

# User's Manual

M004 Motherboard



**CREATIVE**  
CREATIVE LABS

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# *User's Manual*

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### Safety Information

**CAUTION:** This device is intended to be installed by the user in a CSA/TUV/UL certified/listed IBM AT or compatible personal computers in the manufacturer's defined operator access area. Check the equipment operating/installation manual and/or with the equipment manufacturer to verify/confirm if your equipment is suitable for user-installed application cards.

**ATTENTION:** Ce carte est destiné à être installé par l'utilisateur, dans un ordinateur compatible certifié CSA/TUV/UL ou listé IBM AT, à l'intérieur de la zone définie par le fabricant. Consulter le mode d'emploi ou le fabricant de l'appareil pour vérifier ou confirmer si l'utilisateur peut y installer lui-même des cartes périphériques.

### Notice for the USA

**FCC Part 15:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, this notice is not a guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician.

**CAUTION:** To comply with the limits for the Class B digital device, pursuant to Part 15 of the FCC Rules, this device must be installed in computer equipment certified to comply with the Class B limits.

All cables used to connect the computer and peripherals must be shielded and grounded. Operation with non-certified computers or non-shielded cables may result in interference to radio or television reception.

### Modifications

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the device.

### Notice for Canada

This apparatus complies with the Class "B" limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations.

Cet appareil est conforme aux normes de CLASSE "B" d'interférence radio tel que spécifiée par le Ministère Canadien des Communications dans les règlements d'interférence radio.

### Compliance

This product conforms to the following Council Directive:

- Directive 89/336/EEC, 92/31/EEC (EMC)

### CE Notice

The following standards were applied to this product, in order to achieve compliance with the electromagnetic compatibility:

- Immunity in accordance with EN 50082-1: 1992
- Emissions in accordance with EN 55022: 1987 Class B

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# Introduction

Thank you for purchasing the M004 motherboard. It is a highly integrated IBM PC/AT compatible system board designed to meet the industry's most demanding desktop applications.

This manual provides you with information on how to set up your motherboard:

- ❑ Chapter 1, “The M004 Motherboard”  
Gives you a list of the motherboard's capabilities and features. It also provides the motherboard's technical specifications and a diagram of the motherboard's layout.
- ❑ Chapter 2, “The Pentium® II Processor”  
Gives you a brief introduction on the Intel® Pentium II processor and shows you how to mount the processor on the motherboard.
- ❑ Chapter 3, “The Celeron™ Processor”  
Gives you a brief introduction on the Intel Celeron processor and shows you how to mount the processor on the motherboard.
- ❑ Chapter 4, “Connectors”  
Provides information on the connectors on your motherboard.
- ❑ Chapter 5, “Jumper Settings”  
Provides information on the location and settings of the jumpers on your motherboard.
- ❑ Chapter 6, “Memory Configuration and BIOS Settings”  
Provides instructions on how to specify BIOS settings in the CMOS Setup utility. It also provides a list of descriptions for the setup items and a table of recommended settings for some of these items.






# Document Conventions

This manual uses the following conventions to help you locate and identify the information you need.

*Table i: Text conventions.*

<b>Text Elements</b>	<b>Use</b>
<b>bold</b>	Text that must be entered exactly as it appears.
<i>italic</i>	Title of a book or a placeholder. A placeholder represents information that you must provide.
UPPERCASE	Directory name, file name, or acronym.
< >	Symbols, letters, and key names on the keyboard.

*Table ii: Icons.*

<b>Icon</b>	<b>Use</b>
	Note.
	Warning.
	Tip.

---

## The M004 Motherboard

This chapter is organized into the following sections:

- ❑ Features
- ❑ Specifications

---

### Features

M004 is a highly integrated IBM PC/AT compatible system board designed to meet the industry's most demanding desktop applications.

This motherboard is based on the Intel 82440BX AGPset chipset which supports Pentium® II processors with processor speeds of up to 500 MHz with MMX technology. It has four 168-pin Dual Inline Memory Module (DIMM) sockets supporting up to 1024 MB of SDRAM.

M004 also comes with an Accelerated Graphics Port (AGP) slot, a high-performance hardware interface for graphics-intensive applications, such as 3D applications. The AGP slot is independent of the Peripheral Component Interconnect (PCI) bus and is designed to be used exclusively with graphic display devices. The M004 supports 3.3 V AGP devices with data transfer rates up to 133 MHz, and it allows a data throughput rate of 500 MB/sec.

M004 is built with four PCI bus slots, thus providing a high bandwidth data path for intensive data movement functions. In addition, M004 has three ISA slots.

The Intel's 82440BX AGPset chipset provides an integrated Bus Mastering IDE controller with two high-performance IDE interfaces. You can connect up to four IDE devices to the controller and achieve data transfer rates of up to 33 MB/sec.

The onboard Giga I/O controller provides standard PC I/O functions: floppy drive interface, two First In First Out (FIFO) serial ports, an Infrared Data Association (IrDA) device port, and a parallel port that supports Standard Parallel Port (SPP), Enhanced Parallel Port (EPP), and Extended Capabilities Port (ECP).

---

## Specifications

### **Intel Chipset**

Features Intel's 440BX AGPset with I/O subsystems.

### **CPU Support**

Intel Pentium II 233~333 MHz (at 66 MHz system bus frequency) and 350~500 (at 100 MHz system bus frequency in ) or Intel Celeron processor 266 MHz, 300 MHz and 333 MHz.

### **Versatile Memory Supports**

Four DIMM sockets that support 168-pin 3.3V SDRAM memory modules, with maximum possible memory size of up to 1024 MB. Configurable support for Error Checking (EC) and Error Checking and Correcting (ECC).

### **PCI and ISA Expansion Slots**

Provides four 32-bit PCI slots and three 16-bit ISA slots.

### **AGP Slot**

Supports AGP cards for high-performance, component-level connection targeted at 3D graphical display applications.

### **Onboard GiGA-I/O**

Provides one floppy drive port, one optional PS/2 mouse connector, two high-speed 16C550 UART compatible serial ports and one parallel port with SPP, ECP and EPP capabilities. Serial Port 2 can also be directed from COM2 to the infrared module for wireless connections.

## **Onboard PCI Bus Master IDE Controller**

Two Ultra DMA/33 Bus Master IDE ports that support four IDE devices and provide data transfer rates of up to 33 MB/sec. This controller supports Enhanced PIO Modes 3 and 4, and Bus Master IDE DMA Mode 2 devices.

## **Onboard 20-pin ATX Power Supply**

Provides ATX power connector onboard supports soft-on/off function.

## **System BIOS**

Provides licensed Award V4.51PG BIOS on Flash Electrically Erasable Programmable Read-Only Memory (EEPROM). Supports Green PC, DMI and bundled with NCR SCSI BIOS.

## **ACPI**

Support ACPI (Advanced Configuration and Power Interface) function. ACPI provides more energy-saving features for future operating systems that support OS Direct Power Management (OSPM) functionality.

## **Board Size**

ATX form factor 305mm x 170mm.

## **Advanced Features**

### **Low EMI**

Built-in Spread Spectrum.  $\pm 1.5\%$  modulation and automatic clock shut-off of unused PCI/SDRAMS slots to reduce the EMI.

❑ **Dual Function Power Button**

The system can be in one of two modes, Suspend or Soft-off. If you hold the Power button down for less than 4 seconds, the system will go into the Suspend mode. If you hold the Power button for more than 4 seconds, the system will go into the Soft-off mode.

Use the CMOS Setup Utility to specify the mode you want. For details, see the section “Power Management Setup” on page 6-15.

❑ **Modem Ring Power-on**

Automatic switching on of the system when the modem ring is activated.

Figure 1-1 on page 1-5 is a diagram of the M004 motherboard for your reference.

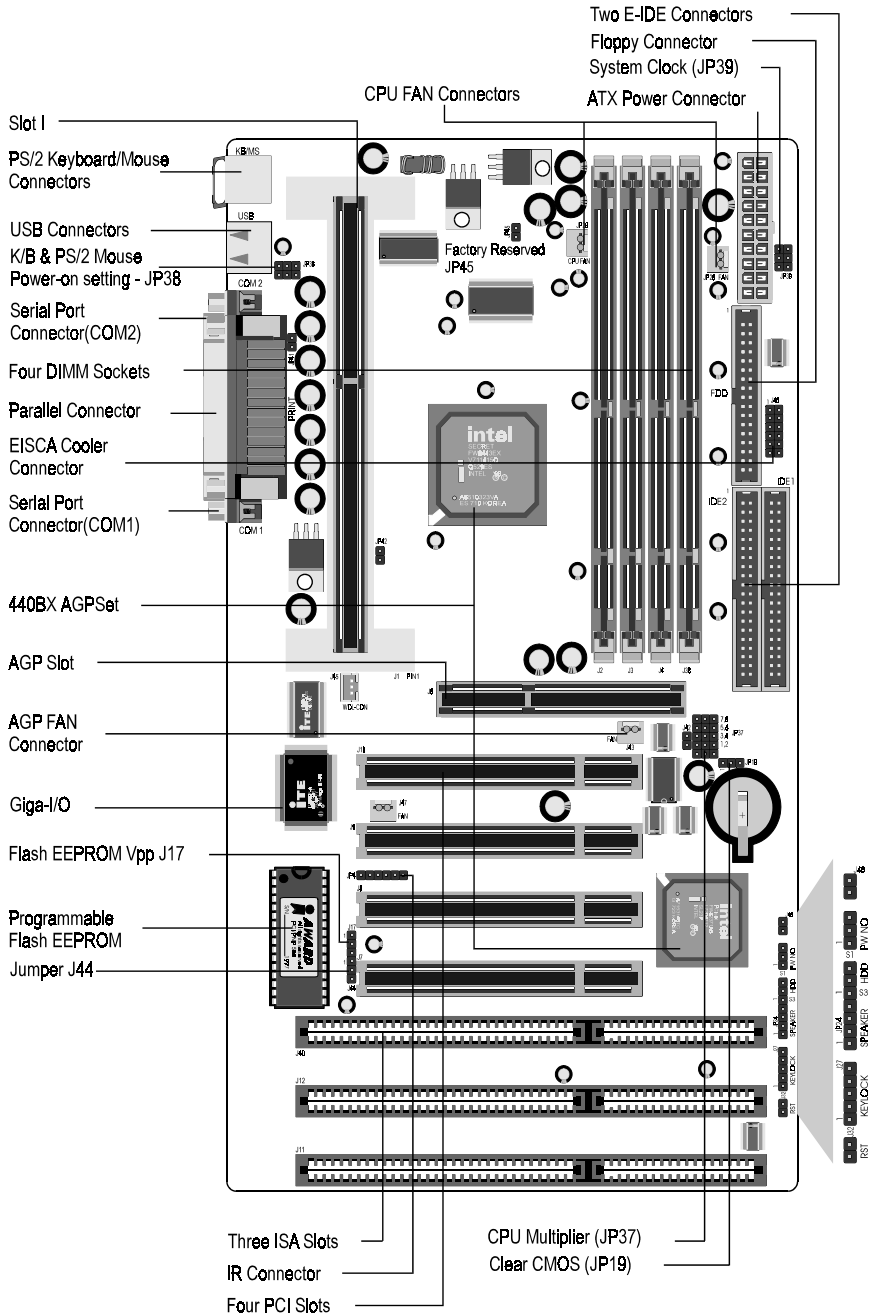


Figure 1-1: The M004 motherboard.

