IBM
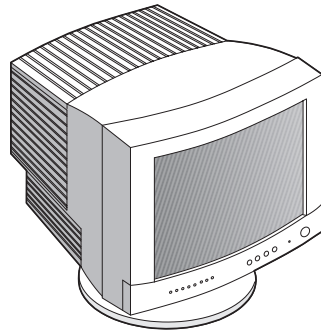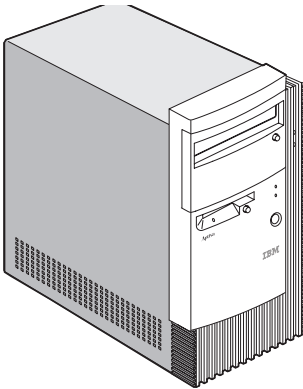
Hardware Maintenance Service
for Service Level A

Machine Types 2158, 2163 and 2164 and
IBM Monitors 2235, 2236 and 2237

2158/2163/2164 2235/2236/2237

Aptiva

First Edition (September, 1998)

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Contents

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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
200-240 V	230 V

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

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

Safety Information

DANGER

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

To avoid shock hazard:

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

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

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

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

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

Do not:

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

II

- Repair or disassemble

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

CAUTION:

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

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

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

DANGER

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

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

CAUTION:

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

PERIGO:

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

Para evitar choques elétricos:

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

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

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

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

CUIDADO:

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

 Não:

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

Descarte a bateria conforme requerido pelas disposições e regulamentações locais.

CUIDADO:

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

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

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

PERIGO:

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

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

CUIDADO:

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

声明 10

注意！

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

声明 1

危险！

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

为避免电击危险：

- 电源线必须连接到适当的电线及接地插座。

- 此产品将要连接的所有设备也必须连接到正确接线的插座上。

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

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

要连接电缆	要断开电缆
1.关闭所有设备。	1.关闭所有设备。
2.首先将所有电缆与设备连接。	2.首先从电源插座拔下电源线。
3.将信号线连接到插座。	3.从插座拔下信号电缆。
4.将电源线连接到电源插座。	4.从设备上拔下所有电缆。
5.打开设备。	

声明 2

注意！

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

不要：

– 将其投入或浸于水中

– 加热超过100℃ （212℉）

– 修理或拆卸

应按照当地法规和条例对此电池进行处理。

声明 3

注意 ！

在已安装 CD-ROM 驱动器的情况下，请注意下面的内容。

不遵循此处指定的控制、调整、或操作过程的操作将可能导致危险的辐射泄漏。

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

声明 4

危险 ！

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

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

• 聲明 10

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

• 聲明 1

危險

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

為了避免雷擊：

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

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

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

連接	拔掉
1.關掉所有開關。	1.關掉所有開關。
2.首先，將所有電纜線連接到裝置。	2.首先，自電源插座拔掉電源線。
3.將信號電纜連接到信號插座。	3.拔掉信號插座上的所有信號電纜。
4.將電源線連接到電源插座。	4.拔掉裝置上的所有電纜線。
5.開啟裝置電源。	

· 聲明 2

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

嚴禁：.

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

處理癈棄電池時，請遵照當地法令規章處理。

· 聲明 3

注意：
安裝光碟機時，請注意下列事項：

不依此處所指示的控制、調整或處理步驟，恐有遭致輻射之虞。

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

· 聲明 4

危險

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

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

PERIGO:

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

Pour éviter tout risque de choc électrique :

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

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

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

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

ATTENTION:

Remplacez la pile usagée par une pile de référence identique exclusivement - voir la référence IBM - ou par une pile équivalente recommandée par le

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

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

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

ATTENTION:

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

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

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

PERIGO:

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

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

ATTENTION:

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

modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration)

.

VORSICHT:

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

Aus Sicherheitsgründen:

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

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

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

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

ACHTUNG:

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

Die Batterie nicht

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

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

ACHTUNG:

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

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

VORSICHT:

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

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

ACHTUNG:

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

PERICOLO:

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

Per evitare il pericolo di scosse elettriche:

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

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

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

Per collegare	Per scollegare
1.SPEGNERE tutti i dispositivi.	1.SPEGNERE tutti i dispositivi.
2.Collegare prima tutti I cavi alle unità.	2.Rimuovere prima il(i) cavo(i) di alimentazione dalla presa elettrica.
3.Collegare i cavi di segnale alle prese.	3.Rimuovere i cavi di segnale dalle prese.
4.Collegare il(i) cavo(i) di alimentazione alla presa elettrica.	4.Rimuovere tutti i cavi dalle unità.
5.ACCENDERE le unità.	

ATTENZIONE:

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

Evitare di:

• Gettarla o immergerla in acqua

• Riscaldarla ad una temperatura superiore ai 100°C

• Cercare di ripararla o smaltirla

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

ATTENZIONE:

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

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

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

PERICOLO:

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

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

ATTENZIONE:

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

경고문 10

주의:

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

경고문 1

위험

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

전기 충격을 피하려면 다음과 같아야 합니다.

− 고압선은 적절한 배선 및 접지 상태의 콘센트로 연결되어야 합니다.

− 이 제품이 접속될 모든 장비도 적절한 배서 상태의 콘센트로 연결되어야 합니다.

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

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

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

경고문 2

주의:

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

다음을 주의하십시오.

– 던지거나 물에 담그지 않도록 하십시오.
– 100℃(212℉) 이상으로 가열하지 않도록 하십시오.
– 수리하거나 분해하지 않도록 하십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3

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

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

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

경고문 4

위험

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

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

PELIGRO:

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

Para evitar una posible descarga:

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

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

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

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

CAUTION:

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

Lo que no debe hacer

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

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

CAUTION:

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

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

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

PELIGRO:

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

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

CAUTION:

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

Laser Compliance Statement

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

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

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

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

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

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

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HelpCenter
IBM
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OS/2
Personal System/2
PS/1
PS/2

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Preface

This manual contains service information for the **2158/2163 Service Level A (SL-A)** model of the IBM Aptiva Personal Computer, worldwide. This manual is intended to be used as a stand-alone document to service Aptiva machine type 2158/2163 products. It is divided into the following chapters:

Notices contains important safety information and notices required to service this computer.

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 how to use the diagnostics tools for isolating failures.

Repairing Information contains illustrations and descriptions to disassemble and reassemble the computer.

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

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

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

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

Appendix B, Online Support Information contains online support information.

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

General Information

Introduction

This chapter gives a general overview of the Aptiva Machine Type 2158/2163/2164, describes the standard and optional features, and details functional and environmental specifications.

Product Overview

Machine Types 2158, 2163 and 2164 have two PCI slots and one PCI/ISA shared slot. The 2158 system supports the AMD K6 processor family while the 2163 supports the Pentium II and Celeron processors. On the other hand the 2164 system supports the Pentium II and Pentium III processors.

All the machine types support Accelerated Graphics Port (AGP), which allows all installed system memory to be used as texture memory, yielding a huge texture footprint to enhance 3D graphical display performance.

Listed below are 2158, 2163 and 2164 system features:

Processors (Machine Type 2158)

- Socket-7 Zero Insertion Force (ZIF) connector.
- Detachable CPU heat sink with fan.
- One of the following processors can be installed:
  - AMD K6-2/333 processor; 95MHz external, 333 MHz internal, with 3DNow!™ technology
  - AMD K6-2/350 processor; 100MHz external, 350 MHz internal, with 3DNow!™ technology

Processors (Machine Type 2163)

Pentium II

- Processor with the capabilities of MMX™ technology
- Processor in Single Edge Contact Cartridge (S.E.C.C.) packaging technology (slot 1).
- Dual Independent Bus architecture separates dedicated external system bus and dedicated internal high-speed cache bus.
- One of the following processors can be installed:
  - Intel Pentium II -350 MHz internal, 100 MHz external
  - Intel Pentium II -400 MHz internal, 100 MHz external
  - Intel Pentium II -450 MHz internal, 100 MHz external

Celeron

- Includes Intel MMX™ media enhancement technology.
- Offers Dynamic Execution technology.
- Processor is provided in the Single Edge Processor Package (S.E.P.P.) with out L2 cache and fits into the slot 1.
- One of the following processors can be installed:
    - Celeron - 366MHz internal, 66MHz external
    - Celeron - 400MHz internal, 66MHz external

Processors (Machine Type 2164)

Pentium II

- Processor with the capabilities of MMX™ technology
- Processor in Single Edge Contact Cartridge (S.E.C.C.) packaging technology (slot 1).
- Dual Independent Bus architecture separates dedicated external system bus and dedicated internal high-speed cache bus.
- One of the following processors can be installed:
    - Pentium II-400 w/ ECC, 512K, 100MHz
    - Pentium II-450 w/ ECC, 512K, 100MHz

Pentium III

- Includes Intel MMX™ media enhancement technology plus additional 70 Streaming SIMD (Single Instruction Multiple Data) extensions
- Processor in Single Edge Contact Cartridge II (S.E.C.C.) with integrated PBSRAM L2 cache (512K)
- One of the following processors can be installed:
    - Pentium III - 450MHz internal, 100MHz external
    - Pentium III - 500MHz internal, 100MHZ external

Memory

- 512-KB Pipeline Burst Static RAM (PBSRAM). Fixed onboard for 2158, built-in Pentium II and Celeron processors for 2163 and in Pentium III for 2164.
- 8-MB video Synchronize DRAM (SDRAM). Fixed onboard for 2158, built-in AGP video adapter card for 2163 and 2164
- 168-pin Synchronous Dynamic Random Access Memory (SDRAM), Dual-in-line Memory Module (DIMM) sockets.

- 2 memory sockets for 2158, 3 sockets for 2163 and 2164.
  - 16-MB, 32-MB, 64-MB or 128-MB DIMM.
  - PC-100 (64-bit, non-ECC, 100MHz, 3.3volt) DIMMs with gold contacts
  - Maximum memory is 256 MB for 2158, 384 MB for 2163 and 2164.

External Ports

• Video port (15-pin D-sub connector)

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

• Serial port (9-pin D-sub connector). 2158 has one serial port while 2163 and 2164 has two.

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

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

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

• Two USB ports

• Microphone-in jack

• Speaker-out jack

• Line-in jack

Diskette Drive

• AT-type

• 3.5-in. 1.44 MB slimline diskette drive.

Hard Disk Drive

• 3.5-in., 1-in. height or 5.25-in, 1-in. height IDE AT drive. (3.5-in may be in acoustic mounting bracket)

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

• Average and minimum 12 ms seek time, access time varies for the hard disk drive and the hard disk drive manufacturer.

CD/DVD-ROM Drive

• 5.25-in. high-performance, 32X CD-ROM or 4X DVD-ROM IDE/AT drive.

• Read data and play audio from standard and mini CD-ROM and audio compact discs (audio CDs). DVD media supported on DVD models.

Multimedia

• A pair of external active speakers with power adapter for 2158 or passive speakers for 2163 and 2164.

- Noise canceling microphone (available on certain models)

Power Management

- Compliant to ACPI and supports Display Power Management Signaling (DPMS) monitor.
- Software shutdown by Windows 98.
- System enters standby mode if any of following conditions are met:
  - Execute standby from Windows 98 Start menu
  - Press system power button if it sets to act as standby function.
  - System is idle and the standby timer set in the Windows 98 Power Management Property elapses.

Power Supply

- PC-98 compatible 95W ATX power supply
- Searchable high/low voltage selection

Internal Cabling

- Two 40-pin ribbon cables for hard disk drive and CD/DVD-ROM drive.
- One 34-pin ribbon cable for AT diskette drive.
- One 4-pin (2-wire) cable for hard disk drive light-emitting diode (LED).
- One 3-pin (3-wire) cable for power light-emitting diode (LED).
- One 2-pin (2-wire) cable for power switch.
- One 4-pin modem voice-in/speaker-out cable.

Modem

- 56.6 Kbps PCI modem adapter card with data/fax/voice or non-voice features.
- Telephone line-out (RJ-11) connector.
- Telephone line-in (RJ-11) connector.

Monitor (Not included with some models)

- Super Video Graphics Array (SVGA) monitor.
- Compliant to VESA power saving mode.
- Connector for a detachable grounded 3-wire power cord
- 1.8-m (5.8-ft.) attached signal cable
- Auto-sensing power input for 100 Vac to 240 Vac

- 15" (13.7" viewable image size) monitor
  - 0.28-mm dot pitch
  - Automatic scanning horizontal frequencies from 30 KHz to 54 KHz or 30 KHz to 69 KHz (for Japan)
  - Vertical frequencies between 50 Hz and 120 Hz.
  - DDC2A/B or DDC1/2B+ support (for Japan)
  - OSD (On-Screen Display) menu (for Japan)
- 17" (15.7" viewable image size) monitor
  - 0.28-mm or 0.27-mm dot pitch (for Japan)
  - Automatic scanning horizontal frequencies from 30 KHz to 69 KHz or 30 KHz to 72 KHz (for Japan)
  - Vertical frequencies between 50 Hz and 120 Hz.
  - DDC1/2B+ support and OSD (On-Screen Display) menu

Keyboard

- 104-key, 105-key or 109-key rubber dome Rapid Access™ keyboard with 1.8-m (5.8-ft.) cable
- PC Next keyboard (for Brazil)

Mouse

- 2 button PS/2 sleek or Scroll Point™ mouse with 1.8-m (5.8-ft.) cable

Hardware Interfaces

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

Item-	Interface
Expansion slot for I/O adapter cards	**Machine Type 2158 and 2163** Three PCI (Peripheral Component Interconnect) v2.1 compatible expansion slots that operates at 33 MHz bus speed. One IBM AT-ISA Plug and Play compatible expansion slot that operates at 8 MHz bus speed. Note: There is 1 PCI/ISA shared slot
Hard disk drives	Two PCI local bus Enhanced IDE v1.0 compatible hard disk drive interfaces that support: - PIO mode up to mode 5 - DMA 32-bit access up to mode 2 - Ultra 33 Synchronous DMA up to mode 2 (33M bytes/sec.).
CD/DVD-ROM drive	5.25-in. high-performance, 32X CD-ROM or 4X DVD-ROM IDE/AT drive. Support Bootable CD-ROM Format specification version 1.0. Compliant to Audio-CD, Video-CD, CD-ROM/XA, Karaoke-CD, and Photo-CD (both single and multi-session) format.
Diskette drive	AT diskette interface
Video	Physical interface is compatible with the IBM Personal System/2 (PS/2) VGA interface. Support Accelerated Graphics Port (AGP)
Modem	One 56.6 Kbps PCI modem adapter card with data/fax/voice or non-voice features.
Audio	Compatible to Sound Blaster, Sound Blaster Pro and Windows Sound System
Pointing device	IBM PS/2-compatible mouse
Keyboard device	IBM PS/2-compatible keyboard
Serial port	Supports high speed 16450/16550 compatible UARTs with send/receive 16 bytes FIFOs RS232D electrical interface compliant

Item-	Interface
Parallel port	Supports SPP (IBM PC/XT, PC/AT, PS/2) compatible, EPP (IEEE 1284 compliance), ECP (IEEE 1284 compliance) interface. IEEE 1284 compliant
Game port	Game port interface for joystick. It also supports MIDI.
USB	Supports Universal HCI Specification for USB 1.0

CMOS Reset

This system does not deny access to BIOS Setup Utility. Execute "Load BIOS Default Settings" in BIOS Setup to clear the corrupted CMOS data. See "Loading the Default Settings" on page 13.

Power-On Password

A power-on password denies access to the system by an unauthorized user when the system is powered on. When a power-on password is active, the password prompt appears on the screen each time the system is powered on. The system starts after the proper password is entered. See "Power-on Password" on page 20 for more information about how to change, remove and set password in BIOS Setup.

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, follow these steps.

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

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

Machine Type 2158: Set switch 2 of SW2 to the OFF position to bypass password check process. See "Machine Type 2158 System Board Jumpers and Connectors" on page 131.

Machine Type 2163 and 2164: Set switch 5 of SW1 to the ON position to bypass password check process. See "Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135.

3. Plug power cable, turn on the system, and depress F1 during POST to enter BIOS Setup menu.
4. Select "Advanced Options", then enter "Security Options" and set "Power On Password" setting to "None" to clear password.
5. Save and exit from BIOS Setup.
6. Turn off the system, unplug power cable from electrical outlet.

Machine Type 2158: Set switch 2 of SW2 to the ON position to enable password check process. See "Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135.

Machine Type 2163 and 2164: Set switch 5 of SW1 to the OFF position to enable password check process. See "Power Supply Connectors and Voltages" on page 138.

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

Flash (BIOS) Update Procedure

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

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

NOTE: The AFLASH.EXE and MSG.DAT are flash utility programs. The VXXYYZZ.RN file has the BIOS checksum information. The VXXYYZZ.BIN is BIOS source code binary file.

2. Insert the diskette and boot from drive A.

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

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

4. The program updates the BIOS automatically.

IMPORTANT: : Verify the BIOS checksum value shown on screen is the same as the one in VXXYYZZ.RN file.

5. Wait for the update to complete (indicated by the beeps).

WARNING: : Do not turn off the system power while the BIOS is programming, or the flash ROM will be destroyed.

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

BIOS-contained Model Number and Serial Number

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

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

1. Prepare a bootable DOS diskette with CHGDMI.EXE and MODEL.DMI files.
2. Insert the diskette and boot from drive A.

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

3. At the DOS prompt, type A:>CHGDMI/W then press Enter. When the screen shows:

> System Product Name:

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

4. When the screen shows:

> System Serial Number:

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

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

BIOS Setup Utility

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

Working with the Setup Menus

Starting the Setup Utility

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

1. Turn on your monitor.
2. Turn on the system unit.
3. When you see the IBM Aptiva logo, press F1 to enter Setup and display the Main Menu.

If you have previously set a power-on password, you are prompted to type in the password after you press the F1 key. See "Power-on Password" on page 20 for information on setting, changing, or removing the password.

Refer to the Setup Utility Main Menu below.

```
                      Main Menu

                Select a Menu:

                ● System Information
                ● Video Information
                ● Disk Drives
                ● Input/Output Ports
                ● Power Management
                ● Startup Options
                ● Model Information
                ● Date and Time
                ● Advanced Options


  < ↑ > < ↓ >  Move highlight bar      <←┘> Select
  <Esc> Exit             <F5>  Load default settings
```
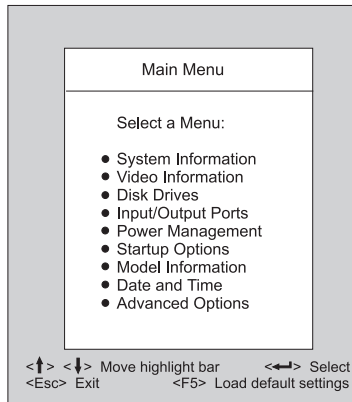
The following table lists specific keys on the keyboard that will help you move through the Setup menus:

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

Changing Parameter Settings

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

Loading the Default Settings

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

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

1. Press F5 to load default settings. A dialog box appears confirming if you want to load the default settings.
2. Use the left-arrow key to select Yes, then press Enter.
3. Press Esc to exit Setup.
   A dialog box appears confirming if you want to save the CMOS settings (in this case, the default settings that you reloaded).
4. Use the left-arrow key to select Yes, then press Enter to save the changes in CMOS.

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

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

Exiting Setup

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

Follow these steps to exit Setup:

1. From the main menu, press the Esc key.
2. The Exit Setup dialog box appears. If you have made changes in the parameter settings, it will contain an option for saving your changes.
   - If you would like to save your changes, press the left-arrow key to select the option Yes then press Enter to save your changes and exit Setup.
   - If you do not want to save your changes, press the right-arrow key to select the option No then press Enter, to exit Setup without saving.

Viewing System Information, Video Information and Model Information

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

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

- Add or change hardware on your computer
- Make changes to other menus in Setup and save those changes

To view the video information such as the video controller and video memory, select the video information option from the setup menu.

Select primary display adapter to initialize onboard VGA as the boot display device. Select Auto to initialize PCI add-on VGA card as the boot display device if a PCI add-on card is found; otherwise, onboard VGA will be initialized.

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

Disk Drives

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

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

Diskette Drive A

This option displays the size and storage capacity of the currently installed diskette drive. Empty drive bays are indicated with a "None" setting.

LS-120 Drive As

This option allows user to set for the LS-120 drive. Empty drive bays are indicated with a "Normal" setting. Its possible settings are:

Normal   The LS-120 drive is configured by Windows 98 and acts as an ATAPI removal media.

Drive A   System recognizes the LS-120 drive as drive number 0 (drive A). If a standard diskette drive A exists, system automatically identifies it as drive B.

Drive B   System recognizes the LS-120 drive as drive B.

ATTENTION: If "Boot Sequence" in "Startup Options" is set to CD-ROM and a bootable CD is loaded, BIOS identifies LS-120 (original set as drive A) as drive B and the standard diskette drive becomes inaccessible.

IDE Hard Disk and CD/DVD-ROM Drives

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

The IDE drive items are identified as follows:

- IDE Primary Channel Master is attached to IDE connector 1 on the system board and is set as the master device. This is the hard disk that comes preinstalled with your computer.
- IDE Primary Channel Slave (if installed) is attached to IDE connector 1 on the system board and is set as the slave device.
- IDE Secondary Channel Master (if installed) is attached to IDE connector 2 on the system board and is set as the master device.
- IDE Secondary Channel Slave (if installed) is attached to IDE connector 2 on the system board and is set as the slave device. Normally, a preinstalled CD/DVD-ROM drive is connected here.

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

Proceed to the following for details on the parameters under each IDE drive submenu.

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

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

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

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

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

Hard Disk Size > 528MB   This enhanced IDE feature works only under DOS and Windows environments. If set to Auto, which is the default, BIOS allows you to use a hard disk with a capacity of more than 528 MB. This is made possible through the Logical Block Address (LBA) mode translation. You may be required to set this parameter to Disabled if you use other operating systems.

To prevent data loss, set this parameter to Auto if you are using a hard disk with more than 528 MB capacity that was previously configured through the LBA mode. If you use a hard disk configured through the user-specific cylinder-head-sector (CHS) mode, set this parameter to Disabled.

Hard Disk 32-bit Access   Setting this parameter to Enabled improves system performance by allowing the use of the 32-bit hard disk access. This enhanced IDE feature only works under Windows 3.x, OS/2, Windows 95, Windows 98, and Novell NetWare. If your software does not support this function, set this parameter to Disabled. The default setting is Enabled.

Input/Output Ports

From the Setup main menu, select the Input/Output Ports option to view or change port configuration settings. The Input/Output Ports menu appears.

This menu lets you configure serial and parallel ports.

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

Serial Port

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

Parallel Port

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

The default mode is ECP. The default DMA is 3.

Onboard PS/2 Mouse (IRQ12)

This parameter enables or disables the onboard PS/2 mouse. When set to Enabled, it allows you to use the onboard PS/2 mouse. When set to Disabled, it deactivates the mouse and frees IRQ 12 for the use of other devices (for 2163).

Onboard USB

This parameter allows you to enable or disable the Universal Serial Bus (USB) controller. The default setting is Enabled.

USB Legacy Mode   This parameter enables or disables the use of a USB keyboard outside of Windows. The default is Disabled.

Onboard Audio Chip

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

Power Management

The system power management features allow you to reduce power consumption.

NOTE: These Power Management settings do not work in Windows 98. Use the Control Panel Power utility for Windows 98 Power Management settings.

Power Management Mode

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

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

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

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

Power Switch< 4 sec.   When set to Suspend, this parameter adds the suspend function to the system power button on the front panel. The suspend function allows you to put the system into suspend mode by pressing the power button for less than four seconds while the system is on. When this parameter is set to Power off, the power button simply turns the system power on or off. This parameter is set to Power off by default.

Modem Wake-Up on Ring   This parameter allows you to enable or disable the Modem Wake-Up on Ring feature. When enabled and if the computer is in

suspend, an incoming call automatically resumes normal power on mode. When disabled, the system does not return to the "Normal on" state even if there is an incoming modem access. The default setting is Enabled.

Startup Options

From the Setup main menu, select Startup Options to view or change start-up configuration settings.

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

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

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

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

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

Boot Sequence   This parameter allows you to set system boots from Floppy, Hard Disk or CD-ROM drive.

Date and Time

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

Mon Nov 10, 1998

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

- 12 midnight is 00:00:00
- 12 noon is 12:00:00
- 1 p.m. is 13:00:00

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

Advanced Options

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

- Security Options
- Memory/Cache Options
- PnP/PCI Options

Each of these options opens an additional menu.

