cord (Linecord)	7-18
Assembly 9: Keyboard and Mouse	7-20
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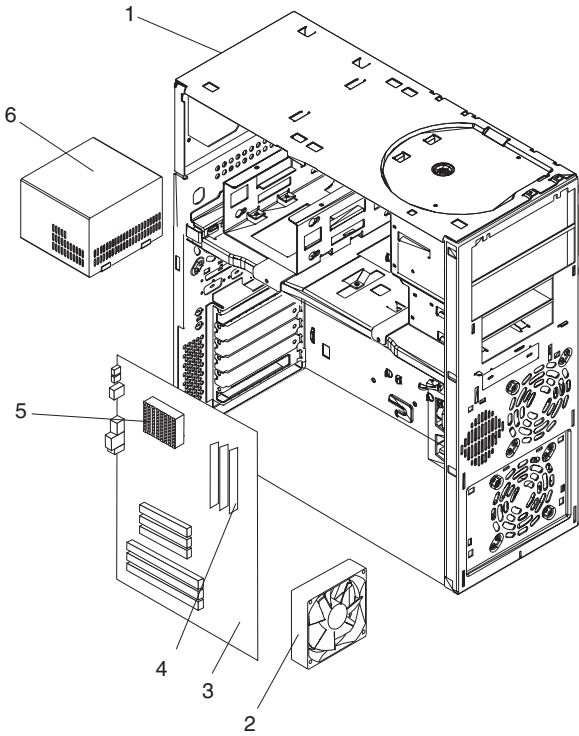
Catalog Section

Assembly 1: Machine Type 2140 System Unit - Exterior (SL-A)



Asm-Index	Part Number	Units	Description
1-1			Type 2140 Exterior
-1	12J6476	1	Cap/Handle Assembly
-NS	12J6295	1	Panel Switch/LED
-2	12J6474	1	Top Cover
-3	12J6475	1	Side Cover
-4	00K8351	1	Panel Assembly
-NS	12J5548	1	Main bezel
-5	12J5550	1	3.5 and 5.25-In Blank Bezel
-6	12J6290	1	CD Bezel Assembly
-NS	12J6473	1	DVD Bezel
-NS	12J6297	1	ZIP Bezel Assembly
-7	12J5546	1	Access cover Assembly
-NS	12J6294	1	Feet (Packet of 4)

Assembly 2: Machine Type 2140 System Unit - Interior (SL-A)

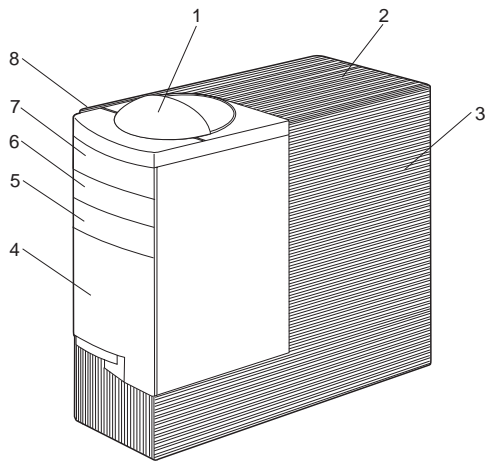


Asm- Index	Part Number	Units	Description
2-1			Machine Type 2140 Note See the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" on page B-1 for model specifications.
-1		R	Chassis Assembly
-NS	76H6353	1	Amplifier Signal to System Board Cable
-NS	76H6355	1	Amplifier Audio to System Board Cable
-NS	75H8905	1	Diskette Drive Cable
-NS	76H6351	1	Power Switch to System Board Cable
-NS	12J5980	1	Serial Cable
-NS	76H6367	1	Amplifier Tier 1
-NS	12J5979	1	Serial Interface Module-Home Director
-2	12J6487	1	Fan Assembly
			All system board FRUs are shipped without processor or DIMMs. When replacing a system board, remove all FRUs from the original system board and install them on the new system board.
			Attention - The amplifier card BIOS in the system board must match the amplifier card installed in the computer. See "Amplifier Card BIOS" on page 1-16.
-3	93H5148	1	System Board - Type A-1
-3	93H5225	1	System Board - Type A-2
-3	93H7524	1	System Board - Type A-2 with TV OUT 'J13'
-NS	93F0063	1	Lithium Battery
-NS	33F8354	1	Lithium Battery (EMEA)
-NS	93F0067	1	Jumper Kit
-NS	12J6296	1	Screw Kit
-4	01K1104	1	DIMM, 16 MB SDRAM
-4	01K1105	1	DIMM, 32 MB SDRAM
-5	42H4865	1	Pentium MMX-166 MHz Processor