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# The Pentium<sup>®</sup> II Processor

This chapter consists of the following sections:

- ❑ About the Pentium II Processor
- ❑ Installing the Hardware for the Pentium II Processor

---

## About the Pentium II Processor

The Pentium II processor and the Celeron™ processor are the latest additions to the P6 processor family. They combine the architectural advances in the Pentium Pro processor with the instruction set extensions of MMX technology. They are fully compatible with the huge base of Intel architecture-based PC software.

In addition, the Pentium II processor delivers new levels of performance for advanced media and communications software including powerful, realistic graphics and imaging capabilities, video conferencing, and the ability to run full-screen, full-motion video. The combination of these advanced features makes the Pentium II processor the ideal choice for executing modern 32-bit CPU-intensive and multimedia-enhanced application work loads using advanced 32-bit operating systems.

The Pentium II processor has a separate 32 KB, on-chip, non-blocking Level 1 cache which runs at the same speed as the processor. It also has a 512 KB or 256 KB onboard Level 2 non-blocking cache which runs at half the speed of the processor.

---

# Installing the Hardware for the Pentium II Processor

The Pentium II processor uses Single Edge Contact (SEC) cartridge packaging technology which enables high volume availability and improved handling protection.

Figure 2-1 shows the front, rear, and top views of the Pentium II processor (without heat sink mounted).

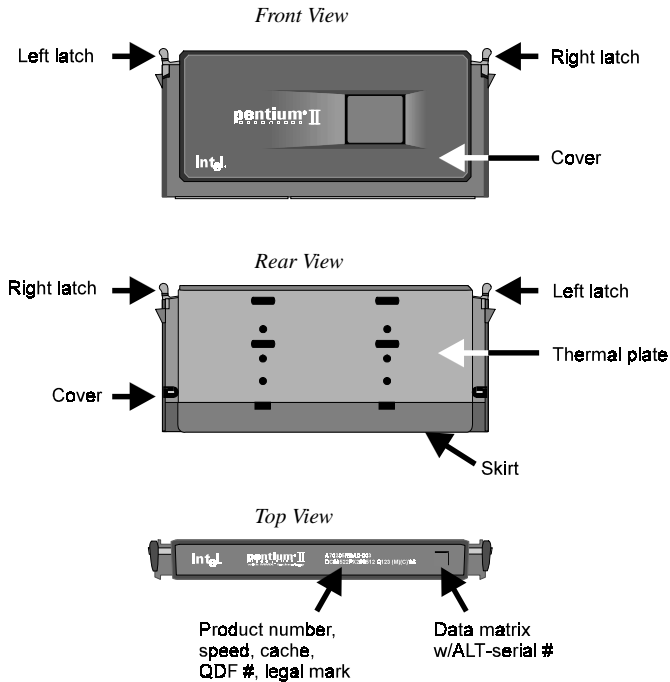


Figure 2-1: Different views of the Pentium II processor.

The Pentium II processor requires the Retention Mechanism (RM) and the Heat Sink Support (HSS) to hold the base processor in the SEC cartridge.

The following sections will show you how to install the RM and HSS. If you should need help with the mechanism, please contact your dealer.



Before you proceed, do the following:

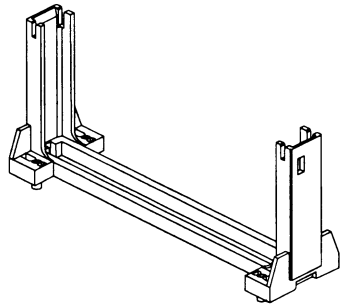
1. Switch off the computer.
2. Remove the motherboard from the chassis.
3. Place it on a workbench.
4. Remove all DIMM chips, cables, and cards from the motherboard so that it is bare.

## Components of the Pentium II Processor's retention mechanism

The Retention Mechanism (RM) consists of the following parts:

□ **Retention Mechanism (RM)**

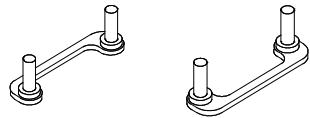
A plastic guide with captive nuts that hold the SEC cartridge in the Slot 1 connector.



*Figure 2-2: The Retention Mechanism.*

□ **RM Attachment Mounts (RMAM)**

Bolt/bridge assemblies inserted through the RM to secure it to the motherboard. Two RMAM assemblies are required for each RM.



*Figure 2-3: The RM attachment mounts.*

## Step 1: To install the retention mechanism

1. Locate the Retention Mechanism (RM) mounting holes and the “Pin 1” mark of Slot 1 on the motherboard (see Figure 2-4).

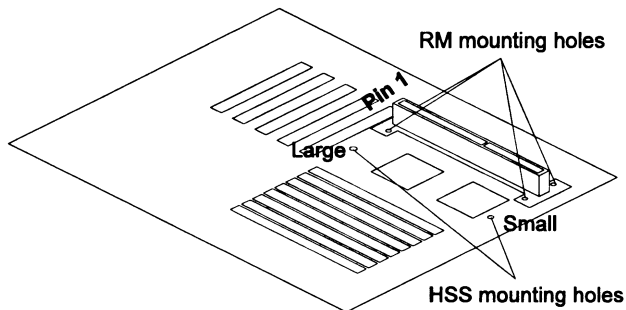


Figure 2-4: Locating the mounting holes on the motherboard.

2. Mount the RM onto Slot 1. Make sure that the square cut mark of the RM has the same orientation as Pin 1 of Slot 1. See Figure 2-5.

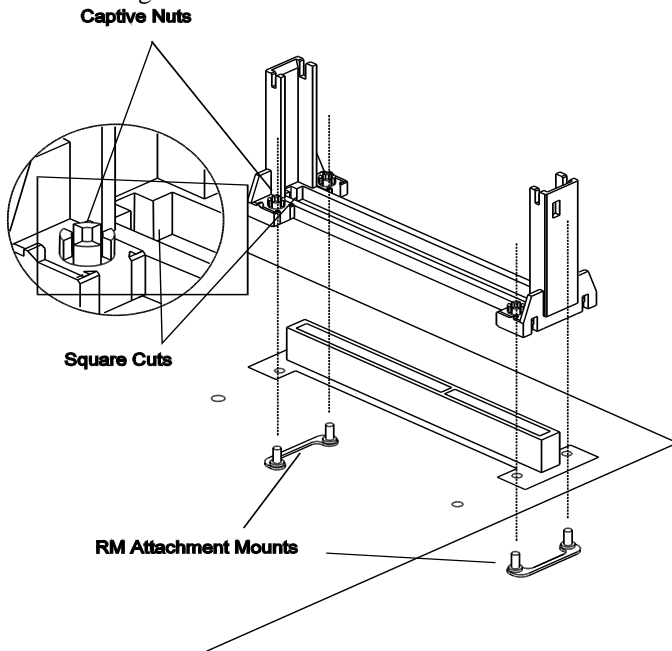


Figure 2-5: Mounting the RM onto Slot 1.

3. Insert the four RMAM pegs through the motherboard and the RM. Secure the RM to the RMAM assemblies by screwing the four captive nuts onto the four RMAM pegs. (see Figure 2-5.)



Two RMAMs and four captive nuts are required for each assembly.

## Components of the Pentium II Processor's heat sink support

The Heat Sink Support (HSS) consists of the following parts:

**HSS Base**

A plastic support bar mounted to the motherboard under the ATX heat sink.

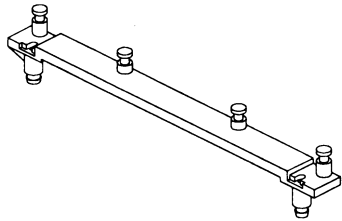


Figure 2-6: The HSS base.

**HSS Pins**

Plastic pins inserted through the HSS base to secure it to the motherboard. Two pins are required for each assembly.

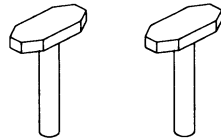


Figure 2-7: The HSS pins.

**HSS Top Bar**

A plastic bar that clips onto the HSS base through the fins of the ATX heat sink.

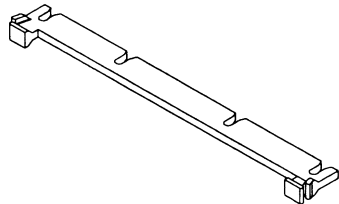


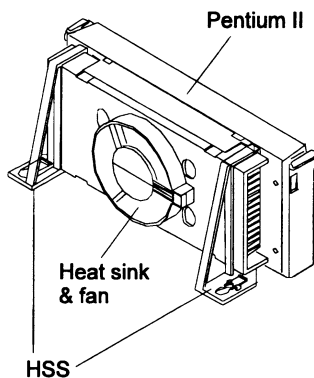
Figure 2-8: The HSS top bar.

## Step 2: To install the heat sink support

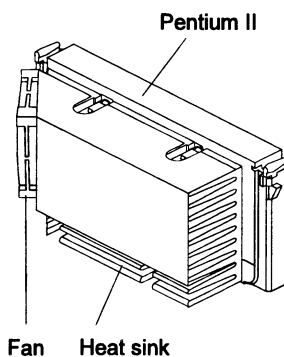


Before you install the heat sink support, please verify if your Pentium II processor is the Intel boxed processor or the OEM type Pentium II processor with active heat sink (see Figure 2-9). If you have an Intel boxed processor, ignore this section. Intel boxed processor kits include their own heat sink support accessories and installation manuals. Refer to Intel's installation manual if you are using an Intel boxed processor.

*The Intel boxed processor*



*The OEM type processor with active heat sink*



*Figure 2-9: The two types of Pentium II processors.*

1. Locate the Heat Sink Support (HSS) mounting holes on the motherboard. Note that one hole is larger than the other. See Figure 2-10.

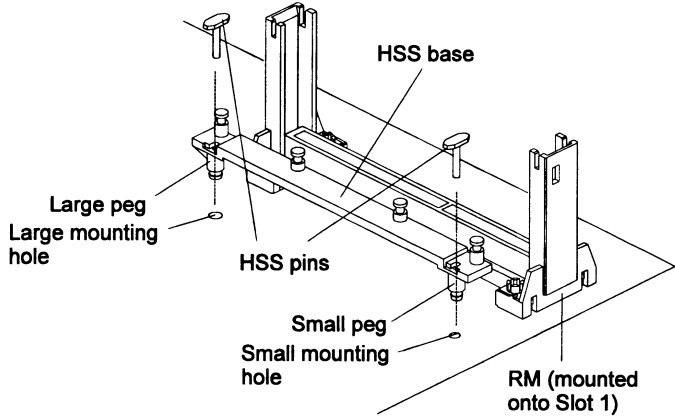


Figure 2-10: The large and small HSS mounting holes on the motherboard.

2. Line up the two plastic pegs on the bottom of the HSS base with the corresponding holes on the motherboard. Note that one peg is larger than the other (see Figure 2-10).
3. Push the pegs firmly into the holes to mount the HSS base onto the motherboard.
4. Insert the HSS pins through the HSS base to secure it to the motherboard (see Figure 2-10).

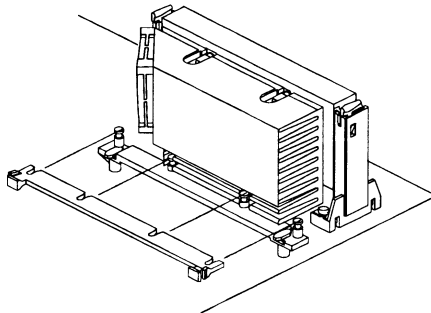


Figure 2-11: Sliding the HSS top bar onto the HSS base.