Security Options

Power-on Password

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

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

Setting a Power-On Password

1. Enter Setup.
2. From the Setup main menu, select Advanced Options, then Security Options.
3. Highlight the Power-on Password parameter and press the left- or right-arrow key to display the Power-on Password window.
4. Type a password consisting of up to seven characters, then press Enter.
5. Retype the password then press Enter.
6. Press Enter again to confirm setting the password. Pressing Esc aborts the password setting.
   After pressing Enter, the Power-on Password window disappears. The Power-on Password parameter automatically sets to Present.
7. Press Esc to return to Setup main menu.
8. Press Esc to exit Setup and reboot the system. Answer Yes when prompted to save settings.

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

If you were not able to set a password after performing the above procedure, or should you encounter any error message when setting a password, refer to "Power-On Password" on page 9 about how to set the hardware jumper to bypass password check.

Changing the Power-On Password

1. Enter Setup.
2. Key in your current password when prompted.
3. From the Setup main menu, select Advanced Options, then Security Options.
4. Highlight the Power-on Password parameter and press the left- or right-arrow key twice to display the Power-on Password window.
5. Type in a new password then press Enter.
6. Retype the new password then press Enter.
7. Press Enter again to confirm changing the password.
8. Press Esc twice to return to the Setup main menu.
9. Press Esc to exit Setup and reboot the system. Answer Yes when prompted to save CMOS settings.
   If you change your mind and decide not to change your password, just answer No when prompted to save CMOS settings.

Removing the Power-On Password

1. Enter Setup and select Advanced Options, then Security Options.
2. Press the left- or right arrow key once to select None.
3. Press Esc to return to Setup main menu.
4. Press Esc to exit Setup and reboot the system. Answer Yes when prompted to save CMOS settings.

Disk Drive Control

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

The settings include:

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

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

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

Onboard Floppy Disk Controller This parameter allows you to enable or disable to onboard floppy disk controller chipset. When set to Enabled, the controller enables the diskette drive on your computer. When set to Disabled, the controller deactivates the drive but simultaneously frees IRQ 6 which is normally assigned to the diskette drive. You may then assign IRQ 6 to another device.

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

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

Memory/Cache Options

The Memory/Cache Options menu allows you to configure the Level 1 and Level 2 caches. Enabling the cache parameters optimize system performance.

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

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

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

Memory Parity Mode This parameter enables or disables the memory ECC check function. The default setting is Disabled.

Memory Configuration This parameter shows the installed memory configuration information.

PnP/PCI Options

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

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

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

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

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

Set this parameter to Yes if you are using the Windows 95 or Windows 98 operating system. Set to No if you run any other operating system. The default setting is Yes.

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

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

Specifications

Dimension (width x depth x height)

- For Machine Type 2158/2163:
  System unit: 190 mm (7.48 in.) x 370 mm (14.57 in.) x 384 mm (15.12 in.)
  For Machine Type 2164:
  System unit: 195 mm (7.68 in.) x 455 mm (17.9 in.) x 428 mm (16.85 in.)
- 15" Monitor: 370 mm x 396 mm x 382 mm
- 17" Monitor: 413 mm x 445 mm x 434 mm

Weight

- For Machine Type 2158/2163:
  System unit: 12.7 kg (28 lb)
  For Machine Type 2164:
  System unit: 10 kg (22 lb)
- 15" Monitor: 13.0 kg (28.6 lb)
- 17" Monitor: 18.5 kg (40.8 lb)

Environment

- Temperature for system unit:
  - Power on: 10° to 35°C (50° to 95°F)
  - Power off: -10° to 60°C (14° to 140°F)
- Temperature for 15" monitor:
  - Power on: 5° to 40°C
  - Power off: -20° to 60°C
- Temperature for 17" monitor:
  - Power on: 10° to 35°C
  - Power off: -20° to 60°C
- Humidity for system unit:
  - Power on: 20% to 80%
  - Power off: 20% to 80%
- Humidity for monitor (15" and 17"):
  - Power on: 20% to 80%
  - Power off: 20% to 90%

Power consumption

- System unit: Maximum 95 Watts
- 15" monitor: Maximum 80 Watts
- 17" monitor: Maximum 130 Watts

Electrical input

- Input voltage for system unit (Sine-wave input is required)
  - Low Range: 90 Vac to 132 Vac
  - High Range: 180 Vac to 264 Vac
- Input voltage for 15" monitor (Sine-wave input is required)
  - 88 Vac to 264 Vac
- Input voltage for 17" monitor (Sine-wave input is required)
  - 90 Vac to 264 Vac (17")

Operating Requirements

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

The system units come with a voltage selector switch, allowing selection of voltage of either 115 Vac or 230 Vac. This switch must be in the 230 Vac position when the machine is plugged into a 230 Vac electrical outlet.

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

Special Tools

The following special tool is required to service this system when running diagnostics program (PC-Doctor):

- Wrap plugs, P/N 72X8546

Check Procedures

Introduction

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

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

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

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

Start

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

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

This book comes with a diagnostic program diskette. This diskette should be used ONLY with **2158/2163/2164 Service Level A (SL-A)** IBM Aptiva Personal Computers. Do not use this diskette on other models.

POST error codes and error messages are displayed on the screen after the IBM logo. Meanwhile, error beeps could be issued to help diagnose system problem. Please refer to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33 for additional help.

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

IMPORTANT: There is a Power Override switch located at the back of the machine, just above the connector for the power cable. If the system does not power on after pressing the power button situated on the front of the machine, please check the power cable and the Power Override switch. If the Power Override switch is switched on, no power is supplied to the system.

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

The hard disk drive contains pre-loaded software. Refer to "Software Recovery Procedure" on page 95 to reinstall the original software. Be sure to reload the software on the primary hard disk drive (Drive C) when replacing it.

IMPORTANT: The drives in the system you are servicing may have been rearranged, or the drive startup sequence has changed. Be extremely careful during write operations, such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive. **Ask the customer to back up any additional software from the hard disk drive before you reload the software.**

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

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

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

READ THE FOLLOWING:

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

001 - START

- To begin, note the following:
- Disable the setting of "Fast POST Mode" in BIOS Setup.
- To disable or reset the power-on password, see "Power-On Password" on page 8.
- Disconnect all external cables and devices including speakers and microphone from the system unit, except for the keyboard, mouse, and monitor.
- Power off the system unit (unplug the power cord) before moving it or when replacing FRUs.
- Remove all adapter cards, except for the factory-installed modem adapter card and any other IBM Aptiva factory-installed adapter cards.
- Disconnect all drives except:
  - 3.5-in. diskette drive
  - Hard disk drive
  - IBM Aptiva factory-installed devices (such as a CD-ROM drive)
- Ensure that all power cords and cables are connected properly.
- Ensure that the monitor brightness and contrast controls are not turned down.

- Power on the system unit.

NOTE: Some monitors have a detachable system I/O signal cable between the monitor and the system unit. In this case, check this signal cable before replacing the unit. See "Monitor Port Signals" on page 151 for pin identification.

- Ensure correct monitor refresh rate.
- Note any symptoms, messages, error codes, or beeps.
- Make sure that there are no diskette or CD in the drives.

002 - DOES AN IBM LOGO SCREEN APPEAR? (YES, READ AHEAD. NO, GO TO STEP 004.)

- Insert diagnostics diskette in the diskette drive.

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

- Follow the instructions on the screen and select Utility from the diagnostics program menu.
- Select Tech Support Form from the menu, press F5 to execute, then generate a system configuration report.
- Compare the system configuration list with the actual devices installed in system.

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

- Go to step 006.

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

- Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33.
- End.

005 -

- If the keyboard responds incorrectly, go to "Keyboard" on page 58.
- If monitor problems appear, such as jittering, shifting, or being out of focus, go to "Monitor" on page 63.

006 - DOES THE SYSTEM CONFIGURATION REPORT CORRECTLY IDENTIFY THE DEVICES INSTALLED IN SYSTEM? (YES, READ AHEAD.

NO, GO TO STEP 007.)

- Select Diagnostics from the diagnostics program menu.

- Select and execute **All Tests.**

   - Go to step 008.

007 -

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

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

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

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

   - Check all adapter card jumper settings.

   - Check all adapter card switch settings.

   - Check all adapter card cables and connectors. Make sure that all of the above are set correctly and show the correct voltages and continuity. Re-place any defective cables or adapter cards. "Parts/Test Point Locations" on page 130.

   - Run the Diagnostics \ All Tests again.

   - If an error or other symptom is displayed, go to "Index of Symptoms, Mes-sages, Error Codes, or Beeps" on page 33.

   - If no error can be detected or the symptom is intermittent, go to "Undeter-mined Problems" On page 63.

- End

009 -

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

- Take note of any messages, error codes, beeps, or new symptoms. Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33.

- If there is no error symptom or the error symptom is intermittent, go to "Undetermined Problems" On page 63.

Index of Symptoms, Messages, Error Codes, or Beeps

How to Use Error Messages: Use the messages, error codes, and beeps combinations that occur to diagnose failures. If more than one failure occurs, begin the diagnosis from the first failure that appeared. The cause of the first failure can result 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 "Table 2-3 Error Symptoms List" on page 41.

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

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

After a successful POST, the system attempts to load operating system. The system can be customized for different startup (boot) methods by the BIOS Setup Utility. See "Startup Options" on page 17.

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

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

Table 2-1 lists BIOS error codes, messages, to their possible causes. table 2-2 lists BIOS beeps to their possible causes. Table 2-3 lists error symptoms and their possible causes. The most likely cause is listed first. Make sure you complete all items in the cause or "Action/FRU" column. When servicing a system, always begin with "Start" on page 29.

If you are unable to correct the problem using these two index tables, go to "Undetermined Problems" On page 63.

NOTE:

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

2. If you cannot run the diagnostics program tests but did receive a POST error code and message, use "Table 2-1 POST Error Codes and Messages List" on page 34 to diagnose system problems.

3. If you cannot run the diagnostics program tests but did receive a POST error

beeps, use "Table 2-2 BIOS Error Beeps List" on page 38 to diagnose system problems.

4. If you did not receive any error message, look for a description of your error symptoms in "Table 2-3 Error Symptoms List" on page 41.

IMPORTANT: 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.

5. If you are unable to correct the problem by using the "BIOS Error Codes, Messages, And Beeps List" table and "Error Symptoms List" table, go to "Undetermined Problems" On page 63.

Table 2-1 POST Error Codes and Messages List

NOTE: To diagnose a problem, first find the BIOS error messages or codes 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.

BIOS Error Codes, Messages	Action/FRU
0111 I/O Parity Error	ISA adapter card System board
0127 CPU Clock Mismatch	Check CPU speed and system board DIP switches. See "Machine Type 2158 System Board Jumpers and Connectors" on page 131 and "Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135. System board
0151 Real Time Clock Error 0161 CMOS Battery Bad 0162 CMOS Checksum Error	Enter BIOS Setup and load the default settings. CMOS battery. System board.
0162 Equipment Configuration Error	Ensure the system configuration set in BIOS Setup is correct. See "BIOS Setup Utility" on page 11. Enter BIOS Setup and load the default settings. CMOS battery. System board.

Table 2-1 POST Error Codes and Messages List (Continued)

NOTE: To diagnose a problem, first find the BIOS error messages or codes 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.

BIOS Error Codes, Messages	Action/FRU
0163 Date and Time Incorrect	Ensure the time set in BIOS Setup is correct. See "Date and Time" on page 18. CMOS battery.
0164 Memory Size Change 0201 Memory Error at MMMM:SSSS:OOOOh	Insert the memory modules in the DIMM sockets properly, then reboot the system. Memory module. See the "Step 005" of "Memory" on page 57 to replace memory module. System board.
301 PS/2 Keyboard Error or Keyboard Not Connected 303 PS/2 Keyboard Interface Error	Re-connect PS/2 keyboard and mouse. Enter BIOS Setup and load the default settings. PS/2 keyboard PS/2 mouse System board
0662 Onboard Floppy Drive I/O Address Conflict(s) 0662 Onboard Floppy Drive DMA Conflict(s) 0662 Onboard Floppy Drive IRQ Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
0662 Floppy Disk Controller Error 0662 Floppy Drive A Error 0662 Floppy Drive B Error	Diskette drive cable/connection. Diskette drive. System board
0648 Floppy Drive(s) Write Protected	Ensure that the diskette drive is not set to [Write Protected] in the Security Options in BIOS Setup. Load default settings in Setup.

Table 2-1 POST Error Codes and Messages List (Continued)

NOTE: To diagnose a problem, first find the BIOS error messages or codes 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.

BIOS Error Codes, Messages	Action/FRU
0962 Onboard Parallel Port Conflict(s) 0962 Onboard Parallel Port I/O Address Conflict(s) 0962 Onboard Parallel Port IRQ Conflict(s) 0962 Onboard ECP Parallel Port DMA Conflict(s) 1162 Onboard Serial Port Conflict(s) 1162 Onboard Serial Port I/O Address Conflict(s) 1162 Onboard Serial Port IRQ Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.
1755 Hard Disk Drive(s) Write Protected	Ensure that the hard disk drive is not set to [Write Protected] in the Security Options in BIOS Setup. Load default settings in Setup.
1762 Onboard IDE Primary Channel I/O Address Conflict(s) 1762 Onboard IDE Primary Channel IRQ Conflict(s) 1762 Onboard IDE Secondary Channel I/O Address Conflict(s) 1762 Onboard IDE Secondary Channel IRQ Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.

Table 2-1 POST Error Codes and Messages List (Continued)

NOTE: To diagnose a problem, first find the BIOS error messages or codes 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.

BIOS Error Codes, Messages	Action/FRU
1780 IDE Primary Channel Master Drive Error 1781 IDE Primary Channel Slave Drive Error 1782 IDE Secondary Channel Master Drive Error 1783 IDE Secondary Channel Slave Drive Error	Enter BIOS Setup and load the default settings. Check IDE drive jumper. See "3.5-In. Hard Disk Drive Jumper Settings" on page 141 and "5.25-In. Hard Disk Drive Jumper Settings" on page 144. IDE hard disk drive power. IDE hard disk drive cable/connection. IDE hard disk drive.
1780 IDE Primary Channel Master Drive Changed 1781 IDE Primary Channel Slave Drive Changed 1782 IDE Secondary Channel Master Drive Changed 1783 IDE Secondary Channel Slave Drive Changed	Enter BIOS Setup and load the default settings. IDE hard disk drive cable/connection.
1800 IRQ Setting Error 1801 Expansion ROM Allocation Failed 1802 I/O Resource Conflict(s) 1803 Memory Resource Conflict(s)	Load default settings in Setup. Enter BIOS Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system. See "PnP/PCI Options" on page 21. Remove all adapter cards that are NOT factory-installed, then reboot the system

Table 2-1 POST Error Codes and Messages List (Continued)

NOTE: To diagnose a problem, first find the BIOS error messages or codes 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.

BIOS Error Codes, Messages	Action/FRU
1800 PnP ISA Card(s) Disabled	Do not have enough system resource allowed to allocate for ISA adapter card. Remove the ISA adapter card. Load default settings in Setup. Enter BIOS Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system. See "PnP/PCI Options" on page 21. Remove all adapter cards that are NOT factory-installed, then reboot the system
8601 PS/2 Pointing Device Interface Error 8603 PS/2 Pointing Device Error 8603 PS/2 Pointing Device Error or Not Connected	Re-connect PS/2 keyboard and mouse. Enter BIOS Setup and load the default settings. PS/2 mouse PS/2 keyboard System board
8602 Onboard Pointing IRQ Device Conflict(s)	Enter BIOS Setup and load the default settings. Remove all adapter cards that are NOT factory-installed, then reboot the system.

Table 2-2 BIOS Error Beeps List

NOTE: To diagnose a problem, first find the BIOS error 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.

BIOS Error Beeps (L: long beep, S: short beep)	Action/FRU
L-S-L-L DMA internal register test fail L-S-S-S KBC (keyboard controller) self test is failed or not installed L-S-S-L Shutdown byte in RTC/CMOS read/write test failed	System board
L-S-L-S System DRAM refresh cycle is out of specification L-L-L-S The first 128KB of base memory r/w test failed	Insert the memory modules in the DIMM sockets properly, then reboot the system. Memory module. See the "Step 005" of "Memory" on page 57 to replace memory module. System board
L-L-S-L The BIOS code in flash ROM is corrupted	See "Flash (BIOS) Update Procedure" on page 9 System board
L-S-S Video buffer has error	Video adapter card System board
S-S Console does not exist and message displayed to terminal	Reconnect monitor. Monitor.
L-L-S-S-S No DIMM installed	Ensure the system board has memory installed.

Table 2-2 BIOS Error Beeps List (Continued)

NOTE: To diagnose a problem, first find the BIOS error 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.

BIOS Error Beeps (L: long beep, S: short beep)	Action/FRU
For 2163 only L-L-S-S No SPD or revision is not correct (Rev must be 1.2 or later) L-L-L-S Registered & Unregistered DIMMs are mixed	Insert the memory modules in the DIMM sockets properly, then reboot the system. Memory module. See the "Step 005" of "Memory" on page 57 to replace memory module. System board
For 2163 only L-L-L-S-S EDO DIMM & SDRAM DIMM are mixed	Ensure the system board has no EDO type DIMM installed.
For 2163 only L-L-L-S-S-S 66MHz DIMM running on 100MHz	Ensure the DIMM type is PC-100.

Table 2-3 Error Symptoms List

NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.

Error Symptoms	Action/FRU
Processor / Processor Fan	
NOTE: Normally, the processor fan should be operative, and the processor clock setting should be exactly set to match its speed requirement before diagnosing any processor problems.	
Processor fan does not run but power supply fan runs.	Ensure that the system is not in power saving mode and the "Stop CPU clock in sleep state" is not set to Yes. See "Power Management" on page 4.
	With the system power on, measure the voltage of processor fan connector FN3 for 2138 and FN2 for 2163. Its reading should be +12Vdc. See "Machine Type 2158 System Board Jumpers and Connectors" on page 131 and "Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135.
	Processor fan.
	System board.
Processor test failed.	Processor.
	System board.
System Board and Memory	
NOTE: Ensure that the memory modules are installed properly and the contact leads are clean before diagnosing any system problems.	
Memory test failed.	See "Memory" on page 57.
	System board
Incorrect memory size shown or repeated during POST.	Insert the memory modules in the DIMM sockets properly, then reboot the system.
	Memory module. See the "Step 005" of "Memory" on page 57 to replace memory module.
	System board.
System works but fails to enter power saving mode when the Power Management Mode is set to [Enabled], and power saving timer set in BIOS has elapsed.	Enter BIOS Setup and load default settings.
	In Windows 98, check settings in Power Management Property of Control Panel.
	Reload software from Recovery CD.

Table 2-3 Error Symptoms List (Continued)

NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.

Error Symptoms	Action/FRU
System hangs before system boot.	See "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33. See "Undetermined Problems" on page 63
System hangs after system boot.	Execute a system test ("Diagnostics/All Tests" in PC-Doctor diagnostics program) and set it to stop at "Halt on Error" to see the potential cause of the problem. See "Undetermined Problems" on page 63.
Blinking cursor only; system does not work.	See "Start" on page 29. Diskette/IDE drive connection/cables Diskette/IDE disk drives See "Undetermined Problems" on page 63 System board
Diskette Drive	
NOTE: NOTE:Ensure that the diskette drive is configured correctly in BIOS Setup and its read/write head is clean before diagnosing any diskette drive problems.	
Media and drive are mismatched.	Ensure that the diskette drive is configured correctly in the Disk Drives of BIOS Setup. See "Hard Disk Drive" on page 3. Ensure that the diskette drive is correctly formatted. Diskette drive connection/cable Diskette drive System board
Diskette drive does not work.	Ensure that the diskette drive is not set to [None] in the Disk Drives of BIOS Setup. See "Hard Disk Drive" on page 3. Diskette drive power Diskette drive connection/cable Diskette drive System board

Table 2-3 Error Symptoms List (Continued)

NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.

Error Symptoms	Action/FRU
Diskette drive read/write error.	Diskette. Ensure that the diskette drive is not set to [Write protect] in the Security Options of BIOS Setup. See "Security Options" on page 19. Diskette drive cable. Diskette drive. System board.
Diskette drive LED comes on for more than 2 minutes when reading data.	Diskette Diskette drive connection/cable Diskette drive System board
Diskette drive LED fails to light, and the drive is unable to access for more than 2 minutes.	Diskette Diskette drive power Diskette drive connection/cable Diskette drive System board
Diskette drive test failed.	Diskette Diskette drive Diskette drive cable System board
Hard Disk Drive	
NOTE: Ensure hard disk drive is configured correctly in BIOS Setup, cable/jumper are set correctly before diagnosing any hard disk drive problems.	
Hard disk drive test failed.	Enter BIOS Setup and Load default settings. Hard disk drive cable. Hard disk drive. System board.
Hard disk drive format error.	Enter BIOS Setup and Load default settings. Hard disk drive cable. Hard disk drive. System board.

Table 2-3 Error Symptoms List (Continued)

NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.

Error Symptoms	Action/FRU
Hard disk drive write error.	Enter BIOS Setup and Load default settings. Hard disk drive.
Hard disk drive LED fails to light, but system operates normally.	With the system power on, measure the voltage of hard disk LED connector CN2 for 2158 or CN14 for 2163/2164. The reading should be: 2158(CN2) 2163/2164(CN14) HDD Idle/Active pin-4 pin-1 +5 Vdc / -- pin-5 pin-2 +5 Vdc / 0 Vdc pin-6 pin-3 +5 Vdc / 0 Vdc pin-7 pin-4 +5 Vdc / -- See "Machine Type 2158 System Board Jumpers and Connectors" on page 131 and "Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135. Hard drive LED cable.
CD/DVD-ROM Drive	
NOTE: Ensure CD/DVD-ROM drive is configured correctly in BIOS Setup, cable/ jumper are set correctly and its laser beam is clean before diagnosing any CD/DVD-ROM drive problems.	
CD/DVD-ROM drive LED flashes for more than 30 seconds before LED shutting off. Software asks to reinstall disc. Software displays a reading CD/DVD error.	CD/DVD may have dirt or foreign material on it. Check with a known good disc. CD/DVD is not inserted properly. CD/DVD is damaged.
CD/DVD-ROM drive LED doesn't come on but works normally.	CD/DVD-ROM drive

Table 2-3 Error Symptoms List (Continued)

NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.

Error Symptoms	Action/FRU
CD/DVD-ROM drive cannot load or eject when the system is turned on and its eject button is pressed and held.	See "CD-ROM Emergency-exit <option 1>" on page 145 and "CD-ROM Emergency-exit <option 2>" on page 146. Disconnect all cables from CD/DVD-ROM drive except power cable, then press eject button to try to unload the disk. CD/DVD-ROM drive power. CD/DVD-ROM drive
CD/DVD-ROM drive does not read and there are no error codes or messages are displayed.	CD may have dirt or foreign material on it. Check with a known good disc. Ensure that the CD/DVD-ROM driver is installed properly. See "CD/DVD-ROM Drive" on page 56. CD/DVD-ROM drive.
CD/DVD-ROM drive can play audio CD but no sound output.	Ensure that the headphone jack of the CD/DVD-ROM has an output, then check if the audio cable from CD/DVD-ROM drive to system board CN15(for 2158) or CN8(for 2163/2164) is connected properly. See "Machine Type 2158 System Board Jumpers and Connectors" on page 131 and "Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135. Turn up the sound volume. Speaker power/connection/cable. CD/DVD-ROM drive.
Real-Time Clock	
Real-time clock is inaccurate.	Ensure that the information in the Date and Time of BIOS Setup is set correctly. See "Date and Time" on page 18. Load default settings. CMOS battery. System board
Audio	
Audio software program invokes but no sound comes from speakers.	Speaker power/connection/cable.

Table 2-3 Error Symptoms List (Continued)

NOTE: To diagnose a problem, first find the error symptom in the left column. If directed
to a check procedure, replace the FRU indicated in the check procedure. If no
check procedure is indicated, the first Action/FRU listed in right column is the
most likely cause.

Error Symptoms	Action/FRU
Modem	
Data/fax modem software program invokes but cannot receive/send data/fax	See "Factory-Installed Modem Card" on page 52.
Fax/voice modem software program invokes but has no sound output. (Data files are received normally; voice from modem cannot be produced, but system sound feature works normally.)	Ensure that the modem voice-in cable from modem adapter card to system board CN13(for 2158) or CN8(for 2163/2164) is connected properly. See "Machine Type 2158 System Board Jumpers and Connectors" on page 131 and "Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135. "Factory-Installed Modem Card" on page 52.
Modem ring cannot wake up system from suspend mode.	Ensure the "Modem Wake-Up on Ring" in BIOS Setup is set to [Enabled]. See "Power Management Mode" on page 17. If PCI modem card is used, reinsert the modem card to PCI slot firmly or replace modem card. If ISA modem card is used, ensure the modem ring-in cable from the modem card to system board CN8(for 2158) or CN13(for 2163/2164) is connected properly. See "Machine Type 2158 System Board Jumpers and Connectors" on page 131 and "Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135. In Win 98 ensure that telephone application is configured correctly for your modem and set to receive messages and/or fax.
Video and Monitor	
Video memory test failed. Video adapter failed.	Remove all non factory-installed cards. Load default settings (if screen is readable). System board

Table 2-3 Error Symptoms List (Continued)

NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.