Assembly 2: (continued)

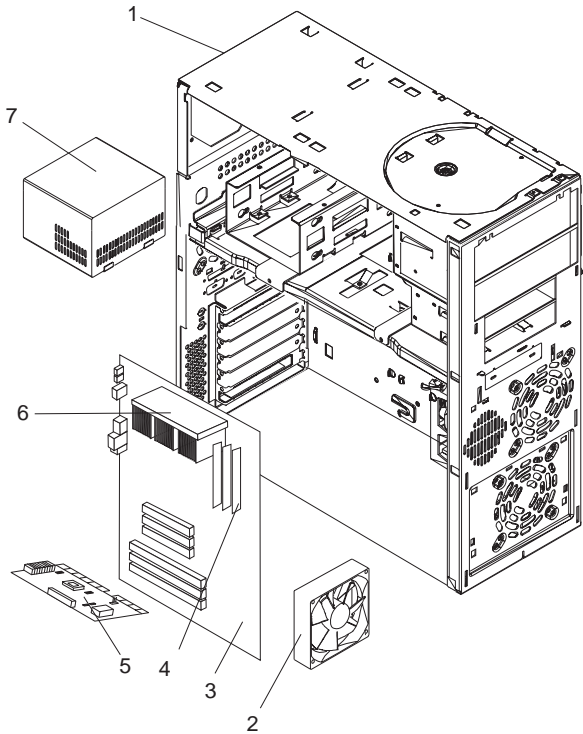
-5	42H4866	1	Pentium MMX-200 MHz Processor
-5	12J6236	1	Pentium MMX-233 MHz Processor
-NS	76H3658	1	Voltage Regulator for Pentium MMX Processor
-5	01K2063	1	Pentium II-233 MHz Processor
-5	01K2064	1	Pentium II-266 MHz Processor
-5	01K2109	1	Pentium II-300 MHz Processor
-5	01K2167	1	Pentium II-333 MHz Processor
-6	75H8991	1	Power Supply-200 Watt
-6	76H4873	1	Power Supply-200 Watt-Japan

Assembly 3: Machine Type 2142 System Unit - Exterior (SL-A)



Asm-Index	Part Number	Units	Description
3-1			Type 2142 Exterior
-1	12J6477	1	Cap/Handle Assembly
-2	12J6474	1	Top Cover
-3	12J6475	1	Side Cover
-4	00K8350	1	Panel Assembly
-NS	12J5548	1	Main bezel
-5	12J5550	1	3.5 and 5.25-In Blank Bezel
-6	12J5550	1	3.5 and 5.25-In Blank Bezel
-7	12J5550	1	3.5 and 5.25-In Blank Bezel
-NS	12J6290	1	CD Bezel Assembly
-NS	12J6473	1	DVD Bezel
-NS	12J6297	1	ZIP Bezel Assembly
-8	12J5546	1	Access cover Assembly
-NS	12J6294	1	Feet (Packet of 4)

Assembly 4: Machine Type 2142 System Unit - Interior (SL-A)