5. Proceed to Step 3: To mount the Pentium II processor.

### Step 3: To mount the Pentium II processor

1. Push the latches on the processor toward the center of the processor until they click into place (see Figure 2-12).

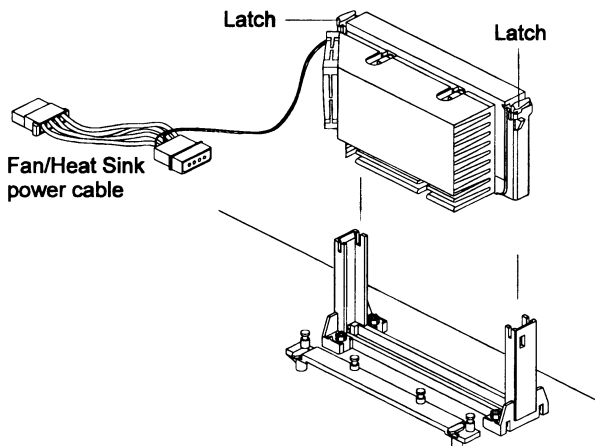


Figure 2-12: Mounting the Pentium II processor.

2. Hold the processor so that the fan shroud is facing toward the HSS base on the motherboard.
3. Slide the processor into the RM. Ensure that the alignment notch in the processor fits over the plug in Slot 1.
4. Push the processor down firmly, with even pressure on both sides of the top, until it is seated.
5. Push the latches on the processor outward until they click into place in the RM.



The latches must lock into place to ensure proper electrical connectivity of the processor.

6. Slide the HSS top on the supports forward to clip onto the HSS base through the fins of the heat sink.
7. Depending on the type of the Fan/Heat Sink power cable, attach the end of the power cable either to the three-pin connector on the motherboard or to the power cord of the ATX power supply.

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## The Celeron™ Processor

This chapter is organized into the following sections:

- ❑ About the Celeron Processor
- ❑ Installing the Hardware for the Celeron Processor

---

### About the Celeron Processor

The Pentium® II processor and the Celeron processor are the latest additions to the P6 processor family. They combine the architectural advances in the Pentium Pro processor with the instruction set extensions of MMX technology. They are fully compatible with the huge base of Intel architecture-based PC software.

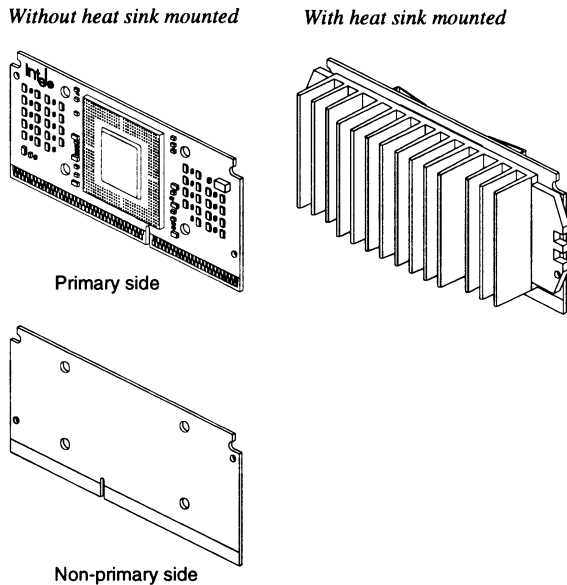
The Celeron processor has a separate 32 KB, on-chip, non-blocking Level 1 cache which runs at the same speed as the processor.

---

# Installing the Hardware for the Celeron Processor

The Celeron processor uses Single Edge Processor Package (SEPP) technology.

Figure 3-1 shows the Celeron processor with and without heat sink mounted.



*Figure 3-1: The Celeron processor.*

Before you proceed, do the following:

1. Switch off the computer.
2. Remove the motherboard from the chassis.
3. Place it on a workbench.
4. Remove all DIMM chips, cables, and cards from the motherboard so that it is bare.



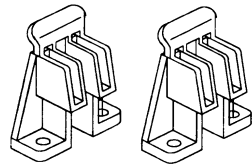
## Components of the Celeron Processor's retention mechanism

With Celeron processors, the Retention Mechanism (RM) is used to hold the base processor in the SEPP. The following instructions will show you how to mount the RM first before showing you how to install the processor. If you should need help with the mechanism, please contact your dealer.

The RM package consists of 2 sets of components. Each set consists of one RM, two post pins, and two lock pins.

**Retention Mechanism (RM)**

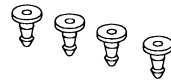
Two plastic guides that hold the SEPP in the Slot 1 connector.



Plastic guides

**Post pins**

Four post pins are pushed into the RM's holes to secure the RM onto the motherboard.



Post pins

**Lock pins**

Four lock pins are pushed into the post pins' holes to lock the RM to the motherboard.



Lock pins

*Figure 3-2: The Retention Mechanism.*

## Step 1: To assemble the retention mechanism

1. Locate the RM mounting holes of Slot 1 on the motherboard.  
(See Figure 3-3.)
2. Align the two plastic guides with the two ends of Slot 1. Make sure that the two guides face each other.
3. Insert four post pins through the RM to secure it to the motherboard.
4. Insert four lock pins through the post pins to lock the RM to the motherboard.

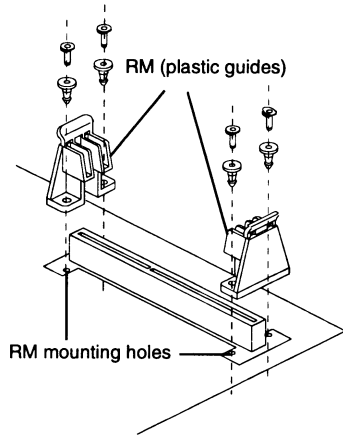
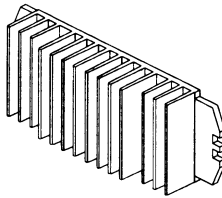


Figure 3-3: Assembling the RM.

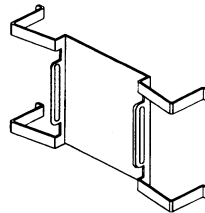
## Components of the Celeron Processor's heat sink

Figure 2-4 shows the components of the heat sink for the Celeron processor:

- Heat Sink (HS)
- HS retention clip



Heat Sink

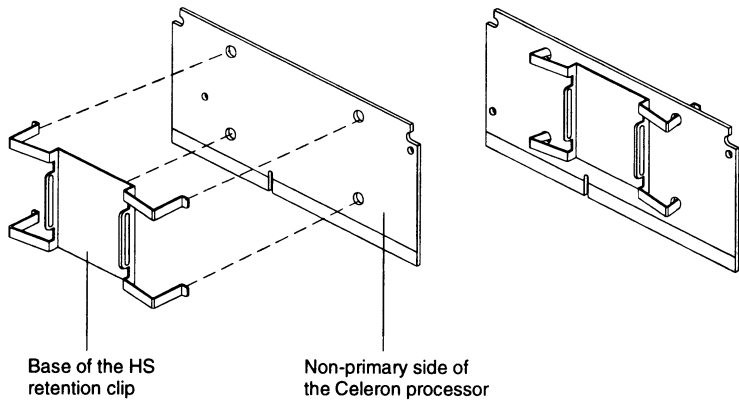


HS retention clip

Figure 3-4: Components of the Heat Sink.

## Step 2: To mount the heat sink onto the Celeron processor

1. Assemble all parts on a static-free bench with proper operator grounding and an ESD mat.
2. Carefully insert all four legs of the HS retention clip into the Celeron processor.  
The base of the HS retention clip must be located on the non-primary side of the processor (see Figure 3-5).



*Figure 3-5: Inserting the heat sink retention clip into the non-primary side of the Celeron processor.*



The side of the clip which touches the substrate surface on the processor is covered with a mylar insulator. This insulator prevents the clip from shorting lines on the substrate.

3. Remove the blue film covering the thermal interface.



The blue film protects the thermal interface from damage during shipping.

4. Turn the processor around so that the primary side is now facing the heat sink.
5. Insert the two left legs of the HS retention clip fully into the heat sink (see Figure 3-6).

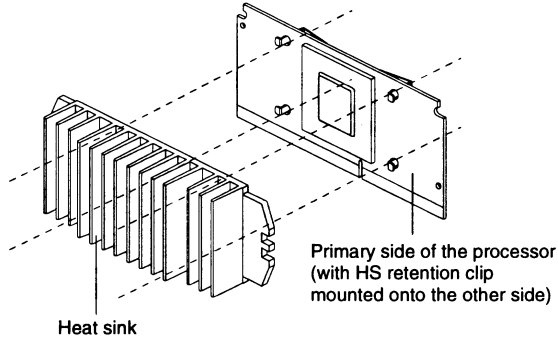


Figure 3-6: Inserting the left legs of the clip into the heat sink.

6. Hold the processor between the HS retention clip and the heat sink.



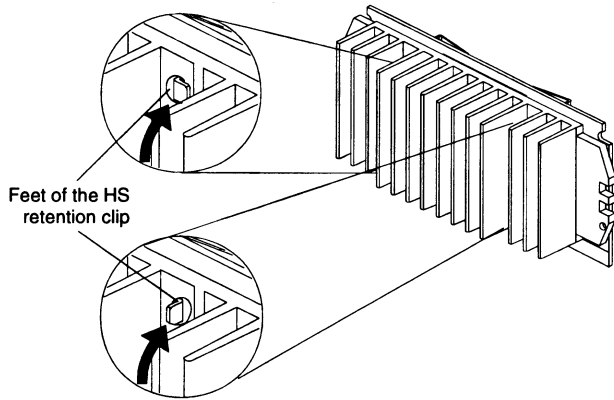
Do not bend or apply pressure directly to the SEPP.

7. Use a non-metallic bar stock or screwdriver to push the remaining two clip legs into the heat sink.



Do not allow the bar stock or screwdriver to come into contact with the processor because the bar stock or screwdriver may scratch the processor's surface.

8. Verify that all the feet of the clip are fully inserted and the clip is firmly attached to the heat sink (see Figure 2-21).



*Figure 3-7: Verifying that the clip is firmly attached to the heat sink.*

9. Proceed to Step 3: To mount the Celeron processor.

### Step 3: To mount the Celeron processor

1. Hold the processor so that the heat sink is facing toward the DIMM sockets on the motherboard.
2. Align the processor with the RM and slowly slide the processor into it (see Figure 3-8).

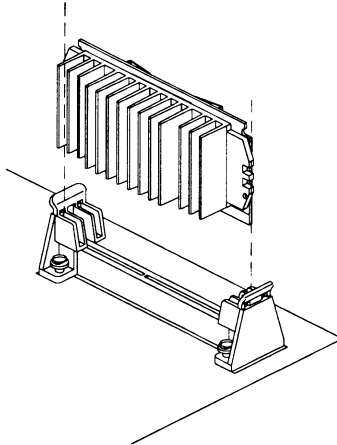


Figure 3-8: Inserting the Celeron processor into its RM.

3. Push the processor down firmly, with even pressure on both sides, until it is seated firmly in the RM (see Figure 3-9).