Error Symptoms	Action/FRU
Display problem: - Incorrect colors - No high intensity - Missing, broken, or incorrect characters - Blank monitor(dark) - Blank monitor(bright) - Distorted image - Unreadable monitor - Other monitor problems	Monitor signal connection/cable. Monitor Video adapter card (for 2163/2164). System board
Display changing colors.	Monitor signal connection/cable Monitor System board
Display problem not listed above (including blank or illegible monitor).	"Monitor" on page 63. Load default settings (if screen is readable). System board
Parallel/Serial Ports	
NOTE: Execute "Load BIOS Default Settings" in BIOS Setup to confirm ports' presence before diagnosing any parallel/serial ports problems.	
Serial or parallel port loop-back test failed.	Make sure that the LPT# or COM# you test is the same as is set in BIOS Setup. Loop-back. System board.
Printing failed.	Ensure that the printer driver is properly installed. Refer to the service manual for the printer. Printer. Printer cable. System board.
Printer problems.	Refer to the service manual for the printer.
Joystick	

Table 2-3 Error Symptoms List (Continued)

NOTE: To diagnose a problem, first find the error symptom in the left column. If directed
to a check procedure, replace the FRU indicated in the check procedure. If no
check procedure is indicated, the first Action/FRU listed in right column is the
most likely cause.

Error Symptoms	Action/FRU
Game port does not respond or does not work.	Connect a joystick to the game port, then execute "Interactive Test/Joystick" test in PC-Doctor diagnostics program. System board.
Diagnostic Program	
Diagnostics programs cannot be executed.	Reboot the system from the diagnostics diskette. Load default settings. Diagnostics diskette. Memory module. System board.
Missing diagnostics files(s).	Diagnostics diskette.
Keyboard	
Some or all keys on keyboard do not work.	"Keyboard" on page 58.
Power Supply	
Pressing power switch does not turn off system. (Only unplug power cord from electrical outlet can turn off system.)	See "Power Switch< 4 sec." on page 4. Power switch cable assembly "Power Supply" on page 61
Pressing power switch does not turn on system.	Ensure the power override switch(situated at the back of the machine, just above the connector for the power cable) is not set to off. Power switch cable assembly.
Executing software shutdown from Windows98 Start menu does not turn off system. (Only pressing power switch can turn off the system).	Load default settings. Reload software from Recovery CD.
No system power, or power supply fan is not running.	"Power Supply" on page 61 System board.
Other Problems	
Any other problems.	"Undetermined Problems" on page 63

Troubleshooting

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

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

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

Factory-Installed Storage Devices

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

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

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

001 - START

• Insert the diagnostics diskette into the diskette drive.

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

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

• Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33.

- End.

003 -
- Select Utility from the menu.
- Select and execute Tech Support Form from the menu to generate a system configuration report.
- Compare the system configuration list with the actual devices installed in system.

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

004 - IF THE NUMBER OF DISKETTE, HARD DISK, OR CD-ROM DRIVE IS NOT CORRECT, READ AHEAD; OR GO TO STEP 005.
- Check the cable installation of all disk drives.(See "Machine Type 2158 System Board Jumpers and Connectors" on page 131 and"Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135.)
  - Diskette drive should be connected to the system board connector CN11 for 2158 and CN5 for 2168.
  - IDE Primary Channel Master and Slave Drives in BIOS Setup should be connected to the system board connector CN9 for 2158 and CN11 for 2168.
  - IDE Secondary Channel Master and Slave Drives in BIOS Setup should be connected to the system board connector CN10 for 2158 and CN10 for 2168.

NOTE: The CD-ROM drive that comes with system unit should be configured as IDE Secondary Channel Master device.
- Check all power supply voltages, switch, and jumper settings before you replace the system board. (See "Machine Type 2158 System Board Jumpers and Connectors" on page 131 and"Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135.)
- Check the power supply voltages if you have a "system no-power" condition. See "Power Supply Connectors and Voltages" on page 138.
- Check the hard disk and CD-ROM drives jumper settings. See "3.5-In. Hard Disk Drive Jumper Settings" on page 141 and "5.25-In. Hard Disk Drive Jumper Settings" on page 144.
- Check the voltages of all disk drive power connectors. See "Power Supply Connectors and Voltages" on page 138.
- Correct the parameter settings under Disk Drives in the BIOS Setup. See "Hard Disk Drive" on page 3.

- In the BIOS Setup, check that the correct drive size is set for the flagged drive shown in the System Information. See "Viewing System Information, Video Information and Model Information" on page 13.

- Enter BIOS Setup and load default settings.
  If the problem remains, check the continuity on the drive and the cable and replace it if necessary. If that does not fix the problem, replace the system board.

- End.

005 -

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

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

- If the diagnostics program did not detect a failure, but the system still displays a failure:
  - If an error or other symptom appears, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33.
  - If no error can be detected or the symptom is intermittent, go to "Undetermined Problems" on page 63.

- End.

Factory-Installed Modem Card

NOTE: The factory-installed modem is a 56.6 Kbps modem with a cable of microphone-in and speaker-out from system board.

001 - START

- In Windows 98 Device Manager, ensure that the modem is not configured with a conflicting COM port and IRQ setting.
- Ensure that the communication software is configured with the correct COM and IRQ settings (same COM port and IRQ as the modem).
- Ensure that all communication parameters (baud rate, data, stop and parity bits) are properly configured and are identical on both sides.
- Connect the phone line to the LINE port of the modem card.
- Power off the system unit.

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

002 -

- Insert the diagnostics diskette into the diskette drive.
- Power on the system unit.
- Select Diagnostics menu,
- Select All Tests, then execute Modem test.

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

- Power off the system unit.
- Remove all adapter cards.
- Connect a hard disk drive with pre-loaded Windows 98.
- Power on the system unit.
- Perform the following steps under Windows 98.

NOTE: If an operating system other than Microsoft Windows 98 is installed, the program screens and icons may differ from these instructions.

1. Start Microsoft Windows 98.
2. Select the **Start** icon.
3. Select **Program**, then select **Accessories, Hyper Terminal.**
4. Select an on-line service station, dial and connect to it.

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

• The modem adapter functions normally.

• End.

005 -

• Ensure that Windows 98 is properly installed, then power off the system unit.

• Plug the modem adapter card into a different PCI expansion slot.

• Go to step 002.

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

• End.

Audio (Not Supported by Diagnostics Program)

IMPORTANT: Audio tests for the sound card cannot be carried out in the PC-Doctor DOS diagnostics program. It is, however, possible to carry out a dial tone test for the modem.
While performing this check, you may need to enter and exit Microsoft Windows 98 several times. When instructed to select an icon or button, double click on the item with the mouse.

NOTE: For more information about using Microsoft Windows 98, see the user's guide that came with the computer.
If an operating system other than Microsoft Windows 98 is installed, the program screens and icons may differ from these instructions.

001 - START

- Power off the system unit.

- Remove all adapter cards.

- Connect a hard disk drive with pre-loaded Windows 98.

- Power on the system unit.

- Load default settings in setup (audio may be disabled).

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

- Go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33.

- End.

003 - DO ANY MESSAGES OR ERROR CODES DISPLAY AFTER POST COMPLETES BUT BEFORE MICROSOFT WINDOWS 98 STARTS? (YES, READ AHEAD. NO, GO TO STEP 004)

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

- Ensure that Windows 98 is properly installed.

- End.

004 -

- Perform the following under Windows 98.

NOTE: If an operating system other than Microsoft Windows 98 is installed, the program screens and icons may differ from these instructions.

1. Start Microsoft Windows 98.
2. Select the **Start** icon.

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

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

- Ensure that Windows 98 is properly installed.

- Go to step 001.

006 -

- Select the Preview button from the Sound window.

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

- The audio feature is functioning normally. Click Cancel to close the dialog box. Exit Microsoft Windows 98.

- If the symptom remains or has changed, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33.

- End.

008 -

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

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

- Make sure that the speaker is plugged in speak-out jack. See "Machine Type 2158 System Board Jumpers and Connectors" on page 131 and "Machine Type 2163 and 2164 System Board Jumpers and Connectors" on page 135

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

- End.

CD/DVD-ROM Drive

001 - START

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

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

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

- Exit the diagnostics program and power off the system.

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

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

- Load default settings.

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

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

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

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

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

- Replace system board.

- End.

006 -

- Replace CD/DVD-ROM drive.

- End.

Memory

001 - START

- Power off the system unit.
- Insert the diagnostics diskette into the diskette drive.
- Ensure that all DIMMs are installed correctly.
- Power on the system unit.
- Take note of any messages, error codes, or symptoms.

002 - DO YOU RECEIVE POST MEMORY ERROR MESSAGE? (YES, READ AHEAD. NO, GO TO STEP003)

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

003 -

- Follow the screen instructions to run the Memory test.

004 - DOES THE MEMORY TEST COMPLETE WITHOUT AN ERROR? (YES, READ AHEAD. NO, GO TO STEP005)

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

005 -

- Replace each DIMM, one at a time, with a known working DIMM of the same size and type.
- If the problem does not appear, it means that the last DIMM replaced is defective. If all DIMMs on the system board, have been replaced and the problem remains, replace system board.
- Go to step 001.

NOTE: If system board has no memory installed, you will hear L-L-S-S-S. (L: long beep, S: short beep) beeps during POST.

Keyboard

001 - START

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

002 -

- Insert the diagnostics diskette into the diskette drive and power on the system unit.
- Select Interactive Tests menu, then execute Keyboard test.

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

- Keyboard is functioning normally.
- End.

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

- Power off the system unit. Carefully remove the grime and solve the stuck keys problem.
- Go to step 001.

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

- Try with a known good keyboard.

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

- Replace the system board.
- End.

007 -

- Replace the keyboard.
- End.

Mouse

NOTE: A sticking key button can cause the mouse to operate incorrectly. If you suspect this, go to "Keyboard" on page 58.

001 - START

- Make sure that the mouse ball turns freely.
- Make sure that the mouse plug connects properly.

002 -

- Power off the system unit.
- Insert the diagnostics diskette into the diskette drive.
- Power on the system unit.
- Select Interactive Tests menu, then execute Mouse test.

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

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

NOTE: If it's a ScrollPoint mouse, run the third button test and press the stick to ensure your mouse works.

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

- Test mouse cursor movement.

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

- Mouse is functioned normally.
- End.

006 -

- Power off the system unit.
- Open mouse bottom cover and clean track ball.
- Go to step 002.

007

- Power off the system unit.

- Check the mouse plug.

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

- Try with a known good mouse.

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

- Replace the system board.
- End

010 -

- Replace the mouse.
- End.

011 -

- Exit diagnostics program.
- Ensure that the mouse driver is properly installed.
- Go to step 002.

Power Supply

001 - START

ATTENTION: Check the Power Override switch, situated at the back of the machine, just above the connector for the power cable. If this switch is activated (switched to on), no power will be supplied to the system.

• Power off (unplug) 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 to the correct voltage.

• Power on the system unit.

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

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

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

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

• Go to step 007.

004 -

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

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

• Disconnect the power connectors to all drives.

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

• Reconnect the power cord and turn on the power supply.

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

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

```
(Pin20)5V ──□□── 12V(Pin10)          (Pin1)3.3V ──□□── (Pin11)3.3V
      5V ──□□── 5V                       3.3V ──□□── -12V
   Empty ──□□── PowerGood                 GND ──□□── GND
     GND ──□□── GND                        5V ──□□── 5V
     GND ──□□── 5V                        GND ──□□── GND
     GND ──□□── GND                        5V ──□□── GND
      5V ──□□── 5V                        GND ──□□── GND
     GND ──□□── GND                 PowerGood ──□□── Empty
    -12V ──□□── 3.3V                        5V ──□□── 5V
(Pin11)3.3V ──□□── 3.3V(Pin1)       (Pin10)12V ──□□── (Pin20)5V
```

Pin-hole side view   Cable side view

```
        ─── Black(GND)                       ─── Black(GND)
              ─── Red(+5V)                          ─── Yellow(+12V)


   Yellow(+12V)                          Red(+5V)
```
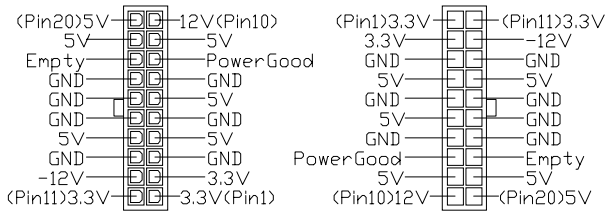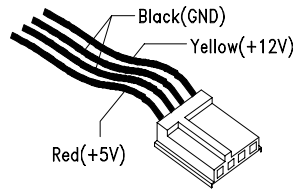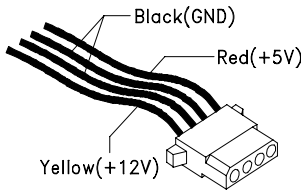
006 - ARE THE VOLTAGES CORRECT AND DOES THE FAN RUN? (YES, READ AHEAD. NO, GO TO STEP 009.)

- The power supply is working normally.

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

- If the fan continues to run when all connectors are plugged back in, go to "Undetermined Problems" on page 63.

- If the fan stops running when a drive connector is plugged back in, go to "Start" on page 29.

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

- Replace the on/off switch cable assembly.

008 -

- Replace the system board.

- End.

009 -

- Replace the power supply.

- End.

Monitor

First, set the system to VGA mode. To do this in Windows 98, depress the F8 function key during startup. Safe mode (VGA) will be set for Windows 98. Use the operating system's video setup to change the monitor resolution.

The monitors that come with the system are DDC2A/B or DDC1/2B+ (Display Data Channel) compliant. While starting Windows 98, the DDC2 monitor passes resolution and frequency information to the system. The system interprets the data and sets up the proper refresh rate.

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

NOTE: Some monitors have a detachable system I/O signal cable between the monitor and the system unit. Check the line voltage, power cord, and continuity for the system I/O signal cable before replacing the monitor. See "Monitor Port Signals" on page 151 for pin identification.

001 - START

- Power off the system unit and monitor.
- Remove all adapter cards.
- Make sure that the monitor I/O signal cable is properly connected to the system unit and monitor.
- Make sure that the power cords are properly connected to the system unit and monitor, and that the line voltage is correct.
- Make sure that the monitor contrast and brightness controls are not turned too low.
- Make sure that the diagnostics diskette is in the diskette drive.
- Power on the monitor, and wait 20 seconds.
- Power on the system unit.

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

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

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

- Select Interactive Tests from the Main Menu.
- Select and execute Video test from the menu.
- Follow the prompts and perform the video test.
- Go to"Index of Symptoms, Messages, Error Codes, or Beeps" on page 33.
- You might have to adjust the monitor controls to obtain the best image.

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

- You have successfully completed the video diagnostics tests. If the problem remains, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33
- End.

004 -

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

005 - IS THE SCREEN READABLE?

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

Undetermined Problems

If an error code, error message or error beeps is present, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33. If you did not receive any messages, error codes, or beeps, see if the symptom is listed in "Table 2-3 Error Symptoms List" on page 41. If you still cannot solve the problem, continue with this check:

1. Check the power supply voltages (See "Power Supply Connectors and Voltages" on page 138). If the voltages are correct, return here and continue with the following steps:

2. Power off the system unit.

3. Perform the following checks, one by one, until you have isolated the problem FRU (refer to "Parts/Test Point Locations" on page 130 for locations):

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

4. If the jumpers, switch, and voltage settings are correct, continue with the following steps:

- Remove or disconnect the following, one at a time:
    - Non-IBM devices
    - External devices
    - Any adapter card (modem card or video card, if installed)
    - CD-ROM drive
    - Diskette drive
    - Hard disk drive
    - DIMM
    - Processor
    - System board

5. Power on the system unit.

6. Repeat steps 2 through 5 until you find the failing device or adapter.

7. If software related, reload software from Recovery CD.

8. If the symptom changes, go to "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33 or to the check procedure for the last item

tested.

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

Diagnostic Aids

Introduction

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

Power-On Self Test

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

POST checks the following:

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

- Mouse
- Parallel Port(s)
- Serial Port(s)
- CD/DVD-ROM Drive(s)
- Sound Controller*

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

1. The IBM Aptiva logo will appear on the screen.
2. At this time one of two hot-keys may be used. The F1 key will cause the system Setup Utility menu to appear. The F9 key will switch the graphical IBM logo screen to the traditional text-based system startup screen, which displays BIOS version and system memory tested. For Aptiva, the F9 key will only work after exiting BIOS Setup.
3. If an error is detected during POST, the IBM logo screen will automatically switch to the text-based screen and display the error message or code with a beep. Depending on the criticality of the POST error, the system may halt and/or display the message "Press <F1> to enter to the Setup or <Enter> to continue..."

   If this message appears, pressing the Enter key will allow the system to attempt to proceed despite the reported error; pressing F1 will cause the system Setup Utility menu to appear.
4. If no keyboard keys are pressed, and if POST is completed without errors, the system will then proceed with the loading of Windows98 or other operating system from a hard disk drive or diskette drive A or CD-ROM

drive, depending on the Start options selected in the BIOS Setup Utility.

If any errors are detected by POST, there will be an error message accompanied with an error code shown on display screen and a beep. See "Index of Symptoms, Messages, Error Codes, or Beeps" on page 33 to find the most likely cause and countermeasure.

Diagnostic Diskette

WARNING: This manual is intended to test the IBM Aptiva 2158/2163/2164 machine type only. Testing devices which are not included with the original product package, including other IBM products, prototype cards, or modifying hardware settings may give false errors and invalid system responses. The diagnostics not specifically made for this model may also report incorrect errors and information.

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

NOTE: The diagnostics program for Aptiva 2158/2163/2164 are the same.

Using the Diagnostic Diskette

1. Power-off the system unit.
2. Insert diagnostic diskette in drive A.
3. Power-on the system unit.

NOTE: Do not press F1 during POST. If any POST errors appear after POST, make a note of the errors.

4. DOS should load. During boot, verify that each driver loads successfully. For drivers that do not load successfully, verify that the device driver is associated with it and is installed properly.
5. Diagnostics program (PC-Doctor) will load, then follow the screen instructions to operate.

Using Diagnostic Program from Recovery CD

1. Insert the Aptiva recovery CD into the CD-ROM drive then restart computer.
2. Depress F1 while POST to enter BIOS Setup menu. Select and enter "Startup Options", set the first priority of boot sequence to CD-ROM. Save

and exit from BIOS Setup.

3. When screen displays IBM Recovery Program menu, choose "Run Diagnostics" to execute diagnostic program.

4. Follow the instructions on the screen to operate the diagnostics program.

Diagnostics Program Features

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

Table 3- 1 Diagnostic Program Main Menu Selections

Main Menu Selections	Submenu Selections
Diagnostics	• System Test • Memory Test • Hard Disk Test • Floppy Disk Test • All Tests
Interactive Tests	• Keyboard • Video • Internal Speaker • Mouse • Joystick Test • Diskette • Printer Test • SCSI Test • CD-ROM/DVD Test • Stereo Speaker

Table 3- 1 Diagnostic Program Main Menu Selections (Continued)

Main Menu Selections	Submenu Selections
Hardware Info	• System Configuration • Memory Contents • IRQ and DMA Use • Device Drivers • COM and LPT Ports • Physical Disk Drives • Logical Disk Drives • VGA Information • Software Interrupts • SCSI Devices • I/O Use • IDE Drive Info • Network Information • PCMCIA Information • PCI Information • SMP Information • PNPISA Information • DMIBIOS Information
Utility	• File Editor • Surface Scan Hard Disk • Terminal • Tech Support Form • Battery Rundown • Select Language
Quit	• Exit Diags • Park HD • Reboot • Upgrade Now

Repair Information

Removals and Replacements (Machine Type 2158 and 2163)

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.

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 the direction to press a tab to release the FRU.

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

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

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

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

Identifying the Parts of the System Unit
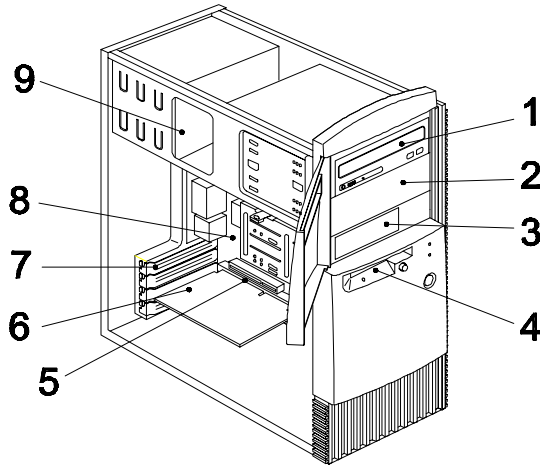
This computer system has four bays that can hold 5.25-inch and 3.5-inch drives.   Additional devices can be installed in the empty bays.

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

It also has interface slots for installation of additional cards devices. Industry Standard Architecture (ISA) and Peripheral Component Interconnect (PCI) adapter cards are both supported.

1. **Bay 1.**
   This drive bay can hold a 5.25-inch half high drive or a 5.25-inch slim drive. A 3.5-inch drive can be accommodated with additional brackets. This bay can hold a CD-ROM, DVD-ROM, diskette, hard disk, tape, or Zip drive.

2. **Bay 2.**
   This drive bay can hold a 5.25-inch half high drive or a 5.25-inch slim drive. A 3.5-inch drive can be accommodated with additional brackets. This bay can hold a CD-ROM, DVD-ROM, diskette, hard disk, tape, or Zip drive.

3. **Bay 3.**
   This drive bay can hold a 3.5-inch slim drive, such as a diskette, hard disk, tape, or Zip drive.

4. **Bay 4.**
   This drive bay is designed for a 3.5-inch diskette drive.

5. **Adapter card connectors.**
   Adapter card connectors are sockets on the system board into which adapter cards are installed. Your system board has four adapter card connectors (for the 2163 machine, there is an additional AGP video connector). One of these connectors is for an ISA card and three are for PCI cards. Since two of these connectors are shared (one ISA and one PCI next to it), only three cards (excluding the AGP video card) can be installed at any time.

6. **Adapter cards.**
   Adapter cards add to your computer's capabilities.

7. **Adapter card slots.**
   Adapter card slots are the holes in the back of the tower that permit external access to adapter cards.

8. **System board.**
   The system board is the main circuit board in your computer. It contains the processor, also known as the central processing unit (CPU), and the system battery. It also contains sockets for memory modules, connectors for adapter cards, and connectors for the cables that carry data to and from drives.

9. **Power supply.**
   The power supply provides the electricity that is used by the other hardware components in your computer. This model may come with a 95W power supply.

Cover

- Disconnect the system unit power cord.
- Remove the screws at the back of the tower.
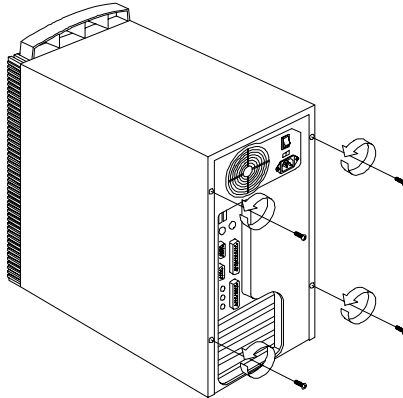
- Insert a screwdriver under one of the tabs on the back of the cover and gently pry the tower cover so that it separates from the tower.
- Slide the cover back about half inch (or 1.25 centimeters).
- Lift the cover up by the top front and back edges, pulling the sides out and away from the tower.
- Touch the outside of the bare metal frame of the tower to dissipate any static electricity from your body. Do not touch any of the components inside the frame. Be careful not to touch any component displaying a voltage warning label, such as the power supply.
- Disconnect the tower power cord.

NOTE: To prevent the tower from tipping over, you may want to lay the tower on its side on a work surface, such as a table.