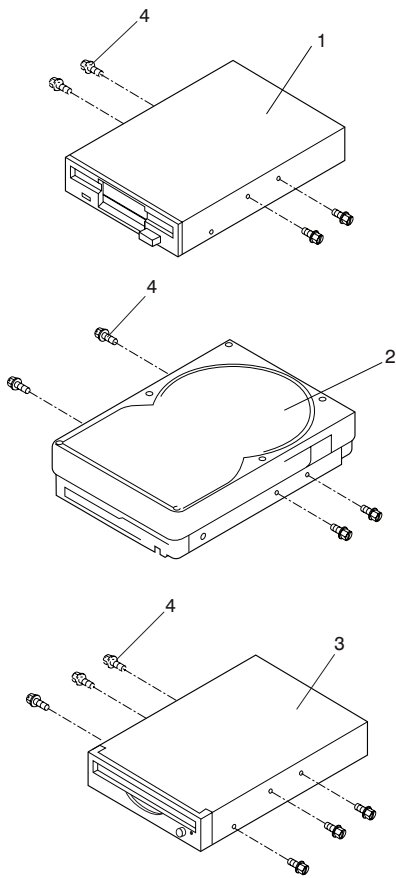


Asm-Index	Part Number	Units	Description
4-1			Machine Type 2142 Note See the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" on page B-1 for model specifications.
-1		R	Chassis Assembly
-NS	76H6367	1	Amplifier Tier 1
-NS	12J5840	1	Amplifier Tier 2
-NS	76H6351	1	Cable, Power Switch to System Board
-NS	76H6353	1	Cable, Amplifier Signal to System Board
-NS	76H6355	1	Cable, Amplifier Audio to System Board
-NS	07H1496	1	Cable, Host Card to System Board Audio
-NS	12J5919	1	Cable, Host Card to System Board LED
-NS	76H6347	1	Cable, Host Card to System Board Signal
-2	12J6487	1	Fan Assembly All system board FRUs are shipped without processor or DIMMs. When replacing a system board, remove all FRUs from the original system board and install them on the new system board. Attention - The amplifier card BIOS in the system board must match the amplifier card installed in the computer. See "Amplifier Card BIOS" on page 1-16.
-3	93H5148	1	System Board - Type A-1
-3	93H5225	1	System Board - Type A-2
-3	93H7524	1	System Board - Type A-2 with TV OUT 'J13'
-NS	93F0063	1	Lithium Battery
-NS	33F8354	1	Lithium Battery (EMEA)
-NS	93F0067	1	Jumper Kit
-NS	12J6296	1	Screw Kit

Assembly 4: (continued)

-4	01K1105	1	DIMM, 32 MB SDRAM
-5	12J5962	1	Host Card
-6	42H4865	1	Pentium MMX-166 MHz Processor
-6	42H4866	1	Pentium MMX-200 MHz Processor
-6	12J6236	1	Pentium MMX-233 MHz Processor
-NS	76H3658	1	Voltage Regulator for Pentium MMX Processor
-6	01K2063	1	Pentium II-233 MHz Processor
-6	01K2064	1	Pentium II-266 MHz Processor
-7	75H8991	1	Power Supply-200 Watt
-7	76H4873	1	Power Supply-200 Watt-Japan

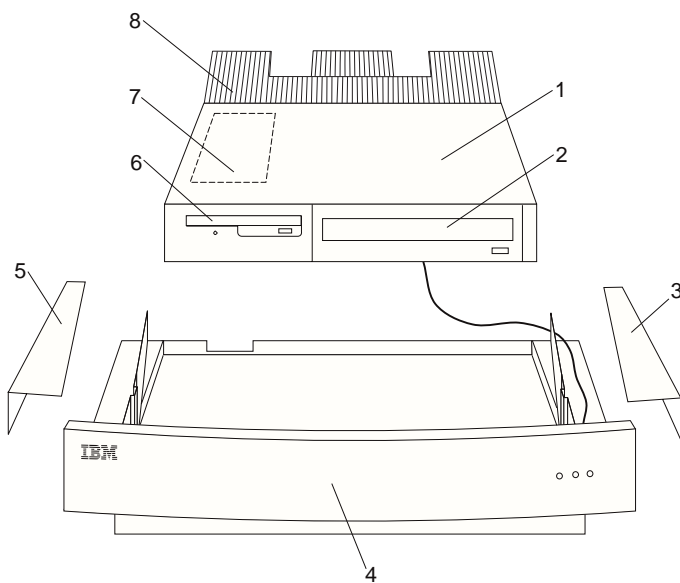
Assembly 5: Diskette, Hard Disk Drives, and Zip Drive



Assembly 5: (continued)

Asm- Index	Part Number	Units	Description
5-1	75H9550	1	3.5-in. 1.44 MB 2 mode Diskette Drive
-1	75H9552	1	3.5-in. 1.44 MB 3 mode Diskette Drive-Japan
-2	12J3141	1	2.1 GB Hard Disk Drive (Type 2140)
-2	02K3410	1	2.1 GB Hard Disk Drive (5.25-Inch) (Type 2140)
-2	12J4560	1	3.2 GB Hard Disk Drive
-2	02K1146	1	4.2 GB Hard Disk Drive
-2	12J3143	1	4.2 GB Hard Disk Drive
-2	02K1148	1	4.2 GB Hard Disk Drive (5.25-Inch)
-2	10L6086	1	6.0 GB 5.25-In. Hard Disk Drive
-2	00K7933	1	6.4 GB 5.25-In. Hard Disk Drive
-2	75H9921	1	6.4 GB 3.5-In. Hard Disk Drive
-2	10L6087	1	8.0 GB 5.25-In. Hard Disk Drive
-NS	12J6421	1	Hard Disk Drive Cable Note When referring to hard-disk-drive capacity, MB means 1 000 000 bytes; total user-accessible capacity may vary depending on operating environment. When referring to hard-disk-drive capacity, GB means 1 000 000 000 bytes; total user-accessible capacity may vary depending on operating environment Note See the Appendix B, "Model/Monitor Configurations and FRU Part Numbers" on page B-1 for model specifications.
-3	76H6097	1	Zip Drive, 100 MB (Type 2142)
-4	93F0041	1	Packet (Mounting Screws)

