

ASUS[®] P3V4X
ATX Motherboard

USER'S MANUAL

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Product Name: **ASUS P3V4X**
Manual Revision: **1.02 E525**
Release Date: **March 2000**

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FCC & DOC COMPLIANCE

Federal Communications Commission Statement

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

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 manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation 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 for help.

WARNING! Any changes or modifications to this product not expressly approved by the manufacturer could void any assurances of safety or performance and could result in violation of Part 15 of the FCC Rules.

Reprinted from the Code of Federal Regulations #47, part 15.193, 1993. Washington DC: Office of the Federal Register, National Archives and Records Administration, U.S. Government Printing Office.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

1. INTRODUCTION

1.1 How This Manual Is Organized

This manual is divided into the following sections:

1. INTRODUCTION	Manual information and checklist
2. FEATURES	Production information and specifications
3. HARDWARE SETUP	Instructions on setting up the motherboard.
4. BIOS SETUP	Instructions on setting up the BIOS
5. SOFTWARE SETUP	Instructions on setting up the included software
6. SOFTWARE REFERENCE	Reference material for the included software
7. APPENDIX	Optional items and general reference

1.2 Item Checklist

Check that your package is complete. If you discover damaged or missing items, contact your retailer.

- (1) ASUS Motherboard
- (1) Universal Retention Mechanism for SECC2/SECC/SEPP processors
- (1) Ribbon cable for master and slave UltraDMA/66 or UltraDMA/33 IDE drives
- (1) Ribbon cable for (1) 5.25" and (2) 3.5" floppy disk drives
- (1) Bag of spare jumper caps
- (1) Support CD with drivers and utilities
- (1) This Motherboard User's Manual

- ASUS IrDA-compliant infrared module (optional)
- ASUS S370 Series CPU cards (optional)
- ASUS PCI-L101 Wake-On-LAN 10/100 Ethernet Card (optional)
- CPU thermal sensor cable (optional)

2. FEATURES

2.1 The ASUS P3V4X

The ASUS P3V4X motherboard is carefully designed for the demanding PC user who wants advanced features processed by the fastest processors.

2.1.1 Specifications

- **Latest Intel Processor Support**

Intel Pentium® III	100MHz FSB, Katmai core	SECC2
Intel Pentium® III B	133MHz FSB, Katmai core	SECC2
Intel Pentium® III E	100MHz FSB, Coppermine core	SECC2
Intel Pentium® III EB	133MHz FSB, Coppermine core	SECC2
Intel Pentium® II	100MHz/66MHz FSB	SECC
Intel Celeron™	66MHz FSB	SEPP

- **VIA Apollo Pro133A Chipset:** Features the VIA VT82C694X system controller and VIA VT82C596B PCI to ISA bridge with support for AGP 4x mode; 133/100/66MHz Front Side Bus (FSB); and UltraDMA/66 / UltraDMA/33.
- **PC133 Memory / VCM /HSDRAM Support:** Equipped with four Dual Inline Memory Module (DIMM) sockets to support Intel PC133/PC100-compliant (8, 16, 32, 64, 128, 256, or 512MB), NEC's Virtual Channel (VC) SDRAM, or Enhanced Memory System's High-speed DRAMs (HSDRAMs) up to 2GB. VC SDRAM and HSDRAM are new DRAM core architectures that dramatically improve the memory system's ability to service, among others, high multimedia requirements.
- **JumperFree™ Mode:** Allows processor settings, core voltage, and easy overclocking of frequency through BIOS setup when JumperFree™ mode is enabled. Easy-to-use DIP switches instead of jumpers are included to allow manual adjustment of the processor's external frequency.
- **Multi-Cache:** Supports processors with 512, 256, 128, or 0KB Pipelined Burst Level 2 cache.
- **AGP Slot:** Supports AGP cards for high performance, component level interconnection targeted at 3D graphical applications supporting 133MHz 4X mode.
- **UltraDMA/66 Support:** Comes with an onboard PCI Bus Master IDE controller with two connectors that support four IDE devices on two channels. Supports UltraDMA/66, UltraDMA/33, PIO Modes 3 & 4 and Bus Master IDE DMA Mode 2, and Enhanced IDE devices, such as DVD-ROM, CD-ROM, CD-R/RW, LS-120, and Tape Backup drives.
- **Wake-On-LAN Connector:** Supports Wake-On-LAN activity through an optional ASUS PCI-L101 10/100 Fast Ethernet PCI card (see 7. *Appendix*).

2. FEATURES

- **Wake-On-Ring Connector:** Supports Wake-On-Ring activity through a PCI modem card that supports a WOR connector.
- **PC Health Monitoring:** Provides an easy way to examine and manage system status information, such as CPU and system voltages, temperatures, and fan status through the onboard hardware ASUS ASIC and the bundled ASUS PC Probe.
- **SMBus:** Features the System Management Bus interface, which is used to physically transport commands and information between SMBus devices.
- **PCI/ISA Expansion Slots:** Provides six 32-bit PCI (Rev. 2.2) expansion slots, which can support Bus Master PCI cards, such as SCSI or LAN cards (PCI supports up to 133MB/s maximum throughput) and one 16-bit ISA slot.
- **Super Multi-I/O:** Provides two high-speed UART compatible serial ports and one parallel port with EPP and ECP capabilities. UART2 can also be directed from COM2 to the Infrared Module for wireless connections.
- **Enhanced ACPI:** Programmable BIOS (Flash EEPROM), offering enhanced ACPI for Windows 98 compatibility and autodetection of most devices for virtually automatic setup.
- **IrDA:** Supports an optional infrared port module for wireless interface.
- **Concurrent PCI:** Concurrent PCI allows multiple PCI transfers from PCI master busses to the memory and processor.
- **Universal Retention Mechanism:** Supports a Pentium®III / II processor packaged in a Single Edge Contact Cartridge (SECC2/SECC) or a Celeron™ processor packaged in a Single Edge Processor Package (SEPP).
- **Smart BIOS:** 2MB firmware provides Vcore and CPU/SDRAM frequency adjustments, boot block write protection, and HD/SCSI/MO/ZIP/CD/Floppy boot selection.
- **Integrated Infrared Support:** Integrated IR supports an optional remote control package for wireless interfacing with external peripherals, personal gadgets, or an optional remote controller.

2. FEATURES

2.1.2 Special Features

- **ACPI Ready:** Advanced Configuration Power Interface (ACPI) provides more Energy Saving Features for operating systems that support OS Direct Power Management (OSPM) functionality. With these features implemented in the OS, PCs can be ready around the clock, yet satisfy all the energy saving standards. To fully utilize the benefits of ACPI, an ACPI-supported OS, such as Windows 98 must be used.
- **Easy Installation:** Incorporates BIOS that supports autodetection of hard disk drives, PS/2 mouse, and Plug and Play devices to make the setup of hard disk drives, expansion cards, and other devices virtually automatic.
- **PC'98 Compliant:** Both the BIOS and hardware levels of ASUS smart series motherboards meet PC'98 compliancy. The PC'98 requirements for systems and components are based on the following high-level goals: Support for Plug and Play compatibility and power management for configuring and managing all system components, and 32-bit device drivers and installation procedures for Windows95/98/NT .
- **Symbios SCSI BIOS:** Supports optional ASUS SCSI controller cards through the onboard SYMBIOS firmware.

2.1.3 Performance Features

- **Concurrent PCI:** Concurrent PCI allows multiple PCI transfers from PCI master busses to the memory and processor.
- **High-Speed Data Transfer Interface:** IDE transfers using UltraDMA/33 Bus Master IDE can handle rates up to 33MB/s. This motherboard with its chipset and support for UltraDMA/66 doubles the UltraDMA/33 burst transfer rate to 66.6MB/s. UltraDMA/66 is backward compatible with both DMA/33 and DMA and with existing DMA devices and systems so there is no need to upgrade current EIDE/IDE drives and host systems. (UltraDMA/66 requires a 40-pin 80-conductor cable to be enabled and/or for UltraDMA Mode 4.)
- **VCM/HSDRAM Optimized Performance:** Supports the new generation memory, NEC's Virtual Channel (VC) SDRAMs (Synchronous Dynamic Random Access Memory) or Enhanced Memory System's High-speed DRAMs (HSDRAMs) for higher system performance at minimal cost premium.

2. FEATURES

2.1.4 Intelligence

- **Auto Fan Off:** The system fans will power off automatically **even in sleep mode**. This function reduces both energy consumption and **system noise**, and is an important feature in implementing silent PC systems.
- **Dual Function Power Button:** Pushing the power button for less than 4 seconds when the system is in the working state places the system into one of two states: sleep mode or soft-off mode, depending on the BIOS or OS setting (see **PWR Button < 4 Secs** in *4.5 Power Menu*). When the power button is pressed for more than 4 seconds, the system enters the soft-off mode regardless of the BIOS setting.
- **Fan Status Monitoring and Alarm:** To prevent system overheat and system damage, the CPU, power supply, and system fans can be monitored for RPM and failure. All fans are set for its normal RPM range and alarm thresholds.
- **PS/2 Keyboard/Mouse Power Up:** Keyboard/Mouse Power Up can be enabled or disabled to allow the computer to be powered on by either pressing the space bar, Ctrl-Esc, or Power keys (see *4.5.1 Power Up Control*).
- **Message LED (requires ACPI OS support):** Turbo LEDs now act as information providers. Through the way a particular LED illuminates, the user can determine if there are messages waiting in the mailbox. A simple glimpse provides useful information to the user.
- **Remote Ring On (requires modem):** This allows a computer to be turned on remotely through an internal or external modem. With this benefit on-hand, users can access vital information from their computers from anywhere in the world!
- **System Resources Alert:** Today's operating systems such as Windows 95/98/NT and OS/2, require much more memory and hard drive space to present enormous user interfaces and run large applications. The system resource monitor will warn the user before the system resources are used up to prevent possible application crashes. Suggestions will give the user information on managing their limited resources more efficiently.
- **Temperature Monitoring and Alert:** CPU temperature is monitored by the ASUS ASIC through the CPU's internal thermal diode (on Pentium III, Pentium II (Deschutes), and PPGA370 Celeron in conjunction with the ASUS S370-133 CPU card) to prevent system overheat and system damage.
- **Voltage Monitoring and Alert:** System voltage levels are monitored to ensure stable voltage to critical motherboard components. Voltage specifications are more critical for future processors, so monitoring is necessary to ensure proper system configuration and management.
- **Chassis Intrusion Detection:** Supports chassis-intrusion monitoring through the ASUS ASIC. A chassis intrusion event is kept in memory on battery power for more protection.

2. FEATURES

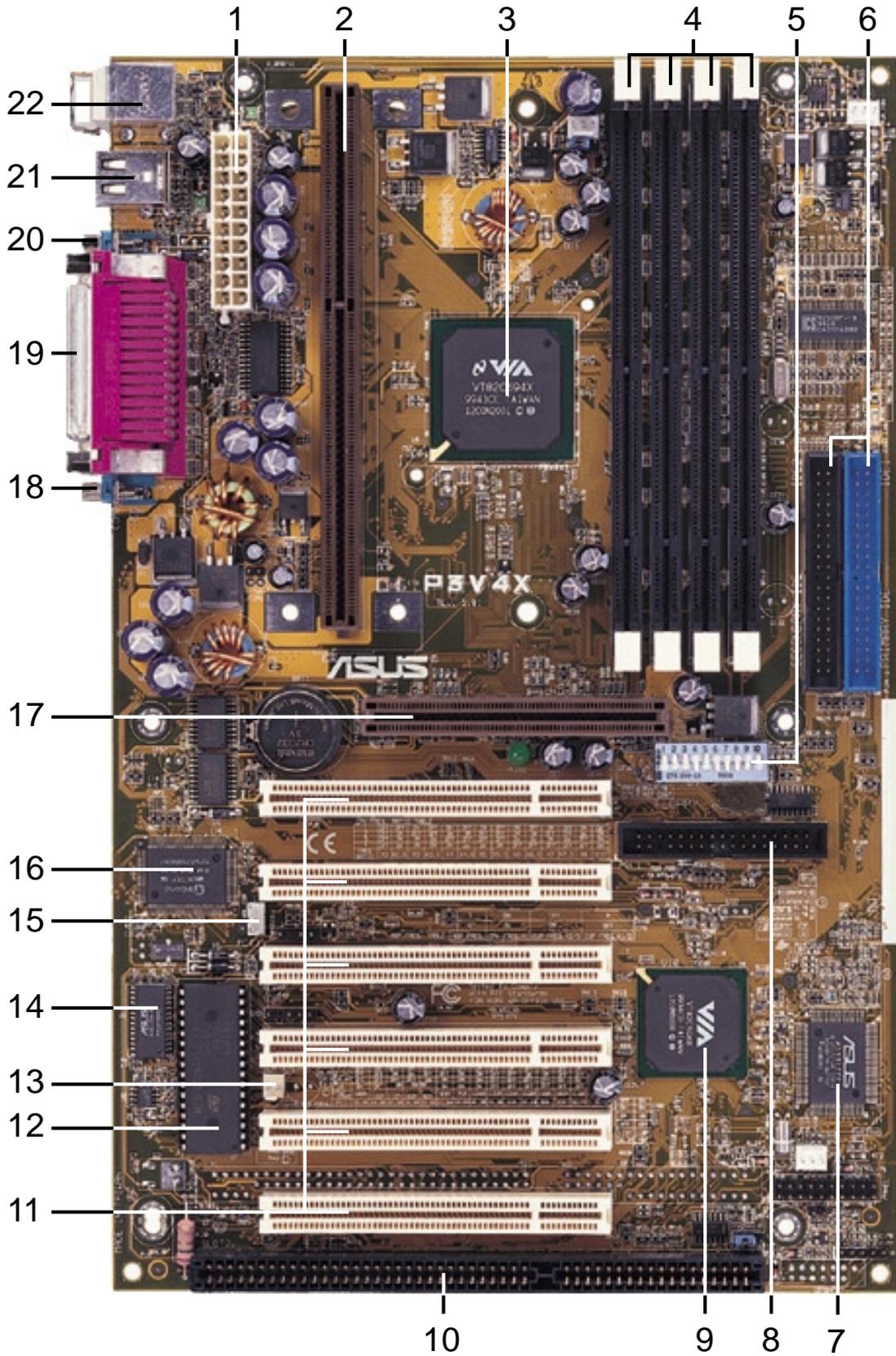
2.2 P3V4X Motherboard Components

See opposite page for locations.

	Location
Processor Support	Slot 1 for Coppermine/Katmai/Mendecino Processors 2
	66MHz to 150MHz bus support (16 external clock settings)
Chipsets	VIA VT82C694X System Controller 3
	VIA VT82C596B PCI to ISA Bridge 9
	2 Mbit Programmable Flash EEPROM 12
	Multi-I/O and Keyboard Controller 16
Main Memory	Maximum 2GB support
	4 DIMM Sockets 4
	PC133 SDRAM support
Expansion Slots	6 PCI Slots 11
	1 ISA Slot 10
	1 Accelerated Graphics Port (AGP) Slot 17
System I/O	2 IDE Connectors (UltraDMA66 Support) 6
	1 Floppy Disk Driver Connector 8
	1 Serial COM1 Connector 20
	1 Serial COM2 Connector 18
	1 Parallel Port Connector 19
	2 USB Connectors 21
	1 PS/2 Mouse Connector (Top) 22
	1 PS/2 Keyboard Connector (Bottom) 22
3D Graphics	VIA VT82C694X System Controller 3
Network Feature	Wake-On-LAN Connector 15
	Wake-On-Ring Connector 13
Hardware Monitoring	Hardware Monitor 7
	3 Fan Power and Speed Monitoring Connectors
Power	ATX Power Supply Connector 1
Form Factor	ATX, 19.2cm x 30.5cm (7.6" x 12")

2. FEATURES

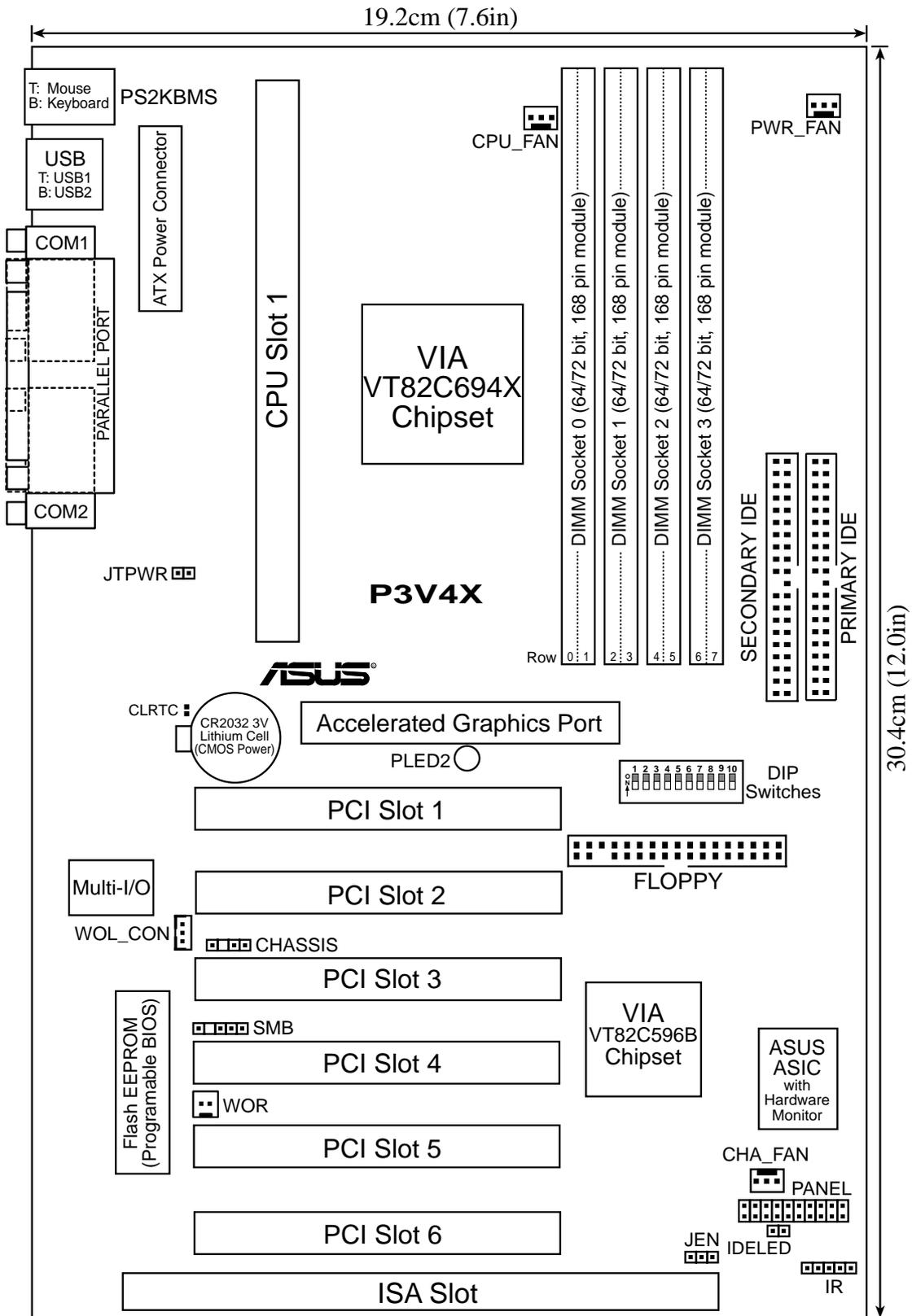
P3V4X Motherboard Component Locations



2. FEATURES
Component Locations

3. HARDWARE SETUP

3.1 P3V4X Motherboard Layout



3. HW SETUP
Motherboard Layout

3. HARDWARE SETUP

3.2 Layout Contents

Motherboard Settings

- | | |
|-----------------------|---|
| 1) JEN | p. 17 JumperFree™ Mode (Enable/Disable) |
| 2) U12-Switches 5 & 6 | p. 17 AGP Bus Frequency Setting |
| 3) U12-Switches 7–10 | p. 18 CPU Bus Frequency Selection |
| 4) U12-Switches 1–4 | p. 19 CPU Core:BUS Frequency Multiple |

Expansion Slots/Sockets

- | | |
|----------------------------|---------------------------------------|
| 1) DIMM1, -2, -3, -4 | p. 20 DIMM Memory Module Support |
| 2) Slot 1 | p. 23 CPU Support |
| 3) PCI1,-2, -3, -4, -5, -6 | p. 29 32-bit PCI Bus Expansion Slots |
| 4) SLOT2 | p. 30 16-bit ISA Bus Expansion Slots* |
| 6) AGP | p. 31 Accelerated Graphics Port |

Connectors

- | | |
|--------------------------|---|
| 1) PS2KBMS | p. 32 PS/2 Mouse Port Connector (6 pin-female) |
| 2) PS2KBMS | p. 32 PS/2 Keyboard Port Connector (6-pin female) |
| 3) PARALLEL | p. 33 Parallel (Printer) Port Connector (25-pin female) |
| 4) COM1, COM2 | p. 33 Serial Port COM1 & COM2 (two 9-pin male) |
| 5) USB | p. 33 Universal Serial BUS Port Connectors 1 & 2 (Two 4-pin female) |
| 6) Primary/Secondary IDE | p. 34 Primary/Secondary IDE Connectors (Two 40-1 pins) |
| 7) FLOPPY | p. 34 Floppy Drive Port Connector (34 pins) |
| 8) IDELED | p. 35 IDE LED Activity Light (2 pins) |
| 9) WOR | p. 35 Wake-On-Ring Connector (2 pins) |
| 10) CHA_, PWR_, CPU_FAN | p. 36 Chassis, Power Supply, CPU Fan Power Lead (3 pins) |
| 11) WOL_CON | p. 37 Wake-On-LAN Connector (3 pins) |
| 12) IR | p. 37 Infrared Port Module Connector (5 pins) |
| 13) SMB | p. 38 SMBus Connector (3 pins) |
| 14) JTPWR | p. 38 Thermal Sensor Connector |
| 15) ATXPWR | p. 39 ATX Motherboard Power Connector (20 pins) |
| 16) CHASSIS | p. 39 Chassis Intrusion Alarm Lead (4-1 pins) |
| 17) PWR.LED (PANEL) | p. 40 System Power LED Lead (3-1 pins) |
| 18) KEYLOCK (PANEL) | p. 40 Keyboard Lock Switch Lead (2 pins) |
| 19) SPEAKER (PANEL) | p. 40 System Warning Speaker Connector (4 pins) |
| 20) MSG.LED (PANEL) | p. 40 System Message LED (2 pins) |
| 21) SMI (PANEL) | p. 40 System Management Interrupt Lead (2 pins) |
| 22) PWR.SW (PANEL) | p. 40 ATX Power / Soft-Off Switch Lead (2 pins) |
| 23) RESET (PANEL) | p. 40 Reset Switch Lead (2 pins) |

*The optional onboard hardware monitor uses the address 290H-297H so legacy ISA cards must not use this address otherwise conflicts will occur.

3. HARDWARE SETUP

3.3 Hardware Setup Procedure

Before using your computer, you must complete the following steps:

- **Check Motherboard Settings**
- **Install Memory Modules**
- **Install the Central Processing Unit (CPU)**
- **Install Expansion Cards**
- **Connect Ribbon Cables, Panel Wires, and Power Supply**

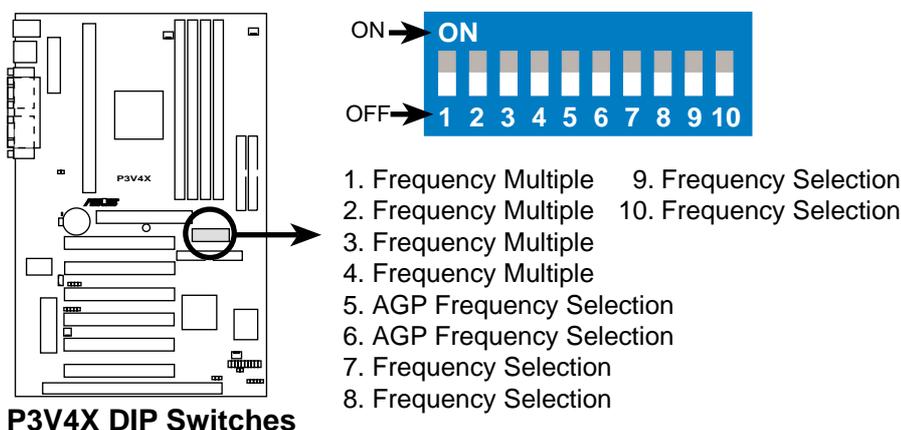
3.4 Motherboard Settings

WARNING! Computer motherboards and expansion cards contain very delicate Integrated Circuit (IC) chips. To protect them against damage from static electricity, you should follow some precautions whenever you work on your computer.

