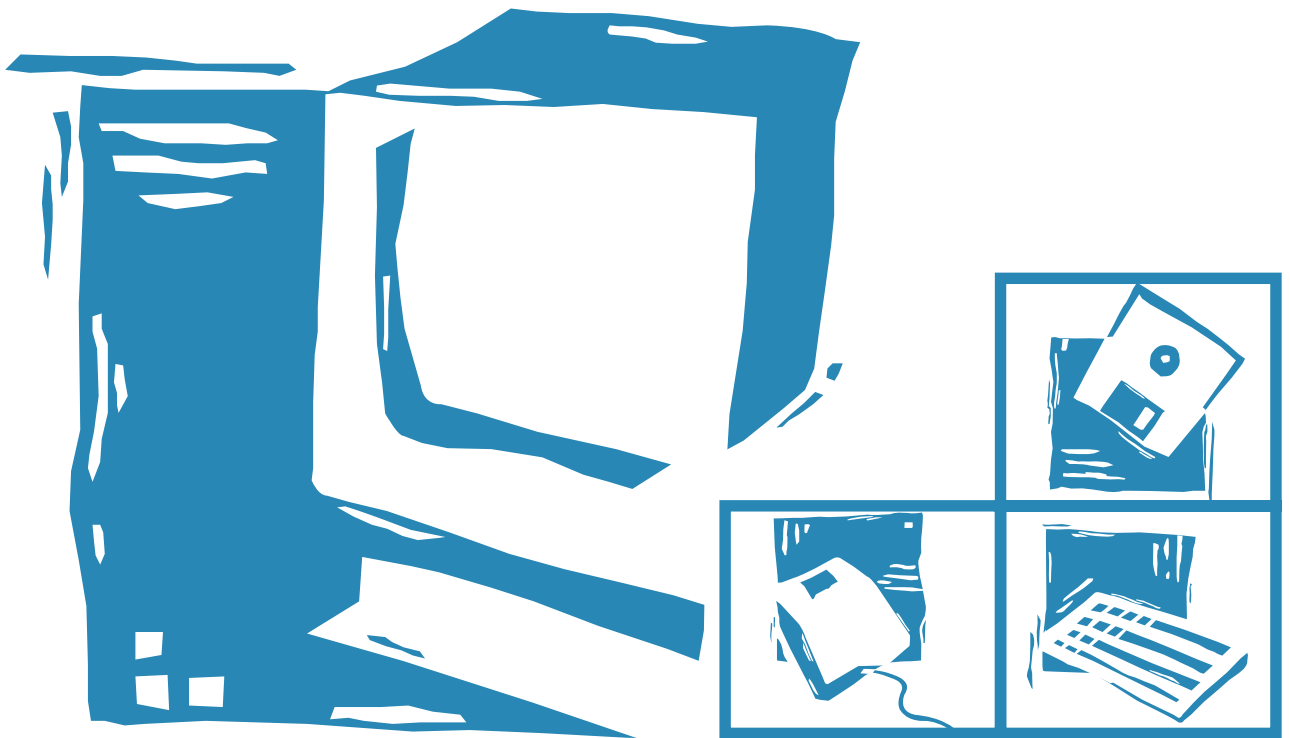


# Motherboard

## User's Guide

DT650



## **Battery Warning Instruction**

---

### ***Caution***

If battery is incorrectly replaced there poses a danger of explosion. Replace battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

### ***Attention***

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un type recommande par le constructeur. Mettre au rebut les batteries usagees conformement aux instructions du fabricant.

### ***Vorsicht***

Explosionsgefahr bei unsachgemäÙ em Austausch der Batterie. Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ. Entsorgung gebraushter Batterien nach Angaben des Herstellers.

## **Fuse Warning Instruction**

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### ***Caution***

For continued protection against risk of fire, replace only with same type and rating of fuse. Disconnect input power before servicing. Only connect this equipment to an earthed socket outlet.

### ***Vorsicht***

Vor jeder service-arbeit netzstecker ziehen! Apparatet ma kun tilkobles jordet stikkontakt.

### ***Attention***

Debrancher avant d'ouvrir. Apparatet skall anslutas till jordat nätuttag.

### ***Atencion***

Desconecte fuerza electrica antes del servicio. Laite on liitettävä suojäkosketinistoraasian.

# Declaration of Conformity (CE)

<b>Application of Council Directives</b>	89/336/EEC EMC Directive										
<b>Manufacturer's Name</b>	TriGem Computer, Inc.										
<b>Manufacturer's Address</b>	1055 Shin-gil-Dong, Ansan City, Kyunggi Do, Republic of Korea										
<b>European Representative Name</b>	TriGem Computer (U.K.) Ltd.										
<b>European Representative Address</b>	69 Bucking Ave. Trading Estate Slough Berkshire SL1 4PN U.K.										
<b>Equipment Type/Environment</b>	Motherboard										
<b>Model Name</b>	DT650 (Detroit)										
<b>Conformance to</b>	<table><thead><tr><th><u>European</u></th><th><u>International</u></th></tr></thead><tbody><tr><td>EN 55022 (1995 Class B)</td><td>CISPR 22 (1985 Class B)</td></tr><tr><td>EN 50082-1 (1992)</td><td>IEC 801-2 (1984 Level 3)</td></tr><tr><td>EN 61000-3-2 (1995)</td><td>IEC 801-3 (1984 Level 2)</td></tr><tr><td>EN 61000-3-3 (1995)</td><td>IEC 801-4 (1988 Level 2)</td></tr></tbody></table>	<u>European</u>	<u>International</u>	EN 55022 (1995 Class B)	CISPR 22 (1985 Class B)	EN 50082-1 (1992)	IEC 801-2 (1984 Level 3)	EN 61000-3-2 (1995)	IEC 801-3 (1984 Level 2)	EN 61000-3-3 (1995)	IEC 801-4 (1988 Level 2)
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EN 61000-3-2 (1995)	IEC 801-3 (1984 Level 2)										
EN 61000-3-3 (1995)	IEC 801-4 (1988 Level 2)										

We hereby declare that the equipment specified conforms to the above Directives.

## **Manufacturer**

### **Full Name**

Hyo-Geun Nam

### **Position**

Team Leader

### **Place**

1055 Shin-gil-Dong, Ansan City,  
Kyunggi Do, Republic of Korea

### **Date**

March, 1998

## **Legal Representative in Europe**

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### **Date**

March, 1998

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# Chapter 1

## Introduction

### Features

Your mini-ATX motherboard provides the following built-in features:

- Built-in Slot 1 processor connector (or microprocessor SEC cartridge connector).
- Support an Intel® Pentium® II processor that runs at an internal speed of 233, 266, 300, or 333 MHz and at an external speed of 66 MHz and Intel Pentium II processor (Deschutes) that runs at internal speed of 300, 350, or 400 MHz and at an external speed of 100 MHz.
- Intel chip set that features Intel's 443BX AGPset with I/O subsystems.
- Support LM78 hardware monitoring feature for optional chassis security feature, temperature sensing, voltage monitoring, and fan status monitoring feature.
- Supports optional wake on ring and wake on LAN feature.
- Built-in Ultra DMA/33 PCI Bus Mastering Enhanced IDE controller with two connectors. These connectors support four IDE devices in two channels up to 33 MB/sec IDE transfers.
- BIOS that supports both PCI and ISA Plug and Play (PnP), Desktop Management Interface (DMI), Advanced Configuration and Power Interface (ACPI), and Advanced Power Management (APM).

- Three 32-bit PCI bus slots, two 16-bit ISA slots, and one PCI/ISA shared slot for either a PCI or ISA card.
- AGP (Accelerated Graphics Port) slot that supports AGP cards with its own graphics bus enhancing 3D performance.
- Four DIMM sockets to expand up to 512 MB using 168-pin SDRAM DIMMs.
- 512 KB of pipelined burst level 2 (L2) cache included within the Pentium II Single Edge Contact (SEC) cartridge.
- Support for two functions of power button (ATX power supply required).
- Support for an IrDA compliant Infrared interface module for wireless interface.
- Bootable with CD-ROM drives, floptical drives, network drives, or SCSI drives.
- Two high-speed UART-compatible serial ports and one parallel port with EPP and ECP capabilities.



# Motherboard Overview

The illustration below shows the components on the motherboard.