- Touch the bare metal frame of the system to dissipate any static electricity from your body (do not touch any of the components inside the frame until you have done this). Do not touch any component(s) with a voltage warning label.
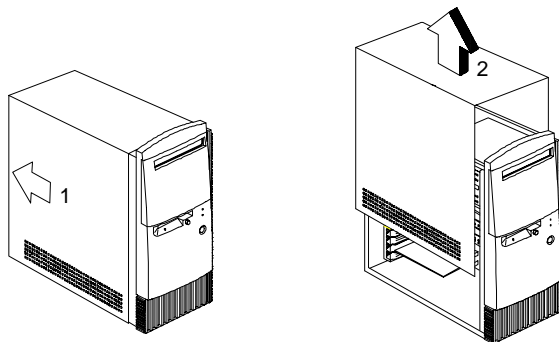
NOTE: Replacing the Cover

• To replace the tower cover, lower the cover down over the tower, pressing in on the sides so the hooks inside the cover fit over the bottom ledge of the tower. Slide the cover forward into place. Secure the tower cover by replacing the screws you removed.

CAUTION: When you replace the cover, there are hooks inside the cover that help fit it to the tower.

Bay Panels

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

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

- Hold a bay panel and press either side to unlatch it from the front of the system unit cover.
- Pull the bay panel and EMI bay cover out.
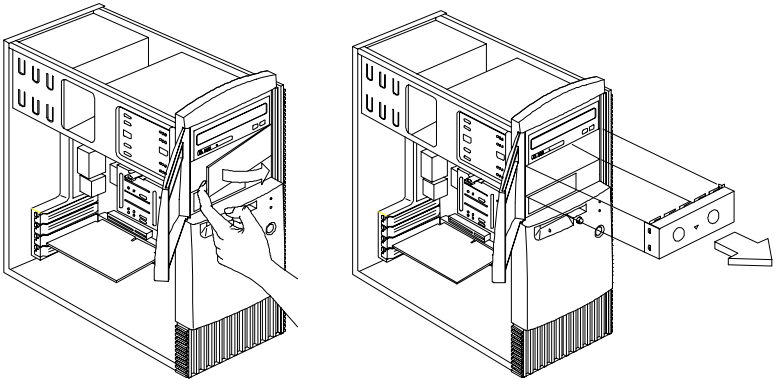
NOTE: Replace the EMI Bay Panel

- Replace the EMI bay cover.
- Insert a bay panel into the opening at the front of the system cover, aligning the panel latches with the sides of the unit.
- Push the panel back until you hear the latches click into place.

Bay 1- 5.25-In. Bay (Internal or External Access)

- Disconnect any cable on the drive (note location and orientation of cables).
- Remove the screws.
- Pull out the drive.
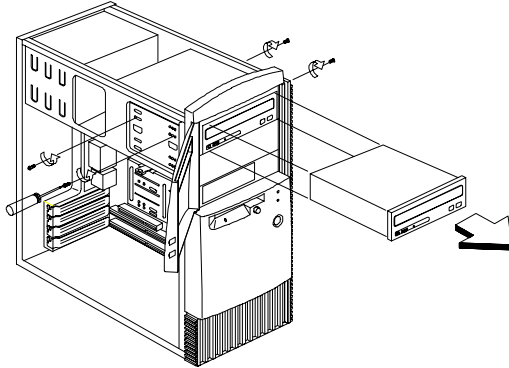
Bay 3 - 3.5-In. Bay (Internal or External Access)

Bay 4 - 3.5-In. Bay (External Access for Diskette Drive)

- Disconnect the cables (note location of cables).

- Press the lever and rotate outward.

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

- The drive frame becomes free after the line behind the arrow appears. Remove the frame from the chassis.
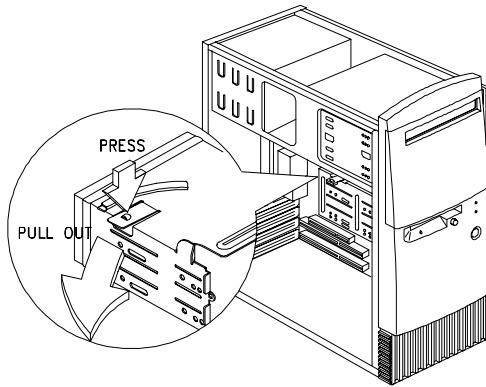
- Remove the screws located on both sides of the drive and slide the drive out.
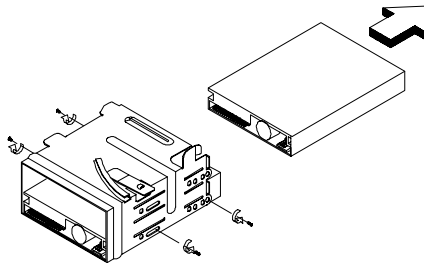
NOTE: Reinstall The 3.5-in Drive Frame

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

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

- Align the top rail of the drive frame with the system chassis and swing inward until it "clicks" to lock.
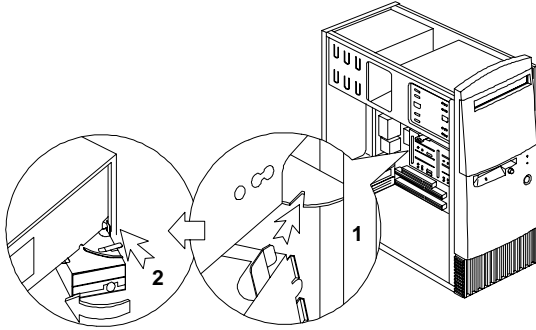
- Re-attach the power and signal cables to the drives.

Power Supply

- Disconnect all cables necessary before removal (note location of cables).
- Remove the four screws from the chassis.
- Push the power supply forward towards the CD/DVD-ROM drive.
- Once it is sufficiently forward, place your hand underneath the power supply and push upwards to detach it from the chassis.
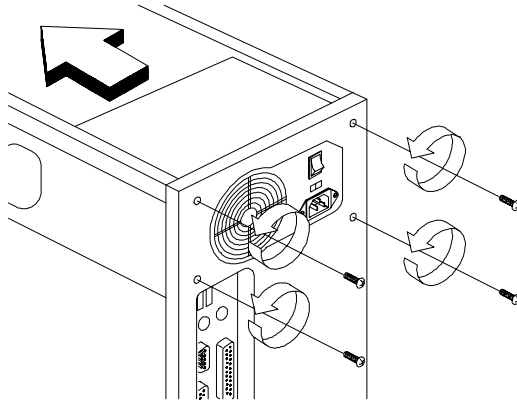
Adapter Cards

NOTE:

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

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

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

- Remove the adapter card screw.

- Carefully pull the adapter card straight out of the slot so that the card does not bend.
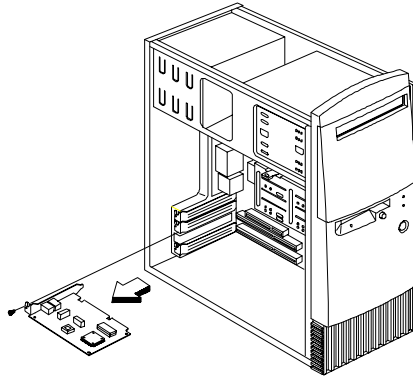
Memory(DIMM)

CAUTION: Memory modules are sensitive to static discharge.

- Press the levers on both sides of the socket down and outwards.
- Lift the DIMM to remove.

ATTENTION: Place your forefingers on the top of the DIMM before you press the holding clips to gently disengage the DIMM from the socket.
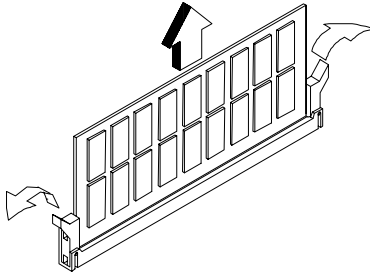
AMD-K6 Processor (for 2158)

NOTE: Determine the type of processor you are installing and make sure the
jumpers are set correctly.   Run the Setup Utility after correctly installing
a processor.

CAUTION: Processors are sensitive to static discharge.

• Remove adapter cards if applicable.

• Detach the heat sink cable from the fan connector.

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

• Pull up the ZIF socket release lever.

• Lift the processor out of the socket.
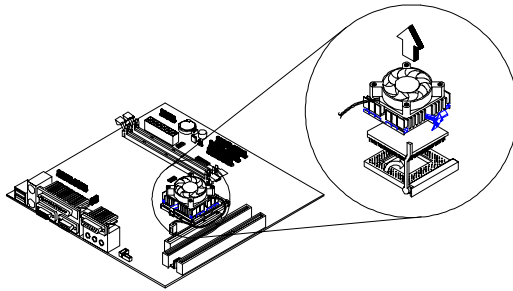
NOTE: Installing the processor

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

• Insert the new processor, matching the notched corner of the processor with
the pin 1 indicator on the socket.
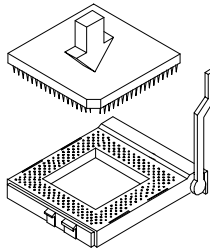
• Push down the lever to lock the processor to the socket.

- Place the processor heat sink fan over the processor.
- Insert one side of fan brace onto the ZIF socket
- Secure by latching the other side to the ZIF socket.
- Reconnect the processor fan sink cable to the connector FN1 on the system board.
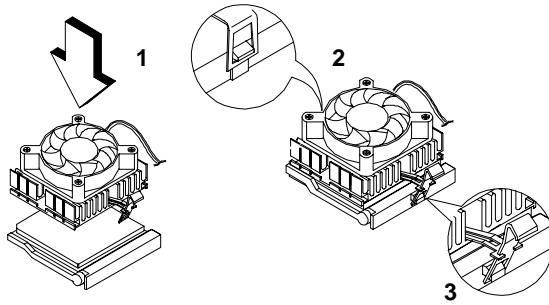
Pentium II Processor Module (for 2163)

The Pentium II Processor Module comes in two packages, SECC1 and SECC2. SECC stands for Single Edge Cartridge CPU. Either of the two packages can be installed to the 2163 system board.

Removing the Pentium II CPU Module

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

NOTE: Determine the type of processor you are installing and make sure the jumpers are set correctly.   Run the Setup Utility after correctly installing a processor.

ATTENTION: Processors are sensitive to static discharge.

• Unlock the latches that secure the processor module.
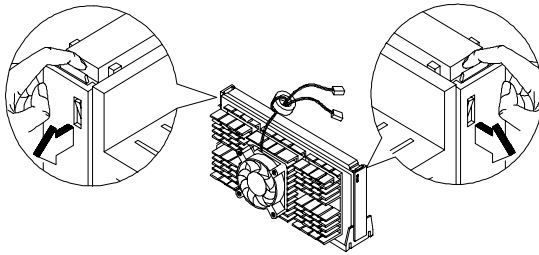
• Firmly hold the processor module and pull it out of the socket.
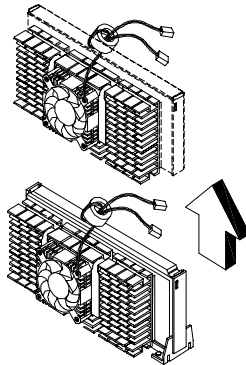
Pentium II Processor Installation

Follow these steps to install the Pentium II processor module with heat sink and fan to the socket on the system board.

- Locate the retention mechanism around the processor socket. Fold out the retainers.
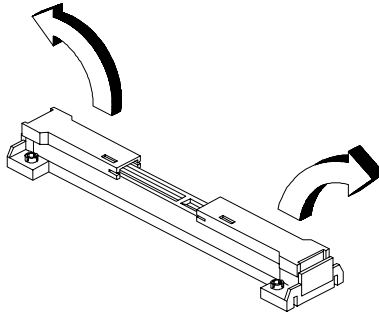
- With the processor module electrical contacts pointing downward, align the processor to the posts of the retention mechanism, then lower it down.
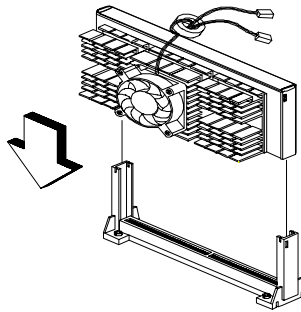
CAUTION: The electrical contacts of the Pentium II module are slotted in such a way that the module only fits in one direction. Make sure that the module groove matches the one on the processor socket.

- Lock the latches to secure the processor module.
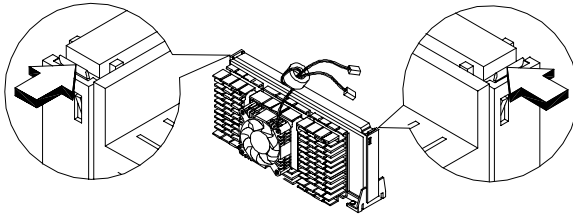
Installing the Processor Heat Sink and Fan

The Pentium II processor module with holes on one side to hold the clips of the heat sink and fan. The upper set of holes (near the latches) on the processor are wider and should match the wider ends of the clips on the heat sink. The lower set of holes are smaller and should match the narrow ends of the heat sink clips.

SECC1 Package Installation

narrow holes

wide holes
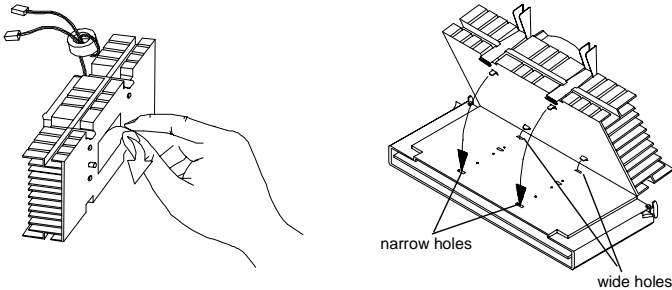
Matching the Fan-Heat Sink Clips with the Holes on the Processor and Inserting the Clip Ends to the Processor Holes

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

- Remove the thermal tape protector at the back of the heat sink.
- Insert the wide clip ends to the wide holes on the processor and the narrow clip ends to the narrow holes.

90

- Using your fingers, push down the metal bracket until it clicks into the CPU cartridge and then push the metal bracket levers down, to lock the metal bracket into place.

1   **2**
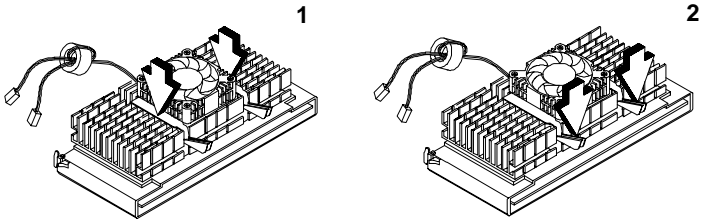
SECC2 Package Installation

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

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

- Attach the fan sink to the PC board side of the Pentium II processor.

- Press the fastener towards the fan sink side to lock the fan sink.

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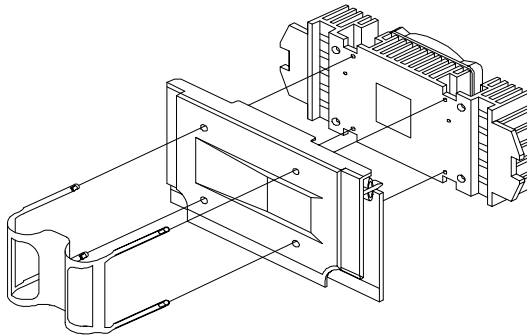
To remove the SECC2 type fan sink, use a screw driver to slide the fastener nodes outward to unlock the fan sink from the processor, then carefully remove the fan sink from the processor.
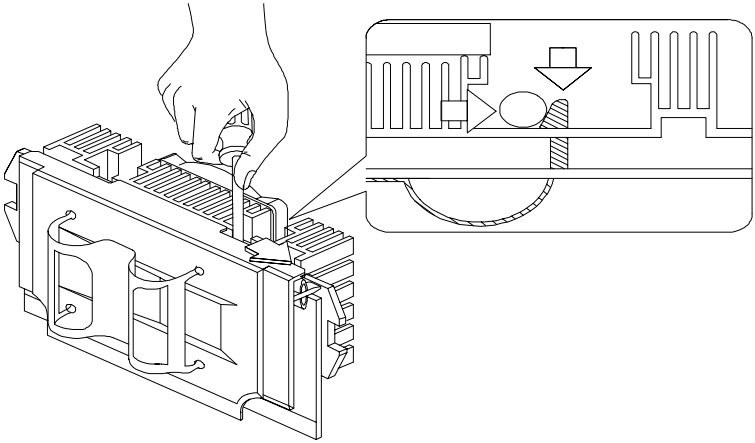
Celeron Processor Module (for 2163)

Removing the Celeron CPU

Follow these steps to remove the Celeron CPU module from the slot.

NOTE: Determine the type of processor you are installing and make sure the jumpers are set correctly.   Run the Setup Utility after correctly installing a processor.

ATTENTION: Processors are sensitive to static discharge.

• While slightly pulling either side of the universal retention mechanism, pull out the CPU.
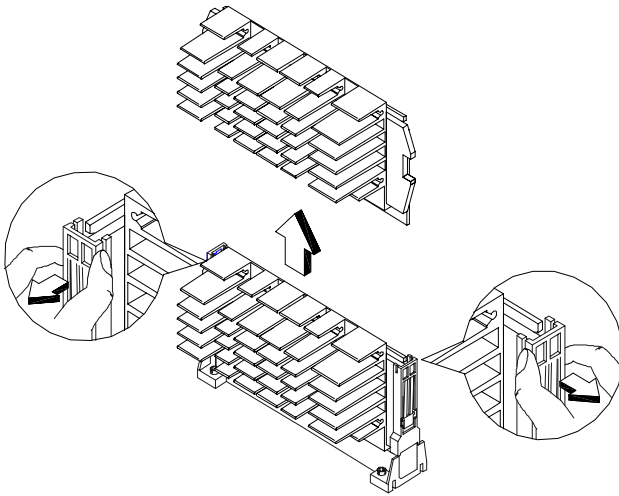
- Use a screw driver to push the four fastener tabs outward to unlock the heat sink from the processor, then carefully detach the heat sink from the processor.
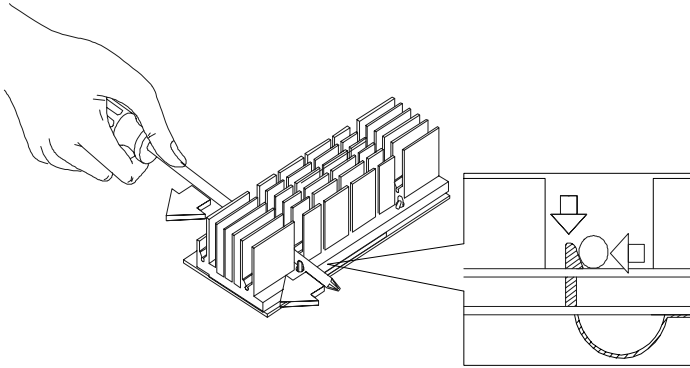
Installing the Universal Retention Mechanism (URM)

Follow these steps to install the universal retention mechanism:

1. Pull out the sides.
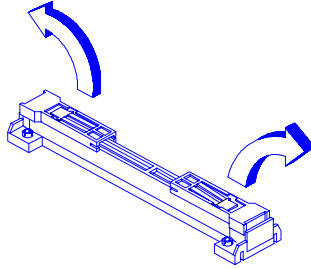
2. Place the universal retention mechanism over the CPU connector on the system board and press it until it clicks into place.

3. Press down the four plastic rivets to secure the URM. Make sure all four rivets are properly inserted into the holes on the system board.
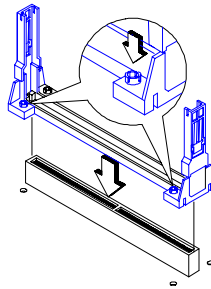
Installing a Celeron CPU

NOTE: Observe the ESD precautions when installing or removing a system component.

The system board supports a Celeron processor that comes in the SEPP (Single-Edge Processor Package) type packaging. The SEPP is similar to SECC and is compatible with Slot 1 connectors.

NOTE: Before you proceed, make sure that there is no processor installed in the CPU connector.

Follow these steps to install a Celeron processor:

1. Install the universal retention mechanism.

2. Remove the Celeron processor from its protective packaging.

3. Position the heatsink fastener underneath the processor card.

4. Remove the thermal tape protector at the back of the heatsink.
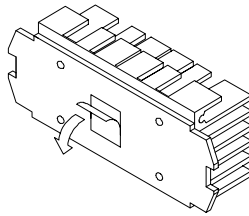
5. Align the four tabs of the fastener with the four holes on the Celeron processor.

6. Press the heatsink, processor card and fastener together to lock the heatsink.
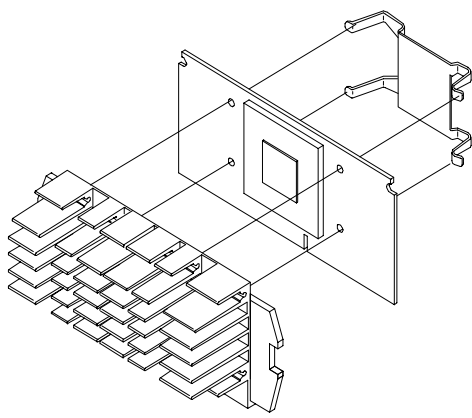
8. With the processor card golden fingers pointing downward, align the processor to the posts of the URM.

9. Lower the processor into to the CPU connector on the system board until the golden fingers touch the connector.

10. Press down the processor until the golden fingers completely fit into the connector and the latches on the sides lock the processor into place.

Check the sides of the URM. The latches should be properly inserted into the appropriate slots on the retention mechanism.

IMPORTANT: If you find the processor card difficult to insert into the slot, do not force it. The orientation of the heatsink may be incorrect.
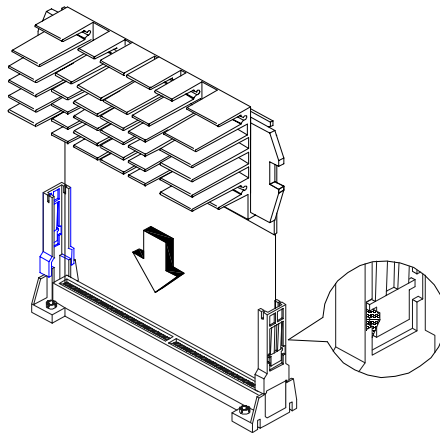
CAUTION: The heatsink becomes very hot when the system is on. NEVER touch the heatsink with any metal or with your hands.

- Processor with the capabilities of MMX™ technology
- Processor in Single Edge Contact (S.E.C.) cartridge packaging technology (slot 1).
- Dual Independent Bus architecture separates dedicated external system bus and dedicated internal high-speed cache bus.
- One of the following processors can be installed:

System Backup Battery

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

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

- Gently pull the metal lever away from the backup battery.
- Lift the backup battery out.
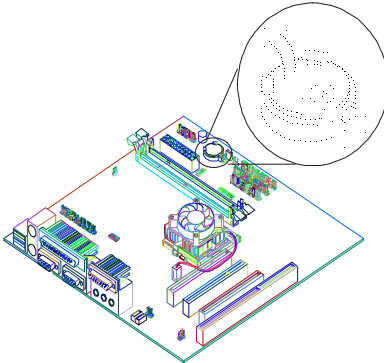
Machine Type 2158   **Machine Type 2163**
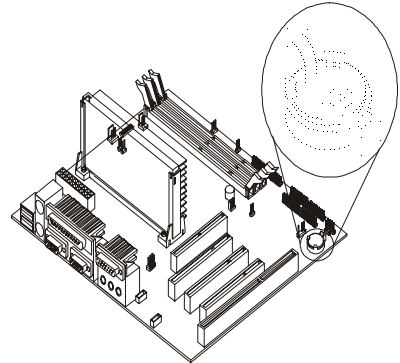
IMPORTANT: Make sure to insert the battery with the positive side facing up. A plus(+) sign indicates the positive side.

- If you replace the system battery, you need to reset the system date and time. You can perform this task from the Window 98 desktop or from the Setup Utility. To reset the system date and time in the Setup Utility, select the Date and Time option from the Main Menu.

Indicator LED and Cable

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

Power LED
HDD LED

System Board

- Remove all adapter cards.
- Disconnect all cables connected to the system board. Note the location and orientation of all cables.
- Remove the screws securing the system board to the chassis.
- Lift the system board to remove from chassis.
- Remove memory (DIMM) if applicable.
- Remove processor if necessary

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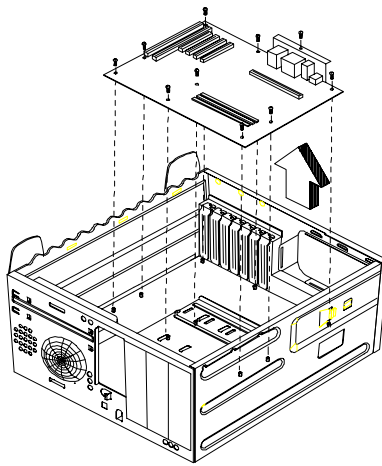
NOTE: System Board Installation

- Before reinstallation, position the housing on its side. When installing a new system board, push the board to the rear and align it with the front locating pin. Visually verify that the board is aligned properly, then press the board down.
- Be sure to reinstall the processor, DIMMs, I/O port bracket onto the new system board if applicable.
- After installing the system board, secure with original screws.
- Change all jumper settings to match those of the original board.