1. Unplug your computer when working on the inside.
2. Use a grounded wrist strap before handling computer components. If you do not have one, touch both of your hands to a safely grounded object or to a metal object, such as the power supply case.
3. Hold components by the edges and try not to touch the IC chips, leads or connectors, or other components.
4. Place components on a grounded antistatic pad or on the bag that came with the component whenever the components are separated from the system.
5. Ensure that the ATX power supply is switched off before you plug in or remove the ATX power connector on the motherboard.

Motherboard Feature Settings (U12)

The motherboard's onboard functions are either adjusted through jumpers or DIP switches. When using DIP switches, the white block represents the switch's position. The example below shows all the switches in the OFF position.



P3V4X DIP Switches

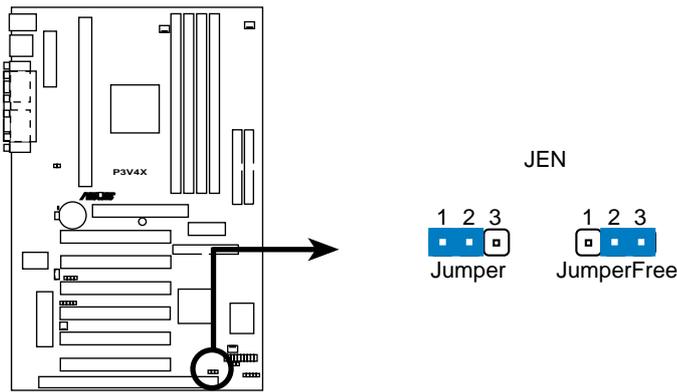
3. HARDWARE SETUP

1. JumperFree™ Mode (JEN)

This jumper allows you to enable or disable the JumperFree™ mode. The JumperFree™ mode allows processor settings to be made through the BIOS setup (see *4.4 Advanced Menu*).

NOTE: In JumperFree™ mode, all dip switches (DSW) must be set to OFF.

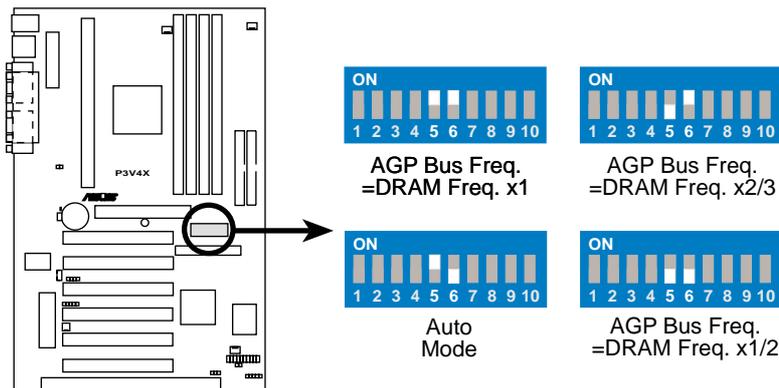
Setting	JEN
Enable (JumperFree)	[2-3] (default)
Disable (Jumper)	[1-2]



P3V4X Jumper Mode Setting

2. AGP Bus Frequency Setting (U12-Switches 5&6)

This option sets the frequency ratio between the AGP bus frequency and the DRAM (CPU bus) frequency. The default sets the AGP frequency to be 2/3 of the DRAM frequency. When the CPU/DRAM frequency is set to 66MHz, set Switch 5 to [ON] and Switch 6, [ON]. See the processor table on the following page.



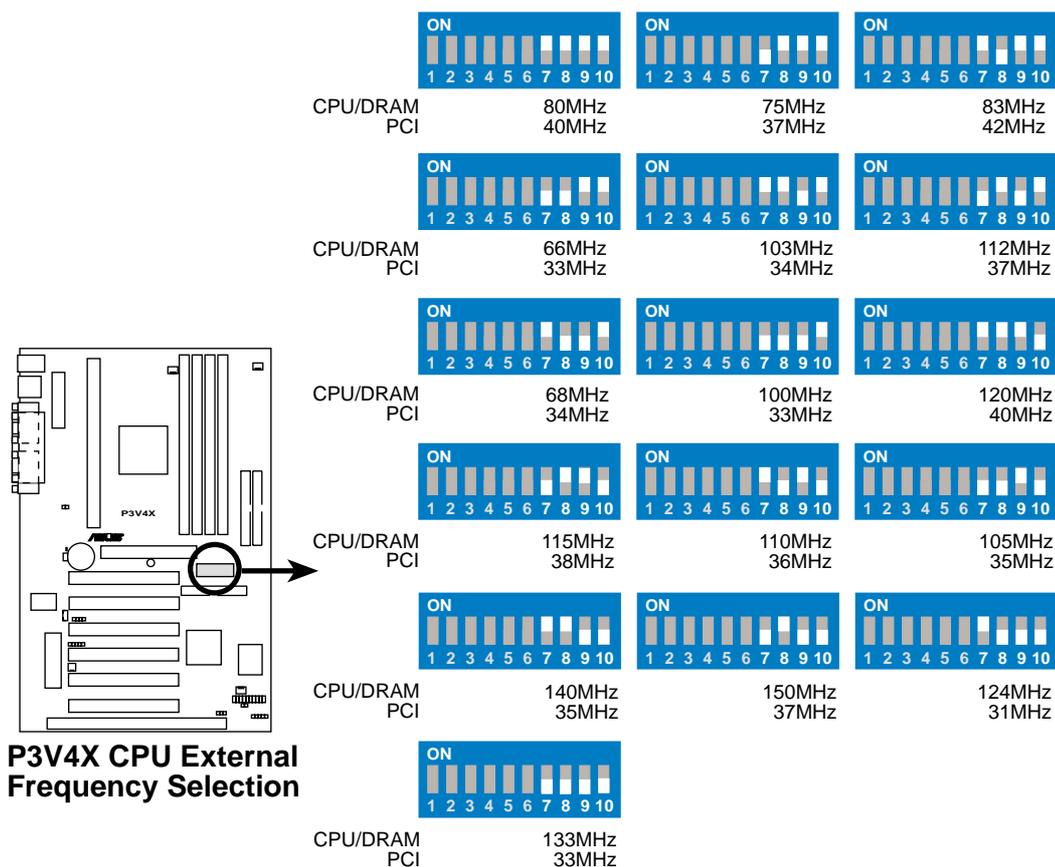
P3V4X AGP Bus Frequency Setting

3. HARDWARE SETUP

3. CPU Bus Frequency Selection (U12–Switches 7, 8, 9, 10)

This option tells the clock generator what frequency to send to the CPU, DRAM, and PCI bus. This allows the selection of the CPU's *External* frequency (or *BUS Clock*). The BUS Clock multiplied by the BUS Multiple equals the CPU's *Internal* frequency (the advertised CPU speed).

NOTE: In JumperFree mode, all dip switches must be set to OFF.



NOTE: Overclocking your processor is not recommended. It may result in a slower speed. Voltage Regulator Output Selection (VID) is not required for Pentium III/II processors because they send signals directly to the onboard power regulator.

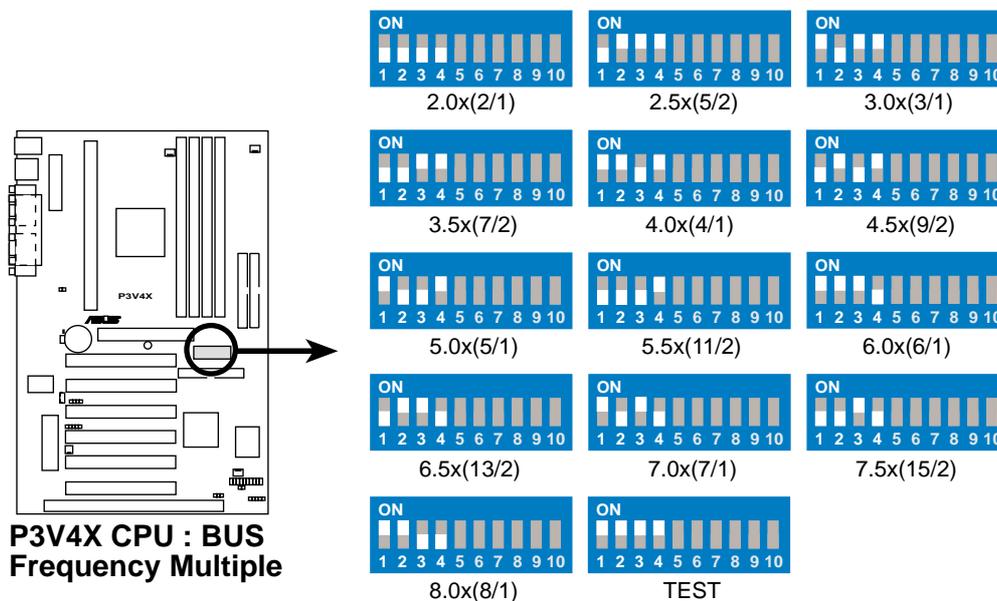
WARNING! Frequencies above 133MHz exceed the specifications for the on-board chipset and are not guaranteed to be stable.

3. HARDWARE SETUP

4. CPU Core:BUS Frequency Multiple (U12–Switches 1, 2, 3, 4)

This option sets the frequency multiple between the *Internal* frequency of the CPU and the CPU's *External* frequency. These must be set in conjunction with the *CPU Bus Frequency*.

NOTE: In JumperFree mode, all dip switches must be set to OFF.



Adjusting CPU Settings Manually

NOTE: JumperFree mode must be disabled when adjusting CPU settings manually.

Set the jumpers by the Internal speed of your processor as follows:

Intel CPU Model	Freq.	Mult.	BUS F.	(CPU BUS Freq.)				(Freq. Multiple)				AGP	
				7	8	9	10	1	2	3	4	5	6
Pentium III	733MHz	5.5x	133MHz	[OFF]	[OFF]	[OFF]	[OFF]	[OFF]	[OFF]	[OFF]	[ON]	[ON]	[OFF]
Pentium III	667MHz	5.0x	133MHz	[OFF]	[OFF]	[OFF]	[OFF]	[ON]	[OFF]	[OFF]	[ON]	[ON]	[OFF]
Pentium III	700MHz	7.0x	100MHz	[OFF]	[OFF]	[OFF]	[ON]	[ON]	[OFF]	[ON]	[OFF]	[ON]	[OFF]
Pentium III	650MHz	6.5x	100MHz	[OFF]	[OFF]	[OFF]	[ON]	[OFF]	[ON]	[ON]	[OFF]	[ON]	[OFF]
Pentium III	600MHz	6.0x	100MHz	[OFF]	[OFF]	[OFF]	[ON]	[ON]	[ON]	[ON]	[OFF]	[ON]	[OFF]
Pentium III	550MHz	5.5x	100MHz	[OFF]	[OFF]	[OFF]	[ON]	[OFF]	[OFF]	[OFF]	[ON]	[ON]	[OFF]
Pentium III	500MHz	5.0x	100MHz	[OFF]	[OFF]	[OFF]	[ON]	[ON]	[OFF]	[OFF]	[ON]	[ON]	[OFF]
Pentium II/III	450MHz	4.5x	100MHz	[OFF]	[OFF]	[OFF]	[ON]	[OFF]	[ON]	[OFF]	[ON]	[ON]	[OFF]
Pentium II	400MHz	4.0x	100MHz	[OFF]	[OFF]	[OFF]	[ON]	[ON]	[ON]	[OFF]	[ON]	[ON]	[OFF]
Pentium II	350MHz	3.5x	100MHz	[OFF]	[OFF]	[OFF]	[ON]	[OFF]	[OFF]	[ON]	[ON]	[ON]	[OFF]
Celeron	466MHz	7.0x	66MHz	[OFF]	[OFF]	[ON]	[ON]	[ON]	[OFF]	[ON]	[OFF]	[ON]	[OFF]
Celeron	433MHz	6.5x	66MHz	[OFF]	[OFF]	[ON]	[ON]	[OFF]	[ON]	[ON]	[OFF]	[ON]	[OFF]
Celeron	400MHz	6.0x	66MHz	[OFF]	[OFF]	[ON]	[ON]	[ON]	[ON]	[ON]	[OFF]	[ON]	[OFF]
Pentium II/Celeron	333MHz	5.0x	66MHz	[OFF]	[OFF]	[ON]	[ON]	[ON]	[OFF]	[OFF]	[ON]	[ON]	[OFF]
Pentium II/Celeron	300MHz	4.5x	66MHz	[OFF]	[OFF]	[ON]	[ON]	[OFF]	[ON]	[OFF]	[ON]	[ON]	[OFF]
Pentium II/Celeron	266MHz	4.0x	66MHz	[OFF]	[OFF]	[ON]	[ON]	[ON]	[ON]	[OFF]	[ON]	[ON]	[OFF]
Pentium II	233MHz	3.5x	66MHz	[OFF]	[OFF]	[ON]	[ON]	[OFF]	[OFF]	[ON]	[ON]	[ON]	[OFF]

For updated processor settings, visit the ASUS web site (see **ASUS CONTACT INFORMATION**)

3. HARDWARE SETUP

3.5 System Memory (DIMM)

This motherboard uses only Dual Inline Memory Modules (DIMMs). Four sockets are available for **3.3Volt** (power level) unbuffered Synchronous Dynamic Random Access Memory (SDRAM) of 8, 16, 32, 64, 128, 256, or 512MB to form a memory size between 8MB to 2GB. One side (with memory chips) of the DIMM takes up one row on the motherboard. This motherboard also supports NEC's Virtual Channel (VC) SDRAMs and Enhanced Memory System's High-speed DRAMs (HSDRAMs). Memory speed setup is recommended through *4.4.1 Chip Configuration*.

IMPORTANT (see **General DIMM Notes** below for more)

- **SDRAMs used must be compatible with the current Intel PC133 SDRAM specification.**
- **DO NOT attempt to mix registered SDRAMs with VC SDRAMs.**

Install memory in any combination as follows:

DIMM Location	168-pin DIMM	Total Memory
Socket 1 (Rows 0&1)	SDRAM 8, 16, 32, 64, 128, 256, 512MB	x1
Socket 2 (Rows 2&3)	SDRAM 8, 16, 32, 64, 128, 256, 512MB	x1
Socket 3 (Rows 4&5)	SDRAM 8, 16, 32, 64, 128, 256, 512MB	x1
Socket 4 (Rows 6&7)	SDRAM 8, 16, 32, 64, 128, 256, 512MB	x1
Total System Memory (Max 2GB)		=

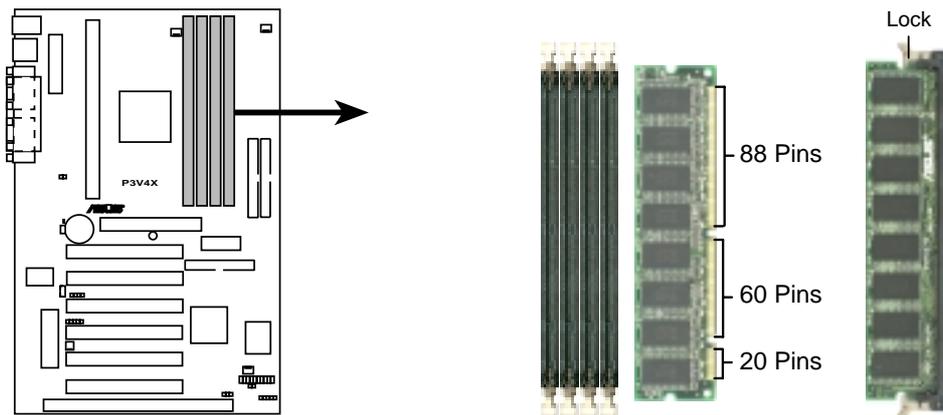
General DIMM Notes

- **DIMMs that have more than 18 chips are not supported on this motherboard.**
- **For the system bus to operate at 100MHz, use only PC100- or PC133-compliant DIMMs; for the system bus to operate at 133MHz, use PC133-compliant DIMMs.**
- ASUS motherboards support SPD (Serial Presence Detect) DIMMs. This is the memory of choice for best performance vs. stability.
- SDRAM chips are generally thinner with higher pin density than EDO (Extended Data Output) chips.
- BIOS shows SDRAM memory on bootup screen.
- Single-sided DIMMs come in 16, 32, 64,128, or 256MB; double-sided come in 32, 64, 128, 256, or 512MB.

3. HARDWARE SETUP

DIMM Memory Installation Procedures:

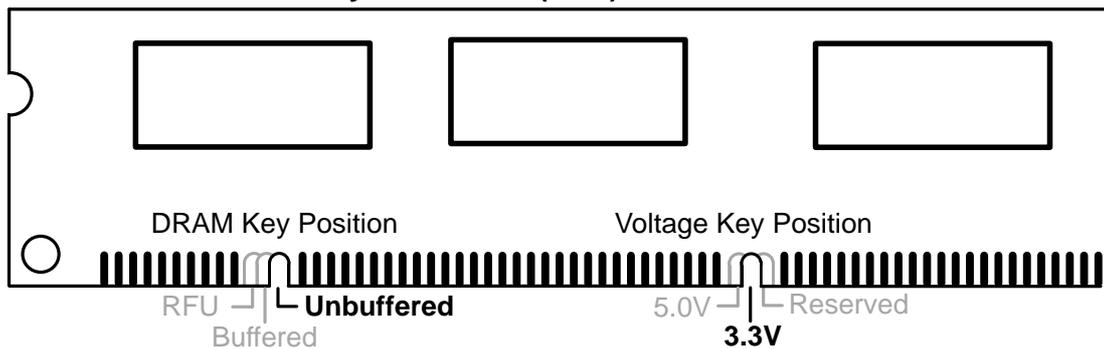
Insert the module(s) as shown. Because the number of pins are different on either side of the breaks, the module will only fit in the orientation as shown. DRAM SIMM modules have the same pin contacts on both sides. SDRAM DIMMs have different pin contacts on each side and therefore have a higher pin density.



P3V4X 168-Pin DIMM Memory Sockets

The DIMMs must be 3.3Volt unbuffered SDRAMs. To determine the DIMM type, check the notches on the DIMMs (see figure below).

168-Pin DIMM Notch Key Definitions (3.3V)



The notches on the DIMM will shift between left, center, or right to identify the type and also to prevent the wrong type from being inserted into the DIMM slot on the motherboard. You must tell your retailer the correct DIMM type before purchasing. This motherboard supports four clock signals.

3. HARDWARE SETUP

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3. HARDWARE SETUP

3.6 Central Processing Unit (CPU)

NOTE: The following pictures are provided for reference purposes only. The appearance of your retention mechanism and fan may be different from the following examples.

Your motherboard provides a Slot 1 connector for a Pentium® III processor packaged in a Single Edge Contact Cartridge 2 (SECC2), a Pentium® II processor packaged in SECC, or a Celeron™ processor packaged in a Single Edge Processor Package (SEPP). An ASUS S370 Series CPU card can allow Socket 370 processors to be used on ASUS motherboards with a Slot 1 connector. (See *7.1 ASUS S370 Series CPU Cards* for instructions on using this card.)



Pentium II processor packaged in an SECC with heatsink and fan (top view)



Pentium III (in an SECC2) with heatsink and fan
NOTE: The SEPP fan (for Celeron processors) is similar to SECC2 fan except that the clamping design is different.

3.6.1 Quick CPU Installation Procedure

1. Attach the heatsink to the processor with thermal grease and retention clip. The recommended heatsinks (see section on recommended heatsinks for Pentium III / II processors for more information) for the boxed Pentium III / II and Celeron processors are those with three-pin fans that can be connected to the fan connectors on the motherboard.

WARNING! Be sure that there is sufficient air circulation across the processor's heatsink by regularly checking that your CPU fan is working. Without sufficient circulation, the processor could overheat and damage both the processor and the motherboard. You may install an auxiliary chassis fan, if necessary.

2. Install the Universal Retention Mechanism onto the motherboard.
3. Insert the processor.

3. HARDWARE SETUP

3.6.2 Attaching the Heatsink

NOTE: If provided, you should follow the heatsink attachment instructions that came with your heatsink or processor. The following steps are provided only as a general guide and may not reflect those for your heatsink.

1. Attach the heatsink to the processor core with a good quality thermal interface material.
2. Mount the heatsink to the processor package.

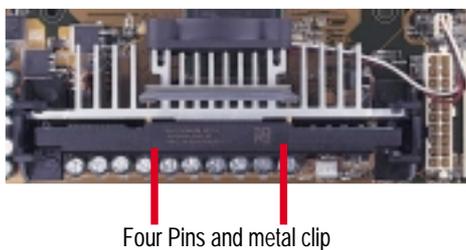
Using SECC fan with Pentium® II

Push the two lock arms one direction to clamp the heatsink onto the processor and the other direction to release.



Using SECC2 fan with Pentium® III

Insert the four heatsink's pins through the holes of the SECC2. Place the metal clip on the ends of the pins and slide until it locks into place.



NOTE: The SEPP heatsink and fan (for Intel Celeron processors) is similar to the SECC2 heatsink and fan except that the clamping design is different.

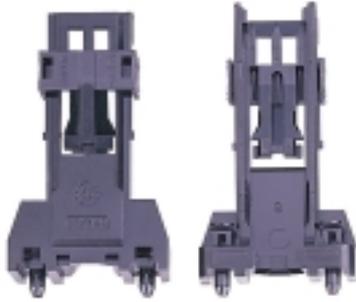
WARNING! Make sure the heatsink is mounted tightly against the SECC2, SECC, or SEPP; otherwise, the CPU will overheat. You may install an auxiliary fan to provide adequate circulation across the processor's passive heatsink.

3. HARDWARE SETUP

3.6.3 Installing the Universal Retention Mechanism

Your motherboard comes with a set of Universal Retention Mechanism (URM), which supports Pentium III / II and Celeron processors. There are two types of URMs: (A) With Integrated Retainer Pins and (B) With Separate Retainer Pins.

URM (A)



Integrated Retainer Pins

URM (B)



Separate Retainer Pins

1. Place the motherboard on the anti-static foam that was shipped with the motherboard. Do not place the motherboard on a hard surface while installing the URM as the black fastener sleeves must protrude through the bottom of the motherboard.
2. Locate the Slot 1 connector on the motherboard.
3. Position the retention mechanism on either side of the Slot 1 connector.
4. Making sure that the top retainer pins are not pushed in, press down on the retention brackets until the black fastener sleeves fit snugly against the board.

WARNING! Installing the URM while the retainer pins are pushed in will not only cause the URM to be installed improperly but will also damage the URM.

5. Push the four retainer pins completely down into the black fastener sleeves until the head of each pin is securely seated.

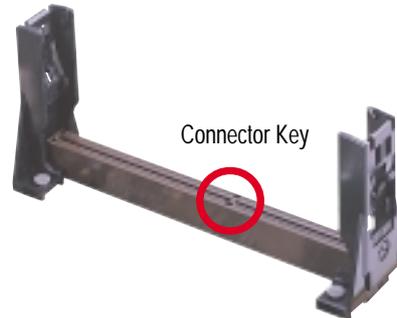
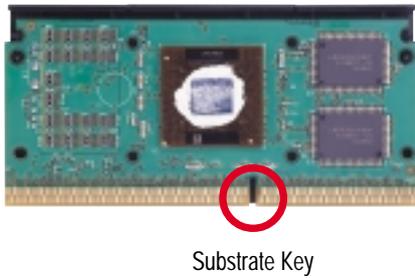


3. HARDWARE SETUP

3.6.4 Installing the Processor

NOTE: The following steps assume that you have already attached the heatsink and installed the URM into your motherboard.

1. Make sure that the processor substrate key is aligned with the Slot 1 connector key.

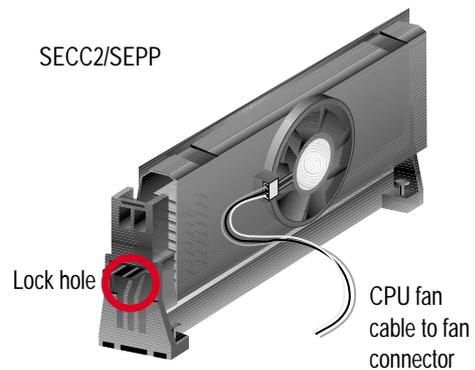
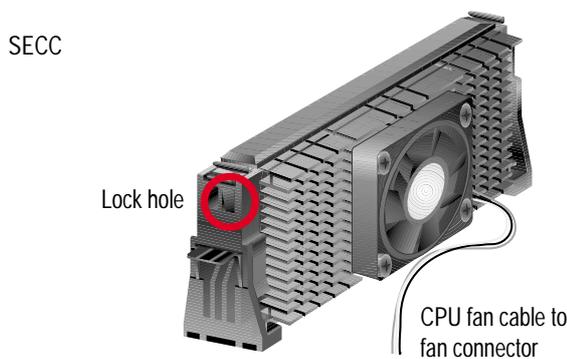


2. Push down firmly but gently the SECC2/SECC/SEPP into the URM until it snaps into place.

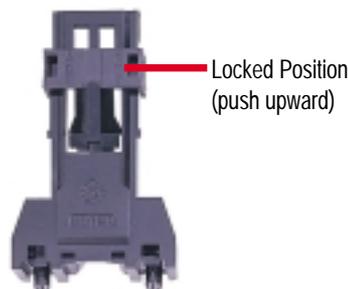
NOTE: The processor edge fingers must be kept parallel to the connector or else misalignment will occur.