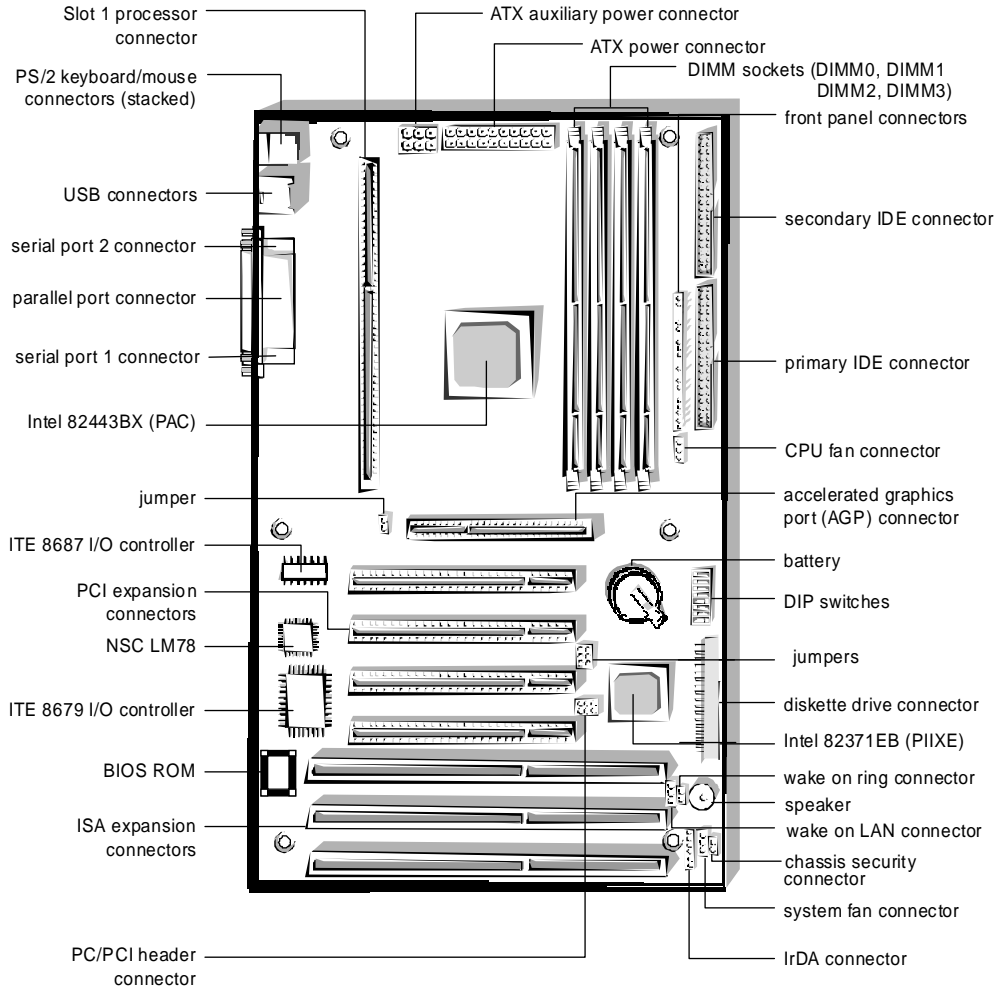


Figure 1-1. Motherboard Overview

# Chipset

The Intel 443BX chipset is the third generation of desktop PCIset and is designed for the Pentium II processor. It consists of the Intel 82443BX PCI/AGP controller (PAC) and the Intel 82371EB PCI/ISA IDE Xcelerator (PIIX4E) bridge chip.

## *Intel 82443BX PCI/AGP Controller (PAC)*

The PAC provides bus-control signals, address paths, and data paths for transfers between the processor's host bus, PCI bus, Accelerated Graphics Port (AGP), and main memory.

## *Intel 82371EB PCI ISA IDE Xcelerator (PIIX4E)*

The PIIX4E is a multifunction PCI device implementing the PCI-to-ISA bridge, PCI IDE functionality, Universal Serial Bus (USB) host/hub function, and enhanced power management.

# Super I/O Controller

The IT8679 Super I/O controller from ITE is an ISA Plug and Play Compatible, multifunction I/O device that provides the serial ports, multimode bidirectional parallel port, diskette drive controller, keyboard and mouse controller, and IrDA interface features.

By default, the I/O controller interfaces are automatically configured during boot up. The I/O controller can also be manually configured in the SETUP program.

# Motherboard Connectors

The illustration below shows the connectors on the motherboard.

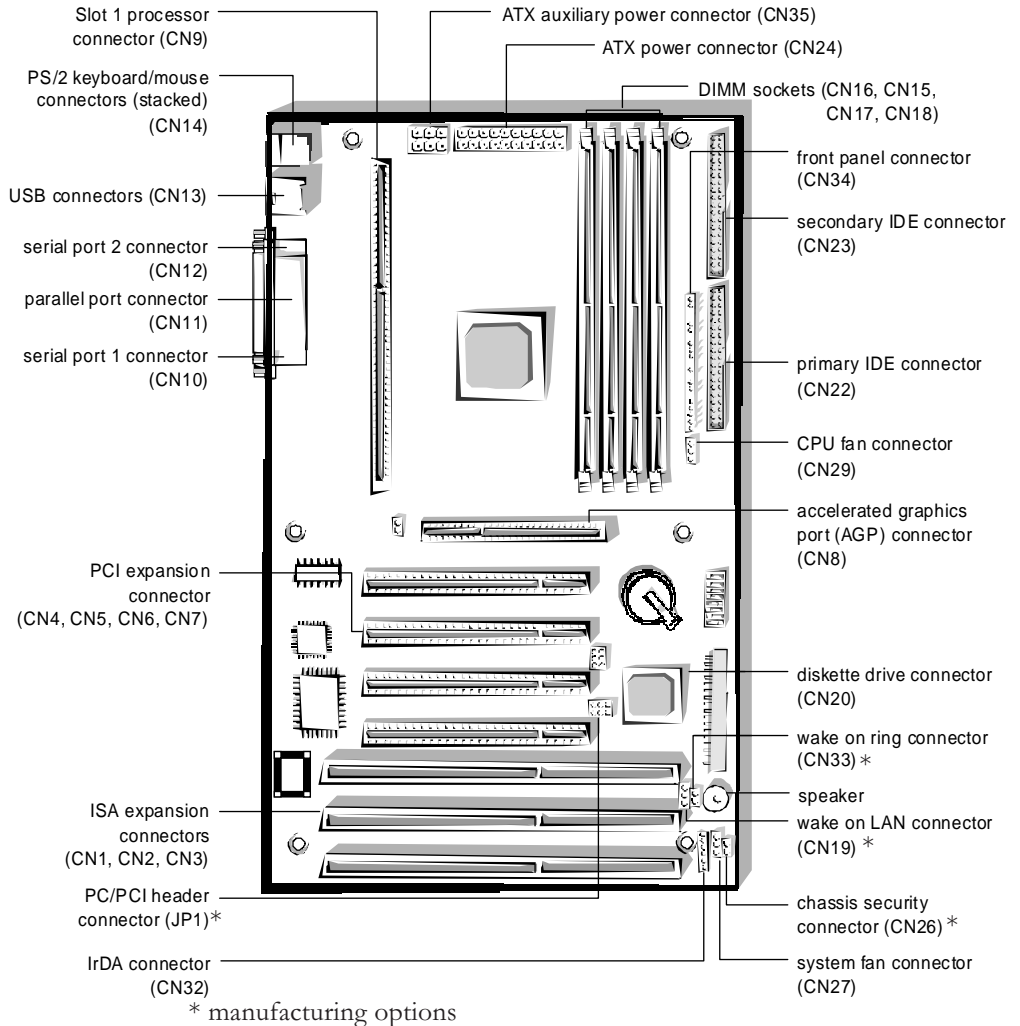


Figure 1-2. Motherboard Connectors

## **Expansion Connectors**

Your motherboard contains two 16-bit ISA option slots, three 32-bit PCI option slots, one PCI/ISA shared slot (CN3 and CN4), and one AGP slot. You can install a maximum of six option cards, since one PCI and ISA slot share the same chassis I/O panel.

You can simply install PnP-compliant PCI or ISA option cards without setting jumpers or switches or performing other configuration tasks by plug and play capacity. If you turn on the computer after adding PnP-compliant cards, the BIOS will automatically configure interrupts, I/O space, and other parameters.

See the option card manual that comes with the option card or your system manual for information on installing or removing option cards.

### **ISA Expansion Connectors (CN1, CN2, CN3)**

You can install ISA option cards to the connectors.

### **PCI Expansion Connectors (CN4, CN5, CN6, CN7)**

You can install PCI option cards to the connectors.

### **AGP (Accelerated Graphics Port) Connector (CN8)**

Accelerated Graphics Port is a dedicated graphics bus with higher bandwidth, which allows texturing from main memory. By providing high-bandwidth access to memory, AGP enables a new level of sophisticated graphics allowing software developers to create richer, more inviting 3D environments with higher resolutions than ever before.

## Diskette Drive Connector (CN20)

You can connect up to two diskette drives to the diskette drive connector. After connecting the one end of the diskette drive ribbon cable to the motherboard, connect the two connectors on the other end to the diskette drives.

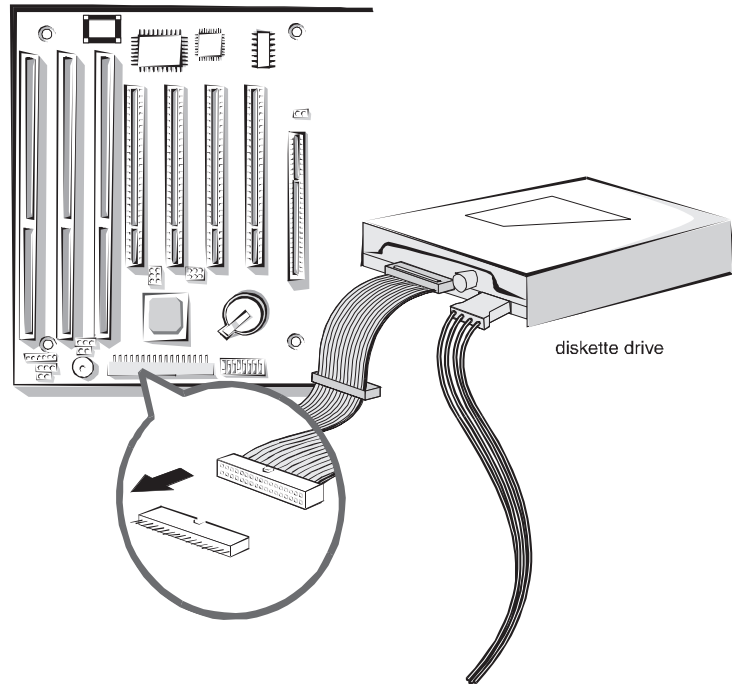


Figure 1-3. Connecting the Diskette Drive Connector Cable

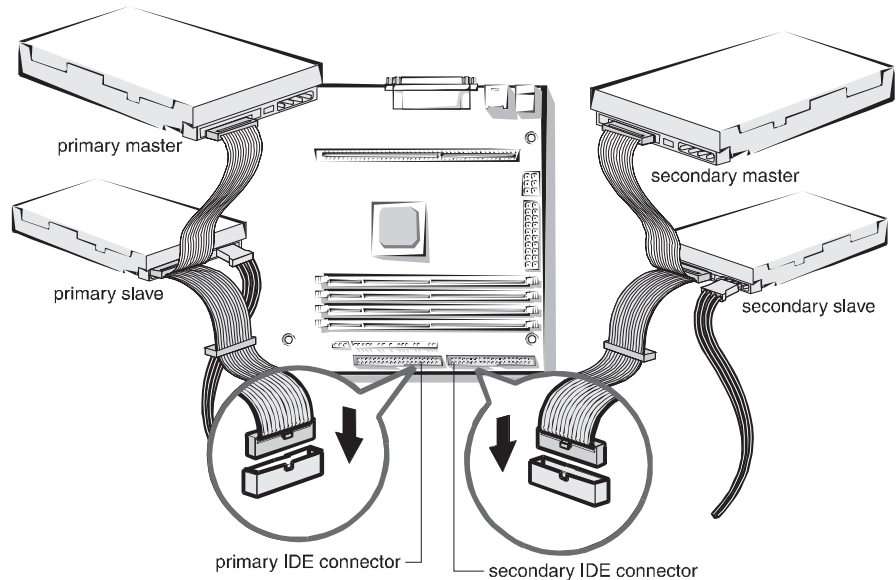
## Enhanced IDE Connectors (CN22 and CN23)

You can connect up to four IDE devices (hard disk drives, CD-ROM drives, and floptical drives) to the two IDE connectors (primary and secondary).