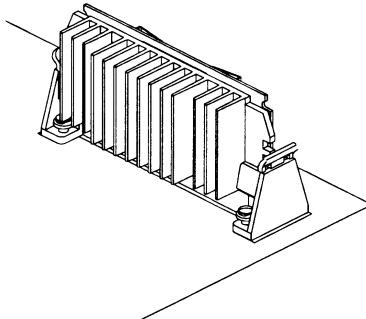


Figure 3-9: The Celeron processor in its RM.

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# Connectors

This chapter is organized into the following sections:

- Front Panel Connectors
- Back Panel Connectors
- Other Connectors

---

## Front Panel Connectors

Figure 4-1 below shows the positions of the front panel connectors on your motherboard.

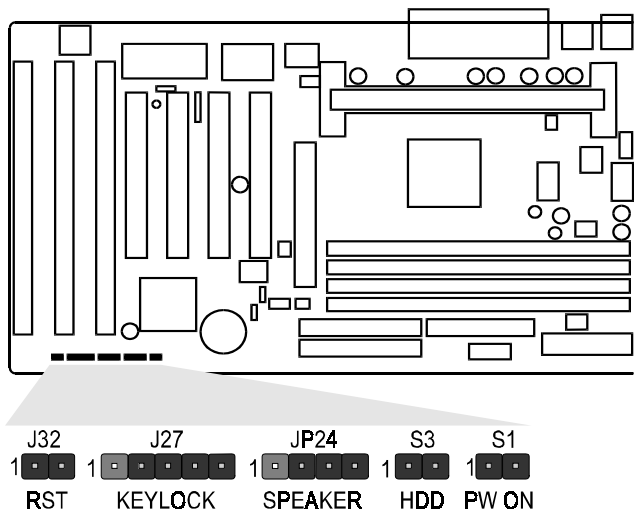


Figure 4-1: The front panel connectors.

### Hardware Reset Connector (J32)

A 2-pin hardware reset switch is attached to it. Closing the reset switch restarts the system.

### KeyLock Connector (J27)

The KeyLock & Power LED connector is a 5-pin connector for a physical lock that may be installed on the system casing for locking the keyboard. It is also connected to the casing's Power LED. Pins 1 and 3 are for the power LED, pins 4 and 5 are for keylock, and pin 2 is empty.

### Speaker Connector (JP24)

You may attach a 4-pin PC speaker cable to the PC speaker connector.

### HD LED Connector (S3)

A 2-pin IDE drive LED cable is attached to this connector. The LED lights up when an IDE device is active.

### ATX Power On/Off Switch Connector (S1)

A 2-pin momentary type switch is attached to this connector. The switch is used to turn your ATX power supply on and off.

---

## Back Panel Connectors

Figure 4-2 below shows the back panel connectors of your motherboard.

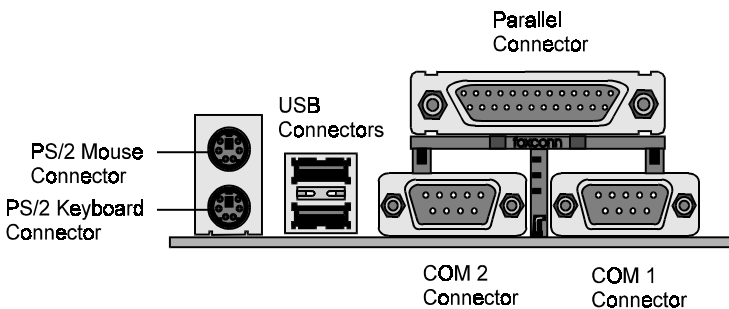


Figure 4-2: The back panel connectors.

### COM1/COM2 Connectors

Attach COM1/COM2 device cables to these connectors.



## PS/2 Keyboard & PS/2 Mouse Connectors

Two 6-pin female PS/2 keyboard & Mouse Connectors are located at the rear of the motherboard. The PS/2 Mouse connector is on top of the PS/2 Keyboard connector. Plug the PS/2 keyboard and mouse into their respective connectors.

## Parallel Port Connector

A 25-pin female connector is located at the rear of the motherboard. Plug the parallel port device cable into this connector.

## USB1/USB2 Port Connectors

Two female USB connectors are located at the rear of the board. Plug USB devices into these connectors.

---

# Other Connectors

## ATX Power Supply Connector (J31)

It is a twenty-pin male connector. Plug the connector from the power supply directly into the board connector. Make sure that pin 1 is inserted into the correct position. The motherboard requires a power supply of at least 200 watts with good power transmission.

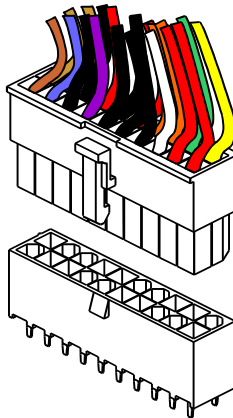


Figure 4-3: The ATX Power Supply connector.

## IR Connector (JP4)

You can attach a 5-pin infrared device cable to the JP4 IR connector from an infrared receiver in order to use the infrared transfer function.

The M004 motherboard meets ASKIR and HPSIR specifications. It is also fully compatible with Creative's infrared receiver for a wireless interface. The Creative infrared receiver re-routes commands it receives from the credit card-sized Creative iNFRA Remote controller to the COM2 serial port of the host computer.

Use the CMOS Setup Utility to enable the infrared receiver. For details, see the section "Integrated Peripherals" on page 6-20.

Figure 4-4 shows JP4's pin assignment and location..

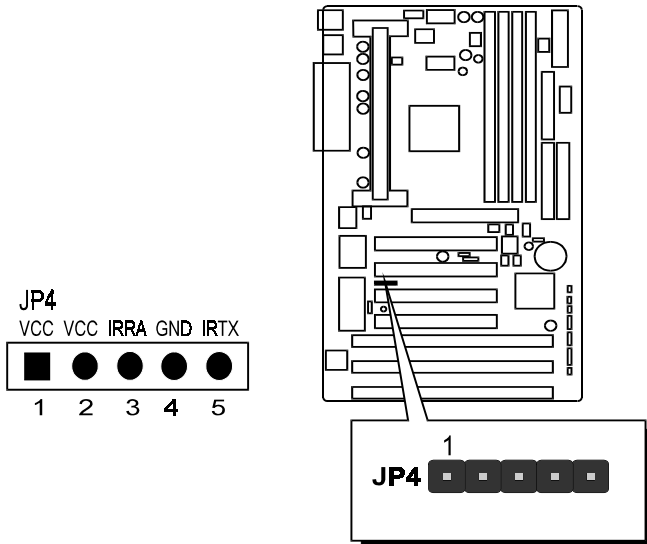


Figure 4-4: JP22's pin assignment and location.

## CPU, Chassis & AGP cooling FAN connectors (JP29, JP28, J43 and J47)

The motherboard provides three onboard 12 V cooling fan power connectors for the CPU (JP28 and JP29), Chassis (J43) and AGP device (J47) cooling fans. Depending on the fan's manufacturer, the wiring and plug type may be different. The red wire should be connected to +12 V and the black wire should be connected to ground (GND).

## Wake-On-LAN Connectors (J45)

You can attach a 3-pin connector from a LAN card which supports the Wake-On-LAN (WOL) feature to this connector. This feature allows users to wake the connected system through the LAN card.

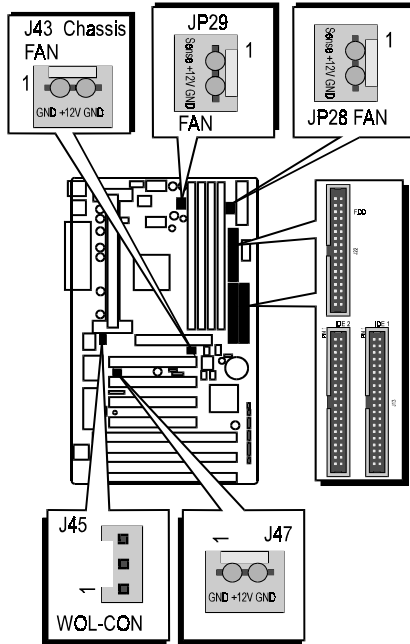


Figure 4-5: Locations of the FAN and Wake-On-LAN connectors.

## Enhanced IDE and Floppy connectors

The motherboard is shipped with one 40-pin ribbon cable for IDE hard disk drives and one 34-pin ribbon cable for floppy disk drives. Make sure that the colored or dotted stripe of each cable is aligned to Pin 1 of its corresponding connector.

# 5

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## Jumper Settings

This chapter is organized into the following sections:

- ❑ About Jumpers
- ❑ Changing Jumper Settings





---

### About Jumpers

Several hardware settings are made through the use of jumper caps to connect jumper pins on the motherboard. Pin 1 of each jumper on the motherboard is either on the top or the left of the jumper when holding the motherboard with the keyboard connector away from yourself.

Table 5-1 below shows the jumper conventions used in this manual:

*Table 5-1: Jumper conventions.*

2-pin Jumper Settings	Represented As	3-pin Jumper Settings	Represented As
Closed (On)		Pin 1-2 Closed (On)	
Open (Off)		Pin 2-3 Closed (On)	

#### To close a jumper

- ▶ Place a jumper cap over the two jumper pins.

#### To open a jumper

- ▶ Remove the jumper cap from the two jumper pins.



Instead of removing the jumper cap completely, you can place the cap over one pin so that the cap will not be lost.

---

# Changing Jumper Settings

This section provides instructions on how to configure some important jumpers on your motherboard. These jumpers have already been set to the factory default. If you do not need to change the jumper settings, you can leave them as the factory default.



Do not change the jumper settings unless you are an advanced user. Changing the jumper settings incorrectly may cause your system to stop functioning.

Figure 5-1 is a diagram showing the relative positions of some of the jumpers on the M004 motherboard.

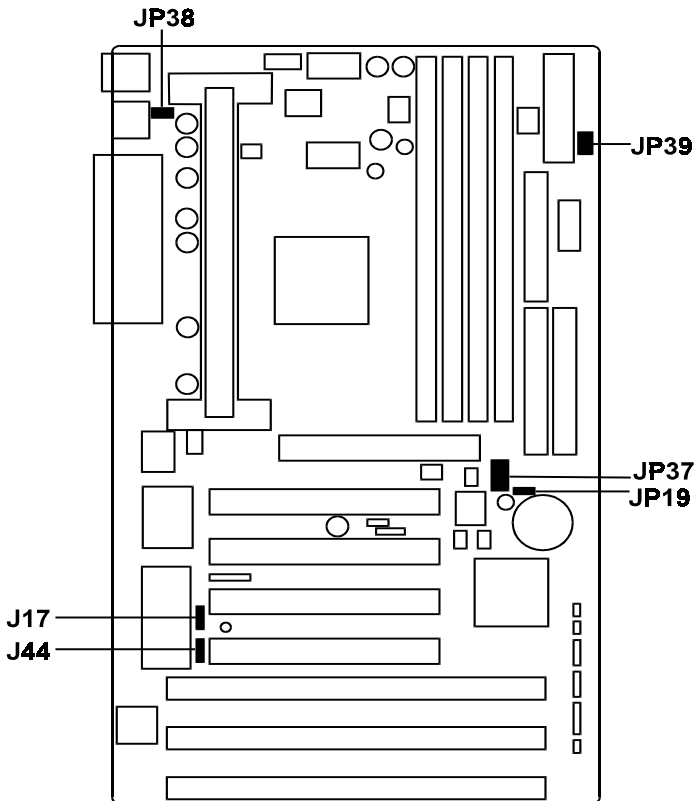


Figure 5-1: Relative positions of jumpers on the M004 motherboard.