SECC for Pentium II only: Secure the SECC in place by pushing the two SECC locks outward so that the locks show through the retention mechanism's lock holes.

SECC2/SEPP: When engaged, the T-bars lock into the slots at the two ends of the SECC2/SEPP heatsink.



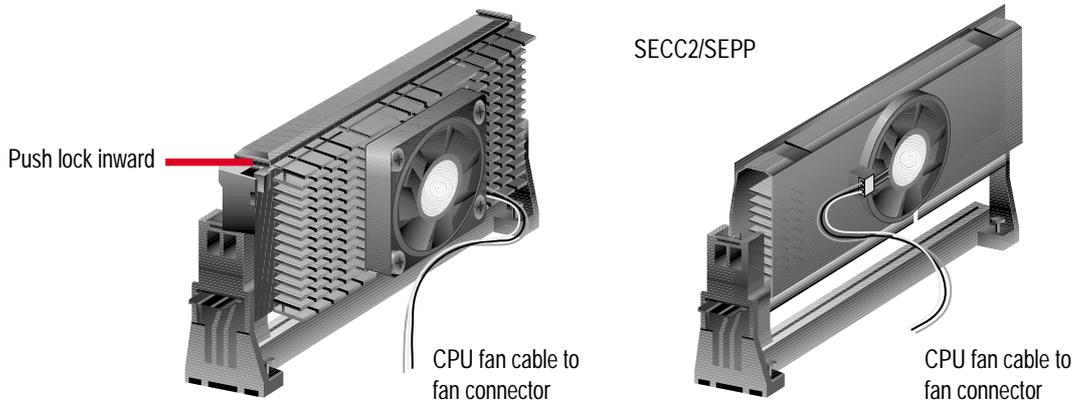
3. If your URM is of type A, make sure the locks are in the locked position as shown.



3. HARDWARE SETUP

3.6.5 Removing the Processor

SECC: Push the SECC's two locks inward to disengage the latch feature and firmly lift the SECC assembly out of the URM.



SECC2/SEPP:

URM (A): Unlock the URM by pushing the two locks down and then pull the SECC2/SEPP assembly out.

URM (B): Place one hand on the heatsink and your other thumb on the top of one of the URM's. Push the URM away from the assembly with your thumb while you rotate the processor out of the slot 1 connector with the other.

CAUTION! You may wear gloves to protect your hands from the sharp edges when removing SECC2/SEPP processors.

3.6.6 Recommended Heatsinks for Slot 1 Processors

The recommended heatsinks for the Slot 1 processors are those with three-pin fans that can be connected to the motherboard's CPU fan connector. These heatsinks dissipate heat more efficiently and with an optional hardware monitor, they can monitor the fan's RPM and use the alert function with the Intel LANDesk Client Manager (LDCM) or the ASUS PC Probe software.



SECC Heatsink & Fan



SECC2 Heatsink & Fan

NOTE: The SEPP heatsink and fan (for Intel Celeron processors) is similar to the SECC2 heatsink and fan except that the clamping design is different.

3. HARDWARE SETUP

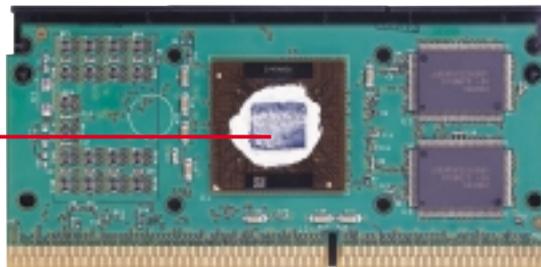
3.6.7 Precautions

Operating a processor at temperatures above its maximum specified operating temperature will shorten the processor lifetime and may cause unreliable operation. To prevent system overheat and/or damage, it is important to have accurate temperature readings of the processor core (the main source of power dissipation) for system thermal management. Included inside Pentium III, Pentium II (Deschutes), FC-PGA370 Celeron, and PPGA370 Celeron processors is a thermal sensor that is connected to the internal thermal diode.

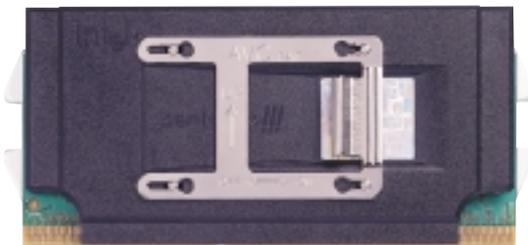
Unlike other motherboards, this motherboard was designed to acquire thermal data directly from the processor thermal diode. Therefore, the CPU temperature reported may be higher than those from motherboards that take readings from thermal sensors external to the processor. This is not a cause for alarm. If, however, the BIOS and/or your hardware monitoring program is reporting a CPU temperature above the threshold, check the following:

1. An Intel recommended fan heatsink is used.
2. Good quality thermal interface material is used.
3. The heatsink is correctly installed onto the processor with a strong retention clip.
4. There is no visible gap between the processor die and heatsink.

The thermal interface material should be continuous with no through-holes or debris.



Example of a correctly installed retention clip



Example of an incorrectly installed retention clip



3. HARDWARE SETUP

3.7 Expansion Cards

WARNING! Unplug your power supply when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards.

3.7.1 Expansion Card Installation Procedure

1. Read the documentation for your expansion card and make any necessary hardware or software settings for your expansion card, such as jumpers.
2. Remove your computer system's cover and the bracket plate on the slot you intend to use. Keep the bracket for possible future use.
3. Carefully align the card's connectors and press firmly.
4. Secure the card on the slot with the screw you removed above.
5. Replace the computer system's cover.
6. Set up the BIOS if necessary
(such as *IRQ xx Used By ISA: Yes* in **4.4.3 PCI Configuration**)
7. Install the necessary software drivers for your expansion card.

3.7.2 Assigning IRQs for Expansion Cards

Some expansion cards need an IRQ to operate. Generally, an IRQ must be exclusively assigned to one use. In a standard design, there are 16 IRQs available but most of them are already in use, leaving 6 IRQs free for expansion cards. If your motherboard has **PCI** audio onboard, an additional IRQ will be used. If your motherboard also has **MIDI** enabled, another IRQ will be used, leaving 4 IRQs free.

IMPORTANT: If using PCI cards on shared slots, make sure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Conflicts will arise between the two PCI groups that will make the system unstable or cards inoperable.

Interrupt Request Table for this Motherboard

	INT-A	INT-B	INT-C	INT-D
PCI slot 1	shared	—	—	—
PCI slot 2	—	shared	—	—
PCI slot 3	—	—	shared	—
PCI slot 4	—	—	—	shared
PCI slot 5	—	—	—	shared
PCI slot 6	—	—	shared	—
AGP slot	shared	shared	—	—
Onboard USB controller	—	—	—	shared

3. HARDWARE SETUP

The following table lists the default IRQ assignments for standard PC devices. Use this table when configuring your system and for resolving IRQ conflicts.

Standard Interrupt Assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	N/A	Programmable Interrupt
3*	11	Communications Port (COM2)
4*	12	Communications Port (COM1)
5*	13	
6	14	Floppy Disk Controller
7*	15	Printer Port (LPT1)
8	3	System CMOS/Real Time Clock
9*	4	ACPI Mode when used
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

*These IRQs are usually available for ISA or PCI devices.

Both ISA and PCI expansion cards may require IRQs. System IRQs are available to cards installed in the ISA expansion bus first, then any remaining IRQs are available to PCI cards. Currently, there are two types of ISA cards.

The original ISA expansion card design, now referred to as legacy ISA cards, requires that you configure the card's jumpers manually and then install it in any available slot on the ISA bus. To see a map of your used and free IRQs in Windows 9x, the **Control Panel** icon in **My Computer**, contains a **System** icon, which gives you a **Device Manager** tab. Double-clicking on a specific hardware device gives you the **Resources** tab which shows the Interrupt number and address. Double-click **Computer** to see all the interrupts and addresses for your system. Make sure that no two devices use the same IRQ or your computer will experience problems when those two devices are in use at the same time.

To simplify this process, this motherboard complies with the Plug and Play (PNP) specification which was developed to allow automatic system configuration whenever a PNP-compliant card is added to the system. For PNP cards, IRQs are assigned automatically from those available.

3. HARDWARE SETUP

If the system has both legacy and PNP ISA cards installed, IRQs are assigned to PNP cards from those not used by legacy cards. The PCI and PNP configuration of the BIOS setup utility can be used to indicate which IRQs are being used by legacy cards. For older legacy cards that do not work with the BIOS, you can contact your vendor for an ISA Configuration Utility.

An IRQ number is automatically assigned to PCI expansion cards after those used by legacy and PNP ISA cards. In the PCI bus design, the BIOS automatically assigns an IRQ to PCI cards that require an IRQ. To install a PCI card, you need to set the INT (interrupt) assignment. Since all the PCI slots on this motherboard use an INTA #, be sure that the jumpers on your PCI cards are set to INT A.

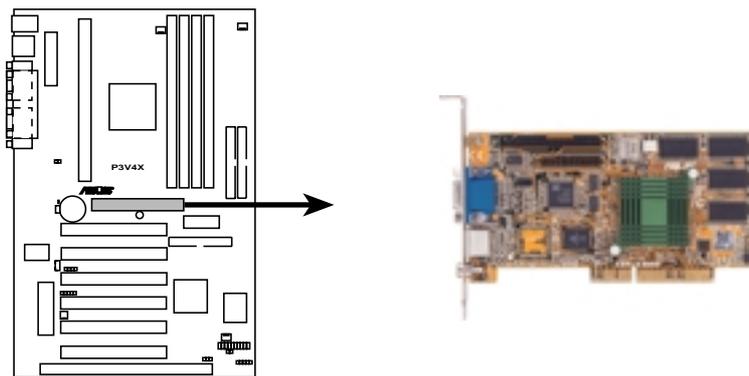
3.7.3 Assigning DMA Channels for ISA Cards

Some ISA cards, both legacy and PNP, may also need to use a DMA (Direct Memory Access) channel. DMA assignments for this motherboard are handled the same way as the IRQ assignment process described earlier. You can select a DMA channel in the PCI and PNP configuration section of the BIOS Setup utility.

IMPORTANT: To avoid conflicts, reserve the necessary IRQs and DMAs for legacy ISA cards (see **4.4.3 PCI Configuration**. Choose *Yes* in *IRQ xx Used By ISA* and *DMA x Used By ISA* for those IRQs and DMAs you want to reserve).

3.7.4 Accelerated Graphics Port (AGP)

This motherboard provides an accelerated graphics port (AGP) slot to support AGP graphics cards.



P3V4X Accelerated Graphics Port (AGP)

3. HARDWARE SETUP

3.8 External Connectors

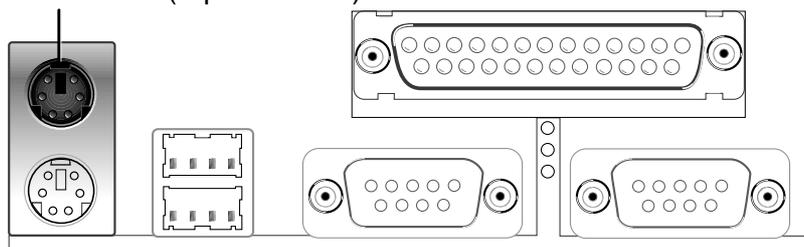
WARNING! Some pins are used for connectors or power sources. These are clearly distinguished from jumpers in the motherboard layout. Placing jumper caps over these connectors will cause damage to your motherboard.

IMPORTANT: Ribbon cables should always be connected with the red stripe on the Pin 1 side of the connector. The four corners of the connectors are labeled on the motherboard. Pin 1 is the side closest to the power connector on hard drives and floppy drives. IDE ribbon cable must be less than 46 cm (18 in), with the second drive connector no more than 15 cm (6 in) from the first connector.

1. PS/2 Mouse Connector (6-pin female)

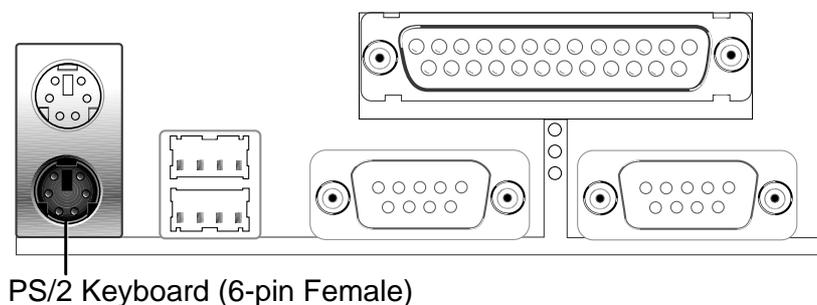
The system will direct IRQ12 to the PS/2 mouse if one is detected. If not detected, expansion cards can use IRQ12. See **PS/2 Mouse Function Control** in *4.4 Advanced Menu*.

PS/2 Mouse (6-pin Female)



2. PS/2 Keyboard Connector (6-pin female)

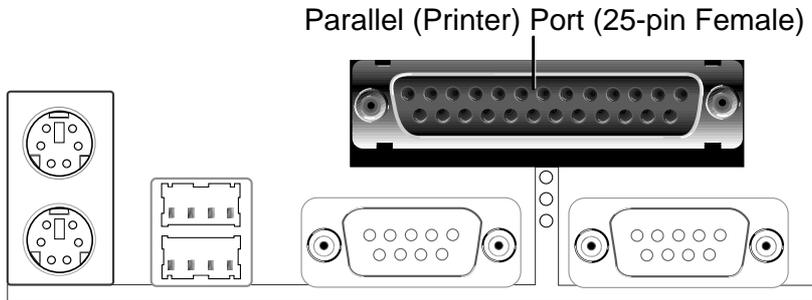
This connection is for a standard keyboard using an PS/2 plug (mini DIN). **This connector will not allow standard AT size (large DIN) keyboard plugs. You may use a DIN to mini DIN adapter on standard AT keyboards.**



3. HARDWARE SETUP

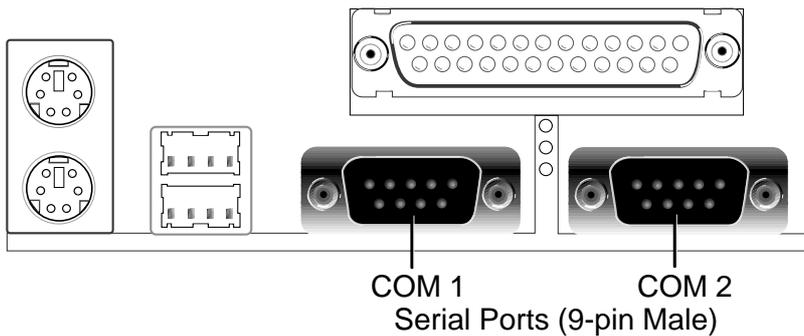
3. Parallel Port Connector (25-pin female)

You can enable the parallel port and choose the IRQ through *Onboard Parallel Port* in *4.4.2 I/O Device Configuration*. **NOTE:** Serial printers must be connected to the serial port.



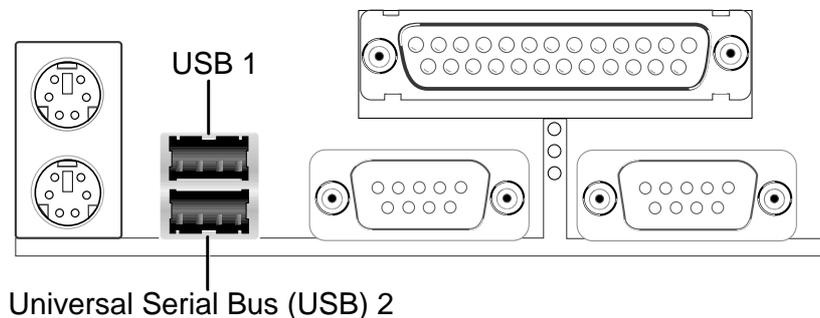
4. Serial Port COM1 and COM2 Connectors (Two 9-pin male)

The two serial ports can be used for pointing devices or other serial devices. See *Onboard Serial Port* in *4.4.2 I/O Device Configuration* for settings.



5. Universal Serial BUS Port Connectors 1 & 2 (Two 4-pin female)

Two USB ports are available for connecting USB devices.



3. HARDWARE SETUP

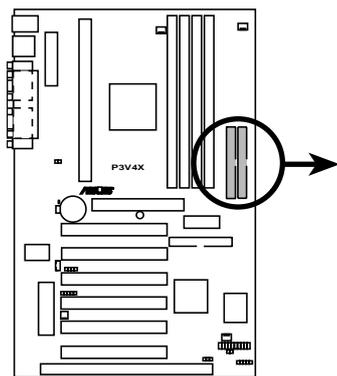
6. Primary / Secondary IDE Connectors (Two 40-1pin IDE)

These connectors support the provided UltraDMA/66 IDE hard disk ribbon cable. Connect the cable's blue connector to the motherboard's primary (recommended) or secondary IDE connector, and then connect the gray connector to your UltraDMA/66 slave device (hard disk drive) and the black connector to your UltraDMA/66 master device. It is recommended that non-UltraDMA/66 devices be connected to the secondary IDE connector. If you install two hard disks, you must configure the second drive to Slave mode by setting its jumper accordingly. Refer to your hard disk documentation for the jumper settings. **(Pin 20 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 20 plugged).** If you have more than two UltraDMA/66 devices, you will need to purchase another UltraDMA/66 cable.

NOTE: The hole near the blue connector on the UltraDMA/66 cable is intentional.

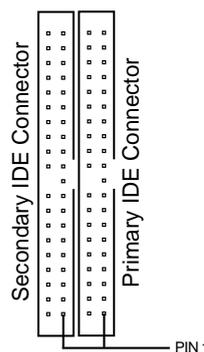
TIP: You may configure two hard disks to be both Masters with two ribbon cables – one for the primary IDE connector and another for the secondary IDE connector. You may install one operating system on an IDE drive and another on a SCSI drive and select the boot disk through **4.6 Boot Menu**.

IMPORTANT: UltraDMA/66 IDE devices must use a 40-pin 80-conductor IDE cable.



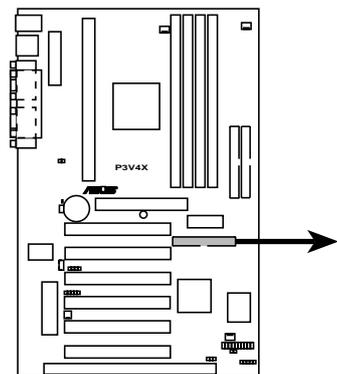
P3V4X IDE Connectors

NOTE: Orient the red stripe to PIN 1



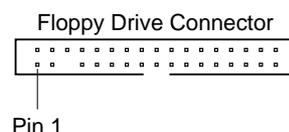
7. Floppy Disk Drive Connector (34-1pin FLOPPY)

This connector supports the provided floppy disk drive ribbon cable. After connecting the single end to the board, connect the two plugs on the other end to the floppy drives. **(Pin 5 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 5 plugged).**



P3V4X Floppy Disk Drive Connector

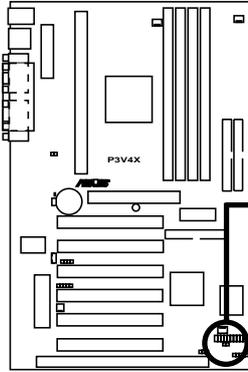
NOTE: Orient the red stripe of the floppy disk drive cable to Pin 1.



3. HARDWARE SETUP

8. IDE Device Activity LED (2-pin IDELED)

This connector supplies power to the cabinet's IDE device activity LED. Read and write activity by devices connected to the Primary or Secondary IDE connectors will cause the LED to light up.



TIP: If the case-mounted LED does not light, try reversing the 2-pin plug.

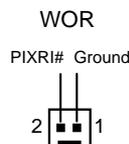
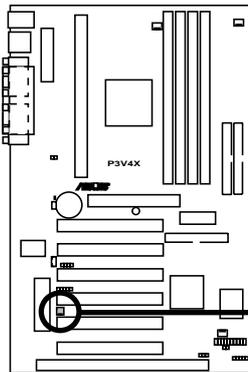


P3V4X IDE Activity LED

9. Wake-On-Ring Connector (2-pin WOR)

This connector connects to internal modem cards with a Wake-On-Ring output. The connector powers up the system when a ringup packet or signal is received through the internal modem card. **NOTE:** For external modems, Wake-On-Ring is detected through the COM port.

IMPORTANT: This feature requires that the **PWR UP On External Modem Act** is set to Enabled (see *4.5.1 Power Up Control*).



P3V4X Wake-On-Ring Connector

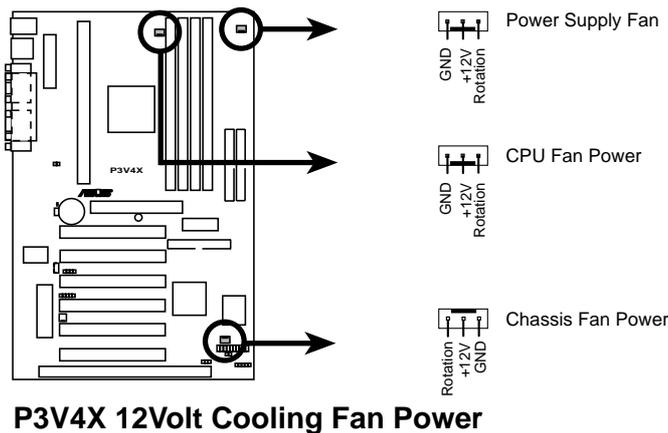
3. HARDWARE SETUP

10. Chassis/CPU/Power Supply Fan Connectors (3-pin CHA_,CPU_,PWR_FAN)

These connectors support cooling fans of 500mA (6W) or less. Orientate the fans so that the heat sink fins allow airflow to go across the onboard heat sink(s) instead of the expansion slots. Depending on the fan manufacturer, the wiring and plug may be different. The red wire should be positive, while the black should be ground. Connect the fan's plug to the board taking into consideration the polarity of the this connector.

NOTES: The "Rotation" signal is to be used only by a specially designed fan with rotation signal. The fans have been designed to power off after entering the sleep/soft-off mode. This is to reduce both energy consumption and system noise.

WARNING! The CPU and/or motherboard will overheat if there is no airflow across the CPU and onboard heatsinks. Damage may occur to the motherboard and/or the CPU fan if these pins are incorrectly used. **These are not jumpers, do not place jumper caps over these pins.**

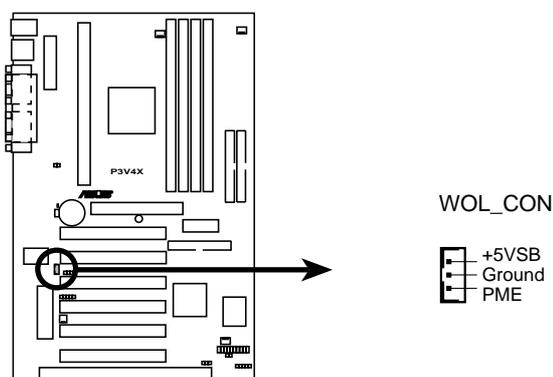


3. HARDWARE SETUP

11. Wake-On-LAN Connector (3-pin WOL_CON)

The WOL_CON connector powers up the system when a wake-up packet or signal is received from the network through an optional PCI-L101 LAN card.

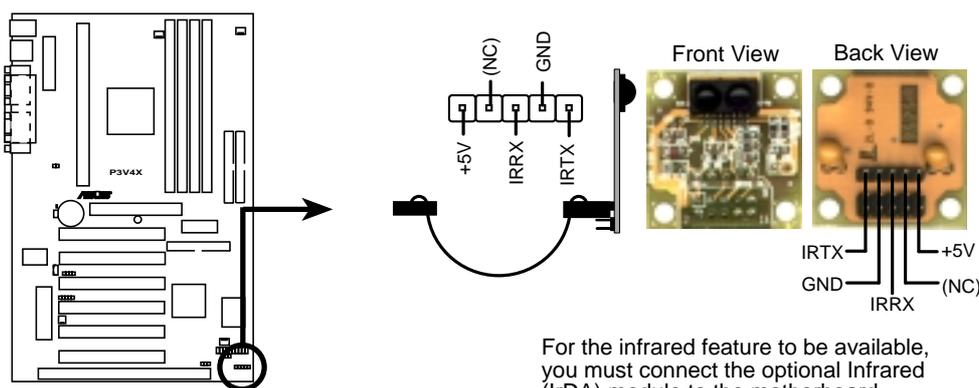
IMPORTANT: This feature requires that the **Wake-On-LAN** is set to *Enabled* (see *4.5.1 Power Up Control*) and that your system has an ATX power supply with at least 720mA +5V standby power.