The PCI Bus Mastering IDE controller supports PIO Mode 3 and 4, and Ultra DMA/33, a DMA data transfer protocol for IDE devices such as hard disk drives or CD-ROM drives. The Ultra DMA/33 allows DMA commands to transfer data at a maximum burst rate of 33 MB/sec. IDE devices must be capable of supporting Ultra DMA/33 in order to enable this feature. Also, an Ultra DMA-aware device driver (a Bus Master IDE driver) for your operating system is required.

The BIOS in the motherboard supports bootup from IDE CD-ROM drive, floptical drive, SCSI drive or network drive. So, you can select a CD-ROM drive or floptical drive as a boot device by setting CD-ROM or Floptical in the Advanced Setup menu of the SETUP program.

After connecting the one end of the IDE ribbon cable to one of the IDE connectors on the motherboard, connect the two connectors at the other end to your hard disk drives.



*Figure 1-4. Connecting the IDE Cable*

If you install two hard disks, you must configure the second drive to slave mode by setting its jumper accordingly. See the manual of your hard disk for the jumper settings.

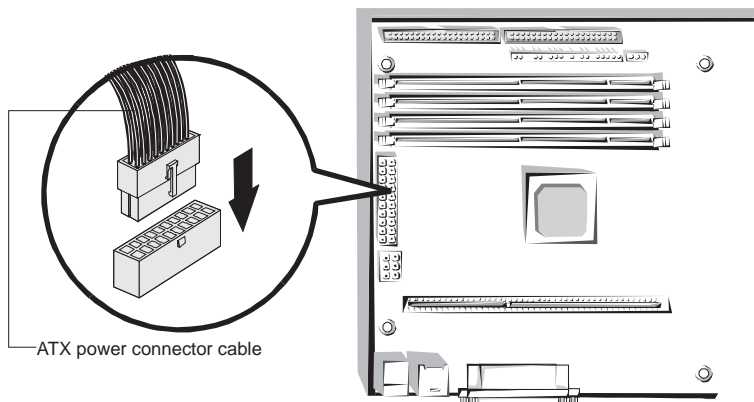
You may configure two hard disk drives to be both masters using one ribbon cable on the primary IDE connector and another ribbon cable on the secondary IDE connector. You may install one operating system on an IDE drive and another on the other IDE drive and select the boot device through SETUP.

If you set up your CD-ROM drive as the primary master drive and boot the system from the CD-ROM drive, the system will recognize the CD-ROM drive as drive A and your drive A as drive B, and can not recognize your drive B.

## ATX Primary Power Connector (CN24)

You can connect an ATX-compliant power supply to the 20-pin block ATX power connector. Connect the cable from the power supply to this connector. Make sure that the cable from the power supply is aligned with the power connector on the motherboard and then firmly push down the cable.

When using an ATX-compliant power supply that supports ATX specification 2.1, connect the auxiliary power cable from the power supply to the 6-pin block auxiliary power connector next to the ATX primary power connector.



*Figure 1-5. Connecting the Primary Power Supply Cable*

## Front Panel I/O Connectors

The motherboard provides header connectors to support functions typically located on the front panel of the computer and the illustration below shows the front panel I/O connectors.

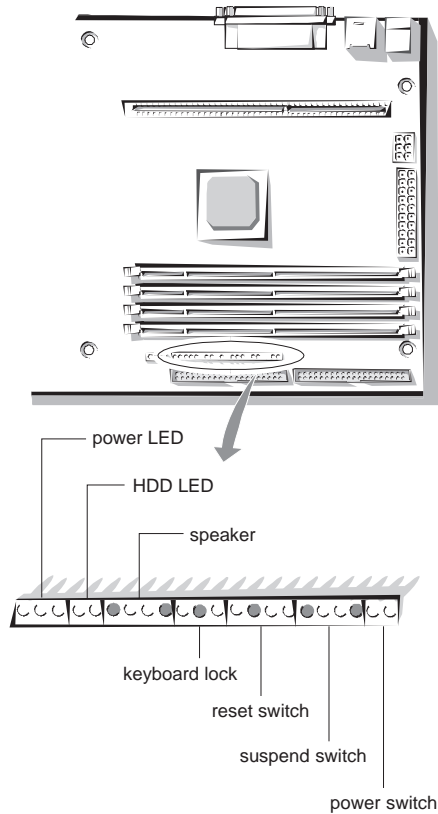
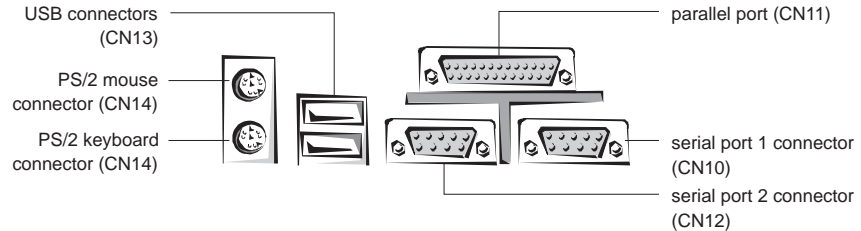


Figure 1-6. Front Panel Connectors



## Back Panel I/O Connectors

The illustration below shows back panel connectors that are located on the edge side of the motherboard.



*Figure 1-7. Back Panel I/O Connectors*

### Serial Port 1 and 2 Connectors (CN10, CN12)

You can connect serial devices such as a mouse, an external modem, or a serial printer to either serial ports. By default, any device connected to the serial port 1 connector (the serial port 2 connector) is designated in software as COM1 (COM2). You can change these designations through the SETUP program.

### Parallel Port Connector (CN11)

You can connect parallel devices such as a printer to the parallel port. By default, any device connected to this port is designated in software as LPT1. You can set the I/O address used by this port through the SETUP program.

### USB Connectors (CN13)

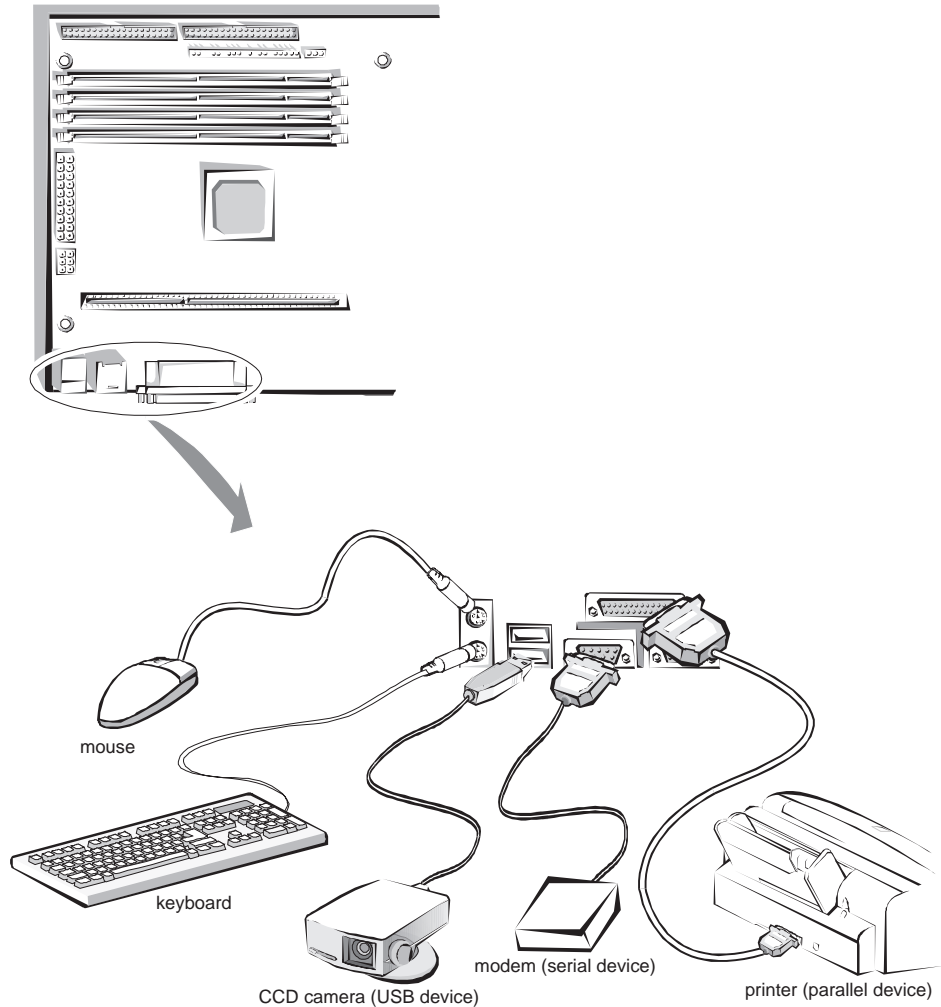
You can connect peripherals such as scanners, printers and joysticks to the USB (Universal Serial Bus) connectors. USB includes devices that in the past used serial ports, parallel ports, the keyboard port, the mouse port, and game ports as well as new kinds of devices. USB peripherals are hot-swappable enabling plug and play for your peripherals.