- Reinstall other components into the machine i.e. drives, power supply, cables, etc.
- Upgrade the BIOS version on the new system board using the BIOS upgrade utility.
- Change the Machine Type and Serial Number in the BIOS to match the original planar BIOS settings.
- Reboot the system and run the Setup Utility.

Removals and Replacements (Machine Type 2164)

See Safety Notice following Translation on page VII

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

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 the direction to press a tab to release the FRU.

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

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

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

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

NOTE: 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.

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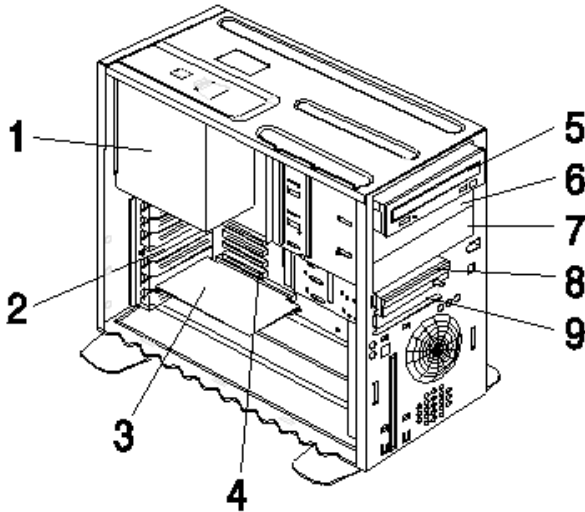
This computer system has five bays that can hold up to three 5.25-inch and two 3.5-inch drives.   Additional devices can be installed in the empty bays.

Diskette drives in this unit use the standard diskette advanced technology (ATX) interface. Hard disk drives in this unit use an Integrated Drive Electronics (IDE) ATX interface. This computer supports the American National Standards Institute (ANSI) standard for ATX attachment disk drives.

It also has interface slots for installation of additional card devices. Industry standard architecture (ISA) and Peripheral Component Interconnect (PCI) adapter.

10. **Switching Power Supply**.

The system comes with a 145-watt switching power supply.

11. **Expansion slots.**

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

12. **Modem Card.**

The system includes a 56.6K voice fax modem.

13. **System board.**

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

14. **Bay 1.**

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

15. **Bay 2**.

This drive bay may accommodate a 5.25-inch half-high drive, such as diskette, hard disk, tape or CD/DVD-ROM drive.

16.**Bay 3**.

This drive bay may accommodate a 5.25-inch half-high drive, such as diskette, hard disk, tape or CD/DVD-ROM drive.

17.**Bay 4.**

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

18.**Bay 5**.

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

Cover

- Disconnect the system unit power cord.
- Release the lock that secures the cover at the back of the unit by pressing it toward the unlocked icon.
- Slip your hand into the underside of the front panel and pull the release handle forward to release the cover.
- The cover slides along grooves that run on the sides of the unit. While still holding the handle, slide the cover forward to remove it completely.
- Touch the bare metal frame of the system to dissipate any static electricity from your body (do not touch any of the components inside the frame until you have done this). Do not touch any component(s) with a voltage warning label.

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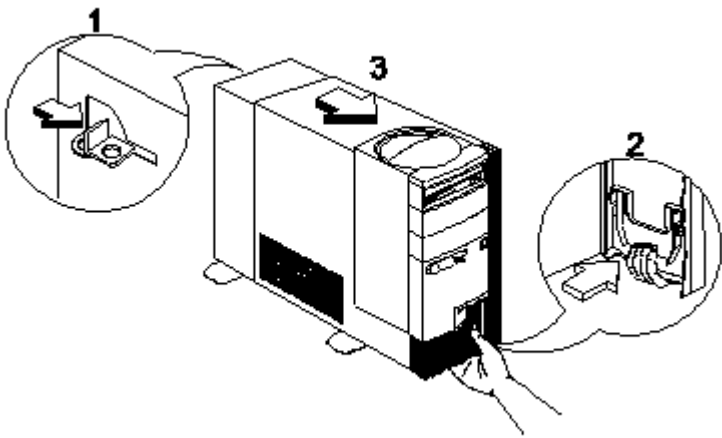
NOTE: Replacing the Cover

• Align the end corners of the cover with the front corners of the chassis. Ensure that the rails of the cover slide along the grooves on the sides of the chassis.
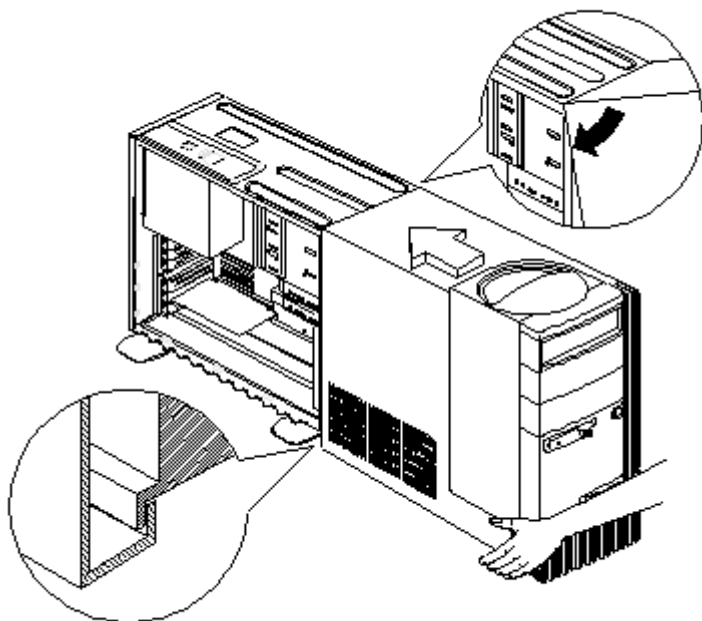
• · Slide back the cover until it fits into place. If the cover does not slide all the way to the rear, hold the upper rear corners of the cover and slightly press it inward while pushing it toward the rear end of the unit.
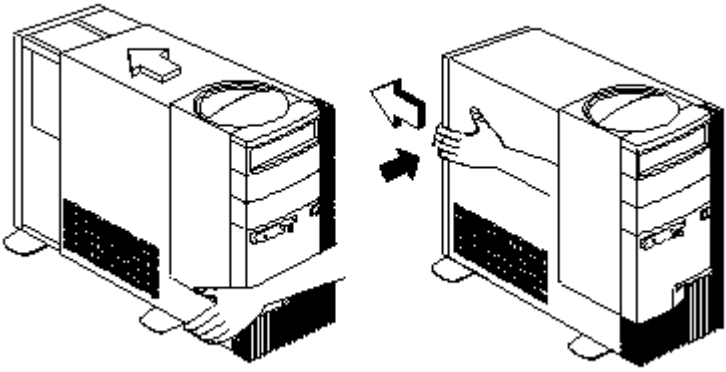
- Slide the lock on the back of the unit to the "locked" icon to secure the cover to the chassis.

Bay Panels

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

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

- Hold a bay panel and press either side to unlatch it from the front of the system unit cover.
- Pull the bay panel out.
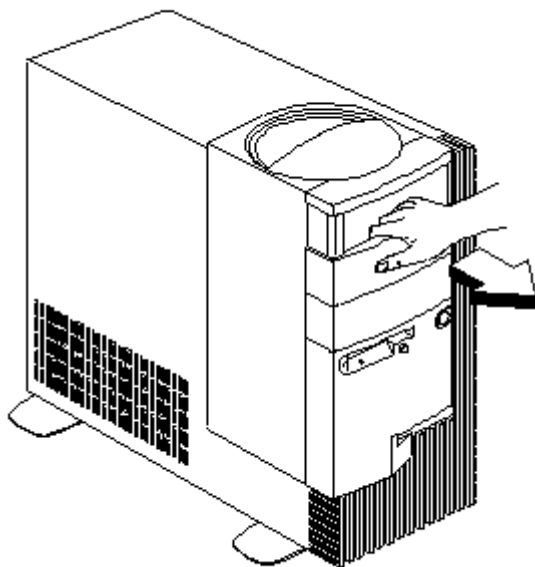
NOTE: Removing the system cover, exposes metal plates in front of each unpopulated drive bay. Push back and break-off these metal plates before installing additional drives.

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

NOTE: To Reinstall A Bay Panel

- Insert a bay panel into the opening at the front of the system cover, aligning the panel latches with the sides of the unit.
- Push the panel back until you hear the latches click into place.

Bays 1, 2, 3 (3.5-In. and 5.25-In. Internal/External Bays)

- Disconnect all cables on the drive (note location of cables).
- Remove the screws.

WARNING: For 5.25-In. hard disk drive installation, it uses different screws from 3.5-In. hard disk drive .

IMPORTANT: Install the 3.5-in. hard disk drive only in bays 1,2 and 3 using the drive tray to keep it in place. Remember to use rubber cushion to avoid acoustic problem.

- Pull out the drive.
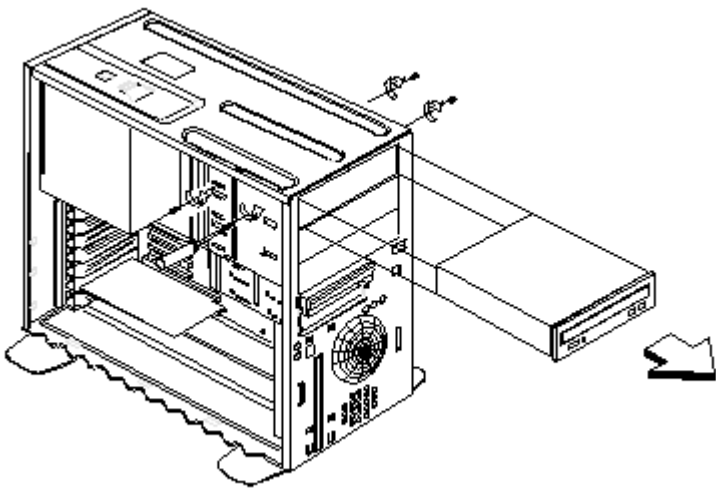
Removing the 3.25-in hard disk drive from the adapter tray

- To remove the hard disk drive from the adapter tray, remove the four shoulder screws on the underside of the tray.

- Four cushion rings are used to minimize the acoustic interference. To remove the cushion rings, slide and lift.
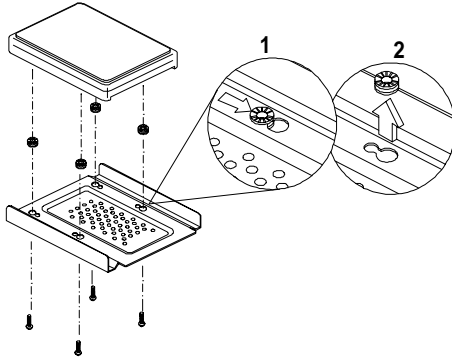
ATTENTION: When installing the hard disk drive, the cushion rings and shoulder screws must be used to secure the hard disk to the tray.

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

- Disconnect the cables (note location of cables).
- Press the lever and rotate outward.
- Pull carefully and slowly as soon as the warning arrow appears.
- The drive frame becomes free after the line behind the arrow appears. Remove the frame from the chassis.
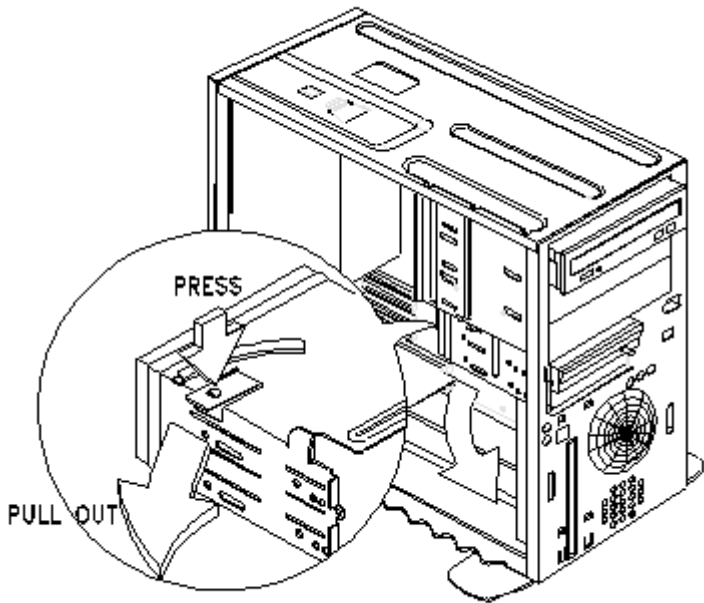
NOTE: Reinstall The 3.5-in Drive Frame

- Align the front notch of the drive frame with the system chassis
- Align the top rail of the drive frame with the system chassis and swing inward until it "clicks" to lock.
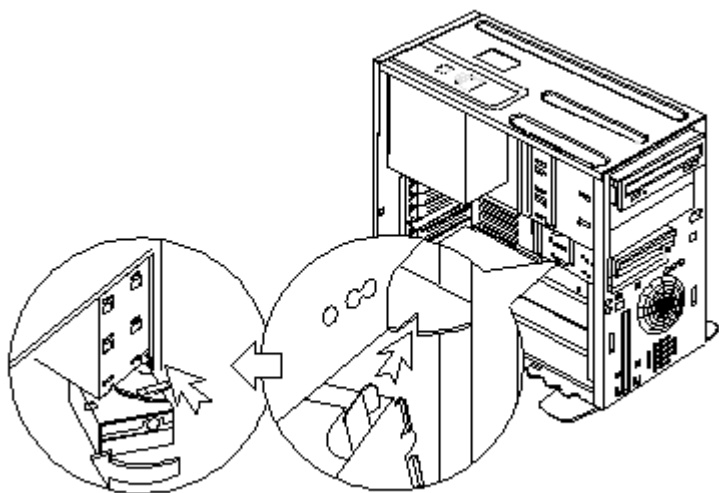
- Re-attach the power and signal cables to the drives.

Power Supply

- Disconnect all necessary cables before removal (note location of cables).
- Remove the two screws from the chassis.
- Press the tab located on top of the housing frame just above the power supply.
- Push the power supply forward towards the CD-ROM drive to detach it from the chassis.
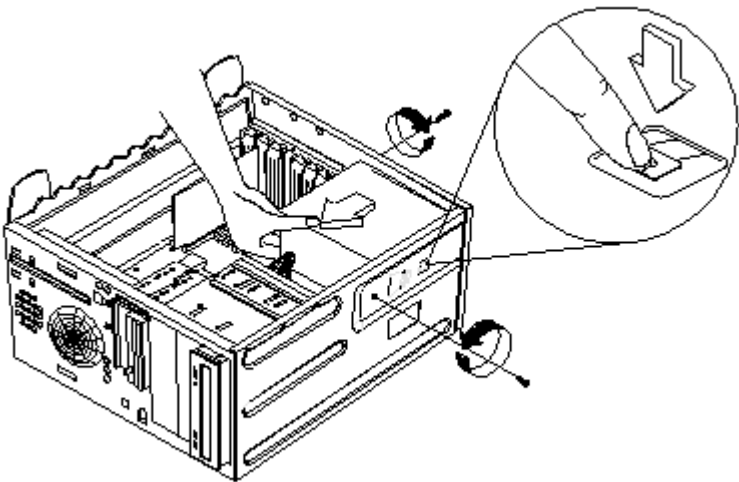
- Detach the power supply from the frame by removing it's four screws.

NOTE: Replacing the Power Supply

• Insert the power supply frame into its corresponding cut-away openings on the chassis.

• Align the top rails and slide in to lock.

• Secure the power supply with it's two original screws
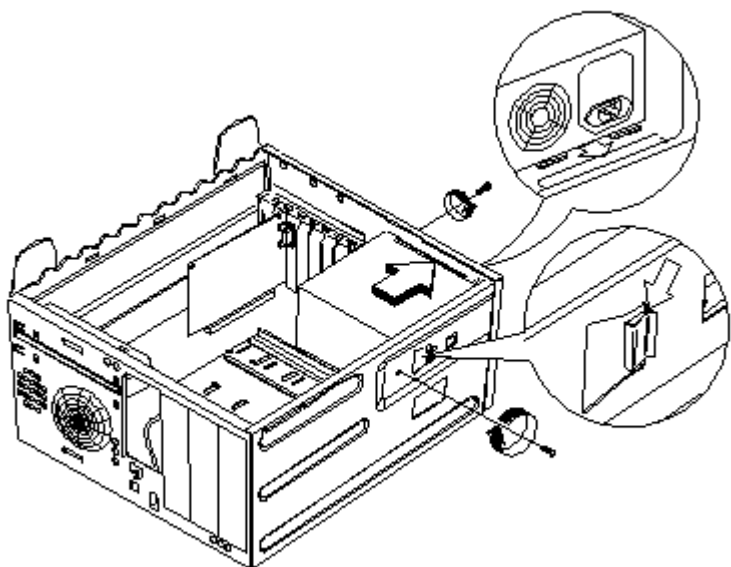
Adapter Cards

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

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

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

• Remove the adapter card screw.

• Carefully pull the adapter card straight out of the slot so that the card does not bend.
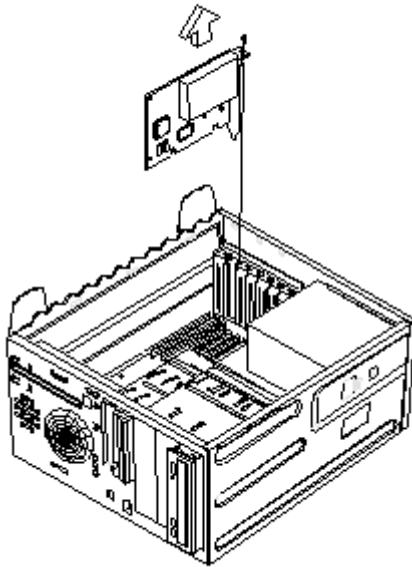
Memory(DIMM)

ATTENTION: Memory modules are sensitive to static discharge.

- Press the levers on both sides of the socket down and outwards.
- Lift the DIMM to remove.

CAUTION: Place your forefingers on the top of the DIMM before you press the holding clips to gently disengage the DIMM from the socket.
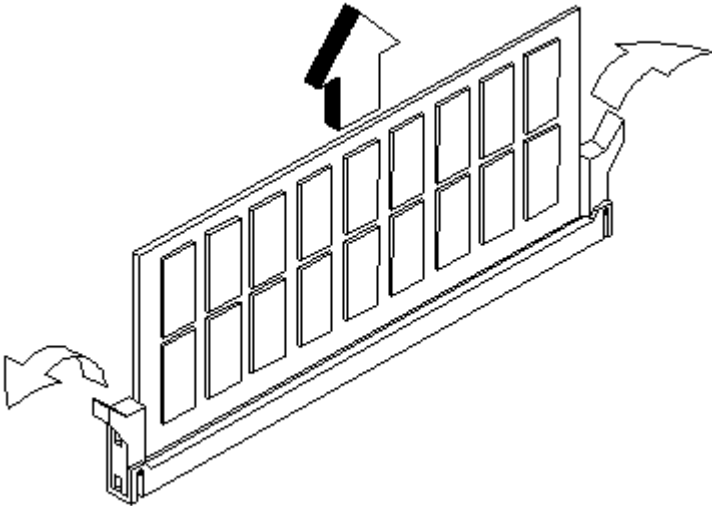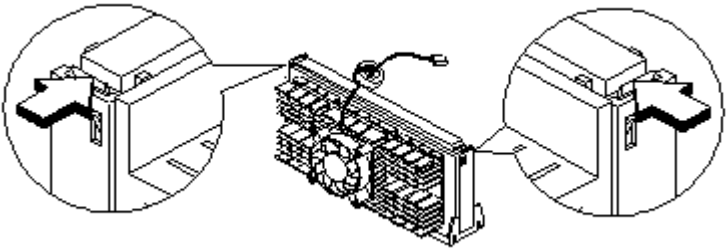
Pentium II and Pentium III Processor Module

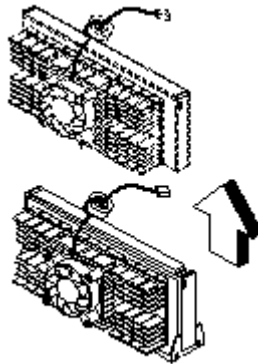Follow these steps to remove the Pentium II and Pentium III CPU module from the slot.

NOTE: Determine the type of processor you are installing and make sure the jumpers are set correctly.   Run the Setup Utility after correctly installing a processor.

ATTENTION: Processors are sensitive to static discharge.

• Unlock the latches that secure the processor module.

• Firmly hold the processor module and pull it out of the socket.

NOTE: Pentium II Processor Installation

Follow these steps to install the Pentium II processor module with heat sink and fan to the socket on the system board

- Place the retention mechanism over the processor socket on the CPU board. Secure it with the screws that came with the package.
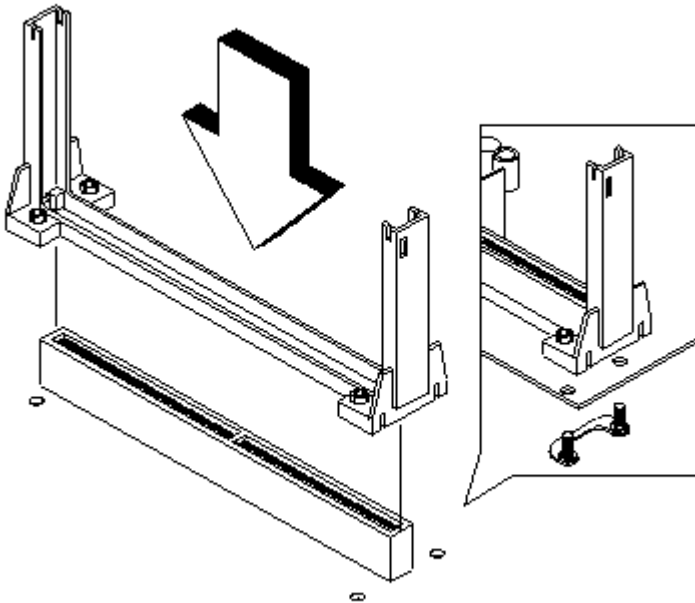
- With the processor module golden fingers pointing downward, align the processor to the posts of the retention mechanism, then lower it down.
- The golden fingers of the Pentium II module are slotted in such a way that the module only fits in one direction. Make sure that the module groove matches the one on the processor socket.

Installing the Processor Heat Sink and Fan

The Pentium II processor module comes with holes on one side to hold the clips of the heat sink and fan. The upper set of holes (near the latches) on the processor are wider and should match the wider ends of the clips on the heat sink. The lower set of holes are smaller and should match the narrow ends of the heat sink clips.
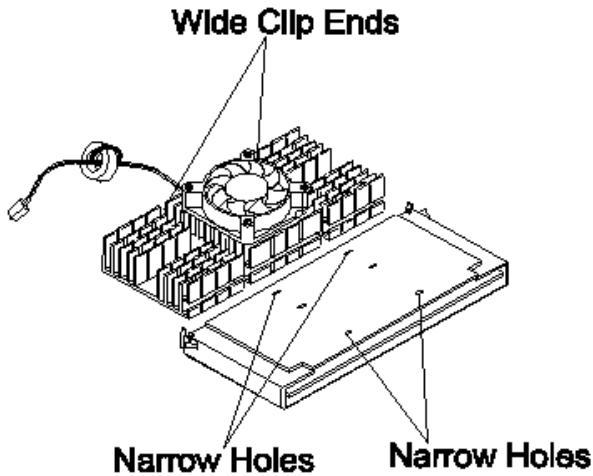

Follow these steps when installing the heat sink and fan to the Pentium II processor module:

- Remove the thermal tape protector at the back of the heat sink.
- Insert the wide clip ends to the wide holes on the processor and the narrow clip ends to the narrow holes.

