

P4BP-MX

User Guide

ASUS

Motherboard

E1534

First Edition

February 2004

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Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. 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.



The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS Websites**

The ASUS website provides updated information on ASUS hardware and software products. The ASUS websites are listed in the ASUS Contact Information on the inside front cover.

2. **Optional Documentation**

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



WARNING: Information to prevent injury to yourself when trying to complete a task.



CAUTION: Information to prevent damage to the components when trying to complete a task.



IMPORTANT: Information that you **MUST** follow to complete a task.



NOTE: Tips and additional information to aid in completing a task.

Typography

Bold text	Indicates a menu or an item to select.
<i>Italics</i>	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign indicates that you must press the enclosed key. Example: <Enter> indicates that you must press the Enter or Return key.
<Multiple key names>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: <Ctrl+Alt+D>
Command	Means that you must enter the command exactly as shown. Example: At the DOS prompt, type the command line: FORMAT A: /S

P4BP-MX specifications summary

CPU	Socket 478 for Intel® Pentium® 4 / Celeron® processors with speeds up to 3.06 GHz+ Supports Intel® Hyper-Threading Technology
Chipset	Northbridge: Intel® 845GV Southbridge: Intel® ICH4 (FW82801DB)
Front System Bus	533/400 MHz
Memory	2 x 184-pin DDR DIMM sockets for up to 2GB unbuffered non-ECC PC2700/2100 SDRAM memory
Expansion slots	3 x PCI slots
Storage	2 x UltraDMA 100/66
Audio	Realtek® ALC655 6-channel CODEC Supports S/PDIF-In/Out interface
LAN	Realtek® 8101L integrated 10/100Mbps LAN controller
USB	Maximum of six (6) USB 2.0 ports
Special features	ASUS JumperFree ASUS C.P.R. (CPU Parameter Recall) ASUS CrashFree BIOS ASUS EZ Flash ASUS MyLogo™ Power Loss Restart STR (Suspend-to-RAM) CPU Throttle
Rear Panel I/O	1 x Parallel port 1 x Serial port 1 x VGA port 1 x PS/2 Keyboard port 1 x PS/2 Mouse port 4 x USB 2.0 ports 1 x RJ-45 port
Internal I/O connectors	CPU/Chassis fan connectors 20-pin ATX power connector 4-pin auxiliary power connector 1 x USB 2.0 header supports an additional 2 USB 2.0 ports Chassis intrusion connector IR connector S/PDIF-In/Out connector IDE LED connector Power LED connector Serial connector CD/AUX audio-in connectors Front panel audio connector

(continued on the next page)

BIOS features	2Mb Flash ROM, Award BIOS, TCAV, PnP, DMI2.0, WfM2.0, SM BIOS 2.3
Industry standard	PCI 2.2, USB 2.0
Form Factor	MicroATX form factor: 9.6 in x 8.6 in
Support CD contents	Device drivers ASUS PC Probe ASUS Live Update Utility Trend Micro™ PC-cillin™ anti-virus software

** Specifications are subject to change without notice.*

Chapter 1

This chapter describes the features of the motherboard. It includes brief descriptions of the motherboard components, and illustrations of the layout, jumper settings, and connectors.

Product introduction

1.1 Welcome!

Thank you for buying the ASUS® P4BP-MX motherboard!

The motherboard delivers a host of new features and latest technologies making it another standout in the long line of ASUS quality motherboards!

The motherboard combines the powers of the Intel® Pentium® 4 processor and the Intel® 845GV chipset to set a new benchmark for an effective desktop platform solution.

Supporting up to 2GB of system memory with PC2700/PC2100 DDR SDRAM, high-resolution graphics via an AGP 8X slot, USB 2.0, and 6-channel audio features, the motherboard takes you ahead in the world of power computing!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

1.2 Package contents

Check your motherboard package for the following items.

- ✓ ASUS P4BP-MX motherboard
- ✓ ASUS motherboard support CD
- ✓ 1 x IDE cable
- ✓ 1 x Floppy disk cable
- ✓ I/O shield
- ✓ Bag of extra jumper caps
- ✓ User guide



If any of the above items is damaged or missing, contact your retailer.