## To configure the CPU bus clock multiplier

The JP37 jumper is used to configure the CPU bus clock multiplier. If you want the CPU clock speed to be set by BIOS, do not remove the jumper pack from the JP37 jumper (Auto setting). As the motherboard features CPU Plug & Play function, the BIOS will select the CPU clock speed corresponding to the 233 MHz or 350 MHz processor automatically when the system is switched on for the first time. The clock speed selected will depend on your CPU type. If the CPU clock speed is higher than that selected, you can use the CMOS Setup utility to change it.

Alternatively, if you want to specify the CPU clock speed manually, you should first remove the jumper pack and use the JP37 jumper settings shown below to achieve the multiplier ratio you want (Manual setting). You can then use JP39 jumper settings to set the CPU clock speed manually.

Table 5-2 shows the multiplier needed for various processor speeds with the system clock speed at 66 MHz and at 100 MHz.

*Table 5-2: Settings for System Clock and Multiplier.*

<b>Pentium II/ Celeron Processor</b>	<b>System Clock</b>	<b>Multiplier</b>	<b>Pentium II Processor</b>	<b>System Clock</b>	<b>Multiplier</b>
233 MHz	66 MHz	3.5x	350 MHz	100 MHz	3.5x
266 MHz	66 MHz	4x	400 MHz	100 MHz	4x
300 MHz	66 MHz	4.5x	450 MHz	100 MHz	4.5x
333 MHz	66 MHz	5x	500 MHz	100 MHz	5x

### **To retain the JP37 jumper Auto setting**

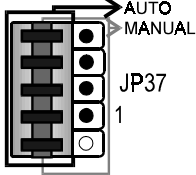
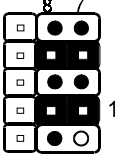
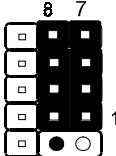
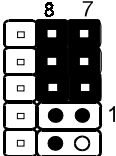
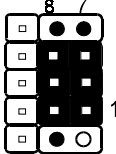
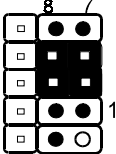
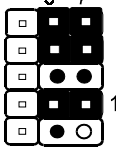
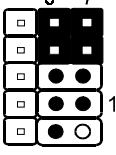
- ▶ Leave the jumper pack on JP37.

### **To configure the Host Bus Clock/CPU Core Clock ratio (multiplier) manually**

- ▶ Remove the jumper pack, and then set the jumper according to the multiplier that you want (see Table 5-3).

Table 5-3 shows all the multipliers that the motherboard supports.

Table 5-3: Jumper Settings for Multiplier.

Multiplier	JP37 Jumper	Multiplier	JP37 Jumper
Setting from BIOS (Default): 2x - 5x		3.5x	
2x		4x	
2.5x		4.5x	
3x		5x	

## To configure the CPU external clock (system frequency)

The motherboard's clock generator provides an adjustable system clock frequency. The JP39 jumper is used to indicate the system clock frequency which can range from 50 MHz to 112 MHz. The CPU Plug & Play function is supported with a default 100 MHz system frequency.



JP39 jumper settings cannot be used if the jumper pack is left on the JP37 jumper (Auto setting).

Table 5-4 shows various speeds of the system bus clock that the motherboard supports.

*Table 5-4: JP39 Jumper Settings for PCI Bus Clock.*

System Clock	JP39 Jumper settings for 66 MHz-based processor	JP39 Jumper settings for 100 MHz-based processor
50 MHz		
66 MHz		
75 MHz		
83 MHz		
100 MHz (Default)	Not Applicable	
103 MHz	Not Applicable	
112 MHz	Not Applicable	



For 66 MHz-based Pentium II/Celeron processors, 75 MHz and 83 MHz are for overclocking the CPU bus. For 100 MHz-based Pentium II processors, 103 MHz and 112 MHz are for overclocking the CPU bus. Generally, overclocking the CPU bus is not a recommended practice.



## To overclock a 66 MHz-based processor

Use the JP45 jumper if you want to force your 66 MHz-based processor to run like a 100 MHz-based processor. JP45 fulfills a function which will not be available to you otherwise. Once overclocked, you can specify the exact system frequency and bus clock multiplier as you would for a 100 MHz-based processor. The whole range of 100 MHz-based processor settings will be available.

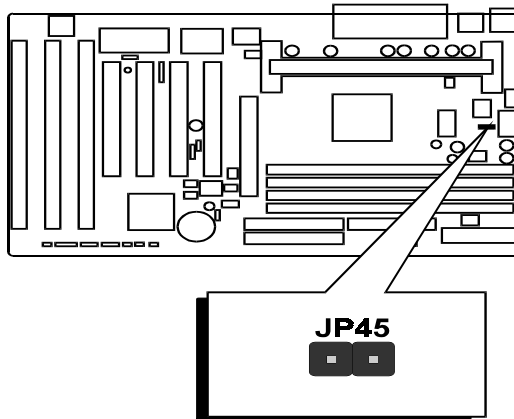


Figure 5-2: Location of JP45.

### To overclock your 66 MHz-based processor to a 100 MHz-based processor

- ▶ Remove the jumper cap from JP45 pins 1 and 2.

## To clear the CMOS



Under some unusual circumstances, the configuration record created by the CMOS Setup utility can become corrupted and unusable. This can cause the motherboard to stop functioning properly. In such cases, you need to clear the CMOS record by using jumper JP19.

To clear the CMOS

1. Switch off the computer.
2. Remove the jumper cap from JP19 pins 1 and 2.
3. Place the jumper cap over JP19 pins 2 and 3 for two seconds.

4. Remove the jumper cap from pins 2 and 3.
5. Place the jumper cap back on pins 1 and 2.



*Table 5-5: Jumper Settings for CMOS.*

Clear CMOS	JP19 Jumper
Clear CMOS	
Normal Operation (Default Setting)	

## To flash the EEPROM Vpp

The M004 motherboard supports two types of flash EEPROM: 5 V and 12 V. By setting up jumper J17, the motherboard can use either 5 V or 12 V to flash the EEPROM with new system BIOS files when necessary.

*Table 5-6: Jumper Settings for Flash EEPROM.*

Flash EEPROM Vpp	J17 Jumper
12V	
5V (Default Setting)	

## To enable or disable the keyboard & PS/2 mouse Power-On function

The M004 motherboard has a power-on by keyboard and PS/2 mouse feature. You can switch on the system with any keystroke (or with an assigned hot-key) or by double-clicking the PS/2 mouse.


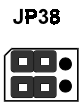



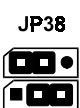

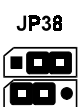


Power-on by serial mouse is not supported.

J44 and JP38 are jumpers used to enable or disable the keyboard and PS/2 mouse power-on function.

When you enable the keyboard & PS/2 Mouse power-on function, you also have to make the appropriate adjustments to the POWER ON Function item in the Integrated Peripherals screen of the CMOS Setup utility. For details, see Table 6-9, “The Integrated Peripherals Screen items.,” on page 6-21.

*Table 5-7: Jumper Settings for Keyboard and PS/2 Mouse.*

Keyboard Power-on	PS/2 Mouse Power-on	J44, JP38 Jumpers
Disabled	Disabled	 
Enabled	Enabled	 
Disabled (Default Setting)	Enabled (Default Setting)	 
Enabled	Disabled	 

---

# Memory Configuration and BIOS Settings

This chapter is organized into the following sections:

- ❑ Memory Configuration
- ❑ BIOS Settings

---

## Memory Configuration

The motherboard provides four 168-pin DIMM sockets that make it possible to install from 8 MB up to 512 MB of 66 MHz or 100 MHz SDRAM. The DIMM sockets support 8 MB, 16 MB, 32 MB, 64 MB, 128 MB and 256 MB 3.3 V single- or double-sided SDRAM DIMM.

The four DIMM sockets are arranged in four banks of one socket each. Each bank provides a 64/72-bit wide data path.

The M004 provides optional data integrity features, including EC (Error Checking) and ECC (Error Checking and Correcting) in the memory array. The EC mode provides single- and multiple-bit error detection. The ECC mode provides error checking and correction of the data during reads from the DRAM. To support ECC, you must use true 72-bit parity-type (as opposed to phantom parity generated by TTL chips) DIMM for all modules.

**Table 6-1:** *Install memory in any or all of the banks in any combination as follows*

<b>DIMM Socket</b>	<b>Memory Modules</b>	<b>Module Quantity</b>
DIMM 0	8 MB, 16 MB, 32 MB, 64 MB, 128 MB, 256 MB 168-pin 3.3V 66 MHz or 100 MHz PC SDRAM DIMM	x1
DIMM 1	8 MB, 16 MB, 32 MB, 64 MB, 128 MB, 256 MB 168-pin 3.3V 66 MHz or 100 MHz PC SDRAM DIMM	x1
DIMM 2	8 MB, 16 MB, 32 MB, 64 MB, 128 MB, 256 MB 168-pin 3.3V 66 MHz or 100 MHz PC SDRAM DIMM	x1
DIMM 3	8 MB, 16 MB, 32 MB, 64 MB, 128 MB, 256 MB 168-pin 3.3V 66 MHz or 100 MHz PC SDRAM DIMM	x1

---

## BIOS Settings

The CMOS Setup Utility is a program that allows you to modify basic system configuration that is stored on the motherboard's BIOS chip. For the motherboard to function properly, this information must be intact and accurate. Normally, you will not need to use this utility once your system is set up.

### To change BIOS settings in CMOS



Do not change the BIOS settings unless you have a good understanding of how they work and what they do. Incorrect BIOS settings may cause your system to stop functioning.

1. Switch on your computer.
2. During the memory check, press the <Delete> key.  
The CMOS Setup Utility menu similar to Figure 6-1 on page 6-3 appears.  
If you did not respond in time, restart your system by pressing the Reset button on your computer.
3. To select a menu option, use the arrow keys to browse to the desired option and then press <Enter>.

- After you have changed the BIOS settings, press <F10> to save the settings and exit the CMOS Setup Utility. Your system continues to start up.

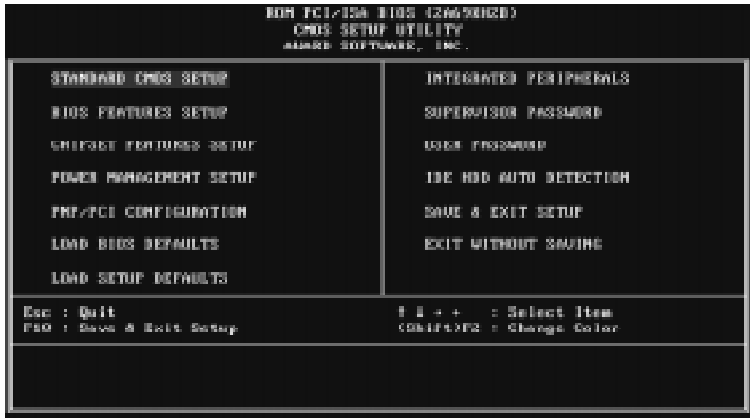


Figure 6-1: The CMOS Setup Utility menu.

## The CMOS Setup Utility Menu

Selecting an option in the CMOS Setup Utility menu will display the corresponding screen or perform a function (for example, Load BIOS Defaults). Table 6-2 below lists the descriptions of the menu options.

Table 6-2: The CMOS Setup Utility menu options.