P3V4X Wake-On-LAN Connector

12. IrDA-Compliant Infrared Module Connector (5-pin IR)

This connector supports the optional wireless transmitting and receiving infrared module. This module mounts to a small opening on system cases that support this feature. You must also configure the setting through “UART2 Use Infrared” in *4.4.2 I/O Device Configuration* to select whether UART2 is directed for use with COM2 or IrDA. Use the five pins as shown on the Back View and connect a ribbon cable from the module to the motherboard according to the pin definitions.

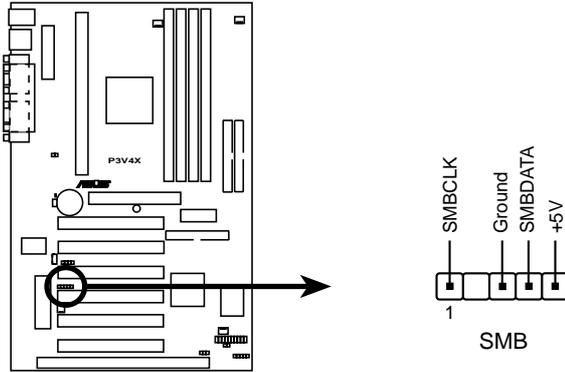


P3V4X Infrared Module Connector

3. HARDWARE SETUP

13. SMBus Connector (5-1 pin SMB)

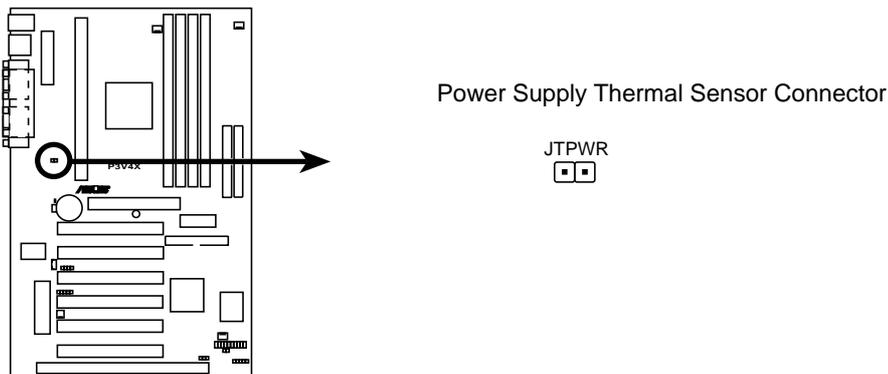
This connector allows you to connect SMBus devices. SMBus devices communicate by means of the SMBus with an SMBus host and/or other SMBus devices. The SMBus or System Management Bus is a specific implementation of an I²C bus, which is a multi-master bus, that is, multiple chips can be connected to the same bus and each one can act as a master by initiating data transfer.



P3V4X SMBus Connector

14. Power Supply Thermal Sensor Connector (2-pin block JTPWR)

If you have a power supply with thermal monitoring, connect its thermal sensor cable to this connector.

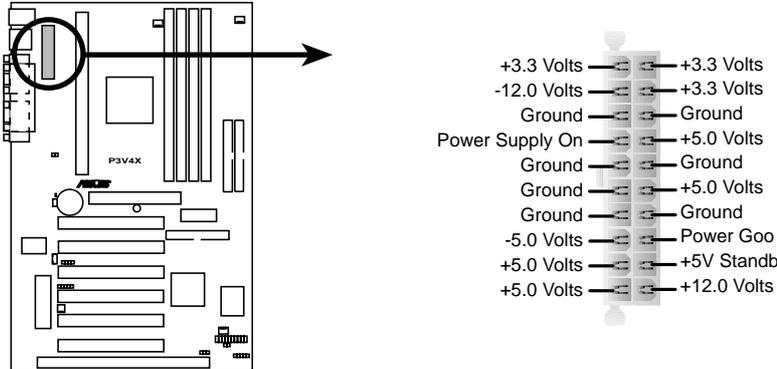


P3V4X Thermal Sensor Connector

3. HARDWARE SETUP

15. ATX Power Supply Connector (20-pin ATXPWR)

This connector connects to an ATX power supply. The plug from the power supply will only insert in one orientation because of the different hole sizes. Find the proper orientation and push down firmly but gently making sure that the pins are aligned.



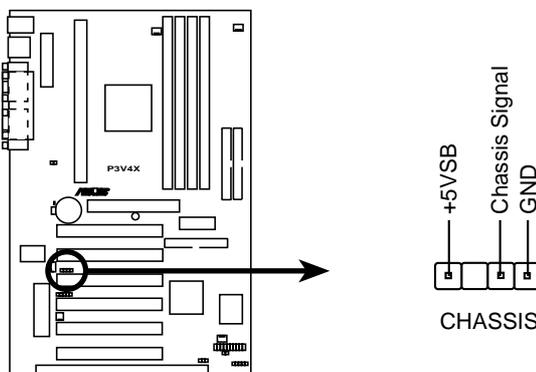
P3V4X ATX Power Connector

IMPORTANT: Make sure that your ATX power supply can supply at least 10mA on the 5-volt standby lead (5VSB). You may experience difficulty in powering on your system if your power supply cannot support the load. For Wake-On-LAN support, your ATX power supply must supply at least 720mA +5VSB.

16. Chassis Intrusion Alarm Lead (optional) (4-1 pin CHASSIS)

This requires an external detection mechanism such as a chassis intrusion monitor/sensor or microswitch. The sensor is triggered when a high level signal is sent to the Chassis Signal lead, which occurs when a panel switch or light detector is triggered. This function requires the optional CIDB chassis sensor module to be installed.

NOTE: When the chassis is opened, connect/short the Chassis Signal pin to the +5VSB pin. When the chassis is closed, connect/short the Chassis Signal pin to the Ground pin.



P3V4X Chassis Intrusion Alarm Lead

3. HARDWARE SETUP

17. System Power LED Lead (3-1 pin PWR.LED)

This 3-1 pin connector connects to the system power LED, which lights when the system is powered on and blinks when it is in sleep or soft-off mode.

18. Keyboard Lock Switch Lead (2-pin KEYLOCK)

This 2-pin connector connects to the case-mounted key switch to allow keyboard locking. **NOTE:** When the keyboard is locked, the mouse can still be used.

19. System Warning Speaker Connector (4-pin SPEAKER)

This 4-pin connector connects to the case-mounted speaker.

20. System Message LED Lead (2-pin MSG.LED)

This indicates whether a message has been received from a fax/modem. The LED will remain lit when there is no signal and blink when there is data received. This function requires an ACPI OS and driver support.

21. System Management Interrupt Lead (2-pin SMI)

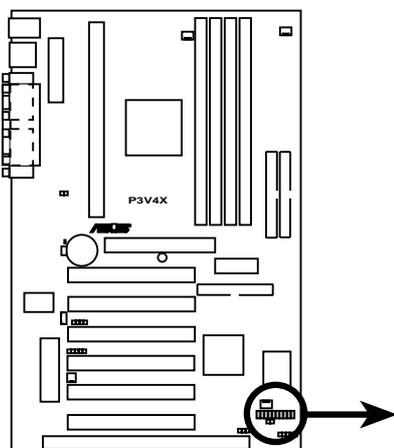
This allows the user to manually place the system into a suspend mode or “Green” mode where system activity will be instantly decreased to save electricity and expand the life of certain components when the system is not in use. This 2-pin connector connects to the case-mounted suspend switch.

22. ATX Power Switch / Soft-Off Switch Lead (2-pin PWR.SW)

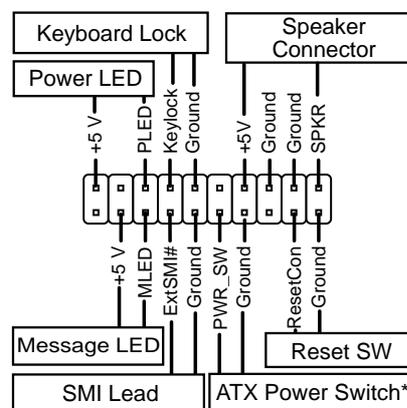
The system power is controlled by a momentary switch connected to this lead. Pushing the button once will switch the system between ON and SLEEP or ON and SOFT OFF, depending on your BIOS or OS setting. Pushing the switch while in the ON mode for more than 4 seconds will turn the system off. The system power LED shows the status of the system’s power.

23. Reset Switch Lead (2-pin RESET)

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting to prolong the life of the system’s power supply.



P3V4X System Panel Connections



* Requires an ATX power supply.

3. HARDWARE SETUP

3.9 Power Connection Procedures

1. After all connections are made, close the system case cover.
2. Be sure that all switches are off (in some systems, marked with ○).
3. Connect the power supply cord to the power supply located on the back of your system case according to your system user's manual.
4. Connect the power cord to a power outlet that is equipped with a surge protector.
5. You may then turn on your devices in the following order:
 - a. Your monitor
 - b. External SCSI devices (starting with the last device on the chain)
 - c. Your system power

For ATX power supplies, you need to switch ON the power supply if a switch is provided as well as press the ATX power switch on the front of the case.

6. The power LED on the front panel of the system case will light. For ATX power supplies, the system LED will light when the ATX power switch is pressed. The LED on the monitor may light up or switch between orange and green after the system's if it complies with "green" standards or if it has a power standby feature. The system will then run power-on tests. While the tests are running, additional messages will appear on the screen. If you do not see anything within 30 seconds from the time you turn on the power, the system may have failed a power-on test. Check your jumper settings and connections again or call your retailer for assistance.

Award BIOS Beep Codes

Beep	Meaning
One short beep when displaying logo	No error during POST
Long beeps in an endless loop	No DRAM installed or detected
One long beep followed by three short beeps	Video card not found or video card memory bad
High frequency beeps when system is working	CPU overheated System running at a lower frequency

3. HARDWARE SETUP

7. During power-on, hold down <Delete> to enter BIOS setup. Follow the instructions in **4. BIOS SETUP**.
- * **Powering Off your computer:** You must first exit or shut down your operating system before switching off the power switch. For ATX power supplies, you can press the ATX power switch after exiting or shutting down your operating system. If you use Windows 95/98, click the **Start** button, click **Shut Down**, and then click **Shut down the computer?**. The power supply should turn off after Windows shuts down.

NOTE: The message “You can now safely turn off your computer” will not appear when shutting down with ATX power supplies.

4. BIOS SETUP

4.1 Managing and Updating Your BIOS

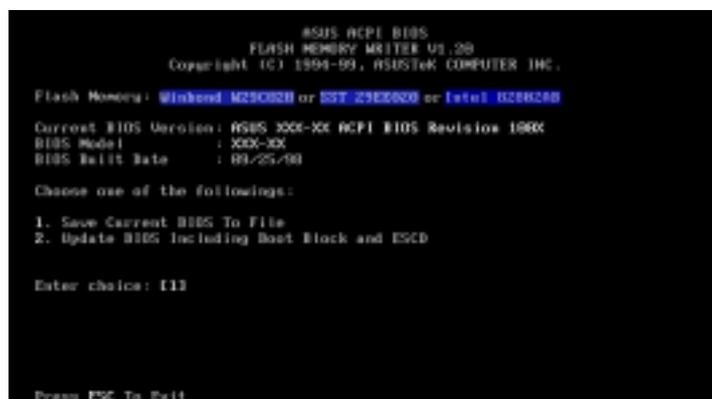
4.1.1 Upon First Use of the Computer System

It is recommended that you save a copy of the original motherboard BIOS along with a Flash Memory Writer utility (AFLASH.EXE) to a bootable floppy disk in case you need to reinstall the BIOS later. **AFLASH.EXE** is a Flash Memory Writer utility that updates the BIOS by uploading a new BIOS file to the programmable flash ROM on the motherboard. This file works only in DOS mode. To determine the BIOS version of your motherboard, check the last four numbers of the code displayed on the upper left-hand corner of your screen during bootup. Larger numbers represent a newer BIOS file.

1. Type **FORMAT A:/S** at the DOS prompt to create a bootable system floppy disk. **DO NOT** copy AUTOEXEC.BAT & CONFIG.SYS to the disk.
2. Type **COPY D:\AFLASH\AFLASH.EXE A:** (assuming D is your CD-ROM drive) to copy AFLASH.EXE to the just created boot disk.

NOTE: AFLASH works only in DOS mode. It will not work with DOS prompt in Windows and will not work with certain memory drivers that may be loaded when you boot from your hard drive. It is recommended that you reboot using a floppy.

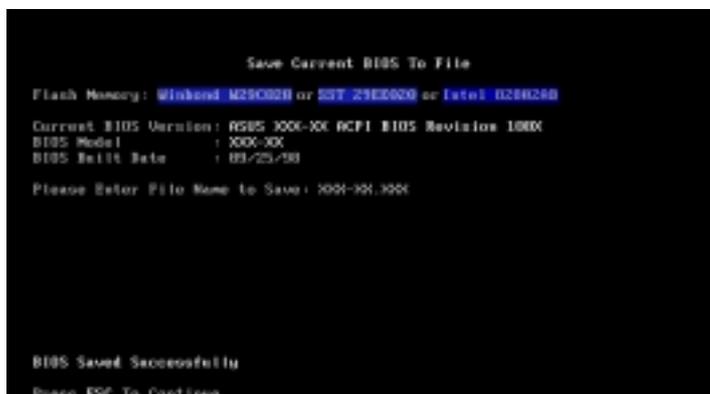
3. Reboot your computer from the floppy disk. **NOTE:** BIOS setup must specify “Floppy” as the first item in the boot sequence.
4. In DOS mode, type **A:\AFLASH <Enter>** to run AFLASH.



IMPORTANT! If “unknown” is displayed after **Flash Memory:**, the memory chip is either not programmable or is not supported by the ACPI BIOS and therefore, cannot be programmed by the Flash Memory Writer utility.

4. BIOS SETUP

5. Select **1. Save Current BIOS to File** from the Main menu and press <Enter>. The **Save Current BIOS To File** screen appears.



6. Type a filename and the path, for example, **A:\XXX-XX.XXX** and then press <Enter>.

4.1.2 Updating BIOS Procedures (only when necessary)

1. Download an updated ASUS BIOS file from the Internet (WWW or FTP) (see **ASUS CONTACT INFORMATION** on page 3 for details) and save to the disk you created earlier.
2. Boot from the disk you created earlier.
3. At the “A:\” prompt, type **AFLASH** and then press <Enter>.
4. At the **Main Menu**, type **2** and then press <Enter>. The **Update BIOS Including Boot Block and ESCD** screen appears.
5. Type the filename of your new BIOS and the path, for example, **A:\XXX-XX.XXX**, and then press <Enter>.

NOTE: To cancel this operation, press <Enter>.



4. BIOS SETUP

- When prompted to confirm the BIOS update, press **Y** to start the update.

```
Update BIOS Including Boot Block and ESCD
Flash Memory: Winbond W95C001 or SST 2900A01 or Intel 1024K01
BIOS Version
(CURRENT) 3 ASUS 3000-XX ACPI BIOS Revision 100X
(Next, use) 3 ASUS 3000-XX ACPI BIOS Revision 100X
BIOS Model
(CURRENT) 3 3000-XX
(Next, use) 3 3000-XX
Date of BIOS Build
(CURRENT) 3 05/25/98
(CURRENT, use) 3 05/25/98
Notice: Boot Block is different. Check use of 1881. B10 is F200.
For use more (F/?) ? EYI
Press ESC To Return to Main Menu
```

- The utility starts to program the new BIOS information into the flash ROM. The boot block will be updated automatically only when necessary. This will minimize the chance of a failed updating. When the programming is finished, *Flashed Successfully* will be displayed.

```
Update BIOS Including Boot Block and ESCD
Flash Memory: Winbond W95C001 or SST 2900A01 or Intel 1024K01
BIOS Version
(CURRENT) 3 ASUS 3000-XX ACPI BIOS Revision 100X
(Next, use) 3 ASUS 3000-XX ACPI BIOS Revision 100X
BIOS Model
(CURRENT) 3 3000-XX
(Next, use) 3 3000-XX
Date of BIOS Build
(CURRENT) 3 05/25/98
(CURRENT, use) 3 05/25/98
Notice: Boot Block is different. Check use of 1881. B10 is F200.
For use more (F/?) ? EYI
Block Erasing -- Base
Programming -- 3FFF
Flashed Successfully
Press ESC To Continue
```

- Follow the onscreen instructions to continue.

```
ASUS ACPI BIOS
FLASH MEMORY WRITER V0.20
Copyright (C) 1996-99, ASUS/ASUS COMPUTER INC.
Flash Memory: Winbond W95C001 or SST 2900A01 or Intel 1024K01
Current BIOS Version: ASUS 3000-XX ACPI BIOS Revision 100X
BIOS Model: 3 3000-XX
BIOS Build Date: 3 05/25/98
Choose one of the following:
1. Save Current BIOS To File
2. Update BIOS Including Boot Block and ESCD
Enter choice: 111
You have flashed the EPROM. It is recommended that you turn off
the power, enter SETUP and Load Setup Defaults to have CMOS
updated with new BIOS when exits.
Press ESC To Exit
```

WARNING! If you encounter problems while updating the new BIOS, DO NOT turn off your system since this might prevent your system from booting up. Just repeat the process, and if the problem still persists, update the original BIOS file you saved to disk above. If the Flash Memory Writer utility was not able to successfully update a complete BIOS file, your system may not be able to boot up. If this happens, your system will need servicing.

4. BIOS SETUP

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4. BIOS SETUP

4.2 BIOS Setup Program

This motherboard supports a programmable EEPROM that can be updated using the provided utility as described in *4.1 Managing and Updating Your BIOS*.

The utility is used if you are installing a motherboard, reconfiguring your system, or prompted to “**Run Setup**”. This section describes how to configure your system using this utility.

Even if you are not prompted to use the Setup program, at some time in the future you may want to change the configuration of your computer. For example, you may want to enable the Security Password Feature or make changes to the power management settings. It will then be necessary to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the EEPROM.

The EEPROM on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. This appears during the Power-On Self Test (POST). Press <Delete> to call up the Setup utility. If you are a little bit late in pressing the mentioned key, POST will continue with its test routines, thus preventing you from calling up Setup. If you still need to call Setup, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the Reset button on the system chassis. You can also restart by turning the system off and then back on again. But do so only if the first two methods fail.

The Setup program has been designed to make it as easy to use as possible. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.

To access the BIOS Setup program, press the <Delete> key after the computer has run through its POST.

NOTE: Because the BIOS software is constantly being updated, the following BIOS screens and descriptions are for reference purposes only and may not reflect your BIOS screens exactly.

4. BIOS SETUP

4.2.1 BIOS Menu Bar

The top of the screen has a menu bar with the following selections:

- MAIN** Use this menu to make changes to the basic system configuration.
- ADVANCED** Use this menu to enable and make changes to the advanced features.
- POWER** Use this menu to configure and enable Power Management features.
- BOOT** Use this menu to configure the default system device used to locate and load the Operating System.
- EXIT** Use this menu to exit the current menu or specify how to exit the Setup program.

To access the menu bar items, press the right or left arrow key on the keyboard until the desired item is highlighted.

4.2.2 Legend Bar

At the bottom of the Setup screen you will notice a legend bar. The keys in the legend bar allow you to navigate through the various setup menus. The following table lists the keys found in the legend bar with their corresponding alternates and functions.

Navigation Key(s)	Function Description
<F1> or <Alt + H>	Displays the General Help screen from anywhere in the BIOS Setup
<Esc>	Jumps to the Exit menu or returns to the main menu from a sub-menu
← or → (keypad arrow)	Selects the menu item to the left or right
↑ or ↓ (keypad arrows)	Moves the highlight up or down between fields
- (minus key)	Scrolls backward through the values for the highlighted field
+ (plus key) or spacebar	Scrolls forward through the values for the highlighted field
<Enter>	Brings up a selection menu for the highlighted field
<Home> or <PgUp>	Moves the cursor to the first field
<End> or <PgDn>	Moves the cursor to the last field
<F5>	Resets the current screen to its Setup Defaults
<F10>	Saves changes and exits Setup

4. BIOS SETUP

General Help

In addition to the Item Specific Help window, the BIOS setup program also provides a General Help screen. This screen can be called up from any menu by simply pressing <F1> or the <Alt> + <H> combination. The General Help screen lists the legend keys with their corresponding alternates and functions.

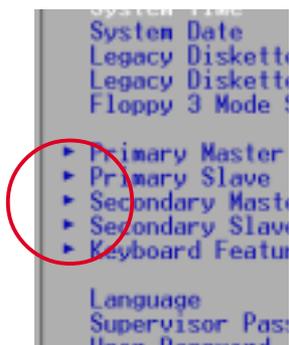
Saving Changes and Exiting the Setup Program

See *4.7 Exit Menu* for detailed information on saving changes and exiting the setup program.

Scroll Bar

When a scroll bar appears to the right of a help window, it indicates that there is more information to be displayed that will not fit in the window. Use <PgUp> and <PgDn> or the up and down arrow keys to scroll through the entire help document. Press <Home> to display the first page, press <End> to go to the last page. To exit the help window, press <Enter> or <Esc>.

Sub-Menu



Note that a right pointer symbol (as shown in the left view) appears to the left of certain fields. This pointer indicates that a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. To call up a sub-menu, simply move the highlight to the field and press <Enter>. The sub-menu will then immediately appear. Use the legend keys to enter values and move from field to field within a sub-menu just as you would within a menu. Use the <Esc> key to return to the main menu.

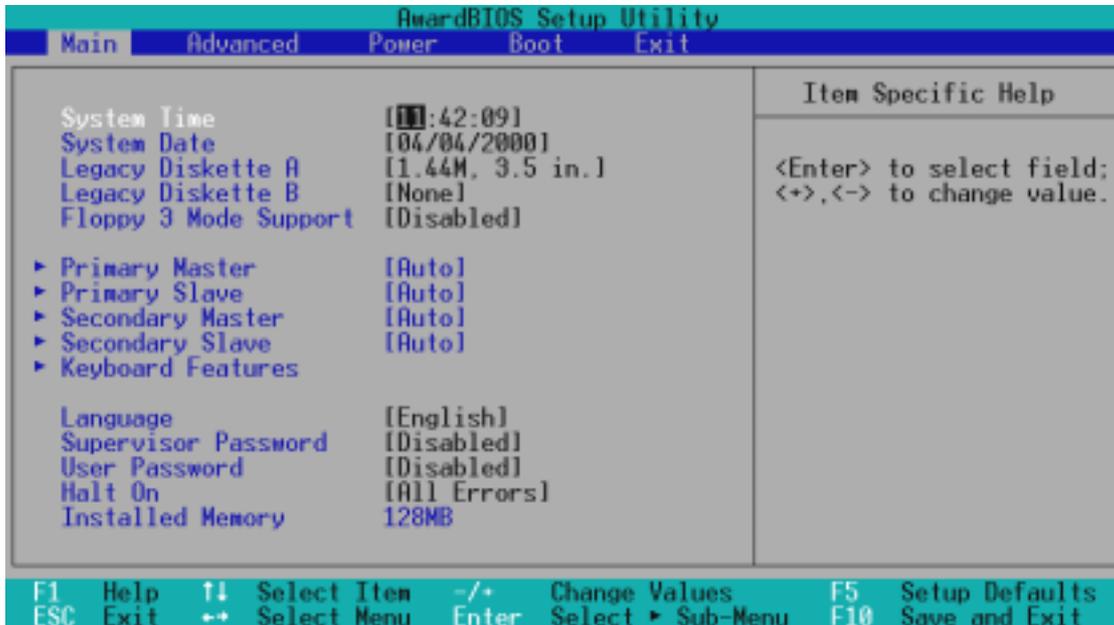
Take some time to familiarize yourself with each of the legend keys and their corresponding functions. Practice navigating through the various menus and sub-menus. If you accidentally make unwanted changes to any of the fields, use the set default hot key <F5>. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.

NOTE: The item heading in square brackets represents the default setting for that field.

4. BIOS SETUP

4.3 Main Menu

When the Setup program is accessed, the following screen appears:



System Time [XX:XX:XX]

Sets your system to the time that you specify (usually the current time). The format is hour, minute, second. Valid values for hour, minute and second are **Hour: (00 to 23)**, **Minute: (00 to 59)**, **Second: (00 to 59)**. Use the <Tab> or <Shift> + <Tab> keys to move between the hour, minute, and second fields.

System Date [XX/XX/XXXX]

Sets your system to the date that you specify (usually the current date). The format is month, day, year. Valid values for month, day, and year are **Month: (1 to 12)**, **Day: (1 to 31)**, **Year: (100 year range)**. Use the <Tab> or <Shift> + <Tab> keys to move between the month, day, and year fields.