1.3 Special features

1.3.1 Product Highlights

Latest processor technology



The motherboard comes with a 478-pin surface mount, Zero Insertion Force (ZIF) socket for the Intel® Pentium® 4 processor in the 478-pin package with 512/256KB L2 cache on 0.13 micron process. This motherboard supports 533/400 MHz system front side bus that allows 4.3GB/s and 3.2GB/s data transfer rates, respectively. The motherboard also supports the Intel® Hyper-Threading Technology.

Onboard 10/100 LAN



The Realtek® 8101L PCI LAN controller provides easy implementation of 10/100 Mbps Fast Ethernet LAN.

Integrated Graphics



The Intel® 845GV chipset delivers realistic 3D/2D graphics with sharp images, fast rendering, smooth motion, and clearly defined details.

6 USB 2.0 ports



The motherboard implements the new Universal Serial Bus (USB) 2.0 specification, extending the connection speed from 12 Mbps on USB 1.1 to a fast 480 Mbps on USB 2.0 - supporting up to eight USB 2.0 ports. The higher bandwidth of USB 2.0 allows connection of devices such as high resolution video conferencing cameras, next generation scanners and printers, and fast storage units. USB 2.0 is backward compatible with USB 1.1.

6-Channel Audio solution



The motherboard uses an onboard audio CODEC that lets you enjoy high-quality 6-channel audio without having to buy advanced sound cards.

S/PDIF out



The motherboard supports S/PDIF-out function turns your computer into a high-end entertainment system with digital connectivity to powerful speaker systems.

1.3.2 Unique ASUS features

CrashFree BIOS

This feature allows you to restore the original BIOS data from a bootable floppy disk in case the BIOS codes and data are corrupted. This protection eliminates the need to buy a replacement ROM chip. See page 2-7.

ASUS EZ Flash BIOS

With the ASUS EZ Flash, you can easily update the system BIOS even before loading the operating system. No need to use a DOS-based utility or boot from a floppy disk. See page 2-2.

ASUS MyLogo™

This new feature present in the motherboard allows you to personalize and add style to your system with customizable boot logos. See page 2-27.

C.P.R. (CPU Parameter Recall)

The C.P.R. feature of the motherboard BIOS allows automatic re-setting to the BIOS previous settings in case the system hangs due to overclocking. When the system hangs due to overclocking, C.P.R. eliminates the need to open the system chassis and clear the RTC data. Simply shut down and reboot the system, and BIOS automatically restores the CPU previous setting for each parameter.

1.4 Before you proceed

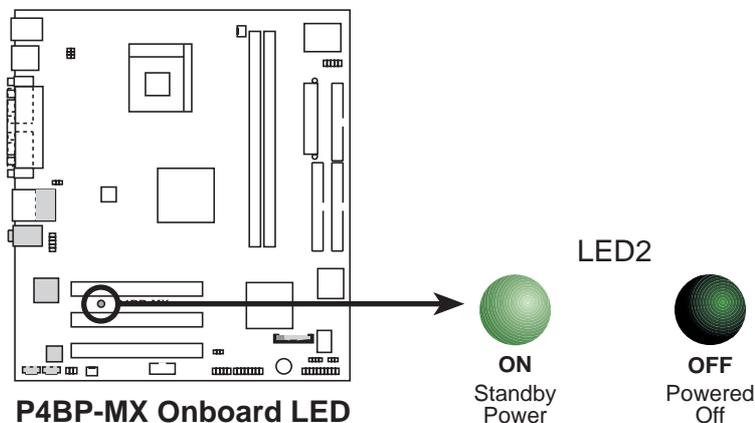
Take note of the following precautions before you install motherboard components or change any motherboard settings.