Assembly 6: Media Console (Type 2142)

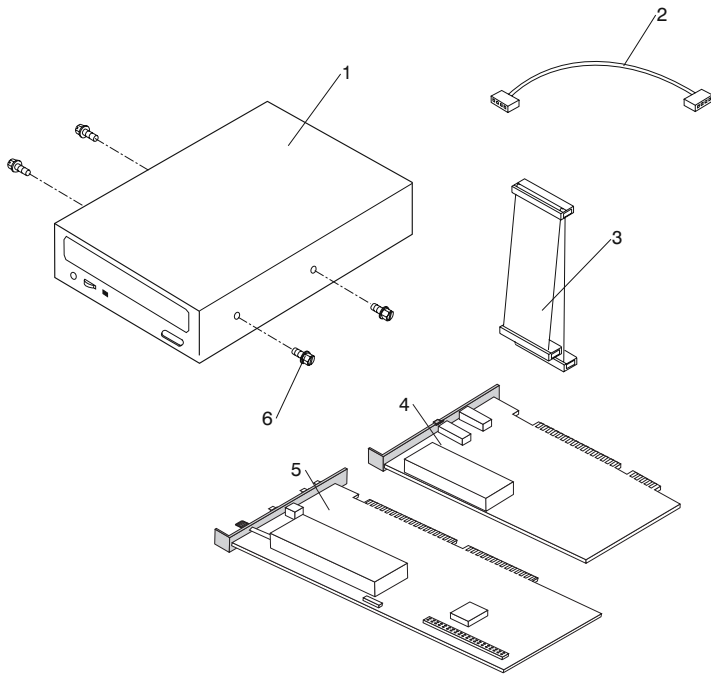


Asm-Index	Part Number	Units	Description
6-1	00K8358	1	Media Console Top Cover
-NS	12J5928	1	Media Console Assembly - 2 Mode/24X Max
-NS	12J5930	1	Media Console Assembly - 2 Mode/DVD-ROM
-NS	12J5938	1	Media Console Assembly - (Japan) 3 Mode/24X Max
-NS	12J5940	1	Media Console Assembly - (Japan) 3 Mode/DVD-ROM
-2	12J3525	1	CD-ROM Drive(24X Max)
-2	02K1119	1	CD-ROM Drive(32X Max)
-2	00K7888	1	DVD-ROM Drive
-3	12J5941	1	Right Wing Cover
-4	00K8357	1	Media Console Base
-NS	76H4738	1	LED Assembly
-5	12J5934	1	Left Wing Cover

Assembly 6: (continued)

-6	75H9550	1	3.5-in. 1.44 MB 2 Mode Diskette Drive
-6	75H9552	1	3.5-in. 1.44 MB 3 Mode Diskette Drive (Japan, Hong Kong, and Korea)
-6	76H6097	1	Zip Drive
-7	12J5835	1	Client Card including On/Off switch
-8	12J5933	1	Media Console Rear Cover
-NS	12J5886	1	CD/DVD-ROM Audio Cable
-NS	12J5867	1	CD/DVD-ROM Power Cable
-NS	12J5785	1	Diskette Power Cable
-NS	12J5787	1	Diskette Signal Cable
-NS	00K8175	1	IDE Shielded Signal Cable
-NS	12J5791	1	LED Panel Cable
-NS	12J5783	1	Umbilical-3 Cable

Assembly 7: CD/DVD-ROM Drive, Modem, and TV Cards

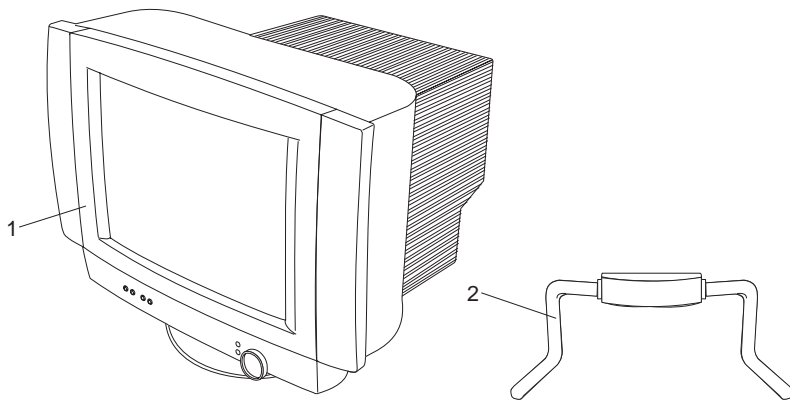


Assembly 7: (continued)