Legacy Diskette A [1.44M, 3.5 in.], Legacy Diskette B [None]

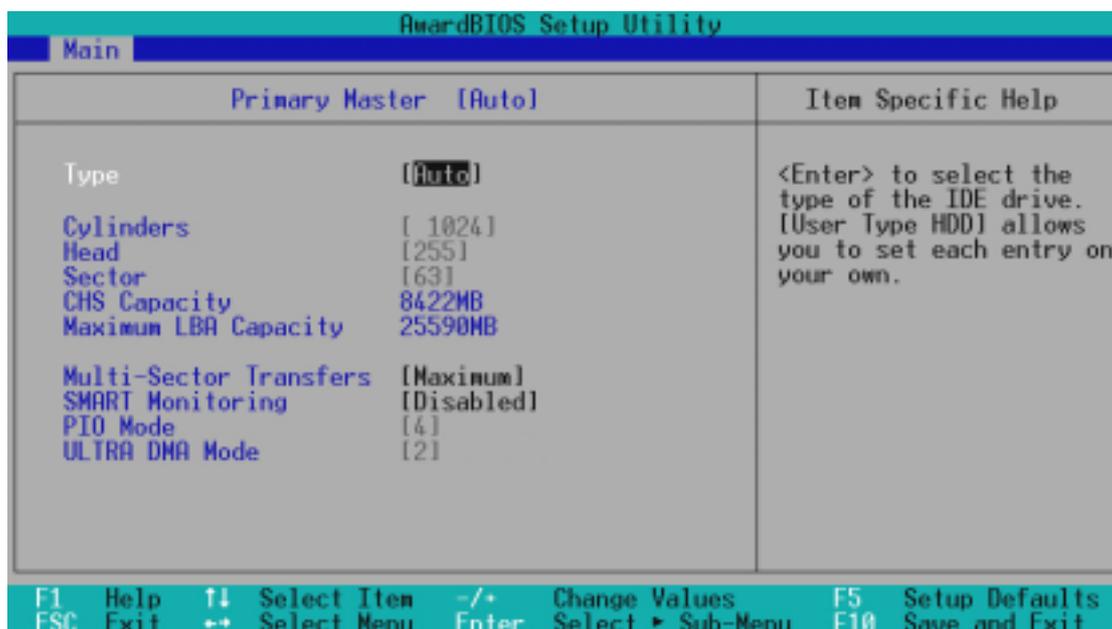
Sets the type of floppy drives installed. Configuration options: [None] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

Floppy 3 Mode Support [Disabled]

This is required to support older Japanese floppy drives. Floppy 3 Mode support will allow reading and writing of 1.2MB (as opposed to 1.44MB) on a 3.5-inch diskette. Configuration options: [Disabled] [Drive A] [Drive B] [Both]

4. BIOS SETUP

4.3.1 Primary & Secondary Master/Slave



NOTE: Before attempting to configure a hard disk drive, make sure you have the configuration information supplied by the manufacturer of the drive. Incorrect settings may cause your system to not recognize the installed hard disk. To allow the BIOS to detect the drive type automatically, select [Auto].

Type [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic detection is successful, the correct values will be filled in for the remaining fields on this sub-menu. If automatic detection fails, your hard disk drive may be too old or too new. You can try updating your BIOS or enter the IDE hard disk drive parameters manually.

NOTE: After the IDE hard disk drive information has been entered into BIOS, new IDE hard disk drives must be partitioned (such as with FDISK) and then formatted before data can be read from and write on. Primary IDE hard disk drives must have its partition set to *active* (also possible with FDISK).

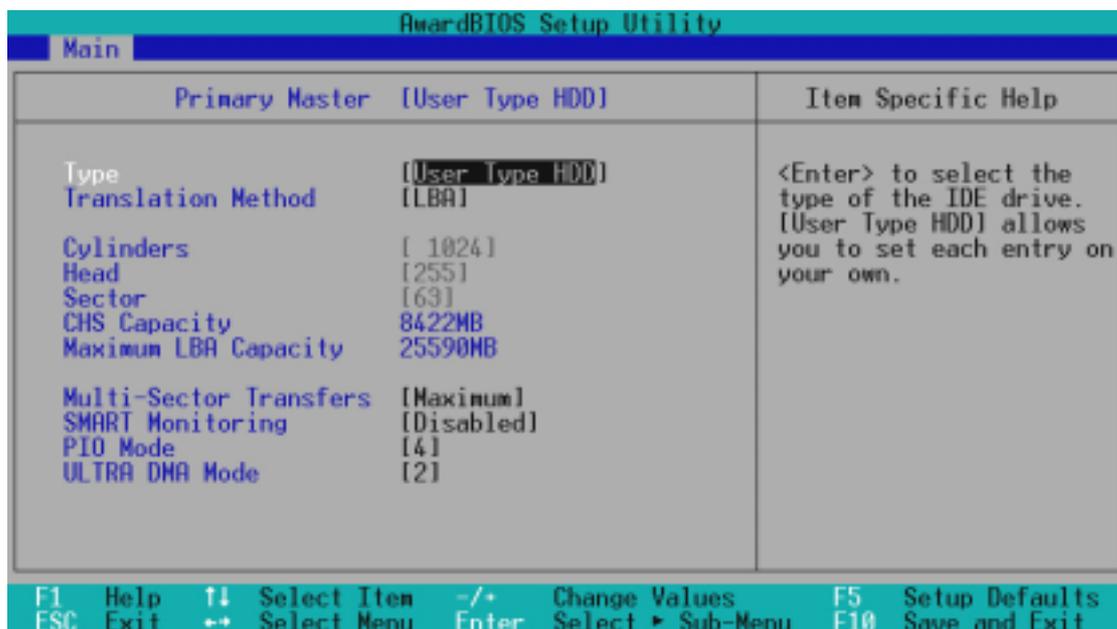
Other options for the **Type** field are:

[None] - to disable IDE devices

4. BIOS SETUP

IMPORTANT: If your hard disk was already formatted on an older previous system, incorrect parameters may be detected. You will need to enter the correct parameters manually or use low-level format if you do not need the data stored on the hard disk. If the parameters listed differ from the ones used when the disk was formatted, the disk will not be readable. If the auto-detected parameters do not match the ones that should be used for your disk, you should enter the correct ones manually by setting [User Type HDD].

[User Type HDD]



Manually enter the number of cylinders, heads and sectors per track for your drive. Refer to your drive documentation or look on the drive for this information. If no drive is installed or if you are removing a drive and not replacing it, select [None].

Translation Method [LBA]

Select the hard disk drive type in this field. When Logical Block Addressing is enabled, 28-bit addressing of the hard drive is used without regard for cylinders, heads, or sectors. Note that Logical Block Access may decrease the access speed of the hard disk. However, LBA Mode is necessary for drives with greater than 504MB in storage capacity. Configuration options: [LBA] [LARGE] [Normal] [Match Partition Table] [Manual]

Cylinders

This field configures the number of cylinders. Refer to your drive documentation to determine the correct value to enter into this field. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD] and the **Translation Method** field must be set to [Manual].

4. BIOS SETUP

Head

This field configures the number of read/write heads. Refer to your drive documentation to determine the correct value to enter into this field. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD] and the **Translation Method** field must be set to [Manual].

Sector

This field configures the number of sectors per track. Refer to your drive documentation to determine the correct value to enter into this field. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD] and the **Translation Method** field must be set to [Manual].

CHS Capacity

This field shows the drive's maximum CHS capacity calculated automatically by the BIOS from the drive information you entered.

Maximum LBA Capacity

This field shows the drive's maximum LBA capacity calculated automatically by the BIOS from the drive information you entered.

Multi-Sector Transfers [Maximum]

This option automatically sets the number of sectors per block to the highest number supported by the drive. This field can also be configured manually. Note that when this field is automatically configured, the set value may not always be the fastest value for the drive. Refer to the documentation that came with your hard drive to determine the optimal value and set it manually. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD]. Configuration options: [Disabled] [2 Sectors] [4 Sectors] [8 Sectors] [16 Sectors] [32 Sectors] [Maximum]

SMART Monitoring [Disabled]

This allows the enabling or disabling of the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system which utilizes internal hard disk drive monitoring technology. This feature is normally disabled because system resources used in this feature may decrease system performance. Configuration options: [Disabled] [Enabled]

PIO Mode [4]

This option lets you set a PIO (Programmed Input/Output) mode for the IDE device. Modes 0 through 4 provide successively increased performance. Configuration options: [0] [1] [2] [3] [4]

ULTRA DMA Mode [Disabled]

Ultra DMA capability allows improved transfer speeds and data integrity for compatible IDE devices. Set to [Disabled] to suppress Ultra DMA capability. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD]. Configuration options: [0] [1] [2] [3] [4] [Disabled]

4. BIOS SETUP

Other options for “Type:” are:

[CD-ROM] - for IDE CD-ROM drives

[LS-120] - for LS-120 compatible floppy disk drives

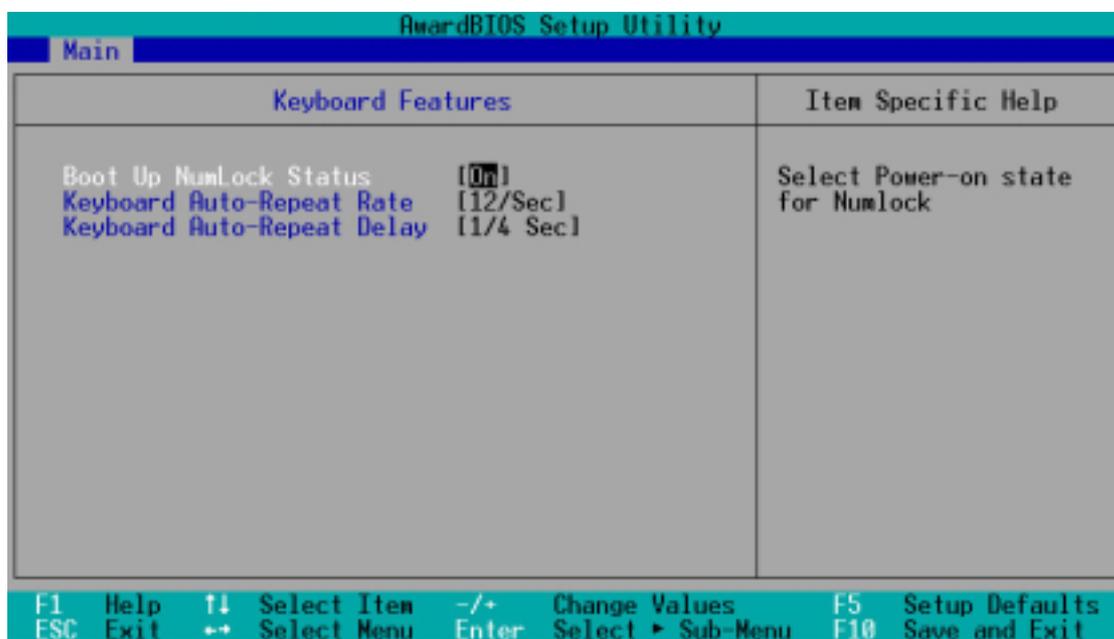
[ZIP-100] - for ZIP-100 compatible disk drives

[MO] - for IDE magneto optical disk drives

[Other ATAPI Device] - for IDE devices not listed here

After using the legend keys to make your selections on this sub-menu, press the <Esc> key to exit back to the Main menu. When the Main menu appears, you will notice that the drive size appear in the field for the hard disk drive that you just configured.

4.3.2 Keyboard Features



Boot Up NumLock Status [On]

This field enables users to activate the Number Lock function upon system boot. Configuration options: [Off] [On]

Keyboard Auto-Repeat Rate [12/Sec]

This controls the speed at which the system registers repeated keystrokes. Options range from 6 to 30 characters per second. Configuration options: [6/Sec] [8/Sec] [10/Sec] [12/Sec] [15/Sec] [20/Sec] [24/Sec] [30/Sec]

Keyboard Auto-Repeat Delay [1/4 Sec]

This field sets the time interval for displaying the first and second characters. Configuration options: [1/4 Sec] [1/2 Sec] [3/4 Sec] [1 Sec]

Language [English]

This allows selection of the BIOS' displayed language. Configuration options: [English]

4. BIOS SETUP

Supervisor Password [Disabled], User Password [Disabled]

These fields allow you to set the system passwords. To set any of the passwords, select the appropriate field and press <Enter>. You can type up to eight alphanumeric characters. Symbols and other keys are ignored. To confirm the password, type the password again and press <Enter>. The password is now set to [Enabled]. This password allows full access to the BIOS setup program. To clear the password, highlight the field and press <Enter>. Press <Enter> again and the password will be set to [Disabled].

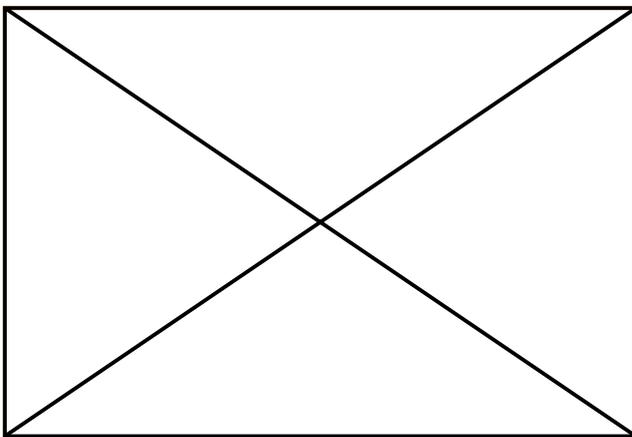
A Note about Passwords

The passwords are not case sensitive. In other words, it makes no difference whether you enter a password using upper- or lowercase letters.

The BIOS Setup program allows you to specify two separate passwords: a Supervisor password and a User password. When both of them are disabled, anyone may access all BIOS Setup program functions.

Forgot the password?

If you forgot the password, you can clear the password by erasing the CMOS Real Time Clock (RTC) RAM. The RAM data containing the password information is powered by the onboard button cell battery. To erase the RTC RAM: (1) Unplug your computer, (2) Short the solder points, (3) Turn ON your computer, (4) Hold down <Delete> during bootup and enter BIOS setup to re-enter user preferences.



Halt On [All Errors]

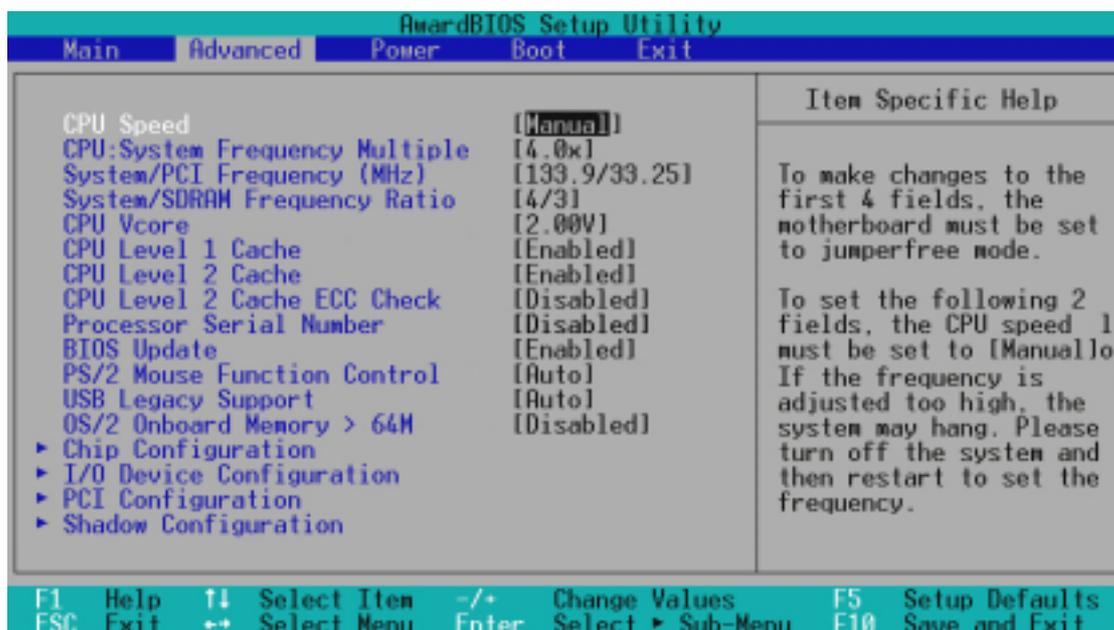
This field determines which types of errors will cause the system to halt. Configuration options: [All Errors] [No Error] [All but Keyboard] [All but Disk] [All but Disk/Keyboard]

Installed Memory [XXX MB]

This field displays the amount of conventional memory detected by the system during bootup. You do not need to make changes to this field. This is a display only field.

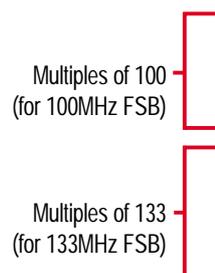
4. BIOS SETUP

4.4 Advanced Menu



CPU Speed [Manual]

When the motherboard is set to JumperFree™ mode, this field allows you to select the internal frequency of your CPU. Available options include multiples of 100 and 133. Select [Manual] if you want to make changes to the subsequent 2 fields. Note that selecting a frequency higher than the CPU manufacturer recommends may cause the system to hang or crash.



CPU : System Frequency Multiple (when CPU Speed is set to [Manual])

This field is for unlocked processors only. If your processor's Frequency Multiple is detected locked, you will not be able to access this field. This field sets the frequency multiple between the CPU's *internal* frequency and *external* frequency. This must be set in conjunction with **System/PCI Frequency (MHz)** to match the speed of your CPU. Configuration options: [2.0x] [2.5x] [3.0x]...[7.0x] [7.5x] [8.0x]

System/PCI Frequency (MHz) (when CPU Speed is set to [Manual])

This feature tells the clock generator what frequency to send to the system bus and PCI bus. The bus frequency (external frequency) multiplied by the bus multiple equals the **CPU speed** (the CPU's internal frequency).

System/SDRAM Frequency Ratio [1/1]

This field determines whether the memory clock frequency is set to be in synchronous or asynchronous mode with respect to the **System/PCI Frequency**. The options displayed in the popup menu vary according to the **System/PCI Frequency (MHz)**.

4. BIOS SETUP

CPU Vcore

This field displays the core voltage supplied to the CPU. If you want to set it manually, always refer to the CPU documentation. The pictures shown here provide only examples of possible Vcore ranges.



Using Pentium II processors



Using Coppermine processors

CPU Level 1 Cache, CPU Level 2 Cache [Enabled]

These fields allow you to choose from the default of [Enabled] or choose [Disabled] to turn on or off the CPU's Level 1 and Level 2 built-in cache. Configuration options: [Disabled] [Enabled]

CPU Level 2 Cache ECC Check [Disabled]

This function controls the ECC capability in the CPU level 2 cache. Configuration options: [Disabled] [Enabled]

Processor Serial Number [Disabled] (when a Pentium III processor is installed)

The Processor Serial Number is a unique number that is added to every Pentium III processor to help verify the identity of the user across the Internet. Set this field to [Enabled] when you need increased security for doing business online or e-commerce. Otherwise, leave it to its default setting of [Disabled] for greater anonymity when surfing the Internet. **NOTE:** This field is available only when a Pentium III processor is installed in your system.

BIOS Update [Enabled]

This functions as an update loader integrated into the BIOS to supply the processor with the required data. In the default position of [Enabled], the BIOS will load the update on all processors during system bootup. Configuration options: [Disabled] [Enabled]

PS/2 Mouse Function Control [Auto]

The default of [Auto] allows the system to detect a PS/2 mouse on startup. If detected, IRQ12 will be used for the PS/2 mouse. IRQ12 will be reserved for expansion cards only if a PS/2 mouse is not detected. [Enabled] will always reserve IRQ12, whether on startup a PS/2 mouse is detected or not. Configuration options: [Enabled] [Auto]

USB Legacy Support [Auto]

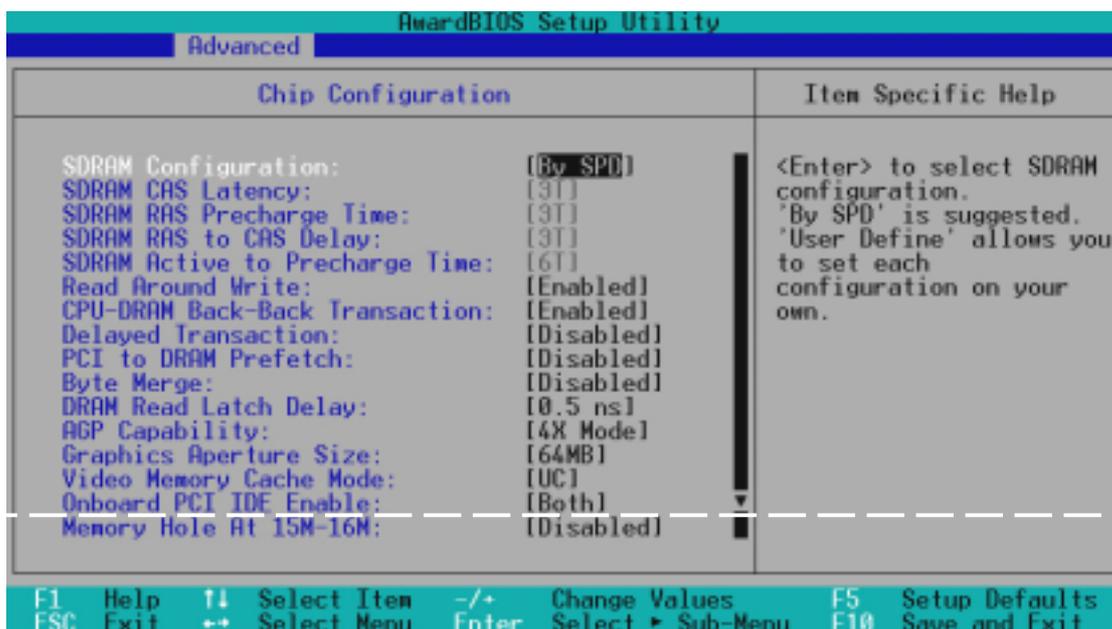
This motherboard supports Universal Serial Bus (USB) devices. The default of [Auto] allows the system to detect a USB device on startup. If detected, the USB controller will be enabled. If not detected, the USB controller will be disabled. When this field is set to [Disabled], the USB controller is disabled no matter whether you are using a USB device or not. Configuration options: [Disabled] [Enabled] [Auto]

OS/2 Onboard Memory > 64M [Disabled]

When using OS/2 operating systems with installed DRAM of greater than 64MB, you need to set this option to [Enabled]; otherwise, leave this on [Disabled]. Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

4.4.1 Chip Configuration



(Scroll down to see more items, as shown here.)

SDRAM Configuration [By SPD]

This sets the optimal timings for items 2–5, depending on the memory modules that you are using. Default setting is [By SPD], which configures items 2–5 by reading the contents in the SPD (Serial Presence Detect) device. The EEPROM on the memory module stores critical parameter information about the module, such as memory type, size, speed, voltage interface, and module banks. Configuration options: [User Define] [7ns (143MHz)] [8ns (125MHz)] [By SPD]

SDRAM CAS Latency

This controls the latency between the SDRAM read command and the time that the data actually becomes available. **NOTE:** To make changes to this field, the **SDRAM Configuration** field must be set to [User Define].

SDRAM RAS Precharge Time

This controls the idle clocks after issuing a precharge command to the SDRAM. **NOTE:** To make changes to this field, the **SDRAM Configuration** field must be set to [User Define].

SDRAM RAS to CAS Delay

This controls the latency between the SDRAM active command and the read/write command. **NOTE:** To make changes to this field, the **SDRAM Configuration** field must be set to [User Define].

4. BIOS SETUP

SDRAM Active to Precharge Time

To make changes to this field, the **SDRAM Configuration** field must be set to [User Define].