1. Unplug the power cord from the wall socket before touching any component.
2. Use a grounded wrist strap or touch a safely grounded object or discharge any static electricity by touching the metal surface of the system chassis.
3. Hold components by the edges to avoid touching the ICs on them.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
5. Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

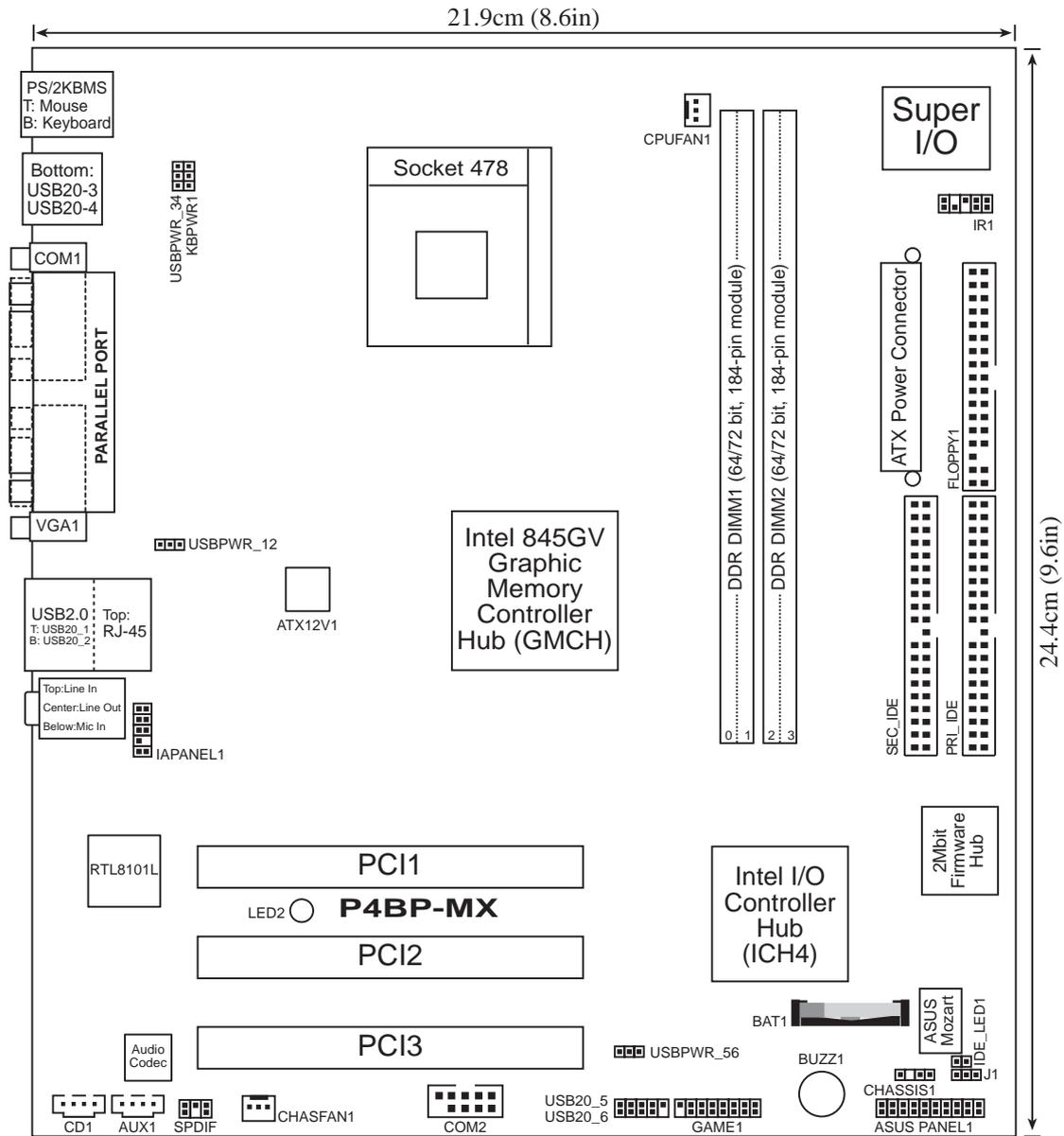
Onboard LED

The motherboard comes with a stand-by power LED. When lit, this green LED indicates that the system is ON, in sleep mode, or in soft-off mode, a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.