## PS/2 Keyboard Connector (CN14)

The PS/2 keyboard is connected to the connector.

## PS/2 Mouse Connector (CN14)

The PS/2 mouse is connected to the connector.



*Figure 1-8. Connecting Peripherals to the Back Panel Connectors*

# Chapter 2

## Using the SETUP Program

### About the SETUP Program

You can use the SETUP program to change the computer's configuration information when you installed or removed motherboard options.

The SETUP program is stored in your motherboard's read-only memory (ROM), so you can run the program any time you turn on or reset the computer. You don't need to insert a diskette or access a hard disk.

The configuration you define through SETUP is stored in a special area of memory called CMOS RAM. The battery on the motherboard backs up this memory, so the memory is not erased when you turn off or reset the computer. Whenever you reboot the computer, it checks the settings, and if it discovers a difference between the information in the CMOS RAM and its actual hardware configuration, it prompts you to run SETUP.

# Starting the SETUP Program

To start SETUP, turn on the computer. After the computer completes its self-test, as soon as you see the message, press the Del key:

Hit DEL if you want to run SETUP

If you do not press Del quickly, the computer starts loading the operating system and you will not be able to run SETUP. If happens, reset the computer again.

When you enter the SETUP program, you see the System Setup window.

SETUP is composed of four windows that contain several icons. An information line at the bottom of the menu displays simple explanations for each option.

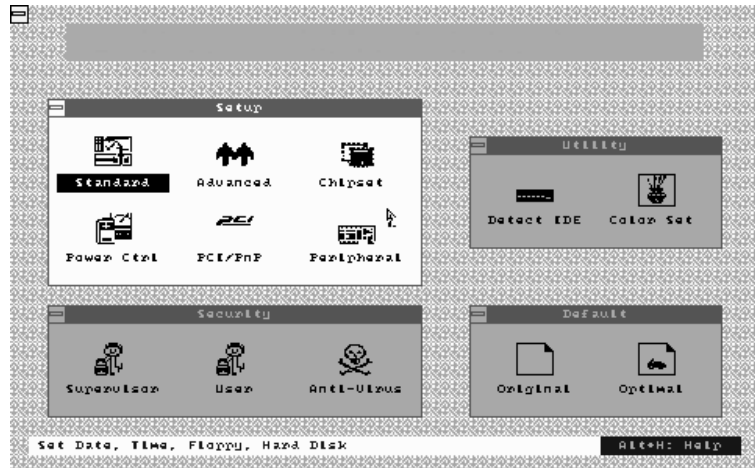


Figure 2-1. System Setup Window

# Selecting Options

You can use the keyboard or mouse to select the options.

The mouse functions in SETUP are click (change or select both global and current fields) or double click (perform an operation in selected field).

The table lists keyboard functions in SETUP:

Key	Function
Tab	Changes or selects a global field.
→, ←, ↑, ↓	Change or select the current field.
Enter	Performs an operation in the current field.
+	Increases a value.
-	Decreases a value.
Esc	Aborts any window function.
PgUp	Returns to the previous screen.
PgDn	Advances to the next screen.
Home	Returns to the beginning of the text.
End	Advances to the end of the text.
Alt-H	Accesses a help window. It describes the keys available in SETUP.
Alt-Spacebar	Exits System Setup.
Alphabetic keys	A to Z are used in the keyboard.
Numeric keys	0 to 9 are used in either the numeric keys along the top of the keyboard or the numeric keypad.

# Setup Menu

The Setup menu has 6 icons, each of which contains a submenu.

## *Standard Setup Menu*

If you select the Standard icon, you will see the submenu.

### **Pri Master/Pri Slave/Sec Master/Sec Slave**

Select one of these icons to configure the hard disk drive named in the options. When you select one of these icons, the parameters are listed: Type, LBA/Large Mode, Block Mode, 32Bit Mode, and PIO Mode.

#### *Type*

The drive parameters and settings are:

Parameter	Description
Type	The number for a drive with certain identification parameters.
Cyl	The number of cylinders on the disk.
Hd	The number of read/write heads in the drive.
WP	The write precompensation cylinder.
Sec	The number of sectors per track on the disk.
Size (MB)	The total amount of storage capacity on the disk (selected automatically). Actual size when formatted may be slightly different than the size listed on the drive label.

Setting	Description
User	If the parameters for your hard disk drive do not match any of the types listed, or your hard disk drive is a non-IDE one, select User to define your own type. You must type the correct drive parameters on the window that you selected.
Auto	If your drive(s) is an IDE drive and you select Auto, BIOS will automatically detect your IDE drives including ATAPI CD-ROM drives and floptical drives during bootup and display Auto Detection Status window. Click OK to accept parameters on the window. If Auto is set for Type, LBA/Large Mode, Block Mode, and PIO Mode are automatically set.
CD-ROM	If a CD-ROM drive is connected to the IDE connector, select CD-ROM. You can load your operating system from the CD-ROM drive. You can also choose Auto and it lets BIOS automatically set the correct drive parameters.
Floptical	If a floptical drive is connected to the IDE connector, select FLOPTICAL for the drive. You can boot the computer from the floptical drive.

### *LBA/Large Mode*

Set this option to On to use 528MB or greater of hard disk drives. The settings are On and Off.

### *Block Mode*

To enable multiple sector read/write on IDE drives, set this option to On. The settings are On and Off.

### *32Bit Mode*

If you set this option to On, it enables 32-bit data transfer to IDE data port in IDE drives. If you set this option to Off, it enables 16-bit data transfer. The settings are On and Off.

### *PIO Mode*

This option sets how fast transfers on the IDE interface occur. PIO (programmed I/O) works with ATAPI CD-ROM drives. The settings are Auto, 0, 1, 2, 3 and 4.

Select Auto to allow SETUP to automatically detect the PIO mode that IDE drives use. If you set this option to Auto, transfers occur at the drive's maximum speed. If you want to select one of 0 to 5, make sure you are selecting the PIO mode supported by the IDE drive.

## Date/Time

Use the Date/Time option to change the date or time. Enter the correct time or date using + or - key. You can only reset the number of seconds to 00.

## Floppy A and B

Select Floppy A or Floppy B to specify the floppy drive type. The settings are Not Installed, 360KB 5 1/4, 1.2MB 5 1/4, 720KB 3 1/2, 1.44MB 3 1/2, and 2.88MB 3 1/2.

## *Advanced Setup Menu*

The Advanced Setup menu is displayed by choosing the Advanced icon from the Setup menu.

## Quick Boot

This option determines whether the computer boot quickly when it is turned on or not. If you select Enabled, the computer runs its self test without performing more than 1MB of system memory test, floppy seek test, and keyboard test. The settings are Disabled and Enabled.

## 1st Boot Device

This option sets the type of the first boot drive the computer checks first to find an operating system to boot from. The settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, Floptical, CDROM, SCSI, and Network.

## 2nd Boot Device

This option sets the type of the second boot drive the computer checks second to find an operating system to boot from. The settings are Disabled, IDE-0, Floppy, Floptical, and CDROM.



## 3rd Boot Device

This option sets the type of the third boot drive the computer checks third to find an operating system to boot from. The settings are Disabled, IDE-0, Floppy, Floptical, and CDROM.

## BootUp Num-Lock

This option determines the beginning state of the NumLock feature on your keyboard, when system is turned on or reset. The settings are On and Off.

## PS/2 Mouse Support

If you enable this option, you can use a PS/2 mouse. The settings are Disabled and Enabled.

## Primary Display

This option lets you define the type of adapter you are using for your primary display. The settings are Absent, VGA/EGA, CGA40X25, CGA80X25, and Mono.

## Password Check

This option sets the type of password protection. The settings are Setup and Always. If you select Setup, every time you run SETUP, the computer checks your password. Once you set password, you should enter your password whenever you run SETUP.

If you select Always, every time you run SETUP or turn on or reset the computer, it checks your password.

## Boot To OS/2

If your system has more than 64MB of main memory and OS/2 operating system installed, set this option to Yes. The settings are Yes and No.

## Internal Cache

The option sets the type of caching algorithm used by your microprocessor for internal L1 cache memory. The settings are Disabled and Enabled.

## C000 / C400, 16K Shadow

These options allow you to shadow the contents of video ROM listed in the option titles to the system's RAM. Cached enables the contents of the video ROM area to be written to the corresponding RAM or cache memory. The settings available for these options are Disabled, Enabled and Cached.

## C800 / CC00 / D000 / D400 / D800 / DC00, 16K Shadow

These options allow you to shadow the contents of the adapter ROM listed in the option titles to the system's RAM. Cached enables the contents of the ROM area to be written to the corresponding RAM or cache memory. The settings available for these options are Disabled, Enabled and Cached.

## *Chipset Setup Menu*

If you select the Chipset icon from the Setup main menu, the Chipset Setup menu is displayed.

## Memory Hole

This option specifies the location of an area of memory that cannot be addressed on the ISA bus. The settings are Disabled, 512KB-640KB and 15MB-16MB.

## Graphics Aperture Size

This option specifies the amount of system memory that can be used by the AGP. The settings are 4MB, 8MB, 16MB, 32MB, 64MB, 128MB and 256MB.

## Power Control Setup Menu

If you select the Power Ctrl icon from the Setup main menu, the Power Control Setup menu is displayed.

### Power Management / APM

Set the option to Enabled to enable the power management and APM (Advanced Power Management) features. If you set Disabled for the option, you will not see any options in the Power Control Setup menu. The settings are Disabled and Enabled.

### Power Button Function

The option allows holding the power button on the computer to enter suspend mode as well as functioning as a normal on/off feature of the power button. It takes effect after finishing power-on self test. The settings are Suspend and On/Off.

From power-on until power-on self test, you should press the power button for more than 4 seconds to turn off your system. However, after finishing power-on self test, the methods for turning off the system depend on the setting for the option.