Read Around Write [Enabled]

With the Read Around Write (RAW) feature, after the CPU issues a write command, the memory controller stores the write data in its buffer so that next time the CPU needs the data, it can provide them without accessing the SDRAM. Configuration options: [Disabled] [Enabled]

CPU-DRAM Back-Back Transaction [Enabled]

Configuration options: [Enabled] [Disabled]

Delayed Transaction [Disabled]

When [Enabled], this frees the PCI Bus when the CPU is accessing 8-bit ISA cards that normally consume about 50-60 PCI Clocks without PCI delayed transaction. Select [Disabled] for ISA cards that are not PCI 2.1 compliant. Configuration options: [Enabled] [Disabled]

PCI to DRAM Prefetch [Disabled]

Configuration options: [Disabled] [Enabled]

Byte Merge [Disabled]

To optimize the data transfer on PCI, this merges a sequence of individual memory writes (bytes or words) into a single 32-bit block of data. However, byte merging may only be done when the bytes within a data phase are in a prefetchable address range. Configuration options: [Disabled] [Enabled]

DRAM Read Latch Delay [0.5 ns]

Configuration options: [0.0 ns] [0.5 ns] [1.0 ns] [1.5 ns]

AGP Capability [4X Mode]

This motherboard supports the AGP 4x interface, which transfers video data at 1066MB/s. Since AGP 4x is backward-compatible, you may leave the default [4X Mode] on no matter you are using an AGP 1x or 2x video card. When set to [1X Mode], the AGP interface will only provide a peak data throughput of 266MB/s even if you are using an AGP 2x/4x card. When set to [2X Mode], the AGP interface will only provide a peak data throughput of 533MB/s even if you are using an AGP 4x card. Configuration options: [1X Mode] [2X Mode] [4X Mode]

Graphics Aperture Size [64MB]

This feature allows you to select the size of mapped memory for AGP graphic data. Configuration options: [4MB] [8MB] [16MB] [32MB] [64MB] [128MB] [256MB]

4. BIOS SETUP

Video Memory Cache Mode [UC]

USWC (uncacheable, speculative write combining) is a new cache technology for the video memory of the processor. It can greatly improve the display speed by caching the display data. You must set this to UC (uncacheable) if your display card cannot support this feature; otherwise your system may not boot. Configuration options: [UC] [USWC]

Onboard PCI IDE Enable [Both]

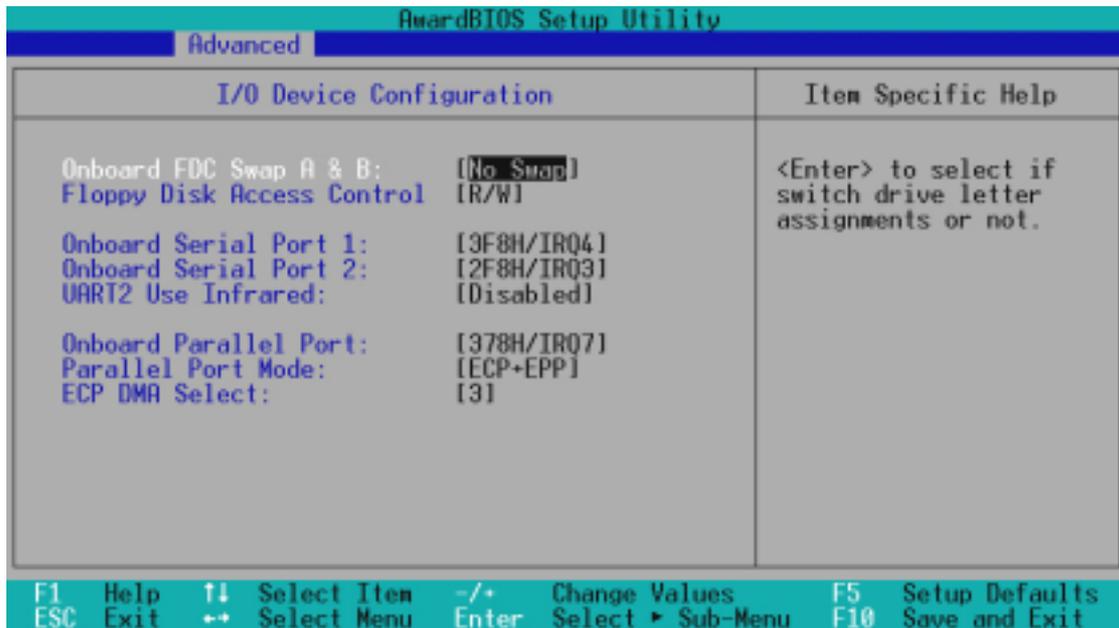
You can select to enable the primary IDE channel, secondary IDE channel, both, or disable both channels. Configuration options: [Both] [Primary] [Secondary] [Disabled]

Memory Hole At 15M-16M [Disabled]

This field allows you to reserve an address space for ISA expansion cards that require it. Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

4.4.2 I/O Device Configuration



Onboard FDC Swap A & B [No Swap]

This field allows you to reverse the hardware drive letter assignments of your floppy disk drives. Configuration options: [No Swap] [Swap AB]

Floppy Disk Access Control [R/W]

When set to [Read Only], this field protects files from being copied to floppy disks by allowing reads from the floppy disk drive but not writes. The setup default [R/W] allows both reads and writes. Configuration options: [R/W] [Read Only]

Onboard Serial Port 1 [3F8H/IRQ4], Onboard Serial Port 2 [2F8H/IRQ3]

These fields allow you to set the addresses for the onboard serial connectors. Serial Port 1 and Serial Port 2 must have different addresses. Configuration options: [3F8H/IRQ4] [2F8H/IRQ3] [3E8H/IRQ4] [2E8H/IRQ10] [Disabled]

UART2 Use Infrared [Disabled]

When enabled, this field activates the onboard infrared feature and sets the second serial UART to support the infrared module connector on the motherboard. If your system already has a second serial port connected to the onboard COM2 connector, it will no longer work if you enable the infrared feature. See **IrDA-Compliant Infrared Module Connector** in *3.8 External Connectors*. Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

Onboard Parallel Port [378H/IRQ7]

This field sets the address of the onboard parallel port connector. If you disable this feature, **Parallel Port Mode** and **ECP DMA Select** configurations will not be available. Configuration options: [Disabled] [378H/IRQ7] [278H/IRQ5]

Parallel Port Mode [ECP+EPP]

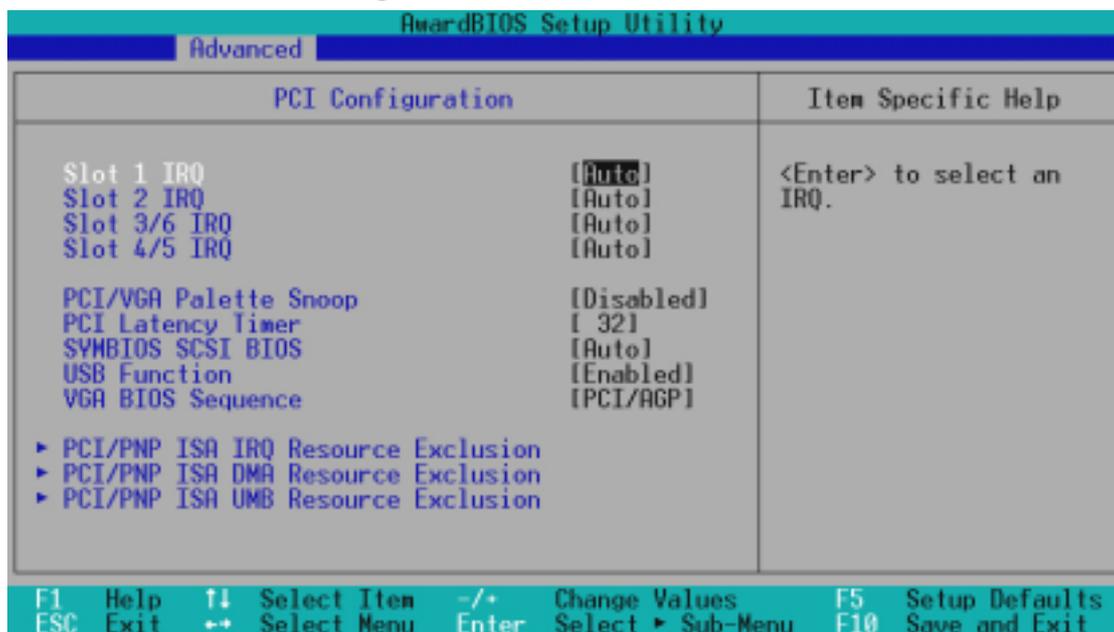
This field allows you to set the operation mode of the parallel port. [Normal] allows normal-speed operation but in one direction only; [EPP] allows bidirectional parallel port operation; [ECP] allows the parallel port to operate in bidirectional DMA mode; [ECP+EPP] allows normal speed operation in a two-way mode. Configuration options: [Normal] [EPP] [ECP] [ECP+EPP]

ECP DMA Select [3]

This field allows you to configure the parallel port DMA channel for the selected **ECP** mode. This selection is available only if you select [ECP] or [ECP+EPP] in **Parallel Port Mode** above. Configuration options: [1] [3] [Disabled]

4. BIOS SETUP

4.4.3 PCI Configuration



Slot 1 IRQ, Slot 2 IRQ, Slot 3/6 IRQ, Slot 4/5 IRQ [Auto]

These fields set how IRQ use is determined for each PCI slot. The default setting for each field is [Auto], which uses auto-routing to determine IRQ use. Configuration options: [Auto] [NA] [3] [4] [5] [7] [9] [10] [11] [12] [14] [15]

PCI/VGA Palette Snoop [Disabled]

Some nonstandard VGA cards, such as graphics accelerators or MPEG Video Cards, may not show colors properly. The setting [Enabled] should correct this problem. Otherwise, leave this on the default setting of [Disabled]. Configuration options: [Disabled] [Enabled]

PCI Latency Timer [32]

Leave on default setting for best performance vs. stability.

SYMBIOS SCSI BIOS [Auto]

[Auto] allows the motherboard's BIOS to detect whether you have a Symbios SCSI card. If the Symbios SCSI card is detected, the motherboard's Symbios BIOS will be enabled; if no Symbios SCSI card is detected, the onboard Symbios SCSI BIOS will be disabled.

[Disabled] will disable the motherboard's Symbios SCSI BIOS so that the BIOS on an external Symbios SCSI card can be used. If your Symbios SCSI card does not have a BIOS, the Symbios SCSI card will not function. Configuration options: [Auto] [Disabled]

4. BIOS SETUP

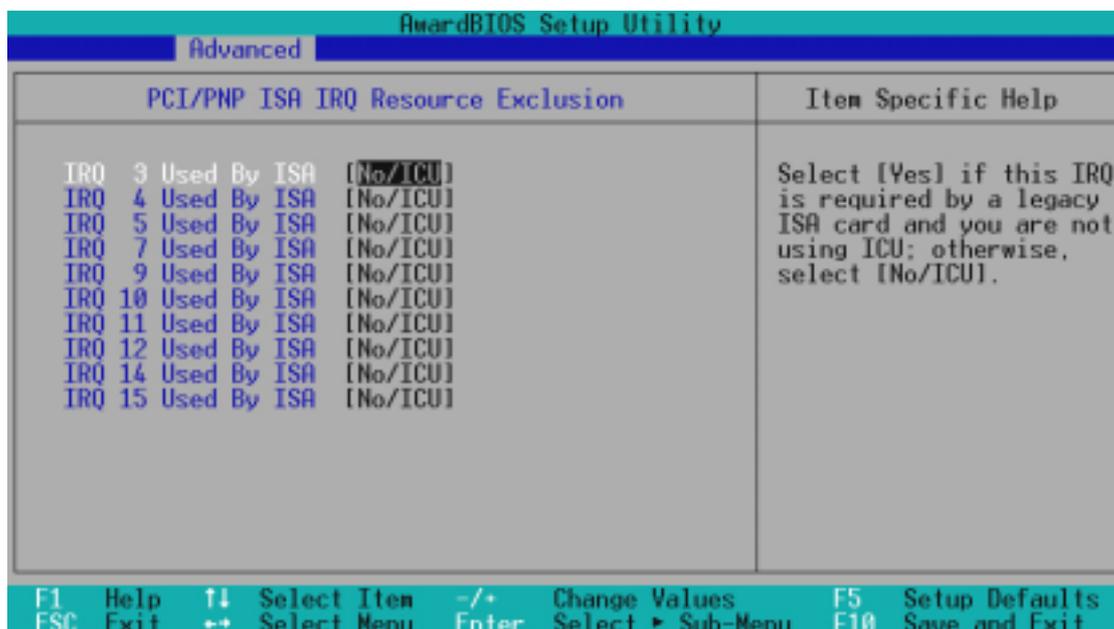
USB Function [Enabled]

This motherboard supports Universal Serial Bus (USB) devices. Set to [Enabled] if you want to use USB devices. Configuration options: [Disabled] [Enabled]

VGA BIOS Sequence [PCI/AGP]

If your computer has both PCI and AGP VGA cards, this field allows you to select which of the cards will act as your primary card. The default, [PCI/AGP], allows your PCI card to take precedent when detected. [AGP/PCI] uses the AGP card as your primary card. Configuration options: [PCI/AGP] [AGP/PCI]

PCI/PNP ISA IRQ Resource Exclusion

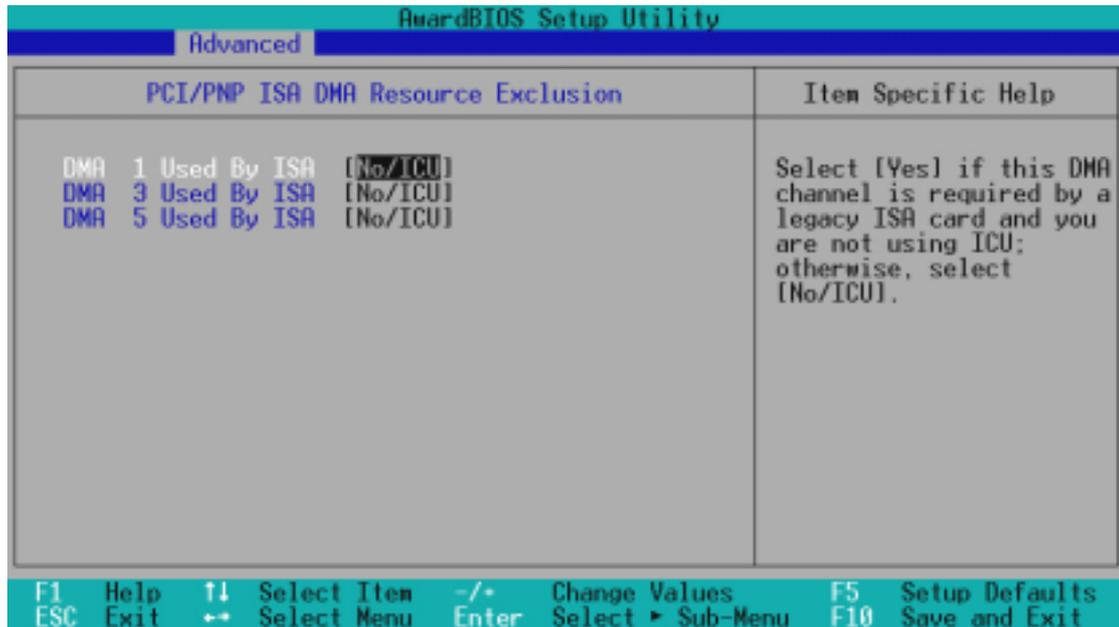


IRQ XX Used By ISA [No/ICU]

These fields indicate whether or not the displayed IRQ for each field is being used by a legacy (non-PnP) ISA card. The default value indicates either that the displayed IRQ is not used or that ISA Configuration Utility (ICU) is being used to determine if an ISA card is using that IRQ. If you install a legacy ISA card that requires a unique IRQ and you are not using an ICU, you must set the field for that IRQ to [Yes]. For example: If you install a legacy ISA card that requires IRQ 10, then set **IRQ10 Used By ISA** to [Yes]. Configuration options: [No/ICU] [Yes]

4. BIOS SETUP

PCI/PNP ISA DMA Resource Exclusion



DMA x Used By ISA [No/ICU]

These fields indicate whether or not the displayed DMA channel for each field is being used by a legacy (non-PnP) ISA card. The default setting indicates either that the displayed DMA channel is not used or an ICU is being used to determine if an ISA card is using that channel. If you install a legacy ISA card that requires a unique DMA channel, and you are not using an ICU, you must set the field for that channel to [Yes]. Configuration options: [No/ICU] [Yes]

PCI/PNP ISA UMB Resource Exclusion

4. BIOS SETUP

ISA MEM Block BASE [No/ICU]

This field allows you to set the base address and block size of a legacy ISA card that uses any memory segment within the C800 and DFFF address range. If you have such a card and you are not using an ICU to specify its address range, select a base address from the six available options; the **ISA MEM Block SIZE** field will then appear for selecting the block size. If you have more than one legacy ISA card in your system that requires the use of this address range, you can increase the block size to 8K, 16K, 32K, or 64K. If you are using an ICU to accomplish this task, leave **ISA MEM Block BASE** to its default setting of [No/ICU]. Configuration options: [No/ICU] [C800] [CC00] [D000] [D400] [D800] [DC00]

4.4.4 Shadow Configuration

Video ROM BIOS Shadow [Enabled]

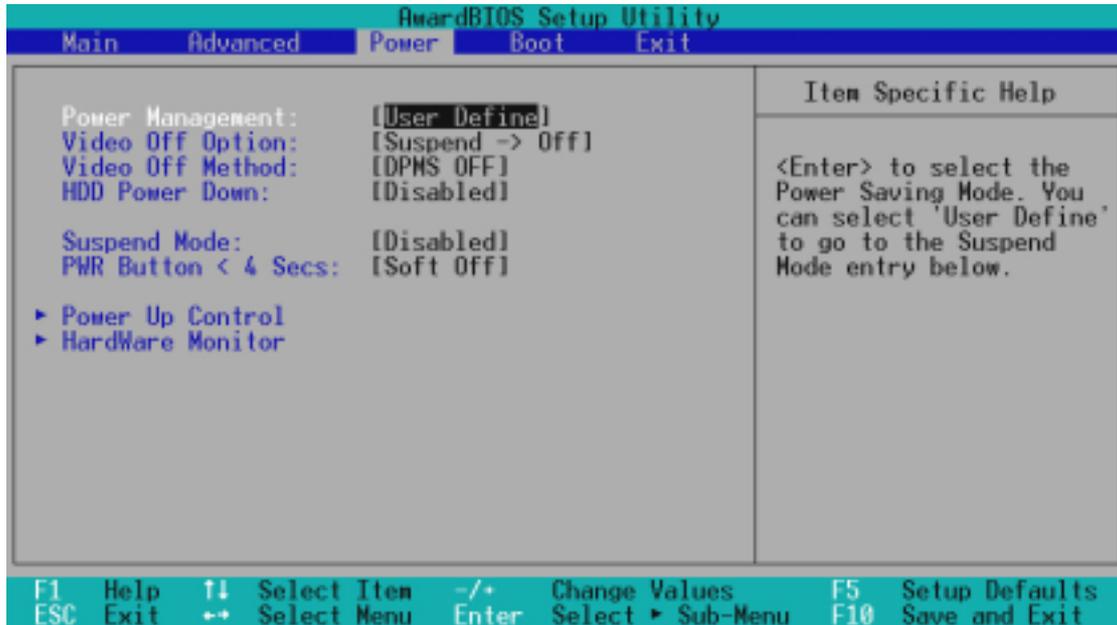
This field allows you to change the video BIOS location from ROM to RAM. Relocating to RAM enhances system performance, as information access is faster than the ROM. Configuration options: [Disabled] [Enabled]

C8000-DFFFF Shadow [Disabled]

These fields are used for shadowing other expansion card ROMs. If you install other expansion cards with ROMs on them, you will need to know which addresses the ROMs use to shadow them specifically. Shadowing a ROM reduces the memory available between 640K and 1024K by the amount used for this purpose. Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

4.5 Power Menu



Power Management [User Define]

This option must be enabled to use any of the automatic power saving features. If this menu item is set to [Disabled], power management features will not function regardless of other field settings on this menu. The [User Define] option allows you to make your own selections in the Power menu. When set to [Max Saving], system power will be conserved to its greatest amount. The **Suspend Mode** field will then be set to predefined value that ensures maximum power savings.

This field acts as the master control for the power management modes. [Max Saving] puts the system into power saving mode after a brief period of system inactivity; [Min Saving] is almost the same as [Max Saving] except that the system inactivity period is longer; [Disabled] disables the power saving features; [User Define] allows you to set power saving options according to your preference. Configuration options: [User Define] [Disabled] [Min Saving] [Max Saving]

IMPORTANT: Advanced Power Management (APM) should be installed to keep the system time updated when the computer enters suspend mode activated by the BIOS Power Management. For DOS environments, you need to add the statement, `DEVICE=C:\DOS\POWER.EXE`, to your `CONFIG.SYS` file. For Windows 3.x and Windows 95, you need to install Windows with the APM feature. For Windows 98 and later, APM is automatically installed. A battery and power cord icon labeled “Power Management” will appear in the “Control Panel.” Choose “Advanced” in the Power Management Properties dialog box.

4. BIOS SETUP

Video Off Option [Suspend -> Off]

This field determines when to activate the video off feature for monitor power management. Configuration options: [Always On] [Suspend -> Off]

Video Off Method [DPMS OFF]

This field defines the video off features. The DPMS (Display Power Management System) feature allows the BIOS to control the video display card if it supports the DPMS feature. [Blank Screen] only blanks the screen. (Use this for monitors without power management or “green” features. Your screen saver will not display with [Blank Screen] selected). [V/H SYNC+Blank] blanks the screen and turns off vertical and horizontal scanning. Configuration options: [Blank Screen] [V/H SYNC+Blank] [DPMS Standby] [DPMS Suspend] [DPMS OFF] [DPMS Reduce ON]

HDD Power Down [Disabled]

When enabled, this shuts down any IDE hard disk drives in the system after a period of inactivity as set in this user-configurable field. This feature does not affect SCSI hard drives. Configuration options: [Disabled] [1 Min] [2 Min] [3 Min]...[15 Min]

Suspend Mode [Disabled]

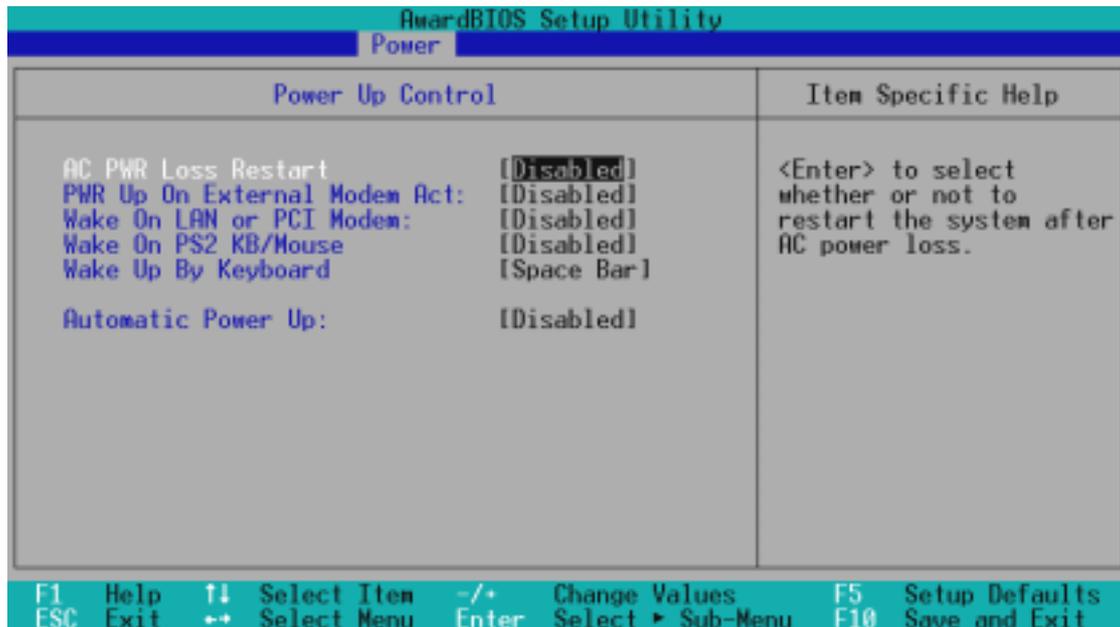
Sets the time period before the system goes into suspend mode. **NOTE:** This field is only effective for DOS, Windows 95, and Windows NT 4.0 environments. Configuration options: [Disabled] [30 Sec] [1 Min] [2 Min] [4 Min] [8 Min] [20 Min] [30 Min] [40 Min] [1 Hour]

PWR Button < 4 Secs [Soft off]

When set to [Soft off], the ATX switch can be used as a normal system power-off button when pressed for less than 4 seconds. [Suspend] allows the button to have a dual function where pressing less than 4 seconds will place the system in sleep mode. Regardless of the setting, holding the ATX switch for more than 4 seconds will power off the system. **NOTE:** This field is only effective in APM OS system. Configuration options: [Soft off] [Suspend]

4. BIOS SETUP

4.5.1 Power Up Control



AC PWR Loss Restart [Disabled]

This allows you to set whether you want your system to reboot after the power has been interrupted. [Disabled] leaves your system off and [Enabled] reboots your system if it was active before power loss. [Previous State] sets your system back to the state it is before the power interruption. Configuration options: [Disabled] [Enabled] [Previous State]

PWR Up On External Modem Act [Enabled]

This allows either settings of [Enabled] or [Disabled] for powering up the computer when the external modem receives a call while the computer is in Soft-off mode. **NOTE:** The computer cannot receive or transmit data until the computer and applications are fully running, thus connection cannot be made on the first try. Turning an external modem off and then back on while the computer is off causes an initialization string that will also cause the system to power on. Configuration options: [Disabled] [Enabled]

Wake On LAN or PCI Modem [Disabled]

Wake-On-LAN or a PCI modem card allows your computer to be booted from another computer via network or dialup connection by sending a wake-up frame or signal. Configuration options: [Disabled] [Enabled]

IMPORTANT: This feature requires an optional network interface with Wake-On-LAN and an ATX power supply with at least 720mA +5V standby power.