Asm- Index	Part Number	Units	Description
7-1	12J3525	1	CD-ROM Drive (24X Max)
-1	00K7888	1	DVD-ROM Drive
-2	76H6349	1	CD/DVD-ROM Audio Cable (Type 2140)
-2		1	For Type 2142, see "Assembly 6: Media Console (Type 2142)" on page 7-13.
-3	76H6347	1	CD/DVD-ROM Signal Cable (Type 2140)
-3		1	For Type 2142, see "Assembly 6: Media Console (Type 2142)" on page 7-13.
-4	76H6947	1	33.6 Kbps Modem Card (Belgium-English/French)
-4	76H6247	1	33.6 Kbps Modem Card (France)
-4	76H6247	1	33.6 Kbps Modem Card (Italy)
-4	76H1760	1	33.6 Kbps Modem Card (Japan)
-4	76H1758	1	33.6 Kbps Modem Card (Netherlands)
-4	76H6945	1	33.6 Kbps Modem Card (Spain)
-4	12J6483	1	55.6 Kbps Modem Card (Australia/New Zealand)
-4	00K8731	1	55.6 Kbps Modem Card (Belgium)
-4	12J6518	1	55.6 Kbps Modem Card (France)
-4	12J6520	1	55.6 Kbps Modem Card (Italy)
-4	12J6516	1	55.6 Kbps Modem Card (Netherlands)
-4	12J3998	1	55.6 Kbps Modem Card (North America/Canada)
-4	00K8735	1	55.6 Kbps Modem Card (Spain)
-4	12J6254	1	55.6 DSP Modem Card (Japan)
-4	12J6576	1	55.6 DSP Modem Card (UK, FR, GR, AUS, DEN, SWE, NOR, FIN, SWI)
-4	12J1850	1	ISDN Modem Card (Type 2142 Model S57)
-NS	12J6228	1	PCI Adapter Card IEEE 1394 (Type 2142 Model S67)
-NS	76H1617	1	Modem to Audio Cable
-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	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	60H6043	1	Telephone Adapter (Spain)
-NS	60H6054	1	Telephone Adapter (Sweden)
-NS	60H6055	1	Telephone Adapter (Switzerland)
-NS	60H6051	1	Telephone Adapter (UK)
-NS	76H1572	1	Joystick (Type 2142)
-NS	76H6978	1	Microphone Headset
-NS	12J3988	1	Headset Y-Adapter
-NS	12J5971	1	Game Pad (Type 2140)
-NS	12J5844	1	Sub Woofer
-NS	12J6221	1	MPEG-2 Card (Type 2142)
-NS	12J6418	1	MPEG-2 Card (Type 2142 Japan)
-5		1	N/A
-6	93F0041	1	Packet (Mounting Screws)

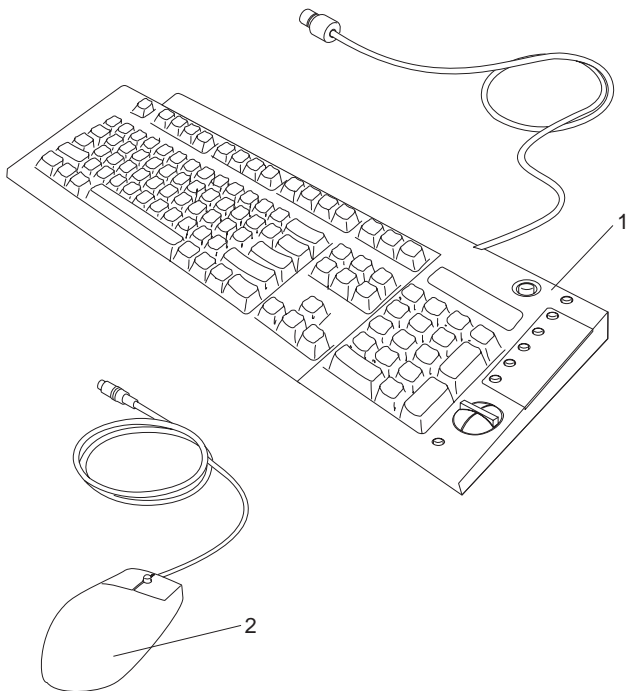
Assembly 8: Monitor and Power Cord (Linecord)



Asm-Index	Part Number	Units	Description
8-1			<p>Monitor (includes I/O cable and swivel stand) EQ = Equatorial NH = Northern hemisphere SH = Southern hemisphere</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>15-Inch Monitor - MM55 Type 2116 (13.6-Inch diagonal viewing area) Integrated Sound/ On Screen Display Auto-sensing Universal Voltage power supply - 88-264 VAC 50/60 Hz</p>