When the option is set to Suspend, you should press the power button for more than 4 seconds to turn off the system after finishing power-on self test. At this time, if you press the power button for less than 4 seconds, the computer will go into suspend mode. When the option is set to On/Off, normally pressing the power button after power-on self test makes the system turned off.

If the Power Management / APM option is set to Disabled, the Power Button Function option can be used only as a normal On/Off feature.

### Note

If you press the power button for more than 4 seconds while in suspend mode to turn off the system, the system will restart. So, we recommend you turn off the system after resuming the system when turning it off.

## AC Power Default Status

This option specifies whether the system will boot up after a power failure. If you select On, the system power will be restored. If you select Off, the system power will be still off until you press the power button. The settings are On and Off.

## Remote Power On LAN

This option allows the computer to respond to a LAN wakeup event when the power is off. The settings are Disabled and Enabled.

## Remote Power On Modem

This option allows the computer to respond to an incoming call on an installed modem when the power is off. The settings are Disabled and Enabled.

## Suspend Time Out

The option specifies the length of the period of system inactivity for going into suspend mode. When the specified period of system inactivity expires, the computer will enter suspend mode, beeping twice. If there are activities of devices described below during suspend mode, the computer will exit the suspend mode. You can make your setting using + or - key. The settings are Disabled and every 4th value between 4 and 508 minutes.

## Device 6 (Serial port 1)

When the computer is in suspend mode, the option sets whether or not the computer monitors the activity of devices connected to the serial port 1. The settings are Ignore and Monitor.

## Device 7 (Serial port 2)

When the computer is in suspend mode, the option sets whether or not the computer monitors the activity of devices connected to the serial port 2. The settings are Ignore and Monitor.

## Device 8 (Parallel port)

When the computer is in suspend mode, the option sets whether or not the computer monitors the activity of devices connected to the parallel port. The settings are Ignore and Monitor.

## Device 5 (Floppy disk)

When the computer is in suspend mode, the option sets whether or not the computer monitors the activity of diskette drives in the system. The settings are Ignore and Monitor.

## Device 0, 1, 2, 3 (Primary master IDE, Primary slave IDE, Secondary master IDE, Secondary slave IDE)

When the computer is in suspend mode, the options set whether or not the computer monitors the activity of each of four IDE drives connected to each channel named in the options. The settings are Ignore and Monitor.

### Note

When the system is in suspend mode, it always monitors the activities of the keyboard or mouse.

## *PCI/PnP Setup Menu*

If you select the PCI/PnP icon from the Setup main menu, the PCI/PnP Setup menu is displayed.

## **Plug and Play Aware O/S**

The option enables the computer to boot with an operating system capable of managing Plug and Play option cards. Set it to Yes if the operating system (such as Windows 95) installed in the computer follows the Plug and Play specification. Windows 95 is PnP-aware. The Windows 95 operating system detects and enables all other PnP-aware adapter cards. Set the option to No if the operating system (such as DOS, OS/2, Windows 3.0, or Windows NT 4.0) does not use PnP. You must set this option correctly, or PnP-aware adapter cards installed in the computer will not be configured properly. The settings are Yes and No.

## PCI Latency Timer (PCI Clocks)

This option sets the length of time (measured in the number of PCI clock cycles) that a PCI device on the PCI bus can hold the bus when another device has requested the bus. The settings are 32, 64, 96, 128, 160, 192, 224, and 248.

## PCI VGA Palette Snoop

The option controls the ability of a primary PCI graphics controller to share a common palette with an ISA video adapter card. The settings are Disabled and Enabled.

## Allocate IRQ to PCI VGA

This option allows BIOS to allocate an IRQ for the VGA controller on the PCI bus. The settings are Yes and No.

## Allocate IRQ to USB

This option allows BIOS to allocate an IRQ for the USB controller on the PCI bus. The settings are Yes and No.

## DMA Channel 0, 1, 3, 5, 6, and 7

These options allow you to specify the bus type used by each DMA channel for legacy(non-PnP) ISA option cards. The settings are PnP and ISA.

## IRQ 3, 4, 5, 7, 9, 10, 11, 14, and 15

These options set the bus type used by each IRQ. These options allow you to reserve IRQs for legacy ISA adapter cards. If these interrupts are available for use by PCI/PnP option cards, the interrupts are assigned for the computer to use. If the computer contains an ISA option card that uses one of these interrupts, select ISA for that interrupt. The settings are PCI/PnP and ISA.

## ***Peripheral Setup Menu***

The Peripheral Setup menu is displayed if you select the Peripheral icon from the Setup main menu.

### **OnBoard FDC**

Set this option to Enabled to enable the built-in diskette drive controller. If you install another FDC card, disable this option. The settings are Auto, Disabled, and Enabled.

### **OnBoard Serial Port 1**

This option specifies the base I/O port address of built-in serial port 1. The settings are Auto, Disabled, 3F8h, 2F8h, 3E8h, and 2E8h.

### **OnBoard Serial Port 2**

This option specifies the base I/O port address of built-in serial port 2. The settings are Auto, Disabled, 3F8h, 2F8h, 3E8h, and 2E8h.

### **Serial Port 2 Mode**

This option specifies the operating mode for serial port 2 for normal (COM2) or infrared applications. It only appears when the OnBoard Serial Port 2 option is not set to Auto or Disabled. The settings are Normal, IrDA, ASKIR (Amplitude Shift Keyed Infrared), MIR 0.5 Mbps, MIR 1.1 Mbps, and FIR (Fast Infrared).

Set this option to IrDA to enable an IrDA module connected to IrDA connector (CN32) on the motherboard. The IrDA specification provides for data transfers at 115Kbps from a distance of 1 meter.

## Duplex Mode

This option specifies the transmission method for serial port 2. The settings are Full and Half. Full is simultaneous transmission mode and Half is sequential transmission/receiving mode.

## OnBoard Parallel Port

It specifies the base I/O port address for the built-in parallel port. The settings are Auto, Disabled, 378, 278, and 3BC.

## Parallel Port Mode

It specifies the mode for the parallel port. The settings are Normal, EPP, and ECP.

Settings	Function
Normal	Normal means the parallel port operates in the standard AT-compatible parallel port mode.
EPP	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bi-directional data transfer driven by the host device.
ECP	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data transfer rates of 2.5 Mbs. ECP provides symmetric bi-directional communication.

## Parallel Port IRQ

This option specifies the IRQ used by the parallel port. It is only available when the OnBoard Parallel Port option is not set to Auto. The settings are 5 and 7.

## Parallel Port DMA Channel

This option sets the DMA channel used by the parallel port. It is only available if the setting for the Parallel Port Mode option is ECP. The settings are 0, 1, and 3.



## OnBoard IDE

The option allows you to set the built-in IDE controller you want to use. The settings are Disabled, Primary, Secondary, and Both.

# Utility Menu

There are 2 icons in the Utility menu.

## *Detect IDE*

If an IDE-type hard disk drive, a CD-ROM drive, or a floptical drive is connected to the primary or secondary IDE controller, this option allows for automatic detection of the hard disk drive or CD-ROM drive type. Once SETUP detects the type of the hard disk or CD-ROM drive installed, it will display the relative information.

After SETUP detects all IDE drives, the hard disk drive type will be forced to be User and the CD-ROM drive type will be forced to be CDROM.

## *Color Set*

This option allows you to change the color of the System Setup window. The settings are Sky, Army, Pastel, and LCD.

# Security Menu

Three icons appear in the Security menu.

## *Supervisor / User*

These two options make it possible to restrict access to the SETUP program and to restrict who can boot the computer by enabling you to set passwords for two different access modes: Supervisor mode and User mode.

A Supervisor password and a User password can be set for the SETUP program and for booting the computer.

Supervisor mode has full access to all the SETUP options whereas User mode has limited access to the options. Setting separate Supervisor and User passwords enables a system supervisor to restrict who can change critical SETUP values.

When you run SETUP by entering your User password, you can change the three items only: Advanced, User, and Color Set.

If you set both the Supervisor and User passwords, you must set the Supervisor password first. Once both are set, you can enter either the Supervisor password or the User password to access SETUP or the computer.

The system can be configured so that all users can enter a password every time you turn on or reset the system, or run SETUP, using Supervisor password only or both passwords.

The table shows the effects of setting the Supervisor and User passwords.

### *Supervisor and User password functions*

Password set	Password during boot	Password to enter SETUP	Supervisor mode	User mode
Neither	None	None	Can change all options	Can change all options
Supervisor and User set	Supervisor or User	Supervisor or User	Can change all options	Can change a limited number of options
Supervisor only	Supervisor	Supervisor	Can change all options	-

## Setting a Password

Follow these steps to set your password:

- 1 When you see "Enter New Password" in the Supervisor or User window, type the letter you want to use using the keyboard or click it using the mouse. You can type up to six characters using the keys listed in the window. The screen displays an asterisk for each character you type. After typing the password, press Enter.
- 2 When you see "Confirm New Password", type your password again and press Enter. If the password you type is different from your password, the screen displays the message "Enter New Password". As you see the following message, press Enter.

Supervisor Password Installed  
or  
User Password Installed

- 3 When you exit the SETUP program, save your new settings. When you turn on or reset your computer or run SETUP (depending on the setting in Password Check of the Advanced Setup menu), you will see the password prompt.

### Note

Be sure to remember the password you enter or write it down. If you cannot remember it, you will not be able to access the computer the next time you turn it on or run SETUP. However, if you forgot your password, there is a way to use your system again. See "Accessing Your Current Password" for more information.

## Deleting or Changing a Password

If you want to delete the current password, follow these steps:

- 1 Select the Supervisor or User icon from the Security menu.

- 2 When you see "Enter Current Password", type the current password and press Enter. If you select the User icon, the message does not appear.
- 3 When you see "Enter New Password", just press Enter to delete your current password.
- 4 When you see "Confirm New Password", press Enter again.
- 5 When you see the following message, press Enter.

Both Passwords Uninstalled  
or  
User Password Uninstalled

To change the current password, type your new password before pressing Enter on steps 3 and 4.