This Option	Allows You To Do This
Standard CMOS Setup	Set the date, time, disk drive, video display and error handling.
BIOS Features Setup	Set the system customization features and video display settings.
Chipset Features Setup	Specify chipset settings, memory configuration feature for special add-on cards and VGA memory configuration.
Power Management Setup	Set up the power management features.
PnP/PCI Configuration	Specify the system resource settings and other settings for the PCI slots.

**Table 6-2: The CMOS Setup Utility menu options.**

<b>This Option</b>	<b>Allows You To Do This</b>
Load BIOS Defaults	Set the system to load the optimized settings from the BIOS ROM.
Load Setup Defaults	Set the system to load the minimum settings from the BIOS ROM.
Integrated Peripherals	Specify the settings for IDE channels and onboard ports.
Supervisor Password	Change, set, or disable supervisor password. This allows you to limit access to the system and setup, or to limit access to the setup only.
User Password	Change, set, or disable user password. This allows you to limit access to the system and setup, or to limit access to the setup only.
IDE HDD Auto Detection	Automatically detect and configure IDE hard disk drives (HDD) in your system.
Save & Exit Setup	Exit setup and save any changes you have made.
Exit Without Saving	Exit setup without saving any changes.

This menu also provides four commands, Quit, Save & Exit Setup, Select Item, and Change Color. Their descriptions are listed in Table 6-3 below.

**Table 6-3: The CMOS Setup Utility menu commands.**

<b>This Command</b>	<b>Allows You To Do This</b>
Quit	Close the Setup utility when you press the <Esc> key.
Save & Exit Setup	Save the current settings and close the Setup utility when you press the <F10> key.
Select Item	Use the arrow keys on your keyboard to move around the screen and select a menu item. The selected item will be highlighted.
Change Color	Change the Setup utility's color scheme by pressing <Shift+F2>.

The following sections provide detailed information on the setup screens and options in the CMOS Setup utility.



PU: the <Page Up> key, PD: the <Page Down> key,  
 +: the plus <+> key, -: the minus <-> key.

## Standard CMOS Setup

Display this screen if you want to set the date and time of the system clock. This screen also allows you to configure your hard disks, floppy disks, video display and error handling procedure.

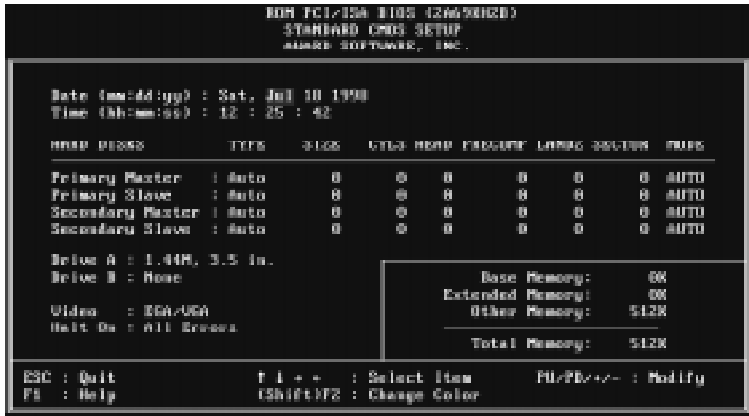


Figure 6-2: The Standard CMOS Setup screen.



**Table 6-4: The Standard CMOS Setup Screen items.**

Item	Description
Date	<p>The date format of the system clock is &lt;day&gt;, &lt;month&gt; &lt;date&gt; &lt;year&gt;.</p> <p>To display the calendar, press &lt;F3&gt;.</p>
Time	<p>The time format of the system clock, a 24-hour clock, is &lt;hour&gt;:&lt;minute&gt;:&lt;second&gt;.</p> <p>For example, 5 p.m. should be entered as 17:00:00.</p>
Hard Disks Type and Parameters	<p>Identifies the types of hard disk drives that have been installed in your system. There are 46 predefined types and a user-defined type.</p> <p><b>Warning: The information entered in this Hard Disk table must match the actual specifications of your hard disk. Otherwise, your hard disk will not work properly.</b></p> <p>For IDE hard disk drives, set the entries to <i>Auto</i> under TYPE and the system will configure the hard disk drives automatically when it is switched on. You can also use the IDE HDD Auto Detection option in the Setup utility menu to do this.</p> <p>If your hard disk type is listed among the 46 predefined types, select the corresponding type for your hard disk. Otherwise, select <i>User</i> under the TYPE column to define the hard disk type manually. Enter the details of the hard disk in the various columns, for example, SIZE and CYLS, directly from the keyboard and press &lt;Enter&gt;. If you are not sure of these details, refer to your hard disk drive's documentation.</p> <p>If no hard disk drive has not been installed or if your hard disk drive is a SCSI one, select <i>None</i> under TYPE and press &lt;Enter&gt;.</p>

Table 6-4: The Standard CMOS Setup Screen items.

Item	Description
Large Hard Disk Modes	<p>The last drive parameter, MODE, has four available settings: <i>Normal</i>, <i>LBA</i>, <i>Large</i>, and <i>Auto</i>. These settings are for IDE hard disks only.</p> <p><i>Normal</i>: For IDE hard disks of 528 MB or less.</p> <p><i>LBA</i>: Logical Block Addressing, the current standard access mode for large IDE hard disk drives. It allows the use of hard disks larger than 528 MB by causing the IDE controller to translate between the logical address it creates and the hard disk's actual physical address. The maximum drive size supported is 8.4 GB.</p> <p><i>Large</i>: For 1 GB or smaller drives with more than 1024 cylinders and no LBA support. This access mode causes the operating system to treat the drive as if it has fewer than 1024 cylinders by dividing the cylinder total in half and doubling the number of heads.</p>
Drive A, Drive B	Specifies the types of floppy disk drive A or drive B that has been installed in the system.
Video	Selects the type(s) of adapter used for the primary system monitor. This setting must match those of your video display card and monitor. Although secondary monitors are supported, you do not have to configure them in CMOS setup.
Error halt	Specifies when the system stops if an error occurs during system startup.
Memory	<p>This item is for display only. The value is automatically determined by POST (Power On Self Test) of the BIOS. <b>Base Memory</b> refers to the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512 K for systems with 512 K memory installed on the motherboard, or 640 K for systems with 640 K or more memory installed on the motherboard.</p> <p><b>Extended Memory</b> refers to the amount of memory located above 1 MB in the CPU's memory address map.</p>

## BIOS Features Setup

Display this screen if you want to configure system features such as virus warning, boot sequence, and security option.

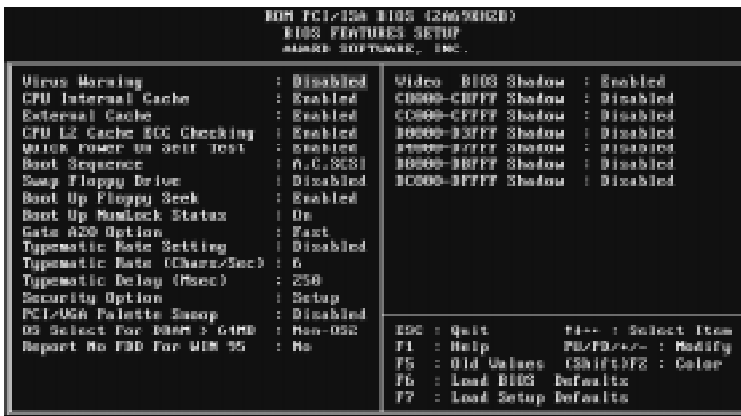


Figure 6-3: The BIOS Features Setup screen.

Table 6-5: The BIOS Features Setup Screen items.

Option	Description
Virus Warning	<p>When this is enabled, the BIOS will monitor the boot sector and partition table of the primary hard disk drive and warn of any attempt to write to it. If an attempt is detected, the BIOS will halt the system and the following warning message will appear:</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>!WARNING!            Disk boot sector is to be modified            Type "Y" to accept write or "N" to abort write            Award Software, Inc.</p> </div> <p>In this situation, restart your system from a virus-free bootable floppy disk and then use an anti-virus utility located on the floppy disk to check the hard disk. The default setting is <i>Disabled</i>.</p>
CPU Internal Cache	Enables CPU internal cache to speed up memory access.
External Cache	Enables CPU secondary cache to speed up memory access.

**Table 6-5: The BIOS Features Setup Screen items.**

<b>Option</b>	<b>Description</b>
Quick Power On Self Test	If this is enabled, BIOS will shorten or skip some check items during Power On Self Test (POST) to speed up the process.
Boot Sequence	Determines which drive the computer searches first for the disk operating system. Default setting is: A, C, SCSI. BIOS also supports system bootup from CD-ROM drive or SCSI hard disk drive.
Swap Floppy Drive	When this is enabled, the BIOS will swap floppy drive assignments so that Drive A: will function as Drive B: and Drive B: as Drive A:.
Boot Up Floppy Seek	When this is enabled, the BIOS will determine whether the installed floppy disk is 40-track or 80-track.
Boot Up NumLock Status	When this is enabled, BIOS turns on Num Lock when the system is switched on.
Boot Up System Speed	Sets the speed of the CPU during system bootup. The setting can be <i>High</i> or <i>Low</i> .
Gate A20 Option	Allows you to specify how the gate A20 is handled. The gate A20 is a device used to address memory above 1 MB. Initially, the gate A20 was handled via a pin on the keyboard. Today, while keyboards still provide this support, it is more common and much faster for the motherboard's chipset to provide support for gate A20. For the chipset to do this, set this item to <i>Fast</i> .
Typematic Rate Setting	Determines if the typematic rate to be used. When this setting is disabled, holding down a key on your keyboard will generate only one instance of the corresponding character or movement (for arrow keys). When this setting is enabled, holding down a key will generate the character or movement repeatedly. For example, you can use this feature to accelerate cursor movements with the arrow keys.
Typematic Rate (Chars/Sec)	When the Typematic Rate Setting (see description above) is enabled, this item allows you to specify the speed at which the characters or movements are repeated when you hold down a key.

**Table 6-5: The BIOS Features Setup Screen items.**

Option	Description
Typematic Delay (Msec)	When the Typematic Rate Setting (see description on previous page) is enabled, this item allows you to specify the amount of time that elapses before repetition of the character or movement takes place when you hold down a key.
Security Option	<p>Allows you to limit access to the System and Setup, or just to Setup.</p> <p>If you select <i>System</i>, the System will not boot up and access to Setup will be denied unless the correct password is entered at the prompt.</p> <p>If you select <i>Setup</i>, the System will boot up. However, access to Setup will be denied unless the correct password is entered at the prompt.</p> <p>Note: The password is created in the Supervisor Password and/or User Password screen(s) in the CMOS Setup menu. If no password is set, the system will ignore this Security Option.</p>
PCI/VGA Palette Snoop	Must be enabled if there is a MPEG ISA card installed in the system, and disabled if there is no MPEG ISA card installed in the system.
OS Select For DRAM > 64 MB	If you are using the OS/2 operating system, and your system has more than 64 MB of DRAM installed, selecting <i>OS/2</i> for this item allows you to access the memory that is over 64 MB in OS/2.
Video BIOS Shadow	Determines whether video display card BIOS will be copied into the system DRAM to increase display speed and improve system performance. The default setting is <i>Enabled</i> .
C8000-CBFFF Shadow/ DC000-DFFFF Shadow	<p>C8000-CBFFF Shadow to DC000-DFFFF Shadow are address ranges for shadowing other expansion card ROMs.</p> <p>This item allows you to specify whether other expansion card ROMs will be copied into the system DRAM. If there are any expansion cards with ROMs installed in your system and you want the system to shadow them specifically, you need to know the address range they use. The default setting for all these address ranges is <i>Disabled</i>.</p>

## Chipset Features Setup

The options on this screen are either set to the optimized values or set automatically when auto configuration is active.