.
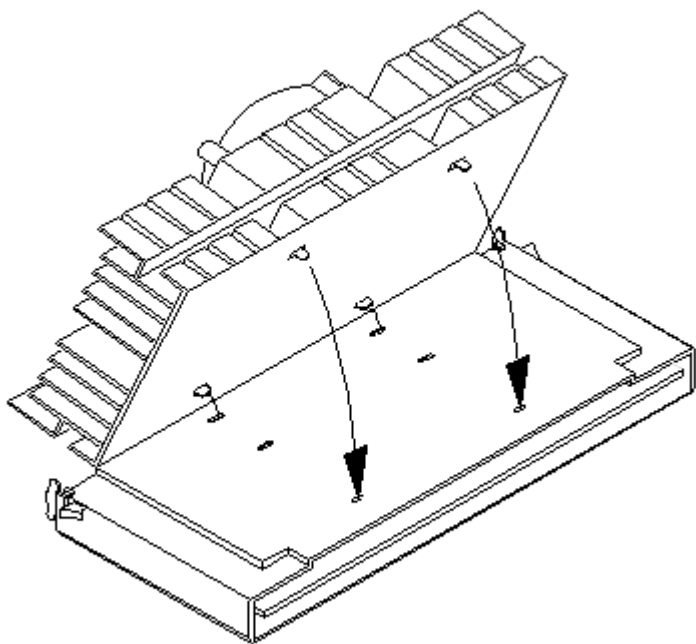
- Use a screwdriver to press and lock in the wide end of a clip first. Then
  without lifting the screwdriver, point it downward to press and lock the
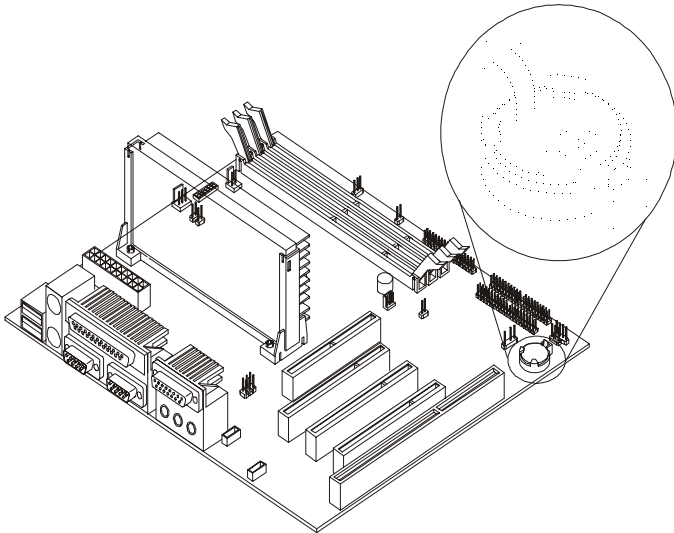 narrow end of the clip.
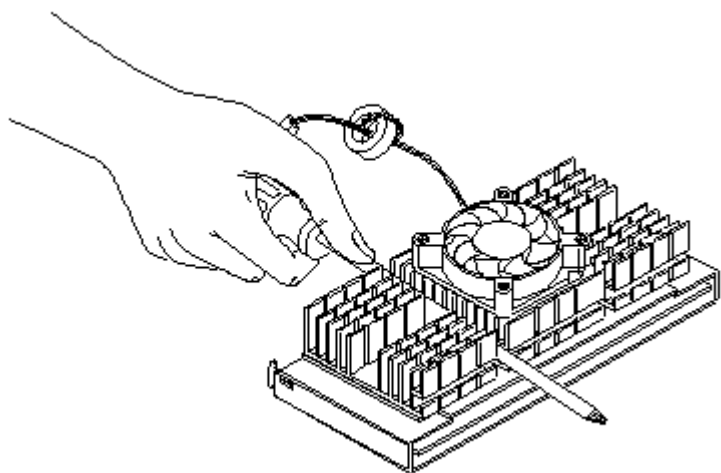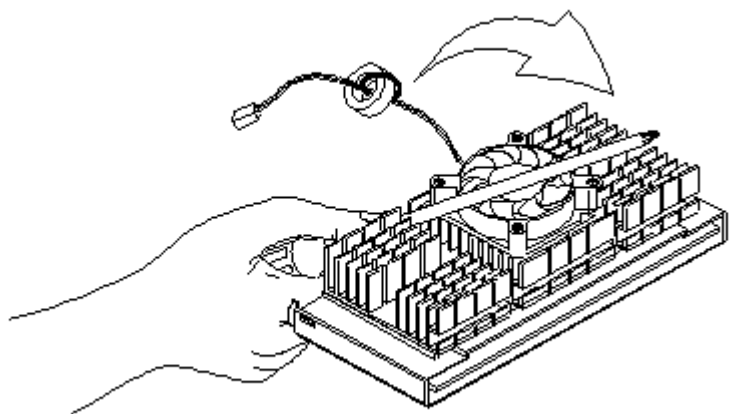
- Repeat to lock clip on the other side.

System Backup Battery

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

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

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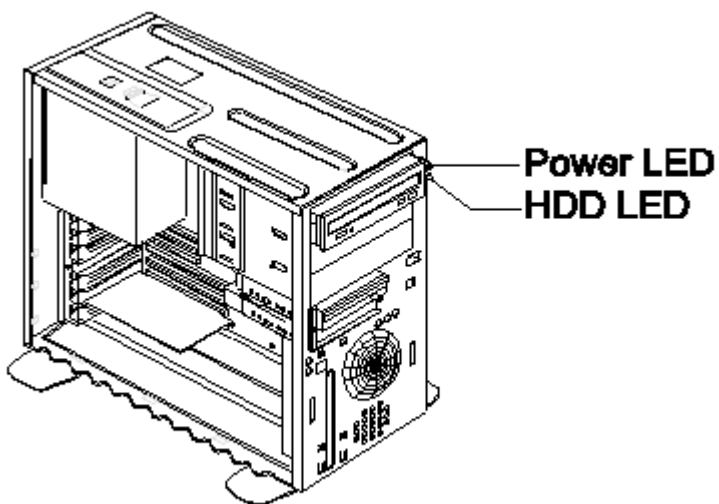- Lift the backup battery out.

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

- If you replace the system battery, you need to reset the system date and time. You can perform this task from the Window 98 desktop or from the Setup Utility. To reset the system date and time in the Setup Utility, select the Date and Time option from the Main Menu.
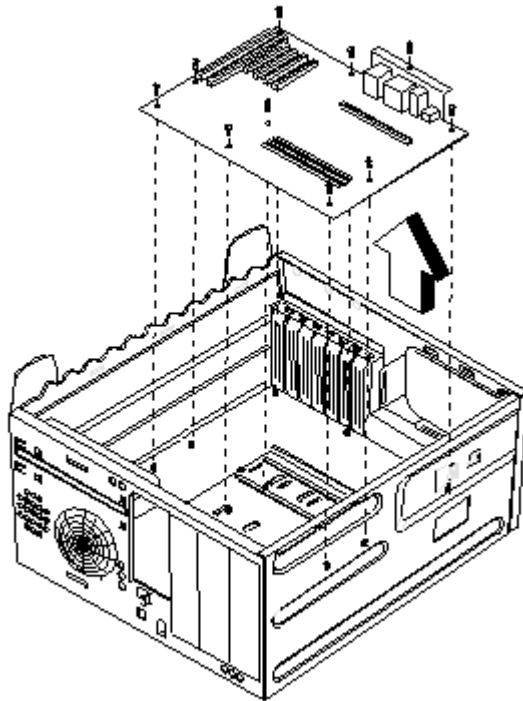
Indicator LED and Cable

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

Power LED
HDD LED

System Board

- Remove all adapter cards.
- Disconnect all cables connected to the system board.
- Remove the screws securing the system board to the chassis.
- Lift the system board to remove from chasis.
- Remove memory (DIMM) if applicable.
- Remove processor.

Handling ESD-Sensitive Parts

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

- Keep the ESD-sensitive part in its original shipping container (or special ESD bag) until you are ready to install the part.
- Make the fewest possible movements with your body to prevent an increase of static electricity from clothing fibers, carpets, and furniture.
- Put the ESD wrist strap on your wrist. Ensure the machine is turned off. Connect the wrist strap to the serial bracket mounting screw. This discharges any static electricity in your body to the machine frame.
- Hold the ESD-sensitive part by its edge connector shroud (cover). Do not touch its pins. If you are removing a plug-able module, use the correct tools.
- Do not place the ESD-sensitive part on the machine cover or on a metal table. If you need to put down the ESD-sensitive part for any reason, put it into it's original container.
- Machine covers and metal tables are electrical grounds. They increase the risk of damage because they make a discharge path from your body through the ESD-sensitive part. (Large metal objects can be discharge paths without being grounded.)
- Prevent ESD-sensitive parts from being accidentally touched by other persons. Reinstall machine covers when you are not working on the machine.
- If possible, keep all ESD-sensitive parts in a grounded metal cabinet.
- Be extra careful when working with ESD-sensitive parts while cold-weather heating is being used. Low humidity increases static electricity.

Software Recovery Procedure

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

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

1. Insert the Aptiva recovery CD into the CD-ROM drive then restart computer.
2. Depress F1 while POST to enter BIOS Setup menu. Select and enter "Startup Options", set the first priority of boot sequence to CD-ROM. Save and exit from BIOS Setup.
3. After system boots from recovery CD, you will be prompted with an "IBM Product Recovery Program" menu, follow the instructions on the screen to operate the software recovery procedure.

Parts/Test Point Locations

Introduction

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

Machine Type 2158 System Board Jumpers and Connectors
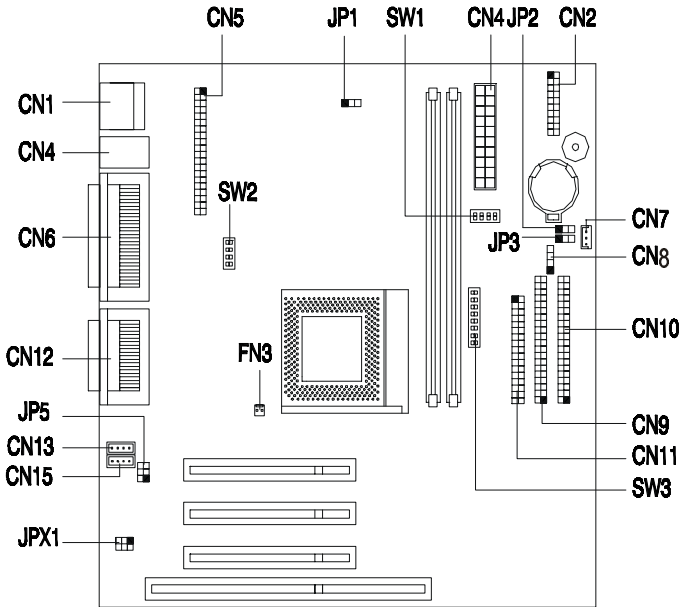
The blackened pin of a jumper represents pin 1.

2158 System Board Jumper Settings

Jumper/Settings	Function
JP1	VGA interrupt
1-2*	Disabled
2-3	Enabled
JP2	Wake-on LAN signal trigger level
1-2	Active low
2-3*	Active high
JP3	Diskette drive LED
1-2	Enabled
2-3*	Disabled
JP5, JPX1	Line-out signal type
1-3 & 2-4	Audio line-out
3-5 & 4-6*	Amplified audio line-out

2158 System Board Jumper Settings (Continued)

Jumper/Settings	Function
SW1(switch 1)	Reserved

SW1(switch 2, 3, 4)
 	
  Off, On, On
  On, On, Off
  On, Off, Off
  Off, Off, Off*
	Bus frequency(MHz)
	<u>Host</u> <u>AGP</u> <u>PCI</u>
	66 66 33
	75 60 30
	95 66 33
	100 66 33

SW2(switch 1)	Reserved

SW2(switch 3, 4)
 	
  Off, Off
  On, Off
  Off, On
  On, On*
	Bus frequency(MHz)
	<u>Host</u>
	66
	75
	95
	100

SW2(switch 2)
  On*
  Off
	Password function
	  Check*
	  Bypass

SW3(switch 1, 2, 3)
 	
  Off, Off, Off
  On, Off, On
  Off, On, Off
  On, On, Off
  On, On, On
  Off, On, On
  Off, Off, On
	Bus Clock Ratio
	<u>P55C</u> <u>6X68/M1</u> <u>M2</u> <u>P54C/K5</u> <u>K6</u>
	3.5 3.0 3.5 1.5 3.5
	2.0 2.0 2.0 2.0 4.0
	3.0 -- 3.0 3.0 3.0
	2.5 -- 2.5 2.5 2.5
	-- -- -- -- 4.5
	-- -- -- -- 5.0
	-- -- -- -- 5.5

SW3(switch 4, 5, 6, 7, 8)
  Off, On, On, Off, On
  Off, On, On, Off, Off
  Off, On, Off, Off, On
  Off, On, Off, Off, Off
  Off, Off, On, Off, Off
  Off, Off, Off, On, On
  Off, Off, Off, On, Off
	CPU Core Voltage
	  3.3V
	  3.2V
	  2.9V
	  2.8V
	  2.4V
	  2.3V
	  2.2V*

*.   Default Setting

Machine Type 2158 Processor Type Jumper Settings

NOTE: You must verify the exact processor type before setting the processor type jumpers. The wrong processor type jumper setting may damage the CPU. The system only supports dual-voltage CPU

CPU	SW1			SW2		SW3							
Switch	2	3	4	3	4	1	2	3	4	5	6	7	8
K6-2 333MHz (Host=95MHz)	N	F	F	F	N	F	F	F	F	F	F	N	F
K6-2 350MHz (Host=100MHz)	F	F	F	N	N	F	F	F	F	F	F	N	F
K6-2XT 350MHz (Host=100MHz)	F	F	F	N	N	F	F	F	F	F	F	N	F
K6-2XT 380MHz (Host=95MHz)	N	F	F	F	N	N	F	N	F	F	F	N	F
K6-2XT 400MHz (Host=100MHz)	F	F	F	N	N	N	F	N	F	F	F	N	F
K6-2XT 450MHz (Host=100MHz)	F	F	F	N	N	N	N	N	F	F	F	N	F

N= On, F=Off

2158 System Board Connector Functions

Connector	Function	Connect to...
CN1	Universal Serial Bus (USB) connector	USB device
CN2	Power LED (pins 1-3) HDD LED (pins 4-7) Reset button (pins 8-9) Power button (pins 10, 20) IrDA connector (pins 14-19) Turbo LED (pins 11-13)	Power LED Hard disk LED Reset button Power button Reserved Reserved
CN3	Power connector	Power supply
CN4	Upper: PS/2 mouse port Lower: PS/2 keyboard port	PS/2 pointing device PS/2 keyboard
CN5	ATI multimedia connector	Special video adapter card (i.e. video image capture card)
CN6	Upper: Printer port Lower-left: VGA port Lower-right: Serial port	Printer or parallel device Monitor Serial device
CN7	Wake-on LAN connector	LAN adapter card
CN8	Modem ring-in connector	Modem adapter card
CN9	Secondary IDE channel	IDE drive
CN10	Primary IDE channel	IDE drive
CN11	Diskette drive connector	Diskette drive

CN12	Upper: Game port (15-pin female)
	Lower: (R-to-L)
	    Microphone-in port
	    Stereo line-in port
	    Stereo line-out port
		Joystick
		
		Microphone
		audio input device
		Speaker

CN13	Modem voice line-in connector	Modem card
CN15	CD/DVD audio input connector	CD/DVD-ROM drive
FN3	Fan connector	Processor fan

Machine Type 2163 and 2164 System Board Jumpers and Connectors
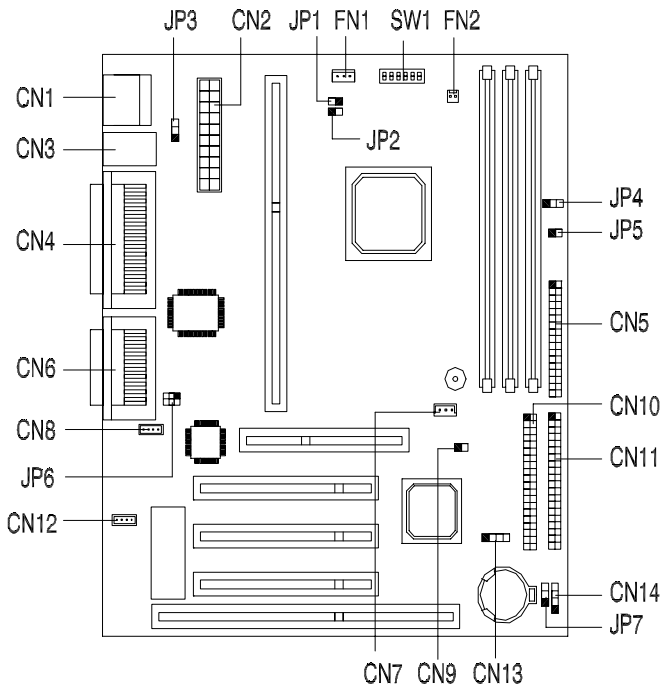
NOTE: The blackened pin of a jumper represents pin 1.

2163 and 2164 System Board Jumper Settings

Jumper/Settings	Function
JP3 　1-2 　2-3	Reserved
JP4	Reserved
JP6 　1-3 & 2-4 　3-5 & 4-6*	Line-out signal type 　Audio line-out 　Amplified audio line-out

2163 and 2164 System Board Jumper Settings (Continued)

Jumper/Settings	Function
SW 1 (switch 1, 2, 3, 4)	Bus Clock Ratio
Off, Off, On, Off	1.5
On, On, On, On	2
On, Off, On, On	2.5
On, On, Off, On	3
On, Off, Off, On	3.5
On, On, On, Off	4
On, Off, On, Off	4.5
On, On, Off, Off	5
On, Off, Off, Off	5.5
Off, On, On, On	6
Off, Off, On, On	6.5
Off, On, Off, On	7
Off, Off, Off, On	7.5
Off, On, On, Off	8
SW1 (switch 5)	Password function
On	Bypass
Off*	Check
SW1 (switch 6)	Reserved

*.   Default Setting

2163 and 2164 System Board Connector Functions

Connector	Function	Connect to
CN1	Universal Serial Bus (USB) connector	USB device
CN2	ATX Power Supply Connector	Power supply
CN3	Upper: PS/2 mouse connector	PS/2 pointing device
	Lower: PS/2 keyboard connector	PS/2 keyboard
CN4	Upper: Printer port	Printer or parallel device
	Lower-left: COM1	Serial device
	Lower-right: COM2	Serial device
CN5	Diskette drive connector	Diskette drive
CN6	Upper: Game port (15-pin female)	Joystick
	Lower: (R-to-L)	
	Microphone-in port	Microphone
	Stereo line-in port	Audio signal input
	Stereo line-out port	Speaker
CN7	Wake-on LAN connector	LAN adapter card
CN8	CD/DVD audio input connector	CD/DVD-ROM drive
CN9	Power button connector	Power button
CN10	Secondary IDE channel	IDE drive
CN11	Primary IDE channel	IDE drive
CN12	Modem voice line-in connector	Modem card
CN13	Modem ring-in connector	Modem card
CN14	Hard disk LED connector	HDD LED
JP1	CPU thermal sense connector	Reserved
JP2	System thermal sense connector	Reserved
JP7	Power LED connector	Power LED
FN1	Fan alarm connector	Processor fan
FN2	Fan connector	Processor fan

Power Supply Connectors and Voltages

Refer to the following figures when checking for voltages on power supply cable connectors.

When checking voltages, the power supply fan must be running. To power-on the power supply without using the on/off switch, use a screwdriver or other tool to short the connector CN2(pin10-20) for 2158 or CN9 for 2163 and 2164 (with the switch cable disconnected from the connector on the system board), or use a connection (jumper) to short the black and green wires of the 20-pin connector on power supply.

```
(Pin20)5V──┤DD├──12V(Pin10)      (Pin1)3.3V──┤ ├──(Pin11)3.3V
       5V──┤DD├──5V                   3.3V──┤ ├──-12V
    Empty──┤DD├──PowerGood            GND──┤ ├──GND
      GND──┤DD├──GND                   5V──┤ ├──5V
      GND──┤DD├──5V                   GND──┤ ├──GND
      GND──┤DD├──GND                   5V──┤ ├──GND
       5V──┤DD├──5V                   GND──┤ ├──GND
      GND──┤DD├──GND           PowerGood──┤ ├──Empty
     -12V──┤DD├──3.3V                  5V──┤ ├──5V
 (Pin11)3.3V──┤DD├──3.3V(Pin1)   (Pin10)12V──┤ ├──(Pin20)5V
```

Pin-hole side view   Cable side view
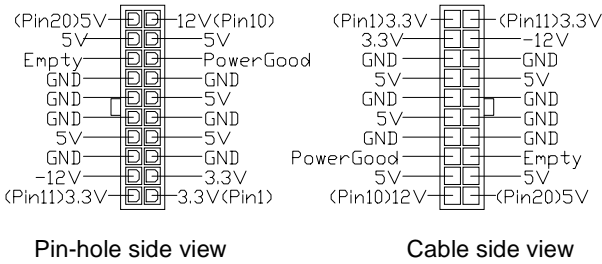
Power Supply Output Pin Assignment

Pin	Voltage	Cable Color
1	+3.3Vdc	Orange
2	+3.3Vdc	Orange
3	Ground	Black
4	+5Vdc	Red
5	Ground	Black
6	+5Vdc	Red
7	Ground	Black
8	Power Good	Gray
9	+5Vdc	Purple
10	+12Vdc	Yellow
11	+3.3Vdc	Orange
12	-12Vdc	Blue
13	Ground	Black
14	Ground	Green
15	Ground	Black

Power Supply Output Pin Assignment (Continued)

Pin	Voltage	Cable Color
16	Ground	Black
17	Ground	Black
18	--	--
19	+5Vdc	Red
20	+5Vdc	Red
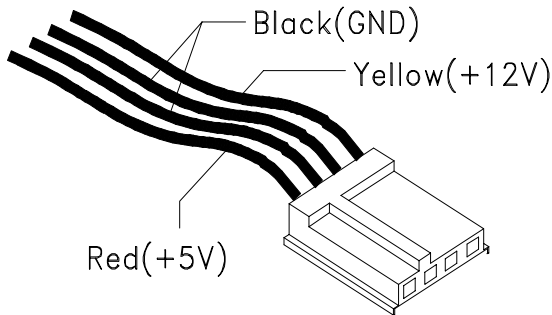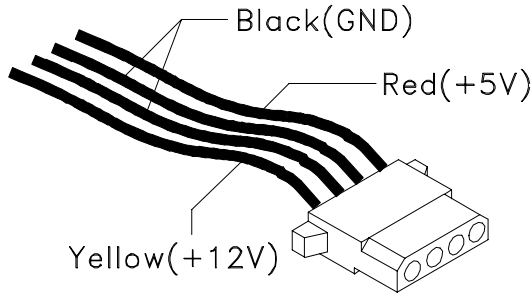
Factory-Installed Modem Card Layout
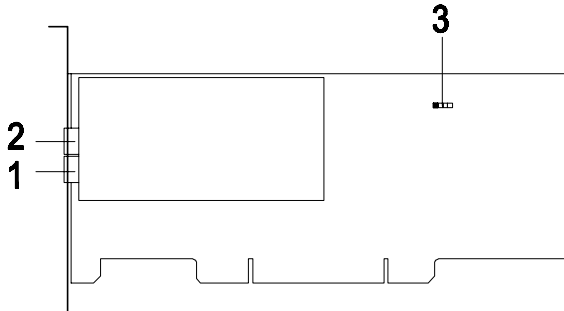
Factory-Installed Modem Card Connector Functions

Item	Function	Connect to...
1	Telephone line-out Some modem adapters may come without this jack.	Telephone set
2	Telephone line-in	Telephone line
3	Voice-in/speaker-out connector	System board Machine Type 2158: CN13 Machine Type 2163 and 2164: CN12

NOTE: Care should be taken while connecting the voice-in/speaker-out connector. The longer exposed end (about. 15mm) of the cable should be connected to the modem card. The other end should be connected to the system board.

3.5-In. Hard Disk Drive Jumper Settings
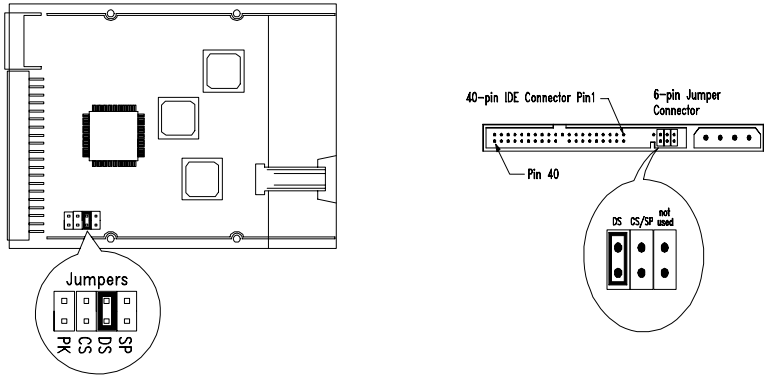
3.5-In Quantum Fireball TM Series Hard Disk

3.5-In Quantum Fireball ST Series Hard Disk

3.5-In Quantum Fireball TM and ST Series Hard Disk Drives Jumper Settings

DS	CS	SP	Description
On	Off	--	Drive configured as a Master, or Drive configured as a Master, with an attached Slave
Off	Off	--	Drive configured as a Slave.