## Accessing Your Current Password

If you forget your current password and cannot use your computer or run SETUP, follow these steps:

- 1 Turn off the computer and disable the password function by setting DIP switch 6 to the on position.
- 2 Turn on the computer. You will not see the prompt that asks you to enter your password when you turn on the computer or run SETUP.
- 3 If you want to set a new password, turn off the computer and enable the password function by setting DIP switch 6 to the off position.
- 4 Turn on the computer. As soon as the "Hit Del if you want to run SETUP" message appears on the screen, press the Del key.

If you set a new password, the prompt that asks you to enter the password will appear on the screen when you turn on or reset the computer or run SETUP.

If you did not set a new password, you would immediately use your system.

If you attempt to set a new password after you set DIP switch 6 to on to disable your password, the password will not be saved to CMOS RAM.

## *Anti-Virus*

This option allows the user to protect the hard disk drive or diskette's boot sector from unnecessary writing.

The available settings are Enabled and Disabled. Setting this option to Disabled makes writing on the boot sector possible. If you select Enabled for this option, when you use the FORMAT, DISKCOPY, or SYS command or any program that tries to write on the boot sector, you will see the following warning message.

```
Boot Sector Write!!!  
Possible VIRUS: Continue (Y / N)?
```

At this point, if you want to complete the running of the program regardless of the message above, press Y. If you see the message above in spite of having not run programs described above, viruses may try to write on the boot sector. Select N to prevent the viruses from writing on the boot sector.

Notice that if you want to install MS-DOS, Windows 95, Windows NT, or OS/2, you should set this option to Disabled.

## **Default Menu**

The Default menu has 2 icons that allow you to select a group of settings for System Setup options. You can use either of these icons to quickly set system configuration parameters and you can select a group of settings when the system has configuration-related problems. Each System Setup option has 2 default settings: original and optimal. These settings are only applied to options in the Setup menu except for the Standard Setup menu.

### *Original*

Selecting the Original icon returns to the system configuration values present in SETUP when you first started this SETUP session. When you see the message “Restore old values?”, select Yes restore the settings.

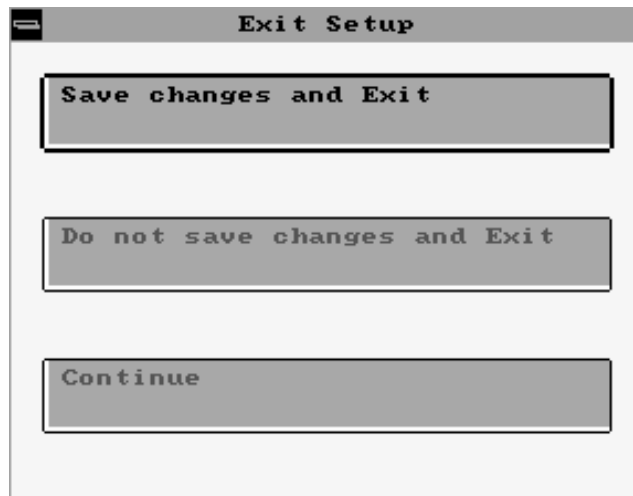
## Optimal

This icon allows you to load the optimal default settings for the BIOS. The Optimal default settings are best values to optimize system performance. If NVRAM (Non-Volatile Random Access Memory) is corrupted, the Optimal settings are loaded automatically. When you see the message “Load optimal values?”, select Yes to load optimal values.

## Exiting the SETUP Program

When you exit the SETUP program after you make your selections for all System Setup options, you can either save the settings you changed or exit the program without saving any changes.

If you press Alt-Spacebar to exit SETUP, you will see the Exit Setup window.



*Figure 2-2. Exit Setup Window*

To save the settings and exit, select "Save changes and Exit". The system reboots with your new settings.

If you want to exit SETUP without saving your settings, select "Do not save changes and Exit". The system reboots with your original settings.

To return to the System Setup window to make corrections, select "Continue".

Regardless of quitting with or without saving your changes, the SETUP program resets the system and the computer performs its power-on self tests.

If your computer detects a problem in your SETUP configuration, you may see an error message and a prompt to run SETUP when it is rebooting.

# Chapter 3

## Installing Motherboard Options

### Before You Begin

- You need a standard ATX chassis for you to install your motherboard in.
- The power supply for the motherboard should be an ATX type that uses DC power.
- Always follow the steps in each procedure in the correct order.
- Set up a log to record information about your computer such as model, serial numbers, and installed options. If you need this information, it will be easier to consult the log than to open up the computer.
- We recommend you use an antistatic wrist strap and a conductive foam pad when working on the motherboard.

#### Warning

After unplugging the computer and any peripherals from their power sources and disconnecting any telephone or telecommunication lines, do any of the procedures described in this chapter. Failure to disconnect power, telecommunications links, networks, or modems before you open the computer or do any procedures may injure your body or damage equipment. Some circuitry on the motherboard may continue to operate even though the power button on the front panel is off.

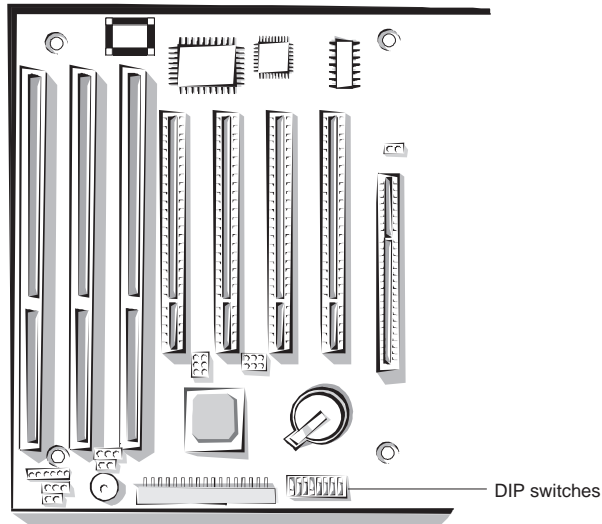


## Caution

Electrostatic discharge (ESD) can damage components on the motherboard. To prevent static damage, discharge static electricity from your body by touching a metal part of the computer chassis.

# Changing the DIP Switch Settings

The illustration below shows the location of the DIP switches on your motherboard.



*Figure 3-1. Location of the DIP Switches*

Switches control various circuits or functions in the motherboard. The switches on the motherboard are rocker type of dual in-line package (DIP) switches. Each of these switches has two settings (on and off). To change the settings of the DIP switches, use a small, pointed object such as a small screwdriver or a straightened paper clip to press down on the appropriate side of the switch.

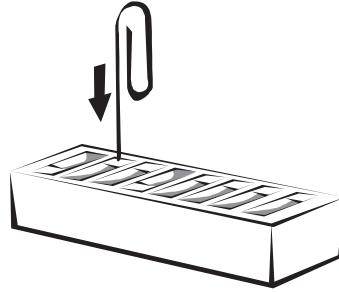


Figure 3-2. DIP Switch Setting

*Setting DIP switches for processor speed*

Processor speed		DIP switches			
66 MHz CPU clock	100 MHz CPU clock	1	2	3	4
-	Pentium II 300 MHz	On	Off	On	On
Pentium II 233 MHz	Pentium II 350 MHz	On	Off	Off	On
Pentium II 266 MHz	Pentium II 400 MHz	Off	On	On	On
Pentium II 300 MHz	-	Off	On	Off	On
Pentium II 333 MHz	-	Off	Off	On	On

*Setting the other DIP switches*

DIP switch	Setting	Function
5	On	Clears CMOS RAM
	Off	Normal
6	On	Disables the User or Supervisor password
	Off	Enables the User or Supervisor password
7	On	Disables access to the Setup program
	Off	Enables access to the Setup program
8	On	Enables write protect for the diskette drive
	Off	Normal

# Microprocessor

The motherboard provides a Slot 1 processor connector for a single Pentium II processor packaged in a Single Edge Contact (SEC) cartridge. You can install an Intel Pentium II (Klamath) processor with MMX technology operating at 233, 266, 300, or 333 MHz or an Intel Pentium II (Deschutes) processor with MMX technology operating at 300, 350, or 400 MHz in the Slot 1 processor connector. The microprocessor kit includes a single-edge contact (SEC) cartridge and heat sink assembly.

To install a processor follow these steps:

- 1 Install the retention mechanism.
- 2 Install the passive heatsink support base.
- 3 Install the processor.
- 4 Install the heatsink support top bar.
- 5 Set the DIP switches for the processor speed.

## Note

Before you install a new processor, check to see if you need to change any DIP switches on the motherboard. You should change any DIP switches according to your processor speed. Refer to the table on "Changing the DIP Switch Settings" for more information on DIP switch settings.

## Warning

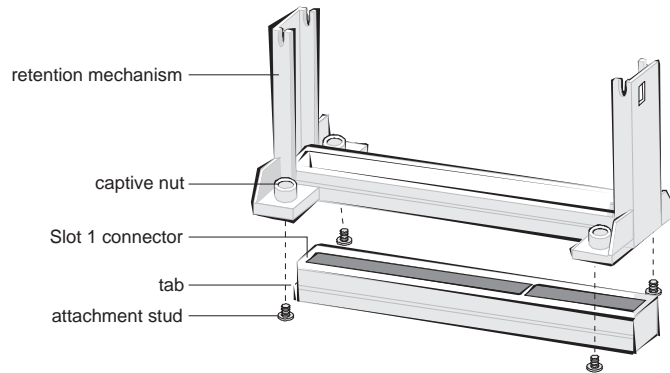
Make sure that sufficient air circulation is available across the processor's passive heatsink. If it were not for sufficient circulation, the processor could overheat and damage both the processor and the motherboard.

## Installing the Retention Mechanism

### Type A

To install the type A retention mechanism on the motherboard, follow these steps:

- 1 See the illustration in "Motherboard Overview" in Chapter 1 to locate the Slot 1 processor connector on the motherboard.
- 2 Position the retention mechanism so that the tab on the connector can fit into a notch in the base of the mechanism.



*Figure 3-3. Installing the Processor Retention Mechanism (Type A)*

- 3 Tighten the four captive nuts with the screwdriver to secure the mechanism to the motherboard.