Unless you are an advanced user, avoid making any manual settings to the chipset features with the exception of the memory hole and the AGP aperture size.



Figure 6-4: The Chipset Features Setup screen.

Table 6-6: The Chipset Features Setup Screen items.

Item	Description
Auto Configuration	If this is enabled, the system will select and apply the pre-determined optimal chipset parameters. If it is disabled, chipset parameters revert to CMOS setup information.
DRAM Speed Selection	Sets the EDO DRAM Read/Write timings that the system uses. The speed required depends on your how your system was designed and its memory configuration. Select either 50ns or 60ns as the DRAM Speed. When Auto Configuration is disabled, this item will not be displayed.
EDO CASx# MA Wait State	Sets the EDO DRAM CAS MA (memory address bus) timing control type. Select either 1 or 2.

**Table 6-6: The Chipset Features Setup Screen items.**

<b>Item</b>	<b>Description</b>
EDO RASx# Wait State	Sets the EDO DRAM RAS MA (memory address bus) timing control type. Select either 1 or 2.
SDRAM RAS-to-CAS Delay	When SDRAM is refreshed, both rows and columns are addressed separately. This item allows you to determine the timing of the transition from Row Address Strobe (RAS) to Column Address Strobe (CAS). The setting can be 3 or 2.
SDRAM RAS Precharge Time	Sets the SDRAM RAS Precharge Timing. SDRAM must continually be refreshed or it will lose its data. Normally, SDRAM is refreshed entirely as the result of a single request. This item allows you to specify the number of CPU clocks allocated for Row Address Strobe to accumulate its charge before the SDRAM is refreshed. If amount of time specified is insufficient, SDRAM refresh may be incomplete and data may be lost. The setting can be 3 CLKs or 2 CLKs.
SDRAM CAS Latency Time	Sets the CAS latency time to HCLKs of 2 or 3. The value for this setting should have been selected already based on the specifications of the installed SDRAM. Do not change it unless the specifications of the installed SDRAM or the CPU have changed.
DRAM Data Integrity Mode	Allows the user to set DRAM Data Integrity mode to ECC (Error Checking and Correcting) or Non-ECC. The ECC setting allows detection of single-bit and multiple-bit errors, and recovery of single-bit errors. The Non-ECC setting enables byte-wide write capability but has no provision for protecting data integrity in the DRAM array.
System BIOS Cacheable	Allows the user to specify the system BIOS F000-FFF area as cacheable or non-cacheable. The Enabled setting yield better performance but poses the danger of system errors if programs are written to this memory area.

**Table 6-6: The Chipset Features Setup Screen items.**

<b>Item</b>	<b>Description</b>
Video BIOS Cacheable	Allows the user to specify the system BIOS C000-C7FF area as cacheable or non-cacheable. The Enabled setting yield better performance but poses the danger of system errors if programs are written to this memory area.
Video RAM Cacheable	This is a new cache technology for the CPU's video memory. By caching the display data, the display speed can be greatly improved. However, if your display card cannot support this feature, you must disable this item. Otherwise, your system may not boot up.
8 Bit I/O Recovery Time	This is the length of time, measured in CPU clocks, which the system will delay after the completion of an 8 bit input/output (I/O) request. This delay is necessary for the CPU to recover from completing the I/O request. This item allows you to specify the amount of recovery time allowed for 8 bit I/O. The setting can be <i>NA</i> , or <i>1 to 8 CPU clocks</i> .
16-Bit I/O Recovery Time	Allows you to specify the amount of recovery time allowed for 16 bit I/O requests. The setting can be <i>NA</i> , or <i>1 to 4 CPU clocks</i> .
Memory Hole at 15M-16M	Some special add-on cards require a 1 MB address space between 15 MB and 16 MB. Verify with the documentation that comes with the card(s) to see if you need this address space.
Passive Release	If this is enabled, the chipset will provide a programmable passive release mechanism to meet the required ISA master latencies.
Delayed Transaction	Since PCI specification version 2.1 requires much tighter controls on target and master latency, PCI cycles to or from ISA typically take longer. If this item is enabled, the chipset will provide a programmable delayed completion mechanism to meet the required target latencies.



**Table 6-6: The Chipset Features Setup Screen items.**

<b>Item</b>	<b>Description</b>
AGP Aperture Size (MB)	Specifies the maximum amount, in MB, of system memory an AGP display card can use to store 3D texture mapping data. The larger the aperture, the better the performance of the card's 3D function. The settings range from <i>4 MB to 256 MB</i> .
Auto Detect PCI Clock	When this item is enabled, the system automatically detects and closes clock signals to empty DIMM/PCI slots to reduce EMI.
Spread Spectrum Modulated	When this item is enabled, EMI is reduced.
CPU Host Clock	When the JP37 jumper is set to the Auto mode, you can set the CPU clock speed using this item. Otherwise, this item cannot be used. For 66 MHz- based processors, the options are 50 MHz, 66 MHz, 75 MHz, and 83 MHz. For 100 MHz-based processors, the options are 100 MHz, 103 MHz, and 112 MHz. For details, see "To configure the CPU external clock (system frequency)" on page 5-4.
CPU Clock Ratio	When the JP37 jumper is set to the Auto mode, you can set the CPU clock ratio using this item. Otherwise, this item cannot be used. The setting can be between 2 to 5. For details, see "To configure the CPU bus clock multiplier" on page 5-3..
CPU Speed	The system calculates and displays the CPU Speed based on the CPU clock speed and CPU clock ratio specified above.

# Power Management Setup

Display this screen if you want to set up the power management features.



Figure 6-5: The Power Management Setup screen.

Table 6-7: The Power Management Setup Screen items.

Item	Description
ACPI Function	This item defines whether the Advanced Configuration Power Interface (ACPI) is to be supported.
Power Management	This item defines the current power management function. <i>Max Saving</i> puts the system into power saving mode after a brief period of system idle time. <i>Min Saving</i> is similar to Max Saving except the period of the system idle time is longer. <i>Disabled</i> disables the power saving feature. <i>User Defined</i> allows you to set power saving options according to your preference.
PM Control by APM	If this item is set to <i>Yes</i> , the Advanced Power Management (APM) feature in Microsoft Windows will control power management operation. The available Power Management (PM) modes include <i>Doze</i> , <i>Standby</i> or <i>Suspend</i> .

**Table 6-7: The Power Management Setup Screen items.**

Item	Description
Video Off Method	<p>This item defines the Video Off feature for monitor power management. The available settings are <i>V/H SYNC+Blank</i> (default), <i>DPMS</i> and <i>Blank Only</i>.</p> <p><i>V/H SYNC+Blank</i>: the screen appears blank and both vertical and horizontal scanning is turned off.</p> <p><i>DPMS</i>: allows the BIOS to control a video display card which supports DPMS.</p> <p><i>Blank Only</i>: the screen appears blank.</p>
Video Off After	<p>This item defines when to activate the Video Off feature for monitor power management. The available settings are <i>N/A</i>, <i>Doze</i>, <i>Standby</i> and <i>Suspend</i>.</p> <p><i>Suspend</i>: the video display gets turned off after system enters Suspend mode.</p> <p><i>Standby</i>: the video display gets turned off after system enters Standby mode.</p> <p><i>Doze</i>: the video display gets turned off after system enters Doze mode.</p> <p><i>N/A</i>: there will be no display shut off.</p>
MODEM Use IRQ	<p>This item defines the IRQ line that the modem can use.</p> <p>The available settings are 1, 3, 4, 5, 7, 9, 10, 11, N/A.</p>
Doze Mode	<p>When this item is enabled, the CPU clock will run at a slower speed after the preset period of system idle time, while all other devices operate at full speed.</p>
Standby Mode	<p>When this item is enabled, the fixed disk drive and video display will shut off after the preset period of system idle time.</p>
Suspend Mode	<p>When this item is enabled, all devices, except the CPU, will shut off after the preset period of system idle time.</p>
HDD Power Down	<p>This item defines the continuous HDD (Hard Disk Drive) idle time before the HDD enters power saving mode (motor off). The available settings are between 1 min to 15 min or <i>Disabled</i>.</p>

**Table 6-7: The Power Management Setup Screen items.**

Item	Description
Throttle Duty Cycle	This item defines the duty cycle for the clock control thermal throttling mode. The duty cycle indicates the percentage of time while in the thermal throttle mode. The available settings are between 12.5% and 87.5%.
VGA Active Monitor	If this item is enabled, the VGA activity event will be monitored to reload the global timer.
Soft-Off by PWR-BTTN (This feature is available for ATX power only.)	When this item is set to <i>Instant-Off</i> , the ATX switch functions as a normal system power-off button when pressed for less than 4 seconds. The setting of Delay 4 Sec allows the button to have a dual function, whereby pressing the button for less than 4 seconds will place the system in Suspend mode, and pressing the button for more than 4 seconds will shut the system off.
IRQ 8 Break Suspend	You can enable or disable the monitoring of IRQ8 (the Real Time Clock) so that it does not wake the system from Suspend mode.  ** Reload Global Timer Events ** If any of these items is enabled, that particular system activity event will be monitored to reload the global timer. These items include IRQ[3-7, 9-15], NMI, Primary IDE0/1, Secondary IDE 0/1, Floppy Disk, Serial Port and Parallel Port.
Resume by LAN (Wake-ON-LAN)	This item defines if the system will resume by activity of LAN. If this feature is enabled, the system will power-on itself from power off when the activity of LAN.  M004 supports Wake-ON-LAN function with Intel LAN cards only.
Resume by Ring	When this item is enabled, the system will resume through the activation of the modem ring.
Resume by Alarm	When this item is enabled, you can set the system to resume at a certain date and time. This feature is available for ATX power only.

# PnP/PCI Configuration Setup

Display this screen if you want to specify the system resource settings and other settings for the PCI slots.

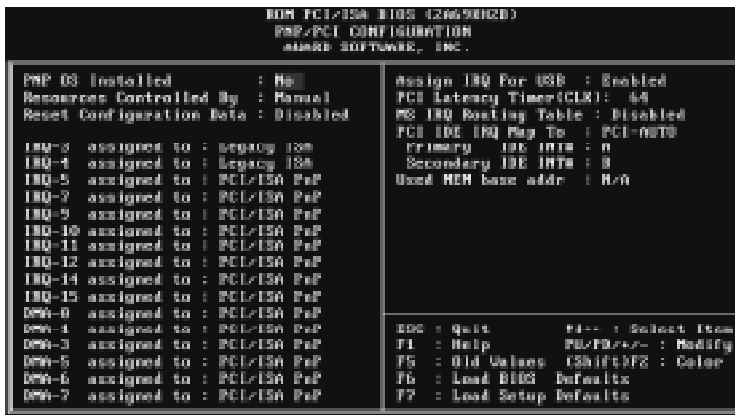


Figure 6-6: The PnP/PCI Configuration screen.

Table 6-8: The PnP/PCI Configuration Screen items.