-1	60H9560	1	- .28, NH
-1	60H9595	1	- .28, EQ
-1	60H9596	1	- .28, SH
-1	60H9597	1	- .28, NH (Japan)
			17-Inch Monitor - MM75 Type 2128 (15.7-Inch diagonal viewing area) Integrated Sound/ On Screen Display Auto-sensing Universal Voltage power supply - 88-264 VAC 50/60 Hz
-1	60H9571	1	- .28, NH
-1	60H9600	1	- .28, EQ
-1	60H9601	1	- .28, SH
-1	60H9602	1	- .28, NH (Japan)
-2	12J5936	1	Monitor Stand (Type 2142)
-2	00K8448	1	Monitor Screw Kit (Type 2142)
			Power Cord (linecord) for monitor and system unit
-	93F2365	1	- Australia
-	13F9978	1	- Belgium (French)
-	93F2364	1	- Canada (English)
-	93F2364	1	- Canada (French)
-	13F9996	1	- Denmark
-	13F9978	1	- Finland
-	13F9978	1	- France
-	13F9978	1	- Germany
-	14F0068	1	- Italy
-	39H0212	1	- Japan
-	13F9978	1	- Netherlands
-	93F2365	1	- New Zealand
-	13F9978	1	- Norway
-	13F9978	1	- Spain
-	13F9978	1	- Sweden
-	14F0050	1	- Switzerland (French)
-	14F0050	1	- Switzerland (German)
-	14F0050	1	- Switzerland (Italian)
-	14F0032	1	- U.K.
-	93F2364	1	- U.S.

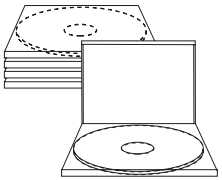
Assembly 9: Keyboard and Mouse



Asm-Index	Part Number	Units	Description
9-1			Keyboard EZ Button
-1	07H0675	1	- Belgium/Dutch
-1	12J5617	1	- Belgium-French
-1	12J5609	1	- Canada (French)
-1	12J5621	1	- Danish
-1	12J5622	1	- Dutch
-1	12J5638	1	- Finnish/Swedish
-1	12J5623	1	- French
-1	12J5624	1	- German
-1	12J5629	1	- Italy
-1	12J5645	1	- Japan
-1	12J5630	1	- Norwegian
-1	12J5637	1	- Spanish
-1	07H0697	1	- Swedish/Finnish
-1	12J5639	1	- Swiss-French/German

-1	12J5642	1	- U.K. English
-1	12J5607	1	- U.S. English
-2	12J4549	1	Mouse
-NS	12J4547	1	Ball and Clip for Mouse
-NS	12J4552	1	Blue Mouse Caps

Assembly 10: Software



CD-ROM

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

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00K7933	5-2	7-12	12J5546	1-7	7-3
00K8175	6-NS	7-14		3-8	7-7
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00K8351	1-4	7-3		3-NS	7-7
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	4-6	7-10	12J5623	9-1	7-20
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01K2109	2-5	7-6	12J5630	9-1	7-20
01K2167	2-5	7-6	12J5637	9-1	7-20
02K1119	6-2	7-13	12J5638	9-1	7-20
02K1146	5-2	7-12	12J5639	9-1	7-20
02K1148	5-2	7-12	12J5642	9-1	7-21
02K3410	5-2	7-12	12J5645	9-1	7-20
07H0675	9-1	7-20	12J5783	6-NS	7-14
07H0697	9-1	7-20	12J5785	6-NS	7-14
07H1496	4-NS	7-9	12J5787	6-NS	7-14
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10L6087	5-2	7-12	12J5835	6-7	7-14
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12J3988	7-NS	7-17	12J5928	6-NS	7-13
12J3998	7-4	7-16	12J5930	6-NS	7-13
12J4547	9-NS	7-21	12J5933	6-8	7-14
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12J6295	1-NS	7-3		4-6	7-10
12J6296	2-NS	7-5	42H4866	2-5	7-5
	4-NS	7-9		4-6	7-10
12J6297	1-NS	7-3	43G3398	7-NS	7-16
	3-NS	7-7	60H6043	7-NS	7-17
12J6418	7-NS	7-17	60H6045	7-NS	7-17
12J6421	5-NS	7-12	60H6046	7-NS	7-17
12J6473	1-NS	7-3	60H6047	7-NS	7-17
	3-NS	7-7	60H6048	7-NS	7-17
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	3-3	7-7	60H6051	7-NS	7-17
12J6476	1-1	7-3	60H6052	7-NS	7-17
12J6477	3-1	7-7	60H6053	7-NS	7-17
12J6483	7-4	7-16	60H6054	7-NS	7-17
12J6487	2-2	7-5	60H6055	7-NS	7-17
	4-2	7-9	60H9560	8-1	7-19
12J6516	7-4	7-16	60H9571	8-1	7-19
12J6518	7-4	7-16	60H9595	8-1	7-18
12J6520	7-4	7-16	60H9596	8-1	7-19
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75H9550	5-1	7-12		8-	7-19
	6-6	7-14	93F2365	8-	7-19
75H9552	5-1	7-12		8-	7-19
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75H9921	5-2	7-12		4-3	7-9
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76H6349	7-2	7-16			
76H6351	2-NS	7-5			
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76H6353	2-NS	7-5			
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76H6355	2-NS	7-5			
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76H6367	2-NS	7-5			
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76H6947	7-4	7-16			
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93F0067	2-NS	7-5			