The configuration of the following jumpers controls the drive's mode of operation:

- SP - Slave Present
- DS - Drive Select
- CS - Cable Select
- PK - Park, used as a place to store a jumper
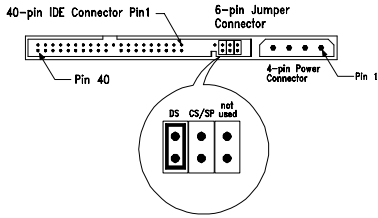
3.5-In Seagate Hard Disk

3.5-In Seagate Hard Disk Drives Jumper Settings

DS	CS/SP	Description
On	Off	Drive configured as a Master.
Off	Off	Drive configured as a Slave.
On	On	Drive configured as a Master, with an attached Slave

The configuration of the following jumpers controls the drive's mode of operation:

- SP - Slave Present
- DS - Drive Select
- CS - Cable Select
- PK - Park, used as a place to store a jumper
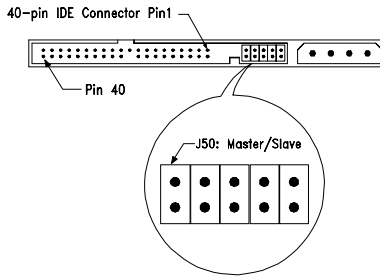
3.5-In Maxtor Hard Disk

3.5-In Maxtor Hard Disk Drive Jumper Settings

J50	Description
On	Drive configured as a Master or Drive configured as a Master, with an attached Slave
Off	Drive configured as a Slave.

5.25-In. Hard Disk Drive Jumper Settings
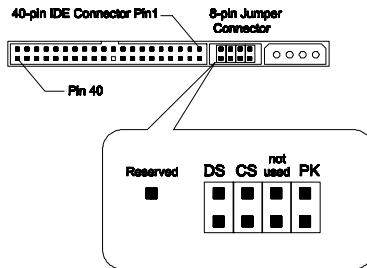
5.25-In. Hard Disk Drive Jumper Settings

DS	CS/SP	Description
On	Off	Drive is configured as a Master.
Off	Off	Drive is configured as a Slave.
On	On	Drive is configured as a Master, with an attached Slave that supports DASP

The configuration of the following four jumpers controls the drive's mode of operation:

- DS - Drive Select
- CS-Cable Select
- PARK - Park or Store position

CD-ROM Drive

Front Panel and Emergency-Exit

ATTENTION: Either <option 1> or <option 2> CD-ROM drive may come with your Aptiva machine. Their front panel buttons, indicators and emergency eject method may be different.
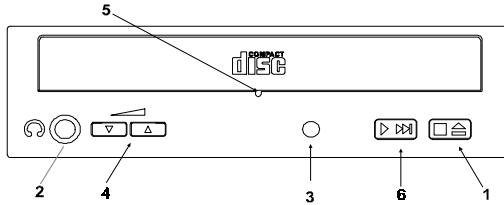
CD-ROM Front Panel Introduction <option 1>

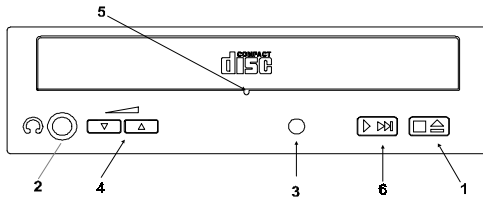| Item	Description
1	Load / eject button
2	Headphone jack
3	Power-on / busy indicator, lights up in green color while disc is set in ready state; lights up and flashes in amber color during data read or seek operation.
4	Headphone volume control
5	Emergency eject hole. See CD-ROM Emergency-exit <option 1> below.
6	Audio Play / Skip track control button

CD-ROM Emergency-exit <option 1>
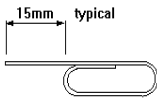
If for any reason the tray does not eject automatically, insert and press an eject-bar inside the emergency eject hole to manually eject the tray. A straightened paper clip with a diameter of 1.2 mm (typical) can be used as an eject-bar.

**ATTENTION:** Make sure to turn off the power before manual disc eject

operation.

CD-ROM Front Panel Introduction <option 2>

Item	Description
1	Headphone jack
2	Headphone volume control
3	Busy indicator, lights up and flashes in amber color during data read or seek operation.
4	Audio Play / Skip track control button
5	Load / eject button
6	Disc tray and emergency eject See CD-ROM Emergency-exit <option 2> below.

CD-ROM Emergency-exit <option 2>
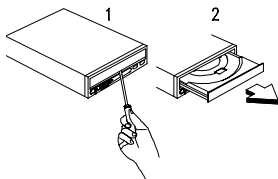
Locate the bottom edge of the disc tray. Gently pry the disk tray open with a screwdriver. When the disc tray opens, simply remove the disc from the CD-ROM drive.

CD-ROM Drive Rear Panel Connectors and Jumpers
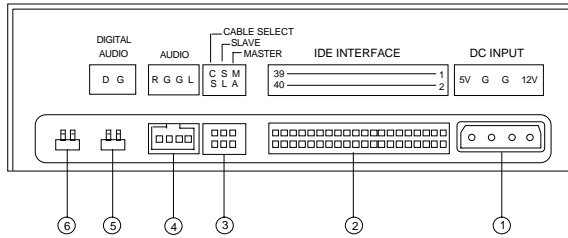
NOTE: CD-ROM drives may come with no item 5 and 6 (digital audio output and testing jumper) connectors.

CD-ROM Drive Rear Panel Connectors and Jumpers

Item	Function	Connect to...
1	Power supply connector	Power supply
2	Interface connector	System board 2158: CN10 2163/2164: CN10
3	Configuration jumper. CS SL MA Description -- -- On Master(default). -- On -- Slave. On -- -- Cable select	--
4	Audio line out connector	System board 2158: CN15 2163/2164: CN8
5	Digital audio output	--
6	Testing jumper is reserved for manufacturer internal testing purposes.	--

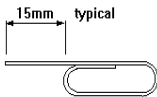# DVD-ROM Drive

Front Panel and Emergency-Exit
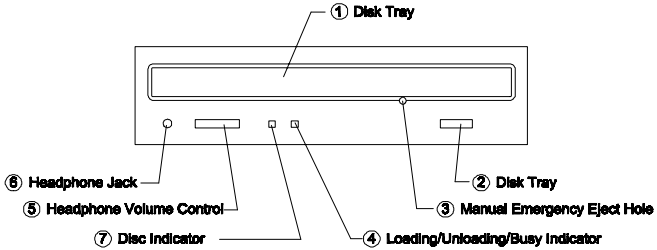
DVD-ROM Front Panel Introduction

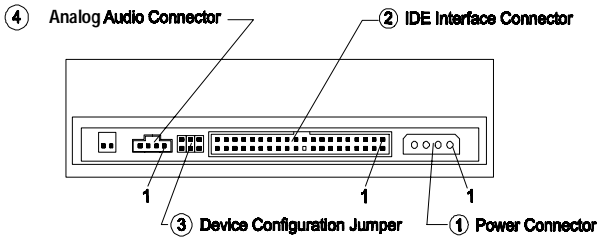| Item	Description
1	Disc Tray
2	Open/Close Button
3	Loading/Unloading/Busy Indicator
4	Loading/Unloading
5	Headphone Volume Control
6	Headphone Jack
7	Disc Indicator

NOTE: Make sure to turn off the power before manual disc eject operation.

DVD-ROM Emergency-exit

If for any reason the tray does not eject automatically, insert and press an eject-bar inside the emergency eject hole to manually eject the tray. A straightened paper clip with a diameter of 1.2 mm (typical) can be used as an eject-bar.

DVD-ROM Drive Rear Panel Connectors and Jumpers

DVD-ROM Drive Rear Panel Connectors and Jumpers

Item	Function	Connect to...
1	Power connector	Power supply
2	IDE Interface connector	System board 2158: CN10 2163/2164: CN10
3	Configuration jumper. CS SL MA Description -- -- On Master(default). -- On -- Slave. On -- -- Cable select	--
4	Analog Audio connector	System board 2158: CN15 2163/2164: CN8

DIMM Configurations

The 2158 system board has two DIMM sockets. A maximum of 256KB memory may be installed. The 2163 and 2164 system board has three DIMM sockets. A maximum of 384KB memory may be installed.

You can install 16MB, 32MB, 64MB, or 128MB PC-100 DIMM in any sockets and with any combinations.

System Board Connector Pin Signals

Monitor Port Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Red Video	O	9	+5 V dc	
2	Green Video	O	10	Synch Ground	
3	Blue Video	O	11	Monitor ID Bit 0	
4	Monitor ID Bit 2	I	12	SDA	I
5	Synch Ground		13	Horizontal Synch	O
6	Red Ground		14	Vertical Synch	O
7	Green Ground		15	SCL	I
8	Blue Ground				

Serial Port Signals

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

Parallel Port Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Strobe	O	14	Auto Feed	N/A
2	Data Bit 0	I/O	15	Error	I
3	Data Bit 1	I/O	16	Initialize	O
4	Data Bit 2	I/O	17	Select (In)	O
5	Data Bit 3	I/O	18	Ground	P
6	Data Bit 4	I/O	19	Ground	Power
7	Data Bit 5	I/O	20	Ground	Power
8	Data Bit 6	I/O	21	Ground	Power
9	Data Bit 7	I/O	22	Ground	Power
10	Acknowledge	I	23	Ground	Power

Pin	Signal Name	I/O	Pin	Signal Name	I/O
11	Busy	I	24	Ground	Power
12	Paper Empty	I	25	Ground	Power
13	Select	0			

Mouse Port Signals

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

Keyboard Port Signals

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

Diskette Drive Cable Connector Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Ground		18	Direction	0
2	Density Select	O	19	Ground	
3	No Connection		20	Step	O
4	No Connection		21	Ground	
5	Ground		22	Write Data	O
6	No Connection		23	Ground	
7	Ground		24	Write Enable	O
8	Index	I	25	Ground	
9	Ground		26	Track 0I	I
10	Motor Enable 0	O	27	Ground	
11	Ground		28	Write Protect	I
12	Drive Select 1	O	29	Ground	
13	Ground		30	Read Data	I
14	Drive Select 0	O	31	Ground	

Pin	Signal Name	I/O	Pin	Signal Name	I/O
15	Ground		32	Select Head 1	O
16	Motor Enable 1	O	33	Ground	
17	Ground		34	Diskette Change	I

IDE Cable Connector Signals

Pin	Signal Name	I/O	Pin	Signal Name	I/O
1	Host Reset	O	21	No Connection	
2	Ground		22	Ground	
3	Host Data 7	I/O	23	Host IOW	O
4	Host Data 8	I/O	24	Ground	Power
5	Host Data 6	I/O	25	Host IOR	O
6	Host Data 9	I/O	26	Ground	Power
7	Host Data 5	I/O	27	I/O Channel Ready	I
8	Host Data 10	I/O	28	No Connection	
9	Host Data 4	I/O	29	No Connection	
10	Host Data 11	I/O	30	Ground	Power
11	Host Data 3	I/O	31	Host IRQ	I
12	Host Data 12	I/O	32	No Connection	
13	Host Data 2	I/O	33	Host A1	O
14	Host Data 13	I/O	34	No Connection	
15	Host Data 1	I/O	35	Host A0	O
16	Host Data 14	I/O	36	Host A2	O
17	Host Data 0	I/O	37	Host CS0	O
18	Host Data 15	I/O	38	Host CS1	O
19	Ground	Power	39	ACTIVE bar	I
20	No Connection		40	Ground	Power

Safety Inspection Guide

General Guidelines

The purpose of this Safety Inspection Guide is to help you identify possible unsafe conditions on machines that are being inspected for a Maintenance Agreement. Each machine has necessary functions items installed to provide the operators and service personnel with an acceptable level of safety. This guide lists only these items. Good judgment should be used to identify possible safety conditions not covered by this Safety Inspection Guide.

If any unsafe conditions are present, you must find out how serious the hazard is and if you can continue before you correct the hazard.

All current IBM Aptiva service supplements outlining feature/model changes, along with the machine history, should be reviewed.

Check the following items:

- Damaged, missing, or changed parts, especially in the area of the On/Off switch and the power supply.
- Damaged, missing, or changed covers.
- Possible safety exposure from any non-IBM attachments.

Parts Catalog

Abbreviations

In this chapter, the following abbreviations are used to identify country and language version:

| Country	Language Version
AT	Austria
AU	Australia
BD	Belgium - Dutch
BF	Belgium - French
CA	Canada
CE	Canada - English
CF	Canada - French
CN	China
DK	Denmark - Danish
FI	Finland - Finish
FR	France
GE	Germany
HK	Hong Kong
IT	Italy
JP	Japan
LS	LA-Spanish
ND	Netherlands - Dutch
NL	Netherlands - Dutch
NO	Norway - Norwegian
SF	Swiss - French
SG	Swiss - German
SP	Spain
SW	Sweden - Swedish
TW	Taiwan
UK	United Kingdom
US	United States
SZ	Switzerland

NOTE: In this chapter you will encounter two Assembly Sections. Section A is for Machine Type 2158 and 2163. Section B is for Machine Type 2164

Section A: Assembly for Machine Type 2158 and 2163

Assembly 1: Machine Type 2158 and 2163 System Unit
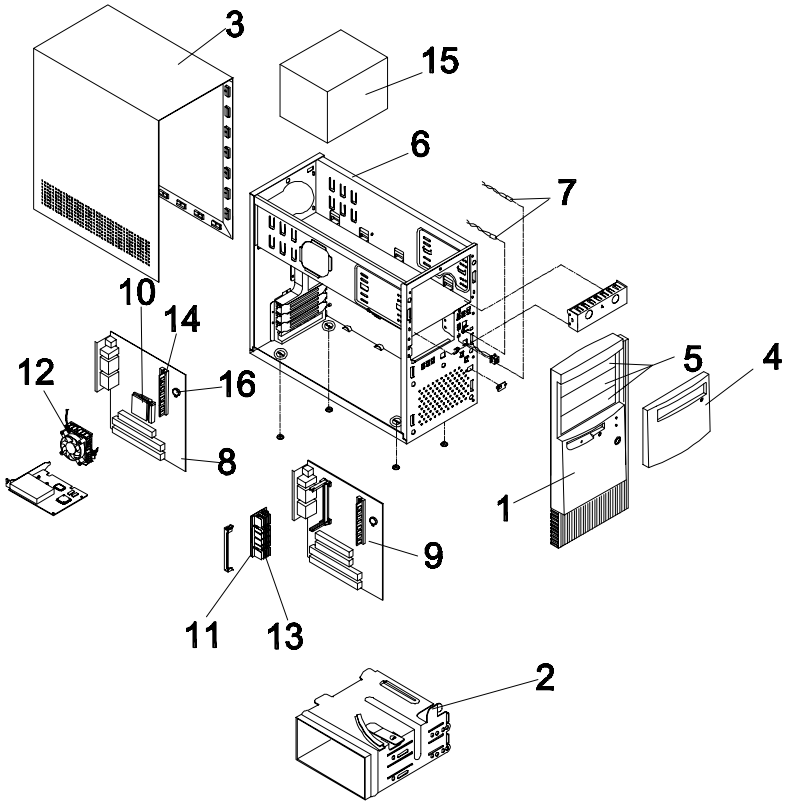
Asm-Index	FRU Number	Description	Model 2158	Model 2163
1-1	20L2196	Front Panel	X	X
1-2	20L2197	Hard Drive Holder	X	X
1-2	36L9138	HDD Tray	X	X
1-3	20L2193	Top Cover	X	X
1-4	20L2194	Door Cover	X	X
1-NS	02K2329	Screws for Front Panel	X	X
1-5	20L2195	Drive Bay Panel	X	X
1-6	20L2198	Assembly Lower Case (without SPS)	X	X
1-NS	02K2334	Screw for Power Supply, Bracket plate and Top Cover	X	X
1-NS	20L2206	Port Bracket Screw	X	X
1-NS	20L2207	Port Bracket Screw	X	X
1-7	20L2190	Power Switch Wire (switch + wire) + Hard Drive LED Wire (LED + wire) + Power LED Wire (LED + wire)	X	X
1-8	00N4318	V72MA (Rage Pro, 8MB SGRAM, 512KB Cache, Solo-1)	X	
1-8	36L9056	V72MA (Rage Pro, 8MB SGRAM, 512KB Cache, Solo-1, China)	X	
1-9	36L9059	V66M		X
1-9	36L9060	V66M China		X
1-NS	02K2334	Screw for System Board	X	X
1-10	36L9070	AMD K6 2XT 333MHz 95FSB (w/o heat sink and fan)	X	
1-10	36L9122	AMD K6 2XT 350 MHz 100FSB (w/o heatsink and fan)	X	
1-10	36L9123	AMD K6 2XT 380 MHz 95FSB (w/o heatsink and fan)	X	
1-10	36L9124	AMD K6 2XT 400 MHz 100FSB (w/o heatsink and fan)	X	
1-10	36L9125	AMD K6 2XT 450 MHz 100FSB (w/o heatsink and fan)	X	
1-11	36L9148	Celeron 366 Mendocino		X
1-11	36L9140	Celeron 400 Mendocino		X

Asm-Index	FRU Number	Description	Model 2158	Model 2163
1-11	28L3842	Pentium II-350 W/ECC, 512K, 100 MHz		X
1-11	20L2162	Pentium II-400 W/ECC, 512K, 100 MHz		X
1-11	00K8476	Pentium II-450 W/ECC, 512K, 100 MHz		X
1-11	36L9099	Pentium II-500 W/ECC, 512K, 100 MHz		X
1-12	20L2187	2 Pin Power Connector, Fan Sink	X	
1-13	20L2163	Fan Sink 2 PIN(TDM) w/o t.d. Sunon		X
1-14	20L2201	32MB module (PC-100)	X	X
1-14	20L2202	64MB module (PC-100)	X	X
1-14	36L9100	128MB module (PC-100)		X
1-15	00K8468	Power Supply 95W API/Delta-854 1-071 V.B.H61	X	X
1-16	01K4278	CMOS Backup Battery (CR2032)	X	X

Assembly 2: Machine Type 2158/2163 Diskette, Hard Drive
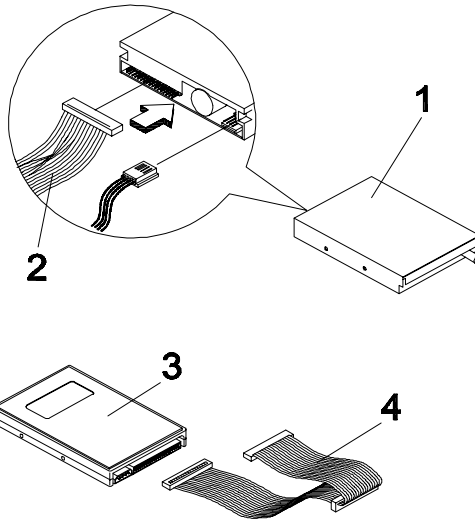
Asm-Index	FRU Number	Description	Model 2158	Model 2163
2-1	02K2299	3.5-in., 3 mode MKE (JU256A276P)	X	X
2-2	02K2603	FDD Cable	X	X
2-3	00N4337	3.5-in., 4 GB Maxtor/Quasar	X	
2-3	36L9105	3.5-in., 6GB Maxtor/Quasar	X	X
2-3	36L9106	3.5-in., 8GB Maxtor/Quasar	X	X
2-3	36L9107	3.5-in., 10GB Maxtor/Quasar	X	X
2-3	36L9108	3.5-in., 12GB Maxtor/Quasar	X	X
2-3	36L9101	5.25-in., 6GB Quantum/Tsunami	X	X
2-3	36L9102	5.25-in., 8GB Quantum/Tsunami	X	X
2-3	36L9103	5.25-in., 12GB Quantum/Tsunami	X	X
2-3	36L9104	5.25-in., 19GB Quantum/Tsunami		X
2-3	36L9109	3.5-in., 16GB Maxtor/Quasar		X
2-4	01K4224	IDE Cable (w/I 3Conn)	X	X
2-NS	01K4259	Screws for 3.5" Drive	X	X

Assembly 3: Machine Type 2158/2163 CD/DVD-ROM Drive
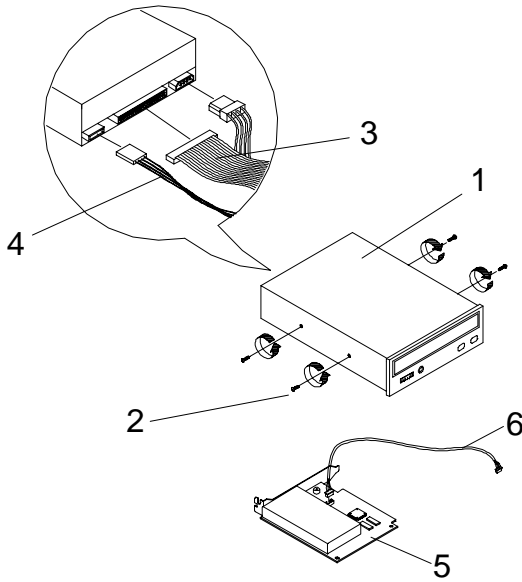
Asm-Index	FRU Number	Description	Model 2158	Model 2163
3-1	36L9087	CD-ROM 32X, Sony/LG	X	X
3-1	00N8328	CD-ROM 40X, Sony/LG	X	
3-3	01K4224	IDE Cable (w/I 3Conn)	X	X
3-4	20L2289	Audio Cable, CD-ROM	X	X
3-5	00N4265	56K GVC Non-Voice Rockwell PCI NA/SA/Asia	X	X
3-5	00N4266	56K GVC Non-Voice Rockwell PCI EMEA/Australia/New Zealand	X	X
3-5	00N4267	56K GVC Non-Voice Rockwell PCI Japan	X	
3-5	00N4268	56K GVC Voice Rockwell PCI EMEA/Australia/New Zealand	X	X
3-5	00N4269	56K GVC Voice Rockwell PCI NA/SA	X	X

Asm-Index	FRU Number	Description	Model 2158	Model 2163
3-5	00N4270	56K GVC Voice Rockwell PCI (Asia) Taiwan/China/HK/ Singapore	X	X
3-5	00N4271	56K GVC Voice Roockwell PCI Japan		X
3-5	37L1968	56K CIS Voice Rockwell PCI NA/Taiwan/China	X	X
3-5	37L1969	56K CIS Voice Rockwell PCI EMEA/LA	X	X
3-5	37L1973	56K CIS Voice Rockwell PCI Japan		X
3-5	37L1974	56K CIS Non-Voice Rockwell PCI Japan	X	
3-5	36L9118	56K CIS Non-Voice Rockwell PCI NA/SA/Asia	X	X
3-5	36L9119	56K CIS Non-Voice Rockwell PCI EMEA/LA	X	X
3-6	36L9017	Modem Card Audio Cable	X	X
3-NS	36L9094	DVD-ROM, Hitachi	X	X
3-NS	00K8183	Phone Cord, 7ft.	X	X
3-NS	36L9126	Speaker Passive Zylux (No Adapter Required)	X	
3-NS	20L2168	Speaker Tier 1 Zylux	X	X
3-NS	36L9095	Adapter Brazil	X	X
3-NS	20L2169	Adapter US/CE/CF/LA/TAIWAN		X
3-NS	20L2170	Adapter Japan		X
3-NS	20L2171	Adapter EURO, LA (Hi Voltage Models)		X
3-NS	20L2172	Adapter UK/HK		X
3-NS	20L2173	Adapter AP-S		X
3-NS	20L2174	Adapter China		X
3-NS	36L9088	Signal Adapter for Andrea NC-8 Microphone C1-1002490-1 (Japan Models)	X	X
3-NS	10L6656	Noise Cancelling Andrea NC-8	X	X

Assembly 4: Machine Type 2158/2163 Monitor and Power Cord
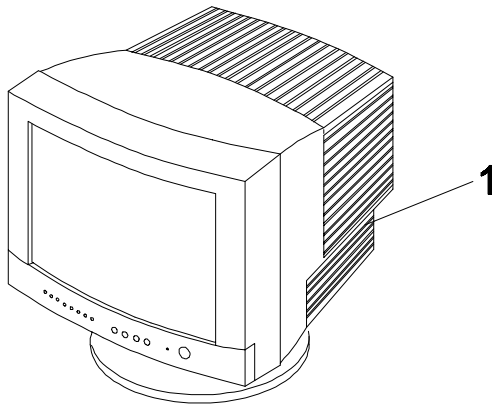
Asm-Index	FRU Number	Description	Model 2158	Model 2163
4-NS	06J7900	CSA/UL 10A/125V Cordset US/CE/CF/LA/AP	X	X
4-NS	01K4196	CE-10A/250V Volex Euro	X	X
4-NS	01K4198	UK-10A/250V Volex UK/HK	X	X
4-NS	02K2648	T-Mark 10A/125V w/i adapter Japan	X	X
4-NS	13F9997	Volex 10A/250A DK	X	X
4-NS	14F0051	Volex 10A/250A Swiss	X	X
4-NS	14F0069	Volex 10A/250A IT	X	X