4. BIOS SETUP

Pwr Up On PS2 KB/Mouse [Disabled]

This field allows you to use your PS2 keyboard or PS2 mouse to power up your computer. This feature requires an ATX power supply that can supply at least 300mA on the +5VSB lead. The default [Auto] will automatically enable or disable this feature based on whether your computer has the appropriate ATX power supply. You may not use this feature if you set it to [Disabled]. Configuration options: [Auto] [Disabled]

Wake Up By Keyboard [Space Bar]

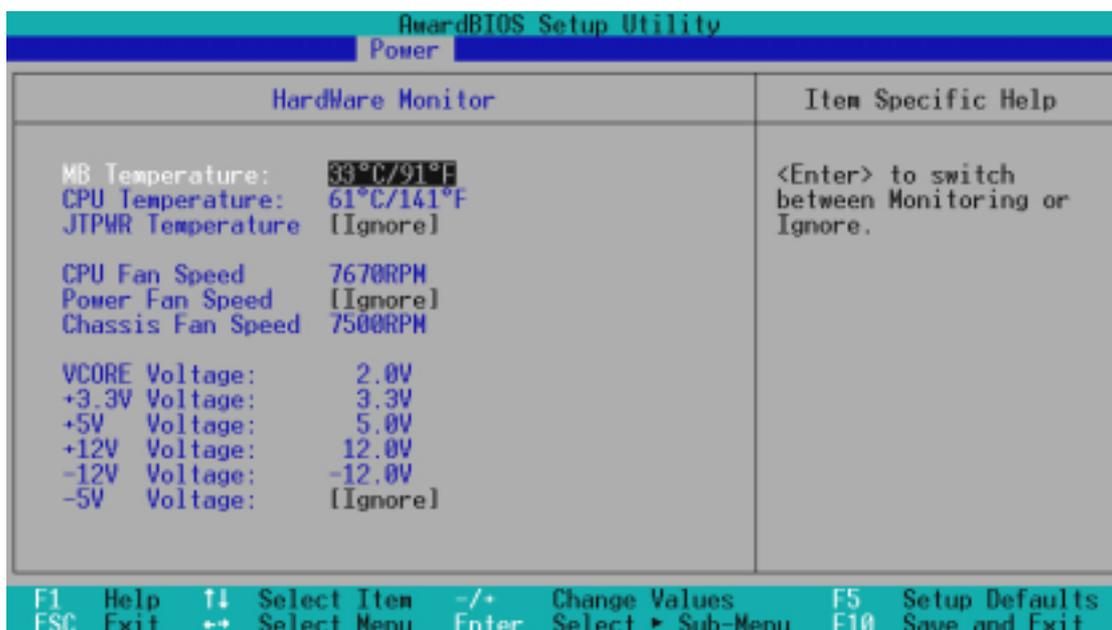
When the previous setup item **Wake On PS2 KB/PS2 Mouse/CIR** is enabled, you may specify the key(s) to press to power up the computer. Configuration options: [Space Bar] [Ctrl-Esc] [Power Key]

Automatic Power Up [Disabled]

This allows an unattended or automatic system power up. You may configure your system to power up at a certain time of the day by selecting [Everyday] or at a certain time and day by selecting [By Date]. Configuration options: [Disabled] [Everyday] [By Date]

4. BIOS SETUP

4.5.2 Hardware Monitor



AwardBIOS Setup Utility	
Power	
Hardware Monitor	Item Specific Help
MB Temperature: 33°C/91°F	<Enter> to switch between Monitoring or Ignore.
CPU Temperature: 61°C/141°F	
JTPWR Temperature [Ignore]	
CPU Fan Speed 7670RPM	
Power Fan Speed [Ignore]	
Chassis Fan Speed 7500RPM	
V CORE Voltage: 2.0V	
+3.3V Voltage: 3.3V	
+5V Voltage: 5.0V	
+12V Voltage: 12.0V	
-12V Voltage: -12.0V	
-5V Voltage: [Ignore]	
F1 Help ↑↓ Select Item -/+ Change Values F5 Setup Defaults	
ESC Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit	

MB Temperature, CPU Temperature [xxx°C/xxxF] / JTPWR Temperature [Ignore]

The onboard hardware monitor is able to detect the MB (motherboard), CPU, and power supply temperatures. Set to [Ignore] only if necessary.

CPU Fan Speed [xxxxRPM], Power Fan Speed [Ignore], Chassis Fan [xxxxRPM]

The onboard hardware monitor is able to detect the CPU fan speed, power supply fan speed, and the chassis fan speed in rotations per minute (RPM). The presence of the fans is automatically detected. Set to [Ignore] only if necessary.

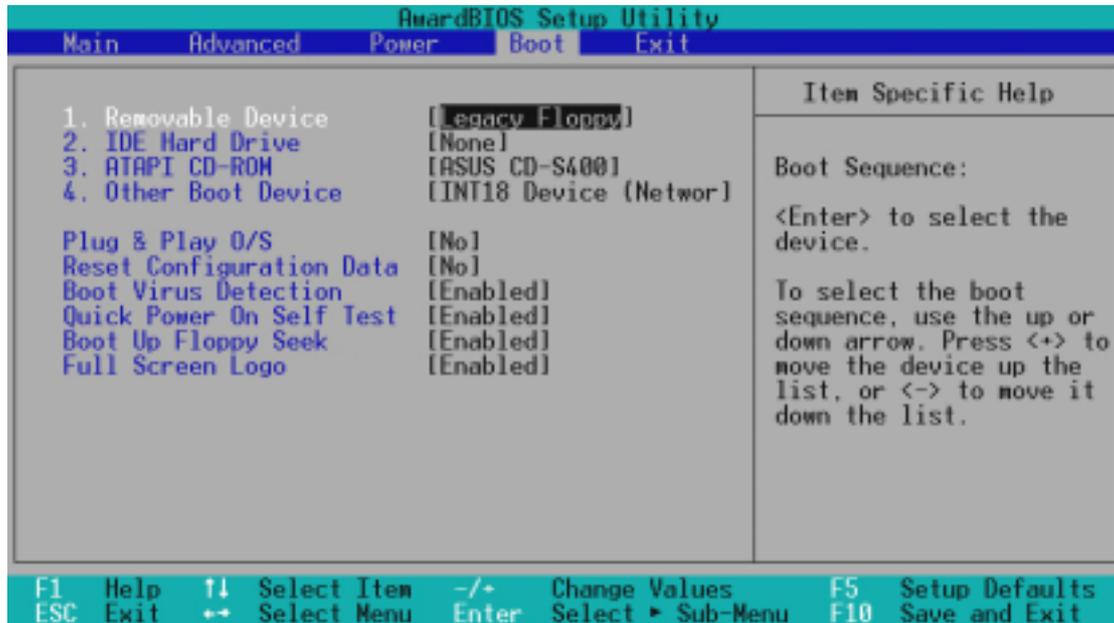
V CORE Voltage, +3.3V Voltage, +5V Voltage, +12V Voltage, -12V Voltage [xx.xV], -5V Voltage [Ignore]

The onboard hardware monitor is able to detect the voltage output by the onboard voltage regulators. Set to [Ignore] only if necessary.

NOTE: If any of the monitored items is out of range, an error message will appear: “Hardware Monitor found an error. Enter Power setup menu for details”. You will then be prompted to “Press **F1** to continue, **DEL** to enter SETUP”.

4. BIOS SETUP

4.6 Boot Menu



Boot Sequence

The Boot menu allows you to select among the four possible types of boot devices listed using the up and down arrow keys. By using the <+> or <Space> key, you can promote devices and by using the <-> key, you can demote devices. Promotion or demotion of devices alters the priority which the system uses to search for a boot device on system power up. Configuration options: [Removable Devices] [IDE Hard Drive] [ATAPI CD-ROM] [Other Boot Device]

Removable Device [Legacy Floppy]

Configuration options: [Disabled] [Legacy Floppy] [LS120] [ZIP-100] [ATAPI MO]

IDE Hard Drive

This field allows you to select which IDE hard disk drive to use in the boot sequence. Pressing [Enter] will show the product IDs of all connected IDE hard disk drives.

ATAPI CD-ROM

This field allows you to select which ATAPI CD-ROM drive to use in the boot sequence. Pressing [Enter] will show the product IDs of all your connected ATAPI CD-ROM drives.

Other Boot Device Select [INT18 Device (Network)]

Configuration options: [Disabled] [SCSI Boot Device] [INT18 Device (Network)]

4. BIOS SETUP

Plug & Play O/S [No]

This field allows you to use a Plug-and-Play (PnP) operating system to configure the PCI bus slots instead of using the BIOS. When [Yes] is selected, interrupts may be reassigned by the OS. When a non-PnP OS is installed or you want to prevent reassigning of interrupt settings, select the default setting of [No]. Configuration options: [No] [Yes]

Reset Configuration Data [No]

The Extended System Configuration Data (ESCD) contain information about non-PnP devices. It can also hold the complete record of how the system was configured the last time it was booted. Select [Yes] only if you want to clear these data during the Power-On Self Test (POST). Configuration options: [No] [Yes]

Boot Virus Detection [Enabled]

This field allows you to set boot virus detection, ensuring a virus-free boot sector. The system halts and displays a warning message when it detects a virus. If this occurs, you can either allow the operation to continue or use a virus-free bootable floppy disk to restart and investigate your system. Configuration options: [Disabled] [Enabled]

Quick Power On Self Test [Enabled]

This feature enables you to speed up the bootup by skipping some POST routines such as memory checking. Configuration options: [Disabled] [Enabled]

Boot Up Floppy Seek [Enabled]

When enabled, the BIOS will seek the floppy disk drive to determine whether the drive has 40 or 80 tracks. Floppy drives with 1.44MB have 80 tracks. You may leave the default [Disabled] to save time if you are using 1.44MB floppy drives. Configuration options: [Disabled] [Enabled]

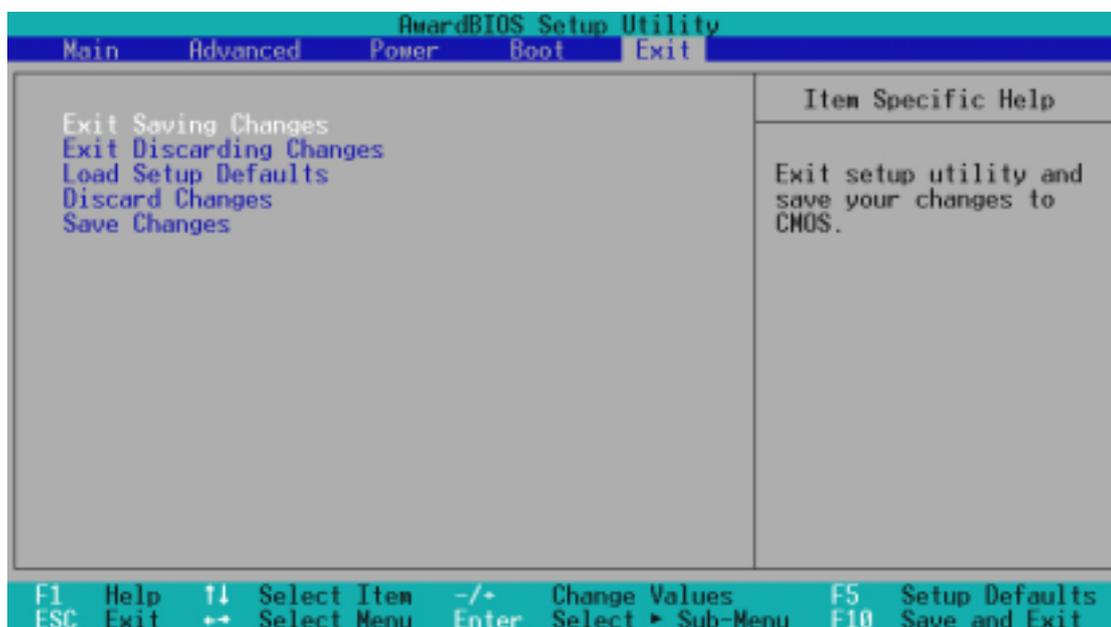
Full Screen Logo [Enabled]

Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

4.7 Exit Menu

Once you have made all of your selections from the various menus in the Setup program, you should save your changes and exit Setup. Select **Exit** from the menu bar to display the following menu:



NOTE: Pressing <Esc> does not exit this menu. You must select one of the options from this menu or <F10> from the legend bar to exit this menu.

Exit Saving Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. Once this option is selected, a confirmation is asked. Select [Yes] to save changes and exit.

NOTE: If you attempt to exit the Setup program without saving your changes, the program will prompt you with a message asking if you want to save your changes before exiting. Pressing <Enter> will then save changes while exiting.

Exit Discarding Changes

This option should only be used if you do not want to save the changes you have made to the Setup program. If you have made changes to fields other than system date, system time, and password, the system will ask for confirmation before exiting.

4. BIOS SETUP

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When this option is selected or if <F5> is pressed, a confirmation is requested. Select [Yes] to load default values. You can now select **Exit Saving Changes** or make other changes before saving the values to the non-volatile RAM.

Discard Changes

This option allows you to discard the selections you made and restore the values you previously saved. After selecting this option, a confirmation is requested. Select [Yes] to discard any changes and load the previously saved values.

Save Changes

This option saves your selections without exiting the Setup program. You can then return to other menus and make changes. After selecting this option, all selections are saved and a confirmation is requested. Select [Yes] to save any changes to the non-volatile RAM.

4. BIOS SETUP

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5. SOFTWARE SETUP

5.1 Operating Systems

You should always use the latest operating system and updates when using new hardware to ensure full compliancy. You may use any version of Windows 98, but for Windows 95, you must use OSR 2.0 or later. For Windows NT 4.0, you must use Service Pack 3.0 or later.

5.1.1 Windows 98 First Time Installation

When you start Windows for the first time after the installation of your motherboard, Windows 98 will detect the onboard audio and video chips and may attempt to install a driver from its system registry. When prompted to restart, select **No** and then follow the normal setup procedures later in this section.

NOTE: The screen displays in this and the following section may not reflect exactly the screen contents displayed on your screen.

5. SOFTWARE SETUP

5.2 P3V Series Motherboard Support CD

NOTE: The support CD contents are subject to change at any time without notice.

To begin using your support CD disc, just insert it into your CD-ROM drive and the support CD installation menu should appear. If the menu does not appear, double-click or run **D:\ASSETUP.EXE** (assuming that your CD-ROM drive is drive **D:**).

5.2.1 Installation Menu



- **Install ASUS PC Probe Vx.xx:** Installs a smart utility to monitor your computer's fan, temperature, and voltages.
- **Install PC-Cillin 98 Vx.xx:** Installs the PC-cillin virus protection software. View the online help for more information.
- **Install ADOBE Acrobat Reader Vx.xx:** Installs the Adobe Acrobat Reader software necessary to view user's manuals saved in PDF format. Updated or other language versions of this motherboard's manual is available in PDF format at any of our web sites.
- **VIA 4 in 1 drivers:** Installs Bus Master PCI IDE Driver, AGP VxD Driver, VIA Chipset Functions Registry, and IRQ Routing Miniport Driver.
- **Show Motherboard Information:** Allows you to view information about your motherboard, such as product name, BIOS version, and CPU.
- **Browse Support CD:** Allows you to view the contents of the CD.
- **ReadMe:** Allows you to view the support CD file list and contact information.
- **Exit:** Exits the CD installation menu.

Additional CD Content: Flash BIOS writer in the **AFLASH** folder and DMI Configuration Utility in the **DMI** folder.

5. SOFTWARE SETUP

5.3 Install ASUS PC Probe Vx.xx

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.

NOTE: ASUS PC Probe will not run if another hardware monitoring utility is installed. To uninstall any program, see *5.7 Uninstalling Programs*.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

(5) Click here.

(6) Click here.

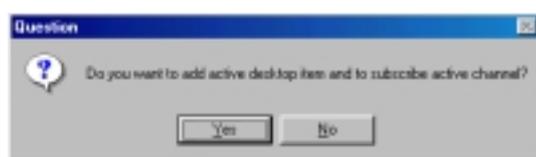
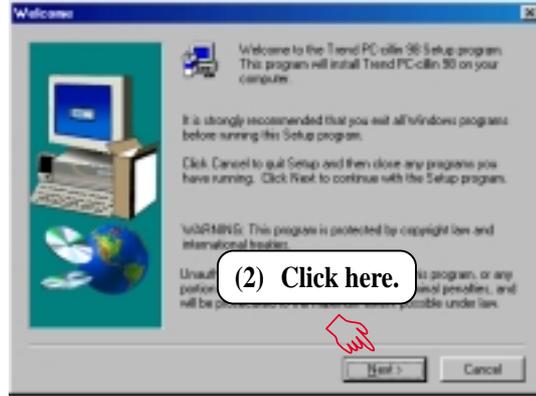
(7) Click here.

(8) Click *Next* and when the *Setup Complete* box appears, click *Finish* to complete setup.

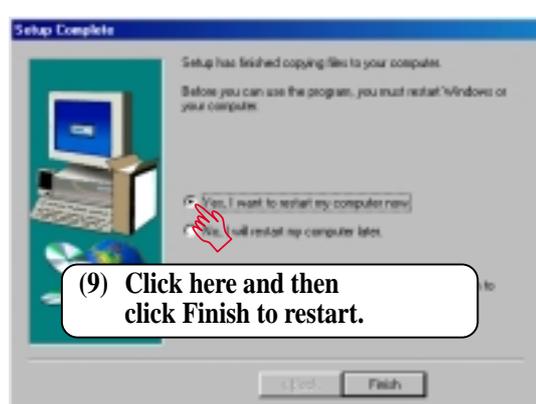
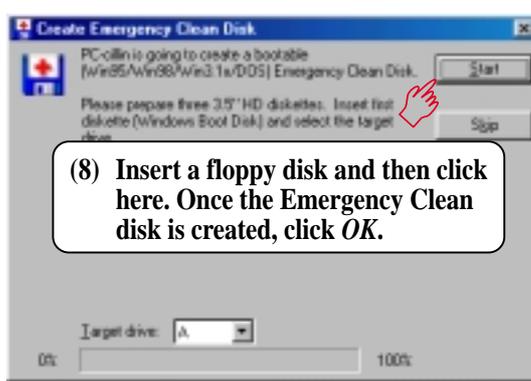
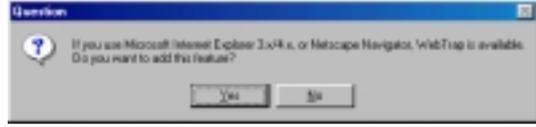
5. SOFTWARE SETUP

5.4 Install PC-Cillin 98 Vx.xx

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.



(6) & (7) Select the preferred features by clicking the appropriate buttons.

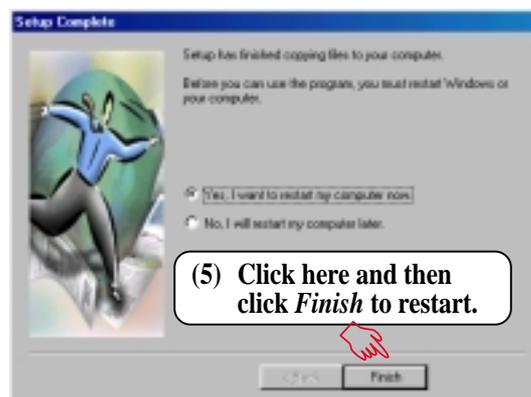
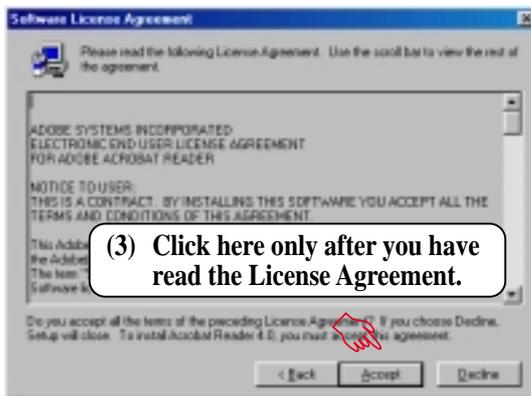


5. SW SETUP
Windows 98

5. SOFTWARE SETUP

5.5 Install ADOBE Acrobat Reader Vx.xx

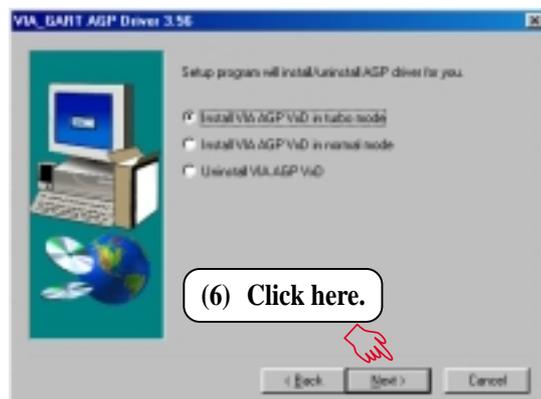
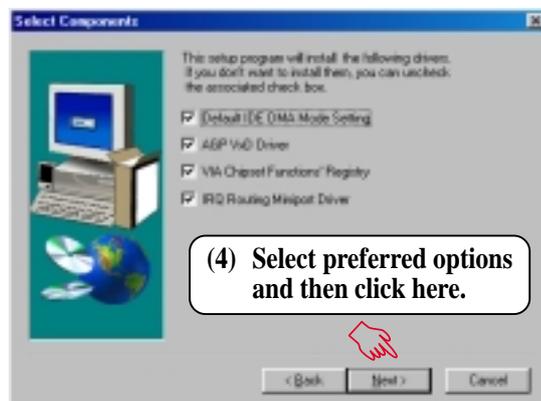
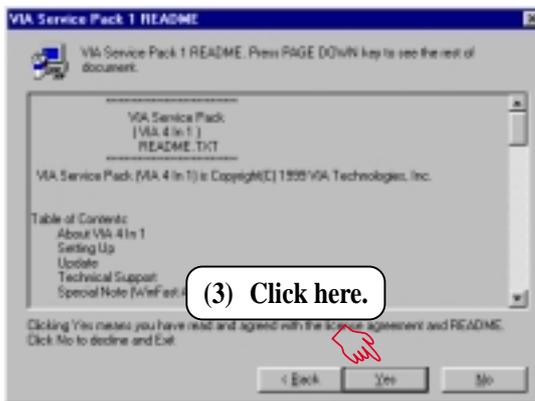
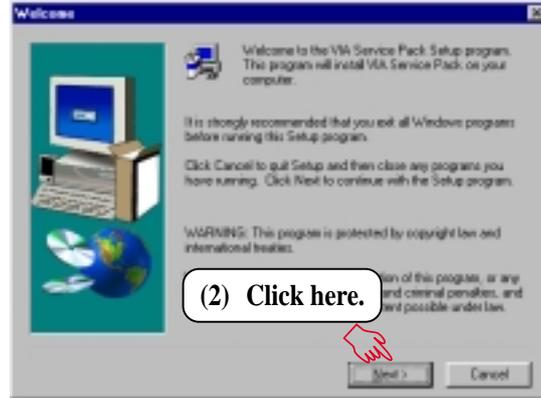
Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.



5. SOFTWARE SETUP

5.6 VIA 4 in 1 Driver

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.



5. SOFTWARE SETUP

5.7 Uninstalling Programs

Add/Remove Programs is a basic component within Windows. You may use this function if a program does not provide its own uninstallation program.

(1) Double-click here to open the Add/Remove Programs Properties dialog box.

(2) Select the program to remove and click here.

(3) Click here.

5. SOFTWARE SETUP

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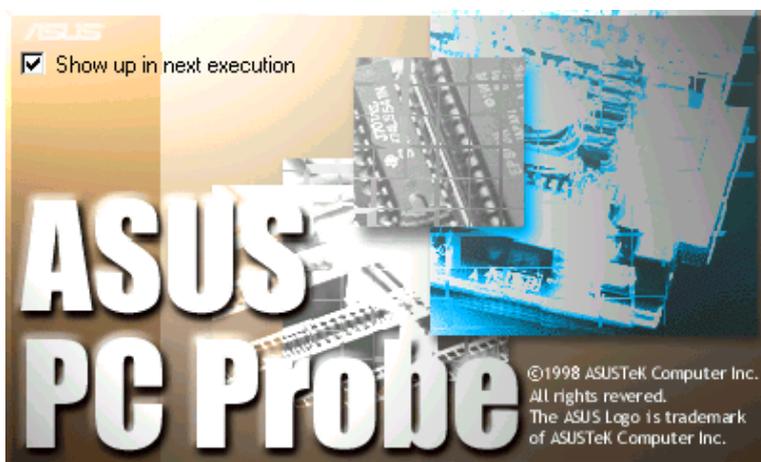
6. SOFTWARE REFERENCE

6.1 ASUS PC Probe

ASUS PC Probe is a convenient utility to continuously monitor your computer system's vital components, such as fan rotations, voltage, and temperatures. It also has a utility that lets you review useful information about your computer, such as hard disk space, memory usage, and CPU type, CPU speed, and internal/external frequencies through the DMI Explorer.

6.1.1 Starting ASUS PC Probe

When ASUS PC Probe starts, a splash screen appears allowing you to select whether or not to show the screen the next time you open PC Probe. To bypass this startup screen, clear the **Show up in next execution** check box.



To open **ASUS PC Probe**, click the Windows **Start** button, point to **Programs**, and then **ASUS Utility**, and then click **Probe Vx.xx**.