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.pc.ibm.com/us/>

IBM PC Company Home Page on the World Wide Web

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

Aptiva Home Page

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

IBM PC Company File Library

Appendix B. Model/Monitor Configurations and FRU Part Numbers

The models described in this Appendix are **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-5 outline by model the FRUs that may be ordered by the part number indicated. You can find the Machine Type (2140, 2142) 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 Types 2140, 2142 (SL-A)	B-2
Asia-Pacific-North Machine Types 2140, 2142 (SL-A)	B-3
Asia-Pacific-South Machine Types 2140, 2142 (SL-A)	B-4
EMEA Machine Types 2140, 2142 (SL-A)	B-5
Latin America Machine Types 2140, 2142 (SL-A)	B-6
Monitor-to-FRU Index	B-7

Table B-1. U.S. and Canada Machine Types 2140 and 2142 (Factory-Installed Parts).

Model	System Board	Processor	Memory	Hard Drive	Monitor	CD-ROM	Modem	Power Supply	Software
L31, L3F	93H5148	12J6236	01K1105	02K1146	N/A	12J3525	See 7-15.	75H8991	See 7-22.
L51	93H5225	01K2063	01K1105	00K7933	N/A	00K7888	See 7-15.	75H8991	See 7-22.
L5H	93H5225	01K2063	01K1105	02K1146	N/A	12J3525	See 7-15.	75H8991	See 7-22.
L61	93H5225	01K2064	01K1105	00K7933	See 7-18.	12J3525	See 7-15.	75H8991	See 7-22.
L71	93H5225	01K2109	01K1105	75H9921	N/A	00K7888	See 7-15.	75H8991	See 7-22.
L7M	93H5225	01K2109	01K1105	75H9921	See 7-18.	00K7888	See 7-15.	75H8991	See 7-22.
S61, S6F	93H5225	01K2064	01K1105	00K7933	N/A	12J3525	See 7-15.	75H8991	See 7-22.
S62	93H7524	01K2064	01K1105	00K7933	N/A	00K7888	See 7-15.	75H8991	See 7-22.
S6H	93H7524	01K2064	01K1104 01K1105	00K7933	N/A	00K7888	See 7-15.	75H8991	See 7-22.
S6S	93H7524	01K2064	01K1104 01K1105	00K7933	N/A	00K7888	See 7-15.	75H8991	See 7-22.

Notes:

1. XXF Models = Canada-French; all other Models = U.S.A. and Canada-English.
2. N/A = Not included in model.
3. For monitor frequencies, see Table B-6 on page B-7.

Table B-2. Asia-Pacific-North Machine Types 2140, 2142 (Factory-Installed Parts)

Model	System Board	Processor	Memory	Hard Drive	Monitor	CD-ROM	Modem	Power Supply	Software
L66, L67	93H5225	01K2064	01K1105	10L6086	See 7-18.	02K1119	See 7-15.	76H4873	See 7-22.
L87	93H5225	01K2167	01K1105	10L6087	See 7-18.	02K1119	See 7-15.	76H4873	See 7-22.
LG2, LV2	93H5148	42H4866	01K1105	12J4560	N/A	12J3525	See 7-15.	75H8991	See 7-22.
LG3	93H5148	12J6236	01K1105	12J4560	N/A	12J3525	See 7-15.	75H8991	See 7-22.
LV4	93H5225	01K2064	01K1105	10L6086	N/A	02K1119	See 7-15.	75H8991	See 7-22.
LV5	93H5225	01K2167	01K1105	10L6087	N/A	02K1119	See 7-15.	75H8991	See 7-22.
S57	93H5225	01K2063	01K1105	02K1146	See 7-18.	12J3525	See 7-15.	76H4873	See 7-22.
S67	93H7524	01K2064	01K1105	00K7933	See 7-18.	00K7888	See 7-15.	76H4873	See 7-22.
SG1, SV1	93H5225	01K2063	01K1105	02K1148	N/A	12J3525	See 7-15.	75H8991	See 7-22.
SG2	93H7524	01K2064	01K1105	00K7933	N/A	00K7888	See 7-15.	75H8991	See 7-22.