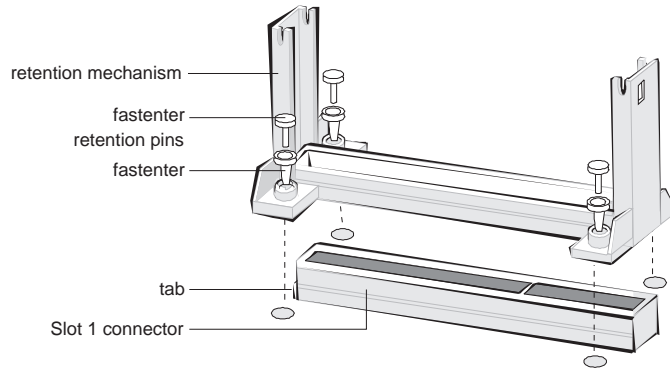
### Caution

Do not overtighten the captive nuts on the retention mechanism to avoid damage of the motherboard.

## Type B

To install the type B retention mechanism on the motherboard, follow these steps:

- 1 See the illustration in "Motherboard Overview" in Chapter 1 to locate the Slot 1 processor connector on the motherboard.
- 2 Position the retention mechanism so that the tab on the connector can fit into a notch in the base of the mechanism.



*Figure 3-4. Installing the Processor Retention Mechanism (Type B)*

- 3 Press the four fasteners through their mounting holes in the retention mechanism and then through the motherboard mounting holes until you feel them snap into place.
- 4 Push each of the fastener retaining pins into the through hole of fastener until it is fully seated against the top of the fastener.

## Installing the Passive Heatsink Support Base

### Note

If you are installing a Pentium II processor with active fan cooling in the motherboard, refer to the manual that comes with the processor.

A passive heatsink support base with two retention pins comes with the motherboard. If the processor uses passive heatsink cooling instead of active fan cooling, you must install this support base on the motherboard. To install the passive heatsink support base, follow these steps:

- 1 Observe the precautions in “Before You Begin”.
- 2 Remove the two retention pins from the support base.
- 3 Position the heatsink support base with the support pins closer to the Slot 1 connector.
- 4 Press the two mounting posts of the support base into the motherboard mounting holes located on midway between the Slot 1 connector and the DIMM sockets until you feel them snap into place.
- 5 Insert the retention pins into the holes in the mounting posts of the support base. Push them down until they are fully seated and oriented as shown below.

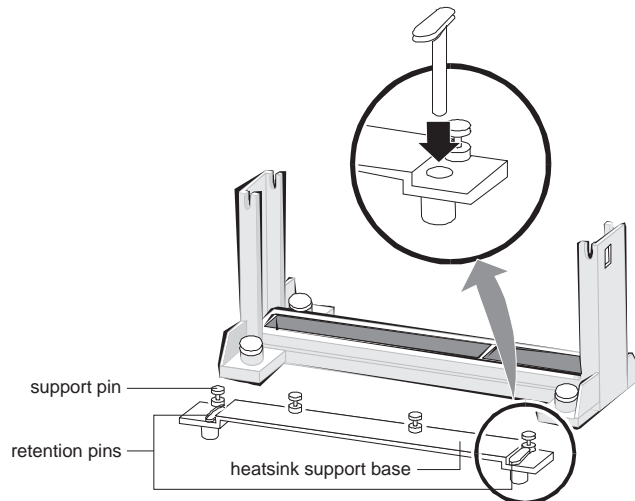


Figure 3-5. Installing the Passive Heatsink Support Base

## Installing the Processor

Follow these steps to install the processor:

- 1 Locate the processor so that the heatsink will be toward the support base next to the connector. Insert the processor into the Slot 1 connector.
- 2 Press down on the processor until it is firmly seated in the Slot 1 connector and the latches on the processor lock into place.

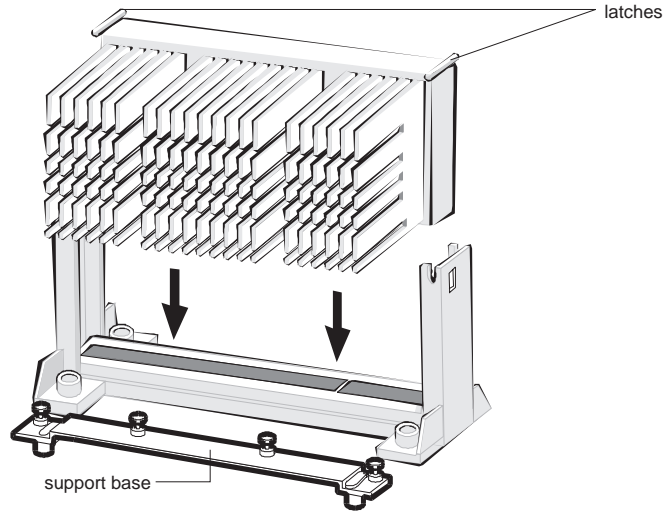


Figure 3-6. Installing the Processor

- 3 Slide the heatsink support top bar onto the retaining pins of the heatsink support base.

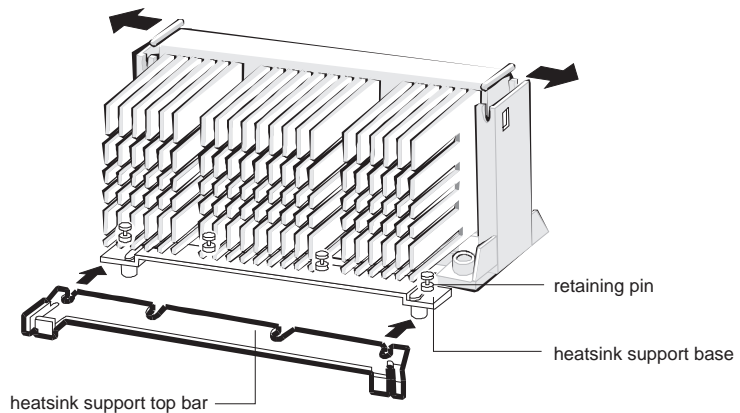


Figure 3-7. Installing the Heatsink Support Top Bar

## Setting the DIP Switches for the Processor Speed

Make sure that DIP switches 1, 2, 3 and 4 are set to the correct value for the speed of the processor. See "Changing the DIP Switch Settings" for DIP switch settings for processor speed.

### Note

If you are installing a processor with a fan heatsink, connect the processor's fan to the connector labeled "CN29" or "FAN2".

## Main Memory

The four 168-pin DIMM sockets are arranged as banks 0, 1, 2 and 3. The sockets are marked with DIMM0 (CN16), DIMM1 (CN15), DIMM2 (CN17) and DIMM3 (CN18) on your motherboard. You can increase the amount of memory in your motherboard up to 512 MB by installing DIMMs with a capacity of 8 MB, 16 MB, 32 MB, 64 MB, or 128 MB.

- You should use only 3.3V, 168-pin, unbuffered SDRAM (Synchronous DRAM) DIMMs that operate at an access speed of 60ns or 50ns or faster.
- Memory modules must be installed in the DIMM3 socket first.
- The motherboard supports ECC (72-bit) or non-ECC (64-bit) DIMMs.
- The motherboard supports 66 or 100 MHz SDRAM DIMMs.
- DIMMs with different size and speed can be populated in each bank.
- The memory size, type, or speed are automatically detected by the BIOS.



- Single sided modules are usually 16 MB or 64 MB and double sided modules are usually 8 MB, 32 MB, or 128 MB.

DIMM size	Non-ECC configuration	ECC configuration
8 MB	1 Mbit x 64	1 Mbit x 72
16 MB	2 Mbit x 64	2 Mbit x 72
32 MB	4 Mbit x 64	4 Mbit x 72
64 MB	8 Mbit x 64	8 Mbit x 72
128 MB	16 Mbit x 64	16 Mbit x 72

## Note

Pentium II processors with an external clock speed of 100 MHz should be paired only with 100 MHz SDRAM. Processors with an external clock speed of 66 MHz can be paired with either 66 MHz or 100 MHz SDRAM.

## Installing a Memory Module

Follow these steps to install DIMMs:

- 1 Observe the precautions in "Before You Begin".
- 2 Turn off all peripheral devices connected to the computer and then the computer.
- 3 Remove the computer cover.
- 4 If any DIMM is not installed in the DIMM sockets, install a DIMM in the DIMM3 socket first. Release the plastic retaining clips at each end of the socket by pressing the clips outward until they snap open.

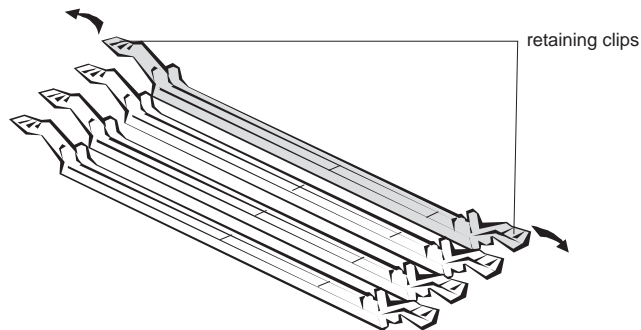
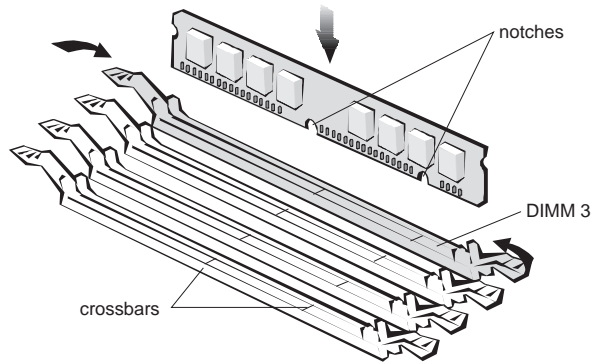


Figure 3-8. Releasing the Retaining Clips

- 5 Orient a DIMM to the socket so the two notches in the DIMM connector are aligned with the crossbars in the socket.
- 6 Press the DIMM straight into the socket until the retaining clips snap into place around the ends of the DIMM.