1.5 Motherboard overview

1.5.1 Motherboard layout



1.5.2 Placement direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

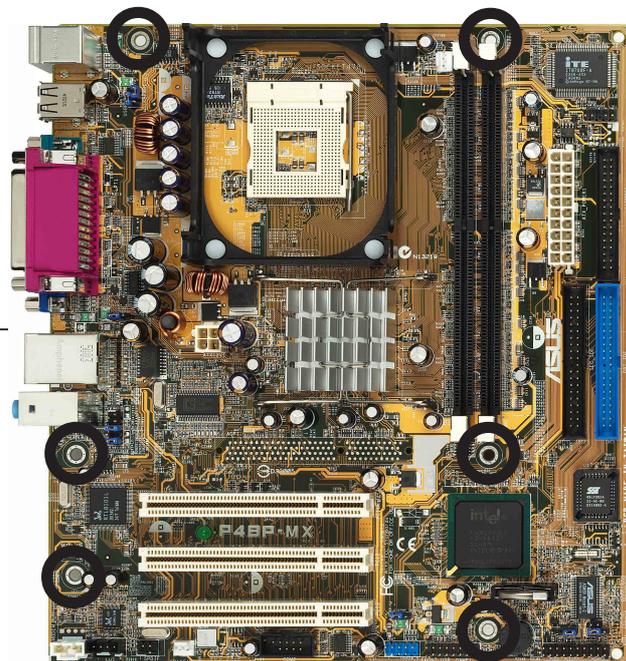
1.5.3 Screw holes

Place six (6) screws into the holes indicated by circles to secure the motherboard to the chassis.



Do not overtighten the screws! Doing so may damage the motherboard.

Place this side towards
the rear of the chassis

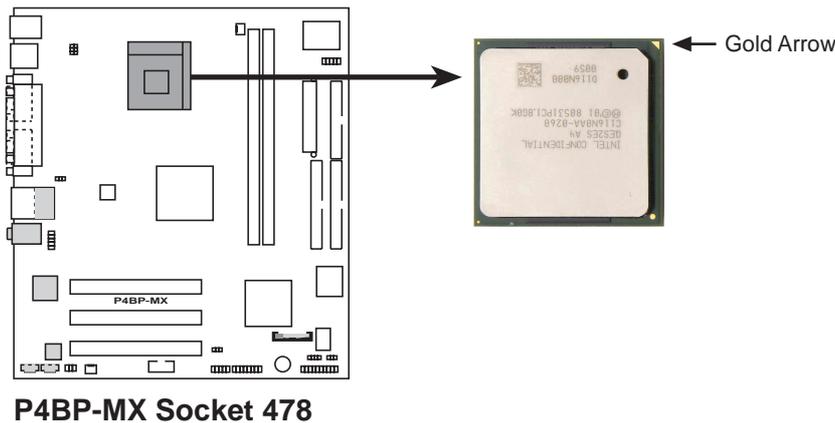


1.6 Central Processing Unit (CPU)

1.6.1 Overview

The motherboard comes with a surface mount 478-pin Zero Insertion Force (ZIF) socket designed for the Intel® Pentium® 4 processor.

Take note of the marked corner (with gold triangle) on the CPU. This mark should match a specific corner on the socket to ensure correct installation.



Incorrect installation of the CPU into the socket may bend the pins and severely damage the CPU!

Notes on Intel® Hyper-Threading Technology

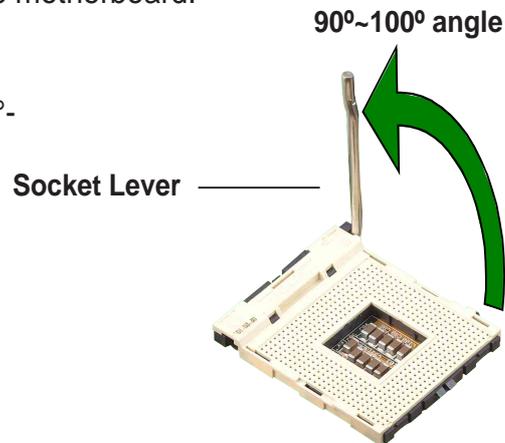


1. This motherboard supports Intel® Pentium® 4 CPUs with Hyper-Threading Technology.
2. Hyper-Threading Technology is supported under Windows® XP and Linux 2.4.x (kernel) and later versions only. Under Linux, use the Hyper-Threading compiler to compile the code. If you are using any other operating systems, disable the Hyper-Threading Technology item in BIOS to ensure system stability and performance.
3. It is recommended that you install Windows® XP Service Pack 1.
4. Make sure to enable the Hyper-Threading Technology item in BIOS before installing a supported operating system.
5. For more information on Hyper-Threading Technology, visit www.intel.com/info/hyperthreading.