Notes:

1. LX7 and SX7 Models = Japan.
2. LGX and SGX Models = Hong Kong.
3. LVX and SVX Models = People's Republic of China
4. N/A = Not included in model.
5. For monitor frequencies, see Table B-6 on page B-7.

Table B-3. Asia-Pacific-South Machine Types 2140, 2142 (Factory-Installed Parts)

Model	System Board	Processor	Memory	Hard Drive	Monitor	CD-ROM	Modem	Power Supply	Software
LQ2	93H5148	42H4866	01K1105	12J4560	See 7-18.	12J3525	See 7-15.	75H8991	See 7-22.
LQ3	93H5148	12J6236	01K1105	12J4560	See 7-18.	12J3525	See 7-15.	75H8991	See 7-22.
LQ4	93H5225	01K2064	01K1105	10L6086	See 7-18.	02K1119	See 7-15.	75H8991	See 7-22.
LQ5	93H5225	01K2167	01K1105	10L6087	See 7-18.	02K1119	See 7-15.	75H8991	See 7-22.
LQ6	93H5148	42H4866	01K1105	02K3410	See 7-18.	12J3525	See 7-15.	75H8991	See 7-22.
LQ7	93H5225	01K2167	01K1105	10L6087	See 7-18.	02K1119	See 7-15.	75H8991	See 7-22.
SQ1	93H7524	01K2063	01K1105	02K1148	See 7-18.	00K7888	See 7-15.	75H8991	See 7-22.
SQ2	93H7524	01K2063	01K1105	02K1146	See 7-18.	00K7888	See 7-15.	75H8991	See 7-22.

Notes:

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

Table B-4. EMEA Machine Types 2140 and 2142 (Factory-Installed Parts).

Model	System Board	Processor	Memory	Hard Drive	Monitor	CD-ROM	Modem	Power Supply	Software
L35, L45	93H5225	01K2063	01K1105	02K1148	Express Repair	12J3525	See 7-15.	75H8991	See 7-22.
L44	93H5225	01K2063	01K1105	02K1146	Express Repair	12J3525	See 7-15.	75H8991	See 7-22.
L46	93H5225	01K2064	01K1105	02K1146	Express Repair	12J3525	See 7-15.	75H8991	See 7-22.
S34, S44	93H5148	12J6236	01K1105	02K1148	Express Repair	12J3525	See 7-15.	75H8991	See 7-22.
S35, S45	93H5225	01K2063	01K1105	02K1148	Express Repair	12J3525	See 7-15.	75H8991	See 7-22.
S36, S46	93H5225	01K2064	01K1105	02K1148	Express Repair	00K7888	See 7-15.	75H8991	See 7-22.
S47	93H5225	01K2109	01K1105	02K1148	Express Repair	12J3525	See 7-15.	75H8991	See 7-22.

Notes:

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

Table B-5. Latin America Machine Type 2140, 2142 (Factory-Installed Parts)

Model	System Board	Processor	Memory	Hard Drive	Monitor	CD-ROM	Modem	Power Supply	Software
LD2	93H5148	12J6236	01K1104	02K1148	N/A	12J3525	See 7-15.	75H8991	See 7-22.

Notes:

1. LD2 Model = Mexico
2. N/A = Not included in model.
3. For monitor frequencies, see Table B-6 on page B-7.

Table B-6 applies only to monitors sold with **Service Level A** Type 2140, 2142 computers. The monitor part number can be found on the back of the monitor.

See "Assembly 8: Monitor and Power Cord (Linecord)" on page 7-18 for FRU part numbers.

<i>Table B-6. Monitor-to-FRU Index and Monitor Frequency Settings</i>		
Monitor Part Number	FRU Number	Monitor Frequency (KHz)
60H9544	60H9560	69.0
60H9548	60H9560	69.0
60H8547	60H9595	69.0
60H9546	60H9596	69.0
60H9548	60H9597	69.0
60H9554	60H9571	69.0
60H9555	60H9571	69.0
60H9557	60H9600	69.0
60H9556	60H9601	69.0
60H9558	60H9602	69.0

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