The PC Probe icon  will appear on the taskbar's system tray indicating that ASUS PC Probe is running. Clicking the icon will allow you to see the status of your PC.



6. SOFTWARE REFERENCE

6.1.2 Using ASUS PC Probe Monitoring

Monitor Summary

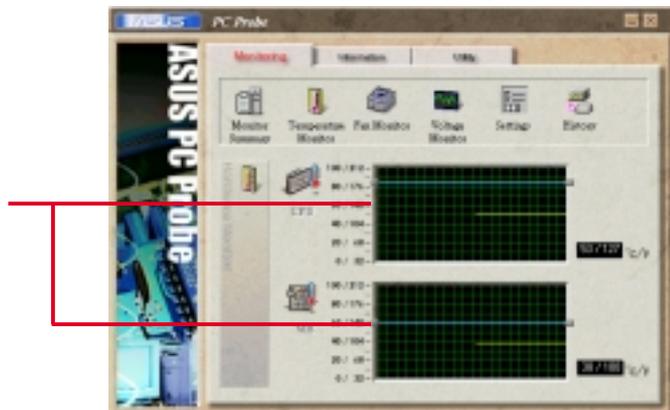
Shows a summary of the items being monitored.



Temperature Monitor

Shows the PC's temperature.

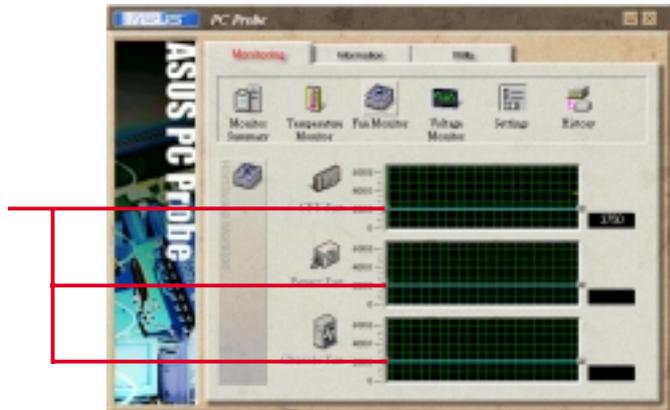
Temperature Warning threshold adjustment
(Move the slider up to increase the threshold level or down to decrease the threshold level)



Fan Monitor

Shows the PC's fan rotation.

Fan Warning threshold adjustment
(Move the slider up to increase the threshold level or down to decrease the threshold level)



Voltage Monitor

Shows the PC's voltages.



6. SOFTWARE REFERENCE

Settings

Lets you set threshold levels and polling intervals or refresh times of the PC's temperature, fan rotation, and voltages.

CPU Cooling System Setup

Lets you select when to enable software CPU cooling. When **When CPU Overheated** is selected, the CPU cooling system is enabled whenever the CPU temperature reaches the threshold value.

History

Lets you record the current monitoring activity of a certain component of your PC for future reference.

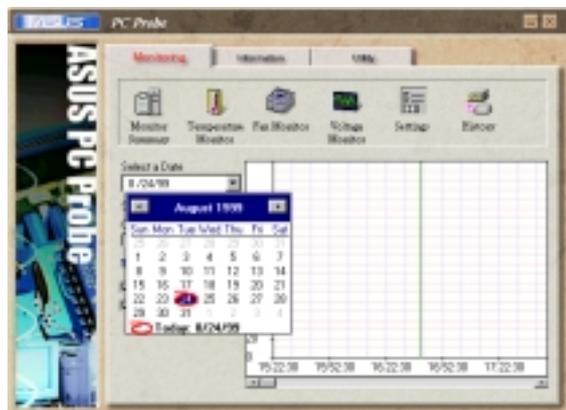
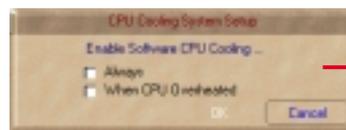
Information

Hard Drives

Shows the used and free space of the PC's hard disk drives and the file allocation table or file system used.

Memory

Shows the PC's memory load, memory usage, and paging file usage.



6. SOFTWARE REFERENCE

Device Summary

Shows a summary of devices in your PC.



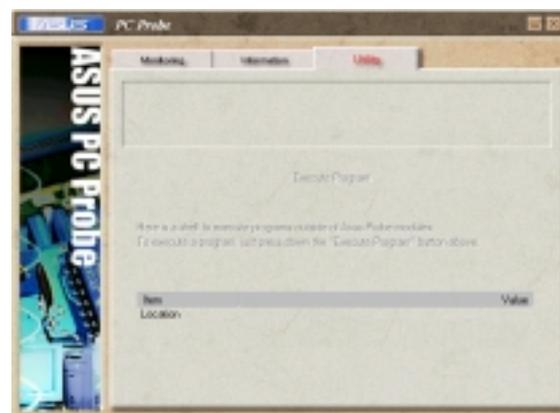
DMI Explorer

Shows information pertinent to the PC, such as CPU type, CPU speed, and internal/external frequencies, and memory size.



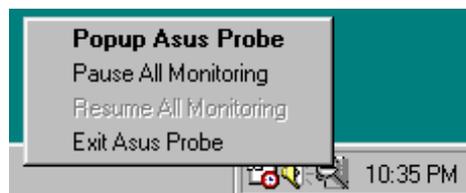
Utility

Lets you run programs outside of the ASUS Probe modules. To run a program, click **Execute Program**.

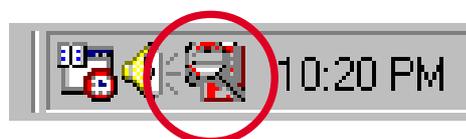


6.1.3 ASUS PC Probe Task Bar Icon

Right-clicking the PC Probe icon will bring up a menu to open or exit ASUS PC Probe and pause or resume all system monitoring.



When the ASUS PC Probe senses a problem with your PC, portions of the ASUS PC Probe icon changes to red, the PC speaker beeps, and the ASUS PC Probe monitor is displayed.



7. APPENDIX

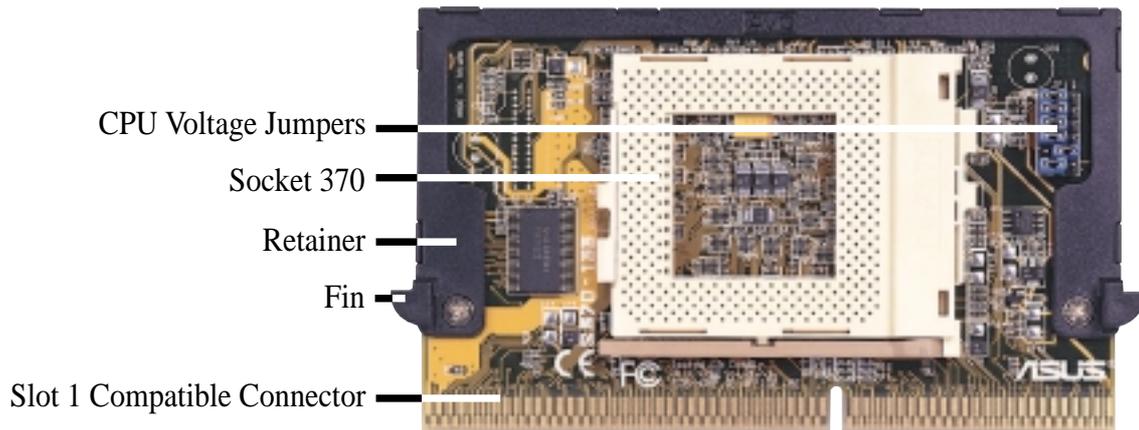
7.1 S370 Series CPU Cards

The ASUS S370 Series CPU cards allow Slot 1 motherboards to accept socket 370 processors with Front Side Bus running at up to 133MHz. The ASUS S370 Series CPU cards support both Coppermine and Celeron processors to give Slot 1 motherboard owners an inexpensive way to upgrade their Pentium II/III computers using lower costing socket 370 processors. Since socket 370 processors are designed on the Pentium II/III design, the only difference is the package form factor. Additionally, the S370 Series CPU cards can acquire temperature data from the processor's thermal diode and send it to the motherboard that supports CPU thermal monitoring.

The following are pictures of the ASUS S370 Series CPU cards with black plastic retainers attached to the edges. The retainers are used to hold the ASUS S370 Series CPU cards in place using the motherboard's Slot 1 retention mechanisms.

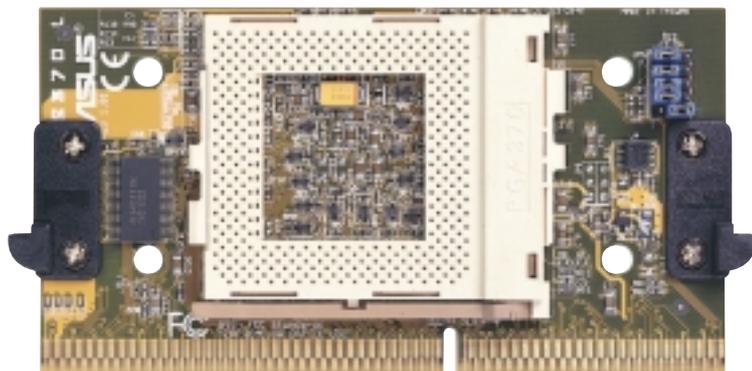
ASUS S370-133 CPU Card (standard model)

- 133MHz FSB Coppermine/Celeron Processor Support
- Better Support with Full Retainer



ASUS S370-L CPU Card (for smaller cases)

- 133MHz FSB Coppermine/Celeron Processor Support
- Low Profile



7. APPENDIX

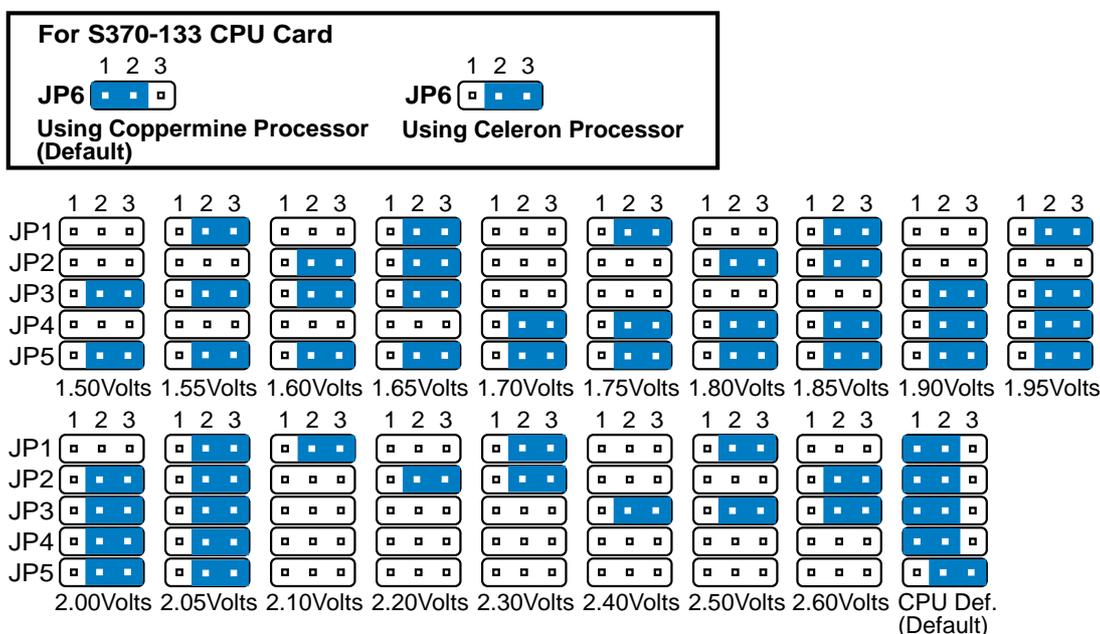
7.1.1 Using the ASUS S370 Series CPU Cards

The general procedure for using the ASUS S370 Series CPU cards:

1. Check the voltage setting for your socket 370 processor using the jumpers on the card if necessary. For current socket 370 processors, the default setting should be used.
2. Install the socket 370 processor. Installation of socket 370 processors is exactly like socket 7 processors. Lift the brown lever to 90° to install the processor and lower the brown lever to lock the processor.
3. Install the CPU fan.
4. Insert the ASUS S370 Series CPU cards into Slot 1 on the motherboard. The two fins on the sides of the ASUS S370 Series CPU cards must catch on the retention mechanism so that it locks in place.
5. Connect the socket 370 processor's fan connector to the motherboard.

7.1.2 Setting up the ASUS S370 Series CPU Cards

Setting the CPU voltage is *not* necessary for current socket 370 processors. If required, your socket 370 processor should have its voltage requirement printed on its surface or documentation. If no voltage is indicated or you are not sure, use the "CPU Def." setting as shown below. Notice that **JP6** should be set for the S370-133 CPU card to distinguish between Coppermine and Celeron processors. The S370-L CPU card can distinguish these two types of CPU automatically.

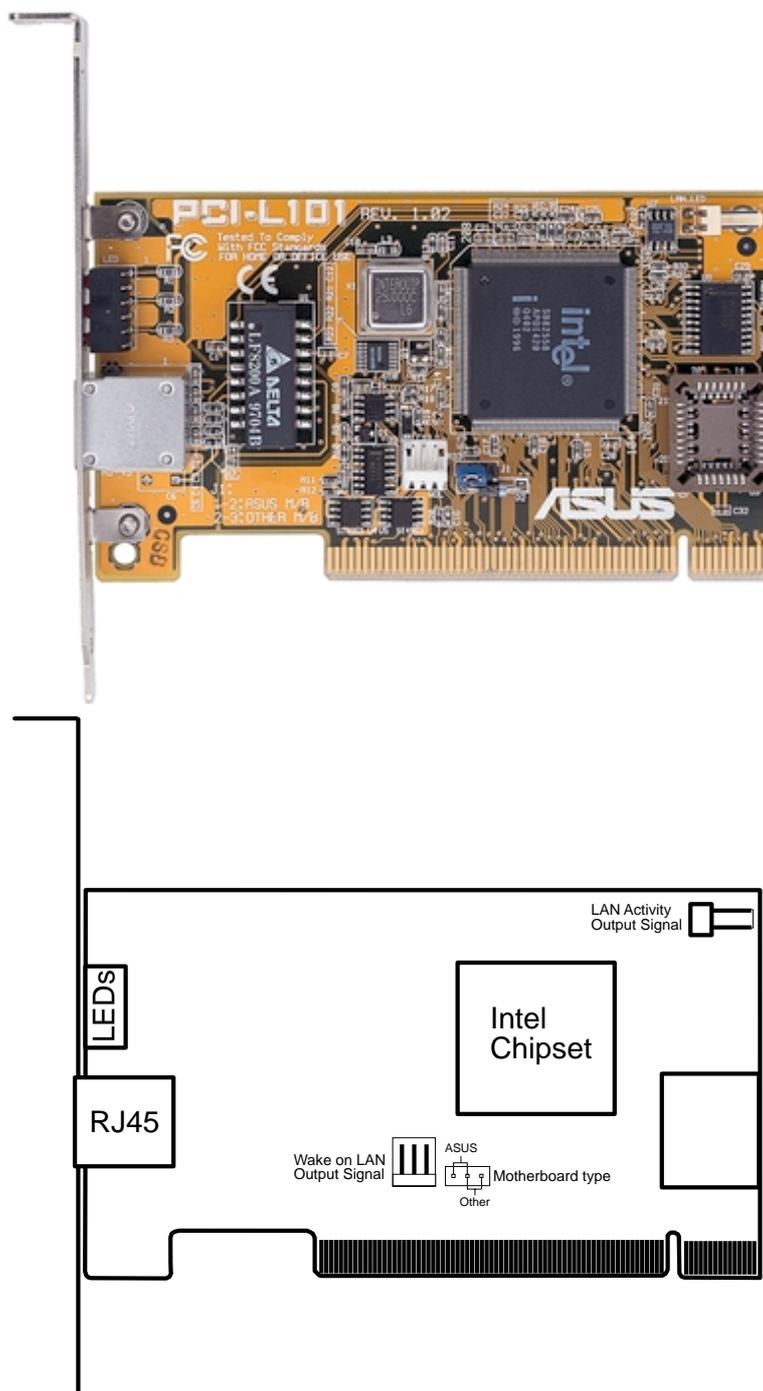


Socket 370 CPU Voltage

WARNING! Exceeding your socket 370 processor's required voltage can damage your processor permanently! Make sure that the jumpers are as shown for "CPU Def." unless otherwise specified before powering on your motherboard.

7. APPENDIX

7.2 ASUS PCI-L101 Fast Ethernet Card



7. APPENDIX
ASUS LAN Card

If you are using the ASUS PCI-L101 on this motherboard, leave the jumper on its default setting of “ASUS.” If you are using another brand of motherboard, set the jumper to “Other.” Connect the Wake on LAN (WOL) output signal to the motherboard’s WOL_CON to utilize the Wake-On-LAN feature of the motherboard. Connect the LAN activity output signal (LAN_LED) to the system cabinet’s front panel LAN_LED to display LAN data activity.

7. APPENDIX

7.2.1 Features

- Intel 82558 Ethernet LAN Controller (Fully integrated 10BASE-T/100BASE-TX)
- Wake-On-LAN Remote Control Function Supported
- PCI Bus Master Complies with PCI Local Bus Rev. 2.1 specifications
- Consists of MAC & PHY (10/100Mbps) interfaces
- Complies with IEEE 802.3 10BASE-T and IEEE 802.3u 100BASE-TX interfaces
- Fully supports 10BASE-T & 100BASE-TX operations through a single RJ45 port
- Supports 32-bit Bus Master Technology / PCI Rev. 2.1
- Enhancements on ACPI & APM
- Adheres to PCI Bus Power Management Interface Rev. 1.0, ACPI Rev. 1.0, and Device Class Power Management Rev. 1.0
- IEEE 802.3u auto-negotiation for 10Mbps/100Mbps Network Data Transfer Rates.
- Provides LED indicators for monitoring network conditions
- Plug and Play

7.2.2 Software Driver Support

- **NetWare ODI Drivers** - Novell Netware 3.x, 4.x, DOS, OS/2 Client
- **NDIS 2.01 Drivers** - Microsoft LAN Manager, Microsoft Windows 3.11, IBM LAN Server
- **NDIS 3.0 Drivers** - Microsoft Windows NT, Microsoft Windows 95, Microsoft Windows 3.11

7.2.3 Questions and Answers

Q: What is Wake-On-LAN?

A: The Wake-On-LAN feature provides the capability to remotely power on systems supporting Wake-On-LAN by simply sending a wake-up frame. With this feature, remotely uploading/downloading data to/from systems during off-peak hours will be feasible.

Q: What can Wake-On-LAN do for you?

A: Wake-On-LAN is a remote management tool with advantages that can reduce system management workload, provide flexibility to the system administrator's job, and then of course save you time-consuming efforts and costs.

Q: What components are required for Wake-On-LAN to function?

A: To enable Wake-On-LAN function, your system requires an Ethernet LAN adapter card that can activate Wake-On-LAN function, a client with Wake-On-LAN capability, and software such as LDCM Rev. 3.10 or up that can trigger wake-up frame.

7. APPENDIX

7.3 Glossary

AGP (Accelerated Graphics Port)

An interface specification that enables high-performance 3D graphics on mainstream PCs. AGP offers a higher throughput than PCI by providing the graphics controller with direct access to system memory.

Bus	Bus Frequency	Bus Speed
PCI	33MHz	133MB/s
AGP 1X	66MHz	200-300MB/s
AGP 2X	133MHz	528MB/s
AGP 4X	266MHz	1 GB/s

AUTOEXEC.BAT

AUTOEXEC.BAT is a special-purpose file that is automatically executed by DOS whenever the computer is turned ON or restarted. This file contains important commands that help configure the system to work with certain software and devices. Windows 95 and later has its own startup files and may not use or may ignore parts of the AUTOEXEC.BAT file.

BIOS (Basic Input/Output System)

BIOS is a set of routines that affect how the computer transfers data between computer components, such as memory, disks, and the display adapter. The BIOS instructions are built into the computer's read-only memory. BIOS parameters can be configured by the user through the BIOS Setup program. The BIOS can be updated using the provided utility to copy a new BIOS file into the EEPROM.

Bit (Binary Digit)

Represents the smallest unit of data used by the computer. A bit can have one of two values: 0 or 1.

Boot

Boot means to start the computer operating system by loading it into system memory. When the manual instructs you to "boot" your system (or computer), it means to turn ON your computer. "Reboot" means to restart your computer. When using Windows 95 or later, selecting "Restart" from "Start | Shut Down..." will reboot your computer.

Bus Master IDE

PIO (Programmable I/O) IDE requires that the CPU be involved in IDE access and waiting for mechanical events. Bus master IDE transfers data to/from the memory without interrupting the CPU. Bus master IDE driver and bus master IDE hard disk drives are required to support bus master IDE mode.

Byte (Binary Term)

One byte is a group of eight contiguous bits. A byte is used to represent a single alphanumeric character, punctuation mark, or other symbol.

7. APPENDIX

COM Port

COM is a logical device name used by to designate the computer serial ports. Pointing devices, modems, and infrared modules can be connected to COM ports. Each COM port is configured to use a different IRQ and address assignment.

CPU (Central Processing Unit)

The CPU, sometimes called “Processor,” actually functions as the “brain” of the computer. It interprets and executes program commands and processes data stored in memory. Currently, there are socket 370 (for Pentium Celeron-PPGA), socket 7 (for Pentium, AMD, Cyrix, IBM), slot 1 (for Pentium II and III), and slot 2 (for Xeon) processors.

Device Driver

A device driver is a special set of instructions that allows the computer’s operating system to communicate with devices such as VGA, audio, ethernet, printer, or modem.

DOS (Disk Operating System)

DOS is the foundation on which all other programs and software applications operate, including Windows. DOS is responsible for allocating system resources such as memory, CPU time, disk space, and access to peripheral devices. For this reason, DOS constitutes the basic interface between you and your computer.

Hardware

Hardware is a general term referring to the physical components of a computer system, including peripherals such as printers, modems, and pointing devices.

IDE (Integrated Drive Electronics)

IDE devices integrate the drive control circuitry directly on the drive itself, eliminating the need for a separate adapter card (in the case for SCSI devices). UltraDMA/33 IDE devices can achieve up to 33MB/Sec transfer.

LPT Port (Line Printer Port)

Logical device name reserved by DOS for the computer parallel ports. Each LPT port is configured to use a different IRQ and address assignment.

MMX

A set of 57 new instructions based on a technique called Single Instruction, Multiple Data (SIMD), which is built into the new Intel Pentium PP/MT (P55C) and Pentium II (Klamath) CPU as well as other x86-compatible microprocessors. The MMX instructions are designed to accelerate multimedia and communications applications, such as 3D video, 3D sound, video conference.

PCI Bus (Peripheral Component Interconnect Local Bus)

PCI bus is a specification that defines a 32-bit data bus interface. PCI is a standard widely used by expansion card manufacturers.

Peripherals

Peripherals are devices attached to the computer via I/O ports. Peripheral devices allow your computer to perform an almost limitless variety of specialized tasks.

7. APPENDIX

POST (Power On Self Test)

When you turn on the computer, it will first run through the POST, a series of software-controlled diagnostic tests. The POST checks system memory, the motherboard circuitry, the display, the keyboard, the diskette drive, and other I/O devices.

PS/2 Port

PS/2 ports are based on IBM Micro Channel Architecture. This type of architecture transfers data through a 16-bit or 32-bit bus. A PS/2 mouse and/or keyboard may be used on ATX motherboards.

RAID (Redundant Array of Independent Disks)

RAID can be set up to provide mirroring (for fault tolerance), parity (for data guarding), or striping (for data distribution over several drives for increased performance). A RAID card is required to setup a RAID system.

RAM (Random Access Memory)

There are several different types of RAM such as DRAM (Dynamic RAM), EDO DRAM (Extended Data Output DRAM), SDRAM (Synchronous DRAM).

ROM (Read Only Memory)

ROM is nonvolatile memory used to store permanent programs (called firmware) used in certain computer components. Flash ROM (or EEPROM) can be reprogrammed with new programs (or BIOS).

SCSI (Small Computer System Interface)

High speed parallel interface defined by the X3T9.2 committee of the American National Standards Institute (ANSI) for connecting many peripheral devices.

System Disk

A system disk contains the core file of an operating system and is used to boot up the operating system.

Ultra DMA/33

Ultra DMA/33 is a specification to improve IDE transfer rates. Unlike traditional PIO mode, which only uses the rising edge of IDE command signal to transfer data, the DMA/33 uses both rising edge and falling edge. Hence, the data transfer rate is double of the PIO mode 4 or DMA mode 2. (16.6MB/s x2 = 33MB/s).

USB (Universal Serial Bus)

A new 4-pin serial peripheral bus that allows plug and play computer peripherals such as keyboard, mouse, joystick, scanner, printer and modem/ISDN to be automatically configured when they are attached physically without having to install drivers or reboot. With USB, the traditional complex cables from back panel of your PC can be eliminated.