1.6.2 Installing the CPU

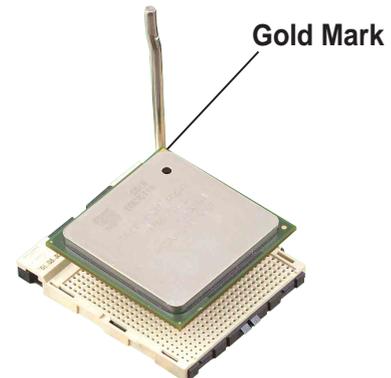
Follow these steps to install a CPU.

1. Locate the 478-pin ZIF socket on the motherboard.
2. Unlock the socket by pressing the lever sideways, then lift it up to a 90°-100° angle.



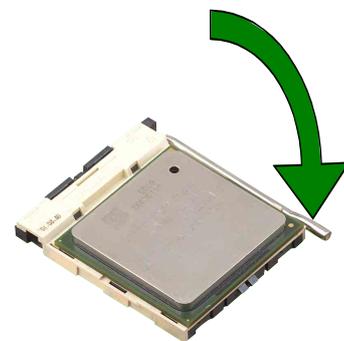
Make sure that the socket lever is lifted up to 90°-100° angle; otherwise, the CPU does not fit in completely.

3. Position the CPU above the socket such that its marked corner matches the base of the socket lever.
4. Carefully insert the CPU into the socket until it fits in place.



The CPU fits only in one correct orientation. **DO NOT** force the CPU into the socket to prevent bending the pins and damaging the CPU!

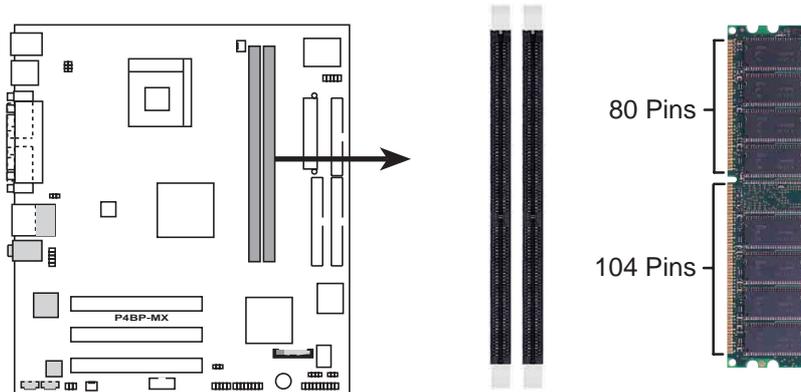
5. When the CPU is in place, push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



1.7 System memory

1.7.1 DIMM sockets location

You can install 64MB, 256MB, 512MB, and 1GB DDR DIMMs into the DIMM sockets of this motherboard. The following figure illustrates the location of the DDR DIMM sockets.



P4BP-MX 184-Pin DDR DIMM Sockets

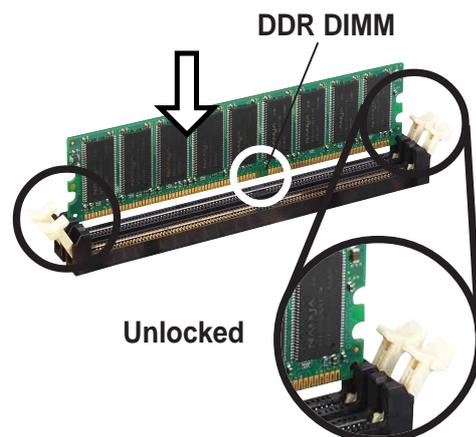


Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1.7.2 Installing a DIMM

Follow these steps to install a DIMM.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



A DDR DIMM is keyed with a notch so that it fits in only one direction. **DO NOT** force a DIMM into a socket to avoid damaging the DIMM.

1.8 Expansion slots

To install and configure an expansion card:

1. Install an expansion card following the instructions that came with the chassis.
2. Turn on the system and change the necessary BIOS settings, if any. See Chapter 2 for BIOS information.
3. Assign an IRQ to the card. Refer to the tables next page.
4. Install the drivers and/or software applications for the expansion card according to the card documentation.