*Figure 3-9. Installing a DIMM*

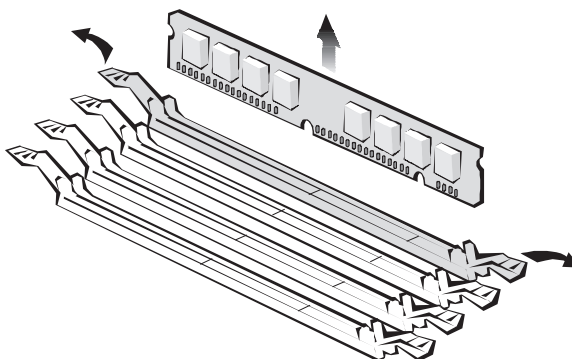
- 7 Replace the computer cover.

## *Removing a Memory Module*

Follow these steps to remove a DIMM:

- 1 Observe the precautions in "Before You Begin".
- 2 Turn off all peripheral devices connected to the computer and then the computer.
- 3 Remove the computer cover.

- 4 Press the retaining clips outward simultaneously until the DIMM disengages from the socket.



*Figure 3-10. Removing a DIMM*

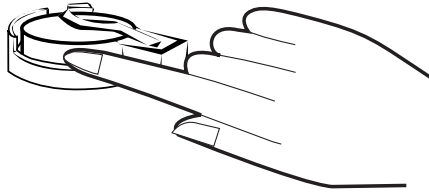
- 5 Replace the computer cover.

## Replacing the Battery

The 3 V, coin-cell CR2032-type battery on the motherboard provides power to the real-time clock and CMOS RAM. It has an estimated lifetime of three years if the computer is turned off. See the illustration in Chapter 1 for the location of the battery. To replace the battery, follow these steps:

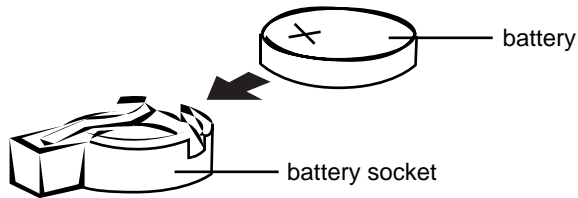
- 1 Enter the SETUP program and make a printed copy of the SETUP screens.
- 2 Observe the precaution in "Before You Begin".
- 3 Turn off all peripheral devices connected to the computer and then turn off the computer.
- 4 Remove the system cover.

- 5 Pry the battery out of its socket by pushing from the position marked with "PUSH" with your fingers to remove the battery.



*Figure 3-11. Removing the Battery*

- 6 Insert the new battery into the battery socket with the "+" side facing up.



*Figure 3-12. Installing the Battery*

- 7 Replace the system cover.
- 8 Enter the SETUP program and set the date and time again. Restore any system configuration information that was lost while replacing the battery according to the copy made in step 1.

# Chapter 4

## Update on Installing Windows 95

If you have USB devices connected to your system and (re)installed Windows 95, you must install the Microsoft USB Supplement for Windows 95 after installing Windows 95. The USB Supplement is included in your Windows 95 CD.

After installing USB Supplement for Windows 95, you must install the Bus Master IDE driver for Windows 95. The driver allows Windows 95 to detect and configure PCI devices controlled by the integrated 82371EB PIIX4E bridge chip on the motherboard. Intel 82371xB INF Update Installer will update your system .INF files so that the 82371EB components can be recognized or configured properly in the system.

### Note

If you install the Bus Master IDE driver, you must install it after installing the USB Supplement for Windows 95.

# Installing the USB Supplement for Windows 95

You must install the Microsoft USB Supplement for Windows 95 to configure the USB ports on the motherboard correctly. If you install the USB Supplement, you must install it before installing the Bus Master IDE driver for Windows 95.

Follow these steps to install the USB Supplement:

- 1 Insert Windows 95 CD into your CD-ROM drive.
- 2 Click the Start button and then click Run.
- 3 Type "[CD-ROM drive name]:\OTHER\USB\USBSUPP.EXE" and click OK.
- 4 When prompted with "Install Microsoft USB Supplement to your system?" click Yes.
- 5 At the license agreement screen, review the agreement and then click Yes to continue.
- 6 The installation program runs the ScanDisk utility to check the hard disk drive for errors, and then copies the USB Supplement files to the drive. When all files are copied, the following message is displayed:

Microsoft USB Support Installed! Setup will now restart your system to complete setup. Please close any applications now.

- 7 Close any open applications, remove Windows 95 CD from the CD-ROM drive, and then click OK to restart the system.

# Installing the Bus Master IDE Driver for Windows 95

For detail information on driver installation and verification, see README.TXT file in the Bus Master IDE driver files provided.

## *Enabling the Bus Master IDE Driver for Windows 95*

After installing the Bus Master IDE driver, enable the Bus Master IDE driver as below. To do so, Windows 95 must be version OSR2 (4.00.950B) or later.

- 1 Click Start, point to Settings and then click Control Panel.
- 2 Double click the System icon and click on the Device Manager tab.
- 3 Double click Disk Drives and then double click the IDE drive.
- 4 Click on the Settings tab and check the DMA check box on the tab.
- 5 Click OK and then OK.
- 6 Click Yes to restart the system.

# Appendix A

## Specifications

Processor	Processor type	Intel Single Pentium II (Klamath) processor that runs at 233, 266, 300, or 333 MHz internally/66 MHz externally  Intel Single Pentium II (Deschutes) processor that runs at 300, 350, or 400 MHz internally/100 MHz externally
	L1 cache	32 KB level 1 cache (16 KB data cache; 16 KB instruction cache)
	L2 cache	512 KB pipelined burst, write-back level 2 cache in the Single Edge Contact (SEC) cartridge
	Math coprocessor	Included in microprocessor
Main memory	Architecture	64-bit (non-ECC) or 72-bit (ECC), non-interleaved
	DIMM sockets	Four 168-pin DIMM sockets
	DIMM capacities	8 MB, 16 MB, 32 MB, 64 MB or 128 MB synchronous DRAM (SDRAM)
	Maximum RAM	512 MB
Expansion slots	ISA	Two ISA slots, 98-pins, 16 bit data width, 8.33 MHz bus speed (One slot shared with one PCI slot)
	PCI	Three PCI slots, 120-pins, 32 bit data width, 33 MHz bus speed (One slot shared one ISA slot)
	AGP	One AGP slot, 64 bit data width, 66 (1x) or 133 MHz (2x) bus speed



Core chipset	Intel 82443BX PCI/AGP controller (PAC)	Processor host bus speed up to 66/100 MHz Accelerated Graphics Port controller Integrated PCI bus mastering controller
	Intel 82371EB PCI/ISA/IDE Xcelerator (PIIX4E)	Supports up to four IDE drives or devices Multifunction PCI-to-ISA bridge USB and DMA controllers Two fast IDE interfaces Real-time clock
I/O controller	Serial ports	16550 UART compatible
	Parallel port	Standard Parallel Port (SPP) mode Enhanced Parallel Port (EPP) mode Extended Capabilities Port (ECP) mode
	Diskette drive controller	360 KB, 5.25-inch 1.2 MB, 5.25-inch 720 KB, 3.5-inch 1.44 MB, 3.5-inch 2.88 MB, 3.5-inch
	Keyboard and mouse controller	Supports the key combination [Ctrl] [Alt] [Del] for resetting the system by the keyboard controller
	IrDA	The Infrared Data Association (IrDA) specification supports data transfers of 115 Kbaud at a distance of 1 meter
Ports	Serial port	Two 9-pin D-sub connectors
	Parallel port	One 25-hole D-sub connector
	PS/2 keyboard connector	6-pin mini-DIN
	PS/2 mouse connector	6-pin mini-DIN
	USB connector	Two 4-pin USB-compliant connectors
	IDE connector	Two (primary and secondary) 40-pin connectors on PCI local bus
	Diskette drive connector	34-pin connector
BIOS ROM	2 Mbit flash ROM	
Manufacturing options	<ul style="list-style-type: none"> <li>• Chassis security header</li> <li>• Wake on ring header</li> <li>• Wake on LAN header</li> <li>• PC/PCI header</li> </ul>	

# Power Supply

At least a 200 W power supply should be used for the motherboard. The power supply must provide sufficient +5VSB current (720mA) to support the motherboard's optional Wake On LAN feature and meet the following requirements:

- Rise time for power supply: 2 ms to 20 ms
- Minimum delay for reset to Power Good(PWRGD): 100 ms
- Minimum powerdown warning: 1 ms
- 3.3 V output must reach its minimum regulation level within  $\pm 20$  ms of the +5 V output reaching its minimum regulation level

The table below lists the power supply's tolerances for DC voltages:

DC voltage	Acceptable tolerance
+3.3 V	$\pm 5\%$
+5 V	$\pm 5\%$
+5 VSB (standby)	$\pm 5\%$
-5 V	$\pm 5\%$
+12 V	$\pm 5\%$
-12 V	$\pm 5\%$

# Appendix B

## Motherboard Resources

### DMA Channels

DMA	Data width	System resource
0	8 or 16 bits	
1	8 or 16 bits	Parallel port
2	8 or 16 bits	Diskette drive controller
3	8 or 16 bits	Parallel port (for ECP or EPP)
4		Direct memory access controller
5	16 bits	Open
6	16 bits	Open
7	16 bits	Open

# Interrupts

IRQ	System resource
NMI	I/O channel check
0	Reserved, interval timer
1	Reserved, keyboard buffer full
2	Reserved, cascade interrupt from slave PIC
3	Serial port 2
4	Serial port 1
5	Parallel port 2
6	Diskette drive controller
7	Parallel port 1
8	Real time clock (RTC)
9	Reserved
10	Reserved
11	Reserved
12	PS/2 mouse port
13	Reserved, math coprocessor
14	Primary IDE controller (if present, else user available)
15	Secondary IDE controller (if present, else user available)

\* Default, but can be changed to another IRQ