Assembly 5: Machine Type 2158/2163 Keyboard and Mouse
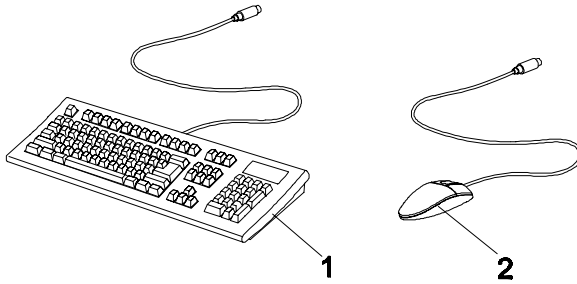
Asm-Index	FRU Number	Description	Model 2158	Model 2163
5-1	12J5558	Rapid Access - U.S. English, 104 keys	X	X
5-1	12J5562	Rapid Access - French Canadian, 104 keys	X	X
5-1	12J5575	Rapid Access - German, 105 keys	X	X
5-1	12J5574	Rapid Access - France, 105 keys	X	X
5-1	12J5593	Rapid Access - U.K. English, 105 keys	X	X
5-1	12J5573	Rapid Access - Netherlands, 105 keys	X	X
5-1	12J5589	Rapid Access - Sweden/Finland, 105 keys	X	X
5-1	12J5572	Rapid Access - Denmark, 105 keys	X	X
5-1	12J5581	Rapid Access - Norwegian, 105 keys	X	X
5-1	12J5580	Rapid Access - Italy, 105 keys	X	X
5-1	12J5588	Rapid Access - Spain, 105 keys	X	X
5-1	12J5564	Rapid Access - L.A. Spain, 105 keys	X	X
5-1	12J5590	Rapid Access - Swiss FR/GR, 105 keys	X	X
5-1	12J5569	Rapid Access - Belgium UK/Flemish, 105 keys	X	X
5-1	12J5568	Rapid Access - Belgium French, 105 keys	X	X
5-1	12J5596	Rapid Access - Japan,109 keys	X	X
5-1	12J5597	Rapid Access - Traditional Chinese	X	X
5-1	12J5566	Rapid Access - Brazilian/Portuguese	X	
5-1	02K0814	PC Next A - Brazilian/Portuguese	X	X
5-2	76H5080	2 button Sleek Logitech M-S34	X	
5-NS	12J4546	IBM ScrollPoint	X	X

Assembly 6: Machine Type 2158/2163 Zip Drive and Network Adapter
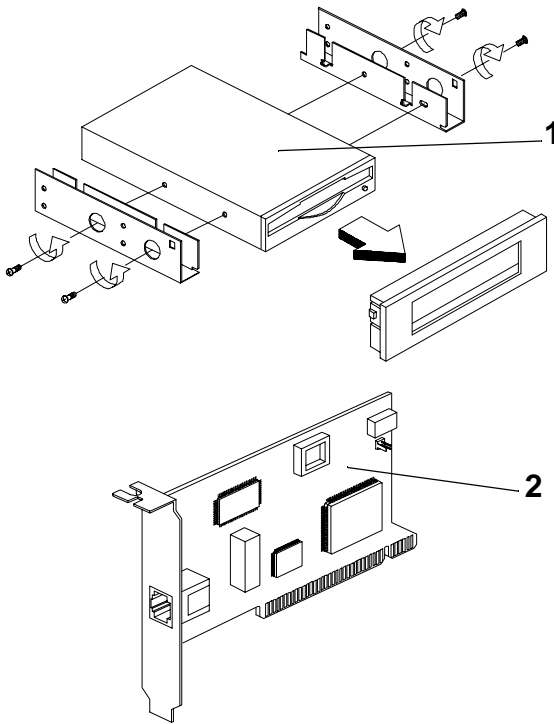
Asm-Index	FRU Number	Description	Model 2158	Model 2163
6-1	28L1605	Iomega Zip Drive, Z100ATAPI	X	X
6-2	08L2550	IBM Ethernet Adapter Lake Clark 1.6	X	X
6-2	34L0409	3COM 10/100	X	X
6-NS	36L9069	Graphics Card		X

Assembly 7: Machine Type 2158/2163 Software
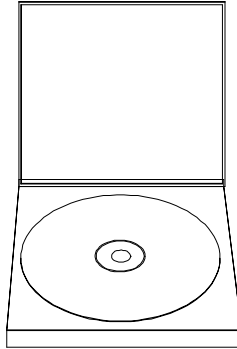
Asm-Index	FRU Number	Description	Model 2158	Model 2163
7		Aptiva owners and servicers will need to call their local IBM HelpCenter to order the above software Application CD Pack, Voice Type 3.0 Kit, Lotus SmartSuite 97, MS Windows 98 Pack and Aptiva Customized I.E. 4.0	X	X

Section B: Assembly for Machine Type 2164

Assembly 1a: Machine Type 2164 System Unit - Interior
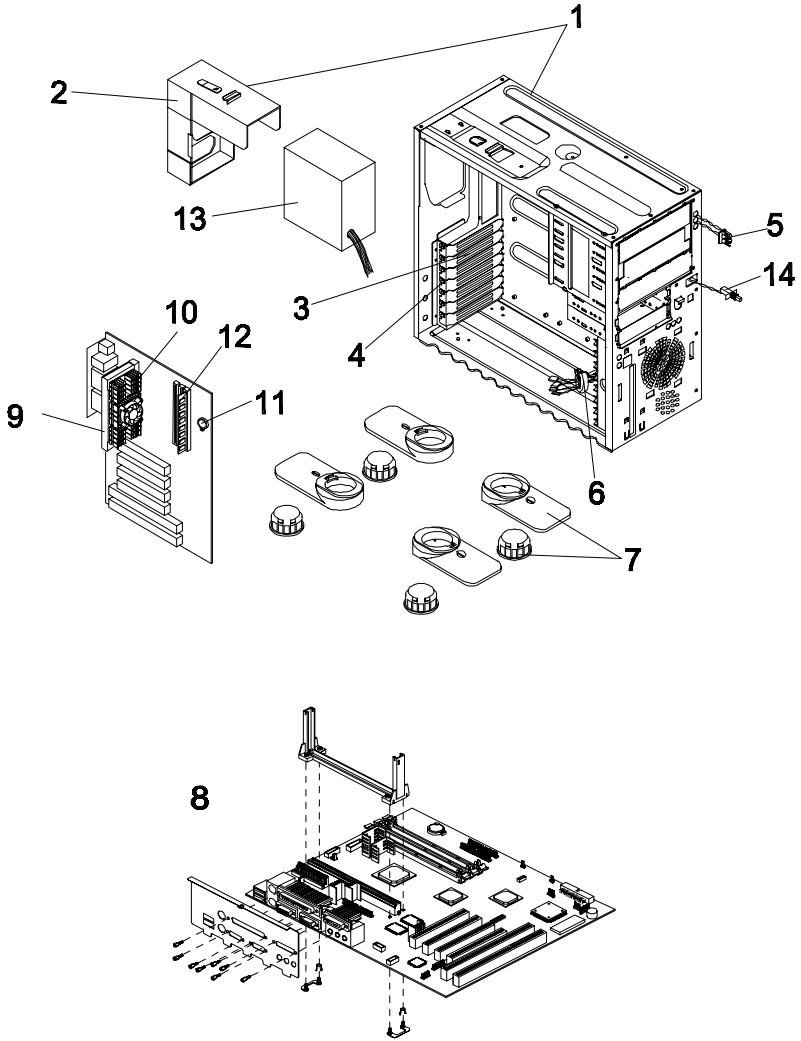
Asm-Index	FRU Number	Description
1a-1	02K2605	Assembly Lower Case
1a-3	01K4200	Bracket Port
1a-4	02K2334	Screw for Bracket Port, Sys. Bd. & P.S. Frame
1a-5	02K2335	Assembly Wire LED
1a-6	01K4192	EMI Core
1a-7	00K8483	Housing Stand (Foot), Black
1a-7	02K2337	Housing Stand (Foot), White
1a-8	36L9059	V66M, Intel Platform,
1a-9	00N4340	Pentium II-400, SECC II, 512K, 100 MHz with Fansink
1a-9	00N4341	Pentium II-450, SECC II, 512K, 100 MHz with Fansink
1a-9	37L1975	Pentium III-450MHz
1a-9	37L1976	Pentium III-500MHz
1a-10	20L2163	Fansink, Pentium II - 2 Pin (TDM) w/o t.d. Sunon
1a-10	36L9146	Fansink,Pentium III - 2 Pin for URM, SECC II
1a-11	01K4278	CMOS Backup Battery
1a-12	20L2201	32MB module (PC-100)
1a-12	20L2202	64MB module (PC-100)
1a-12	36L9100	128MB module (PC-100)
1a-13	20L2166	SPS 145W ATX API-7675 Rev. A H61
1a-14	12J6877	Power Switch and Cable
1a-NS	01K4196	CE-10A/250V Volex Euro
1a-NS	01K4198	UK-10A/250V Volex UK/HK
1a-NS	01K4259	Screw for Power Switch, CD-ROM, FDD, Big-Foot HDD, 5.25"
1a-NS	02K2604	Power Supply Frame
1a-NS	02K2636	CCIB 10A/125W China
1a-NS	02K2648	T-Mark 10A/125V w/i adapter Japan
1a-NS	06J7900	CSA/UL 10A/125V Cordset/Volex US/CE/CF/LA/AP
1a-NS	13F9997	Volex 10A/250A DK

Assembly 1b: Machine Type 2164 System Unit - Exterior
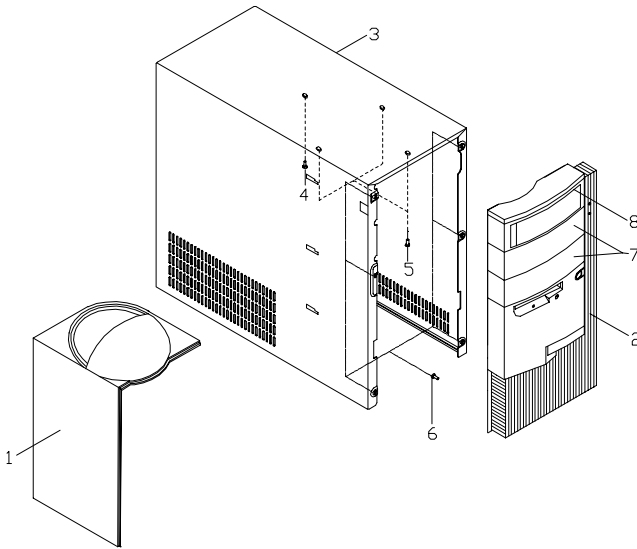
Asm-Index	FRU Number	Description
1b-1	00K8479	Top/Side Panel w/ handle, BLACK
1b-1	02K2324	Top/Side Panel w/ handle, White
1b-2	00K8480	Front Panel, BLACK
1b-2	02K2325	Front Panel, White
1b-3	00K8478	Top Cover, BLACK
1b-3	02K2326	Top Cover, White
1b-4	02K2327	Screw for Top/Side Panel
1b-5	02K2329	Screw for Top/Side Panel & Front Panel
1b-7	00K8481	Drive Bay Panel (Second & Third 5.25" Drive) BLACK
1b-7	02K2330	Drive Bay Panel (2nd & 3rd 5.25" drive), White
1b-7	36L9090	Bezel Blank ,Bay 2 Used With Zip Drive, White
1b-7	36L9091	Bezel Blank ,Bay 2 Used With Zip Drive, Black

Asm-Index	FRU Number	Description
1b-7	36L9092	Zip Frame w/ Bezel 3.5" to 5.25", White
1b-7	36L9096	Zip Frame w/ Bezel 3.5" to 5.25", Black
1b-8	00K8482	Drive Bay Panel (First 5.25" Drive) BLACK
1b-8	02K2331	Drive Bay Panel (First 5.25" drive), White

Assembly 2: Machine Type 2164 Diskette, Hard Drive
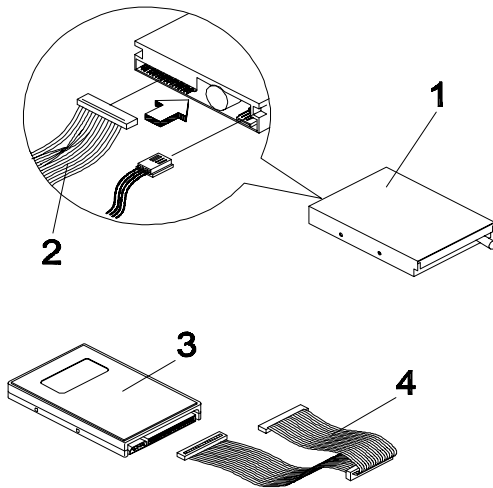
Asm-Index	FRU Number	Description
2-1	02K2299	3.5", 3 mode MKE (JU256A276P)
2-2	02K2603	FDD Cable
2-3	36L9108	3.5", 12GB Maxtor/Quasar
2-3	37L2007	3.5", 13GB Maxtor (Quasar)
2-3	37L2008	3.5", 17.2GB Maxtor (Quasar)
2-3	37L2006	3.5", 20.4GB IBM SSD
2-3	36L9071	3.5", 25.5GB IBM (Janus)
2-NS	01K4260	Mounting Screws for Hard Disk Drive, 3.5"
2-NS	02K2607	3.5" Driver Frame
2-NS	36L9138	3.5" HDD Tray
2-NS	36L9094	Hitachi 4X White
2-NS	37L2004	Hitachi 6X White
2-NS	37L2005	Hitachi 6X Black

Assembly 3: Machine Type 2164 CD/DVD-ROM Drive
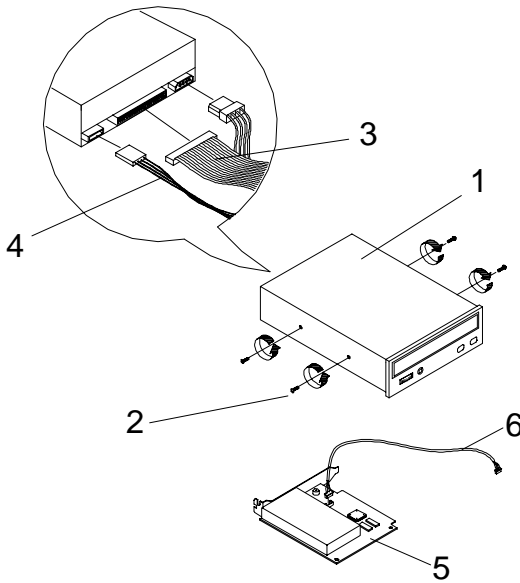
Asm-Index	FRU Number	Description
3-3	01K4224	Hard Disk and CD-ROM Drive IDE Cable
3-4	20L2289	CD/DVD-ROM Drive Audio Cable
3-6	36L9017	Modem Card Audio Cable
3-5	00N4266	56K GVC Non-Voice Rockwell PCI Emea/Australia/New Zealand
3-5	36L9119	56K CIS Non-Voice Rockwell PCI Emea/Australia
3-5	00N4268	56K GVC Voice Rockwell PCI Emea/Australia/New Zealand
3-5	00N4269	56K GVC Voice Rockwell PCI US/Can/LA
3-5	00N4270	56K GVC Voice Rockwell PCI Taiwan/China/HK/Singapore/Malaysia
3-5	37L1968	56K CIS Voice Rockwell PCI US/Can/LA/TW/China/HK

Asm-Index	FRU Number	Description
3-5	37L1969	56K CIS Voice Rockwell PCI Emea/Australia
3-NS	00K8183	7FT Phone Cord
3-NS	00K8474	Tier 1, (Zylux) BLACK
3-NS	10L6656	Microphone, noise cancelling Andrea NC-8
3-NS	20L2168	Speaker Tier 1 Zylux White
3-NS	20L2169	Adapter US/CE/CF/LA/TAIWAN
3-NS	20L2170	Adapter JAPAN
3-NS	20L2171	Adapter EURO, LA (Hi Voltage Mdls)
3-NS	20L2172	Adapter UK/HK
3-NS	20L2173	Adapter AP-S
3-NS	20L2174	Adapter CHINA
3-NS	36L9069	Riva 128/8MB, Creative

Assembly 4: Machine Type 2164 Keyboard and Mouse
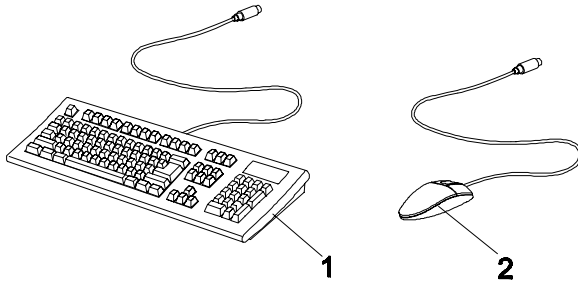
Asm-Index	FRU Number	Description
4-1	12J5574	Rapid Access - France, 105 keys
4-1	12J5593	Rapid Access - U.K. English, 105 keys
4-1	12J5589	Rapid Access - Sweden/Finland, 105 keys
4-1	12J5572	Rapid Access - Denmark, 105 keys
4-1	12J5581	Rapid Access - Norweigian, 105 keys
4-1	10L6140	Rapid Access - Traditional Chinese Taiwan/HK, ID 467 BLACK
4-1	10L6137	Rapid Access - U.S. English, 104 US/China/Australia BLACK
4-1	10L6138	Rapid Access - LA Spanish, ID 171 BLACK
4-1	37L2589	Rapid Access - Japan, ID 194 BLACK
4-2	12J4549	IBM ScrollPoint BLACK
4-2	12J4546	IBM ScrollPoint

Appendix A. FRU Number List

FRU Number	Asm-Index	Page	FRU Number	Asm-Index	Page
00K8183	3-NS	164	01K4224	3-3	162
00K8183	3-NS	164	01K4224	3-3	162
00K8468	1-15	161	01K4259	1a-NS	162
00K8474	3-NS	175	01K4259	2-NS	162
00K8476	1-11	161	01K4260	2-NS	173
00K8478	1b-3	171	01K4278	1-16	161
00K8479	1b-1	171	01K4278	1a-11	161
00K8480	1b-2	171	02K0814	5-1	166
00K8481	1b-7	171	02K2299	2-1	162
00K8482	1b-8	172	02K2299	2-1	162
00K8483	1a-7	170	02K2324	1b-1	171
00N4265	3-5	163	02K2325	1b-2	171
00N4266	3-5	163	02K2326	1b-3	171
00N4267	3-5	163	02K2327	1b-4	171
00N4268	3-5	163	02K2329	1-NS	160
00N4269	3-5	163	02K2329	1b-5	160
00N4270	3-5	164,	02K2330	1b-7	171
00N4270	3-5	174	02K2331	1b-8	172
00N4271	3-5	164	02K2334	1-NS	160
00N4318	1-8	160	02K2334	1a-4	170
00N4337	2-3	162	02K2335	1a-5	170
00N4340	1a-9	170	02K2337	1a-7	170
00N4341	1a-9	170	02K2603	2-2	162
00N8328	3-1	163	02K2603	2-2	162
01K4192	1a-6	170	02K2604	1a-NS	170
01K4196	1a-NS	165	02K2605	1a-1	170
01K4196	4-NS	165	02K2607	2-NS	173
01K4198	1a-NS	165	02K2636	1a-NS	170
01K4198	4-NS	165	02K2648	1a-NS	165
01K4200	1a-3	170	02K2648	4-NS	165
01K4224	2-4	162	06J7900	1a-NS	165

FRU Number	Asm-Index	Page	FRU Number	Asm-Index	Page
06J7900	4-NS	165	12J6877	1a-14	170
08L2550	6-2	167	13F9997	1a-NS	165
10L6137	4-1	176	13F9997	4-NS	165
10L6138	4-1	176	14F0051	4-NS	165
10L6140	4-1	176	14F0069	4-NS	165
10L6656	3-NS	164	20L2162	1-11	161
10L6656	3-NS	164	20L2163	1-13	161
12J4546	4-2	166	20L2163	1a-10	161
12J4546	5-NS	166	20L2166	1a-13	170
12J4549	4-2	176	20L2168	3-NS	164
12J5558	5-1	166	20L2168	3-NS	164
12J5562	5-1	166	20L2169	3-NS	164
12J5564	5-1	166	20L2169	3-NS	164
12J5568	5-1	166	20L2170	3-NS	164
12J5569	5-1	166	20L2170	3-NS	164
12J5572	4-1	166	20L2171	3-NS	164
12J5572	5-1	166	20L2171	3-NS	164
12J5573	5-1	166	20L2172	3-NS	164
12J5574	4-1	166	20L2172	3-NS	164
12J5574	5-1	166	20L2173	3-NS	164
12J5575	5-1	166	20L2173	3-NS	164
12J5580	5-1	166	20L2174	3-NS	164
12J5581	4-1	166	20L2174	3-NS	164
12J5581	5-1	166	20L2187	1-12	161
12J5588	5-1	166	20L2190	1-7	160
12J5589	4-1	166	20L2193	1-3	160
12J5589	5-1	166	20L2194	1-4	160
12J5590	5-1	166	20L2195	1-5	160
12J5593	4-1	166	20L2196	1-1	160
12J5593	5-1	166	20L2197	1-2	160
12J5596	5-1	166	20L2198	1-6	160
12J5597	5-1	166	20L2201	1-14	161

FRU Number	Asm-Index	Page	FRU Number	Asm-Index	Page
20L2201	1a-12	161	36L9102	2-3	162
20L2202	1-14	161	36L9103	2-3	162
20L2202	1a-12	161	36L9104	2-3	162
20L2206	1-NS	160	36L9105	2-3	162
20L2207	1-NS	160	36L9106	2-3	162
20L2289	3-4	163	36L9107	2-3	162
20L2289	3-4	163	36L9108	2-3	162
28L1605	6-1	167	36L9108	2-3	162
28L3842	1-11	161	36L9109	2-3	162
34L0409	6-2	167	36L9118	3-5	164
36L9017	3-6	164	36L9119	3-5	164
36L9017	3-6	164	36L9119	3-5	164
36L9056	1-8	160	36L9122	1-10	160
36L9059	1-9	160	36L9123	1-10	160
36L9059	1a-8	160	36L9124	1-10	160
36L9060	1-9	160	36L9125	1-10	160
36L9069	3-NS	167	36L9126	3-NS	164
36L9069	6-NS	167	36L9138	1-2	160
36L9071	2-3	173	36L9146	1a-10	170
36L9087	3-1	163	37L1968	3-5	164
36L9088	3-NS	164	37L1969	3-5	164
36L9090	1b-7	171	37L1973	3-5	164
36L9091	1b-7	171	37L1974	3-5	164
36L9092	1b-7	172	37L1975	1a-9	170
36L9094	2-NS	164	37L1976	1a-9	170
36L9094	3-NS	164	37L2004	2-NS	173
36L9095	3-NS	164	37L2005	2-NS	173
36L9096	1b-7	172	37L2006	2-3	175
36L9099	1-11	161	37L2007	2-3	173
36L9100	1-14	161	37L2008	2-3	173
36L9100	1a-12	161	37L2589	4-1	176
36L9101	2-3	162	76H5080	5-2	166

180

Appendix B. Online Support Information

This section describes online technical support services available to help repair the Aptiva computer.

This section covers:

- IBM PC Company Bulletin Board Service (BBS)
- IBM PC Company Fax-Back Service (US and Canada only)
- IBM Online HelpCenter on America Online
- 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 America Online.

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.

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). 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 AOL 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

        PC Company Home Page

http://www.pc.ibm.com/us/aptiva

        Aptiva Home Page

http://www.pc.ibm.com/support

        Aptiva Product Specifications and Support

http://www.pc.ibm.com/us/searchfiles.html

        IBM PC Company Searchable File Library

Appendix C. Model/Monitor Configurations and FRU Part Numbers

For FRU replacement part numbers, please see Parts Catalog on page 127.

Index

Numerics

A

B

C

D

E

U

Undetermined Problems
    Check Procedure, 65
URM 95
USB
    Legacy Mode, 17
USB, 17

V

Voltage Supply
    Switch Settings, IIX

W

Weight, 24

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