Item	Description
PnP OS Installed	When this item is set to Yes, it will allow the PnP OS (Windows 95) to control the system resources except PCI and PnP boot devices. Default setting is <i>No</i> .
Resources Controlled By	The Award Plug and Play BIOS has the capability to automatically configure all boot and PnP compatible devices. However, this capability is not available unless you are using a PnP operating system such as Windows 95.
Reset Configuration Data	This item defines whether to reset the configuration data.
IRQ 3/4/5/7/9/10/11/12/14/ 15, assigned to	These items define the IRQ lines assigned to the ISA buses. It is not available for PCI slots. The available settings are Legacy ISA and PCI/ISA PnP.

**Table 6-8: The PnP/PCI Configuration Screen items.**

Item	Description
DMA 0/1/3/5/6/7 assigned to	These items define the DMA assigned to the ISA buses. It is not available for PCI slots. The available settings are Legacy ISA and PCI/ISA PnP.
Assign IRQ for USB	Specifies whether to assign an IRQ line to the on-board USB controller. Since the on-board controller is always enabled, if no IRQ line is assigned to it, an error will be reflected on the system device under windows 95 Device Manager.
PCI Latency Timer	The PCI Latency Timer is used to ensure that the PCI agents are given a minimum amount of the system resource. The number of clocks programmed in the PCI Latency Timer represents the guaranteed time slice allocated to the 440BX, after which it must complete the current data transfer phase and surrender the bus as soon as its bus grant is removed. The default setting is 64 PCI <i>clocks</i> .
MS IRQ Routing Table	Specifies whether the BIOS IRQ Routing Table is enabled or disabled.
PCI IDE IRQ Map to	<p>This item defines the type of IDE disk controller in use in your system. By default, Setup assumes that your controller is an ISA device rather than a PCI controller.</p> <p>If you have equipped your system with a PCI controller, changing this setting allows you to specify which slot has the controller and which PCI interrupt (A, B, C or D) is associated with the connected hard drives.</p> <p>Remember that this setting refers to the hard disk drive itself, rather than individual partitions. Since each IDE controller supports two separate hard disk drives, you can select the INT# for each. Note that the Primary has a lower interrupt than the Secondary as described in “Slot x Using INT#” above.</p> <p>Selecting the PCI Auto setting allows the system to automatically determine the configuration of your IDE disk system.</p>

Table 6-8: The PnP/PCI Configuration Screen items.

Item	Description
Used MEM base addr	This item is used to select a base address for the memory area used by any peripheral that requires high memory. The available settings are C800, CC00, D000, D400, D800, DC00 and N/A.

## Integrated Peripherals

Display this screen if you want to configure the IDE and floppy controllers, and other onboard ports. You can also configure the USB (USB Keyboard Support) and infrared (UR2 Mode and UR2 Duplex Mode) features.



Figure 6-7: The Integrated Peripherals screen.

**Table 6-9: The Integrated Peripherals Screen items.**

<b>Item</b>	<b>Description</b>
IDE HDD Block Mode	If your IDE Hard Disk supports block mode, you can enable this item to speed up the hard disk drive (HDD) access time. Otherwise, disable this item to avoid HDD access error.
IDE Primary Master PIO	In this item, there are five settings (0, 1, 2, 3, and 4) defined for the manual mode and one setting (Auto) for the automatic mode. The default setting is Auto.
IDE Primary Slave PIO	In this item, there are five settings (0, 1, 2, 3, and 4) defined for the manual mode and one setting (Auto) for the automatic mode. The default setting is Auto.
IDE Secondary Master PIO	In this item, there are five settings (0, 1, 2, 3, and 4) defined for the manual mode and one setting (Auto) for the automatic mode. The default setting is Auto.
IDE Secondary Slave PIO	In this item, there are five settings (0, 1, 2, 3, and 4) defined for the manual mode and one setting (Auto) for the automatic mode. The default setting is Auto.
IDE Primary Master UDMA	<p>UDMA stands for Ultra DMA. On this motherboard, Intel PIIX4 improves IDE transfer rate using Bus Master UltraDMA/33 IDE which can handle data transfer up to 33 MB/sec. The setting can be <i>Disabled</i>, <i>Enabled</i> or <i>Auto</i>. The default setting is <i>Auto</i>.</p> <p>Note: For this feature to work, your hard disk drive must also support UDMA.</p>
IDE Primary Slave UDMA	<p>On this motherboard, Intel PIIX4 improves IDE transfer rate using Bus Master UltraDMA/33 IDE which can handle data transfer up to 33 MB/sec. The setting can be <i>Disabled</i>, <i>Enabled</i> or <i>Auto</i>. The default setting is <i>Auto</i>.</p> <p>Note: For this feature to work, your hard disk drive must also support UDMA.</p>
IDE Secondary Master UDMA	<p>On this motherboard, Intel PIIX4 improves IDE transfer rate using Bus Master UltraDMA/33 IDE which can handle data transfer up to 33 MB/sec. The setting can be <i>Disabled</i>, <i>Enabled</i> or <i>Auto</i>. The default setting is <i>Auto</i>.</p> <p>Note: For this feature to work, your hard disk drive must also support UDMA.</p>



**Table 6-9: The Integrated Peripherals Screen items.**

Item	Description
IDE Secondary Slave UDMA	<p>On this motherboard, Intel PIIX4 improves IDE transfer rate using Bus Master UltraDMA/33 IDE which can handle data transfer up to 33 MB/sec. The setting can be <i>Disabled</i>, <i>Enabled</i> or <i>Auto</i>. The default setting is <i>Auto</i>.</p> <p>Note: For this feature to work, your hard disk drive must also support UDMA.</p>
On-Chip Primary PCI IDE	<p>Your system includes two built-in IDE controllers, the primary and the secondary, both of which operate on the PCI bus. This item allows you to enable or disable the primary controller. If you add a higher-performance or specialized controller, you may choose to disable the primary controller.</p>
On-Chip Secondary PCI IDE	<p>Allows you to enable or disable the secondary controller. If you add a higher-performance or specialized controller, you may choose to disable the secondary controller.</p>
USB Keyboard Support	<p>Enables or disables the USB keyboard support.</p>
Initial Display First	<p>Allows you to select either <i>PCI</i> or <i>AGP</i> as the initial device when the system powers up.</p>
POWER ON Function	<p>Specifies how you want to resume the system's power. The setting can be <i>BUTTON ONLY</i>, <i>HOT-KEY</i> or <i>PS/2 MOUSE</i>.</p> <p><b>BUTTON ONLY:</b> Resume the system's power only through the Power switch.</p> <p><b>HOT-KEY:</b> Resume the system's power through the Power switch and the hot-key that you set. Set the hot-key using &lt;Ctrl&gt; and any key from &lt;F1&gt; to &lt;F12&gt;, for example, &lt;Ctrl&gt;&lt;F1&gt;.</p> <p><b>PS/2 MOUSE:</b> Resume the system's power through the Power switch and the PS/2 Mouse.</p> <p>When <i>PS/2 MOUSE</i> or <i>HOT-KEY</i> is selected, you have to set the JP38 jumper to the corresponding setting (see Table 5-7 on page 5 8).</p> <p>This function does not support USB keyboard, USB Mouse and Serial Mouse.</p>
KBC Input Clock	<p>Sets the input clock to onboard keyboard controller (KBC). The setting can be <i>8 MHz</i> or <i>12 MHz</i>.</p>

**Table 6-9: The Integrated Peripherals Screen items.**

<b>Item</b>	<b>Description</b>
Onboard FDC Controller	Specifies the onboard floppy disk controller (FDC). This setting allows you to connect your floppy disk drives to the onboard floppy connector. If you have a separate control card, select <i>Disabled</i> for this item.
Onboard Serial Port 1	Sets the onboard serial port 1 to <i>3F8/IRQ4</i> , <i>2F8/IRQ3</i> , <i>3E8/IRQ4</i> , <i>2E8/IRQ3</i> , <i>Auto</i> or <i>Disabled</i> .
Onboard Serial Port 2	Sets the onboard serial port 2 as <i>3F8/IRQ4</i> , <i>2F8/IRQ3</i> , <i>3E8/IRQ4</i> , <i>2E8/IRQ3</i> , <i>Auto</i> or <i>Disabled</i> .
UR2 Mode	The default setting is <i>SBIrDA</i> .
UR2 Duplex Mode	Specifies whether the onboard infrared transfer mode is full duplex or half duplex. The default setting is <i>Full</i> for full duplex.
Onboard Parallel Port	Sets the onboard parallel port address to <i>378H</i> , <i>278H</i> , <i>3BCH</i> or <i>Disabled</i> .
Parallel Port Mode	Specifies the onboard parallel port mode. The settings are <i>SPP</i> (Standard Parallel Port), <i>EPP</i> (Enhanced Parallel Port), <i>ECP</i> (Extended Capabilities Port), and <i>EPP+ECP</i> .
ECP Mode Use DMA	Specifies the DMA (Direct Memory Access) channel when ECP device is in use. The settings are <i>DMA 1</i> and <i>DMA 3</i> . This item will not be displayed when <i>SPP</i> or <i>EPP</i> printer mode is selected.

## Password Setting

This section describes the two access modes, Supervisor Password and User Password, that can be configured to restrict access to your CMOS settings.

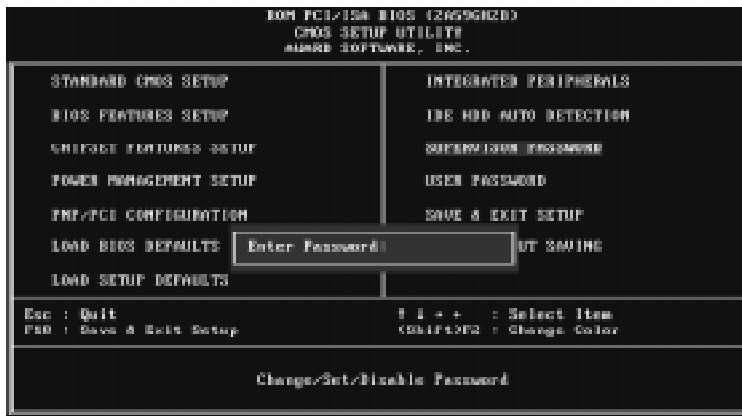


Figure 6-8: Setting password to the CMOS Setup utility.

Table 6-10: The Password Setting options.

Item	Description
Supervisor Password and User Password	<p>The options on the Password screen menu make it possible to restrict access to the Setup program by enabling you to set passwords for two different access modes: Supervisor mode and User mode.</p> <p>Supervisor mode has full access to the Setup options, whereas User mode has restricted access to the Setup options. By setting separate Supervisor and User password, a system supervisor can restrict who can change critical Setup values.</p>

*Table 6-10: The Password Setting options.*

<b>Item</b>	<b>Description</b>
Enter Password	<p>Type a password, up to eight characters long, and press &lt;Enter&gt;. The password typed now will clear any previously entered password from CMOS memory. You will be prompted to confirm the password. Type the password again and press &lt;Enter&gt;. You can press &lt;Esc&gt; to abort the selection and skip entering a password.</p> <p>To disable a password, just press &lt;Enter&gt; when you are prompted to enter the password. A message will confirm that the password is disabled. Once the password is disabled, the system will reboot and you can enter Setup menu freely.</p>
Password Disable	<p>If you selected System at Security Option of BIOS Features Setup Menu, you will be prompted for the password every time the system is rebooted or any time you try to enter the Setup program. If you selected Setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.</p>



Retain a record of your password in a safe place. If you forget the password, the only way to access the system is to clear the CMOS memory. For details, see the section, “To overclock a 66 MHz-based processor” on page 5-6.



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