1.8.1 Standard interrupt assignments

IRQ	Standard Function
0	System Timer
1	Keyboard Controller
2	Programmable Interrupt Controller
3	Communications Port (COM2)
4	Communications Port (COM1)
5	IRQ Holder for PCI IRQ Steering
6	Standard Floppy Disk Controller
7	ECP Printer Port (LPT1)
8	System CMOS/Real Time Clock
9	IRQ Holder for PCI IRQ Steering
10	IRQ Holder for PCI IRQ Steering
11	IRQ Holder for PCI IRQ Steering
12	PS/2 Compatible Mouse Port
13	Numeric Data Processor
14	Primary IDE controller (dual fifo)
15	Secondary Ultra ATA Controller (dual fifo)

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

1.8.2 IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI slot 1	—	—	—	—	—	used	—	—
PCI slot 2	—	—	—	—	—	—	used	—
PCI slot 3	—	—	—	—	—	—	—	shared
Onboard USB 1.1 controller 1shared	—	—	—	—	—	—	—	—
Onboard USB 1.1 controller 2	—	—	—	used	—	—	—	—
Onboard USB 1.1 controller 3	—	—	used	—	—	—	—	—
Onboard USB 2.0 controller	—	—	—	—	—	—	—	shared
Onboard LAN	—	shared	—	—	—	—	—	—
Onboard Audio	—	shared	—	—	—	—	—	—
Onboard VGA	shared	—	—	—	—	—	—	—



When using PCI cards on shared slots, ensure that the drivers support “Share IRQ” or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

1.8.3 PCI slots

The PCI slots support PCI cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications.



1.9 Jumpers

1. Clear RTC RAM (J1)

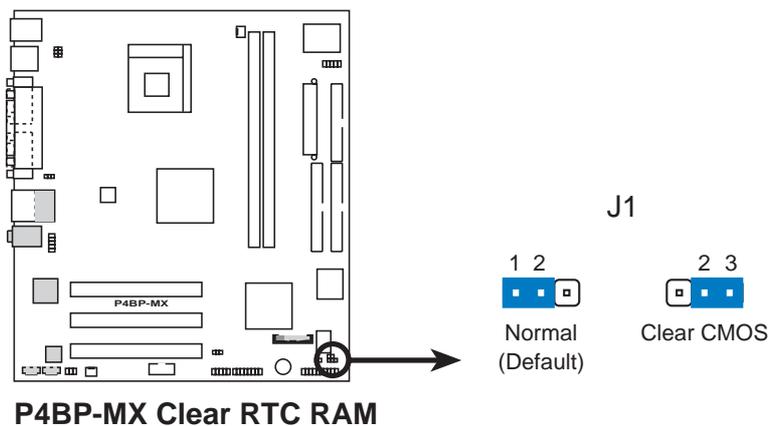
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The RAM data in CMOS, that include system setup information such as system passwords, is powered by the onboard button cell battery.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
3. Plug the power cord and turn ON the computer.
4. Hold down the **** key during the boot process and enter BIOS setup to re-enter data.



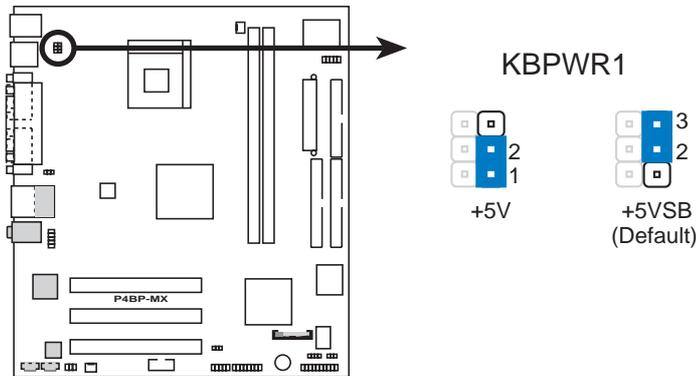
Except when clearing the RTC RAM, never remove the cap on the jumper default position. Removing the cap will cause system boot failure!



You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so BIOS can automatically reset parameter settings to its previous values.

2. Keyboard power (3-pin KBPWR1)

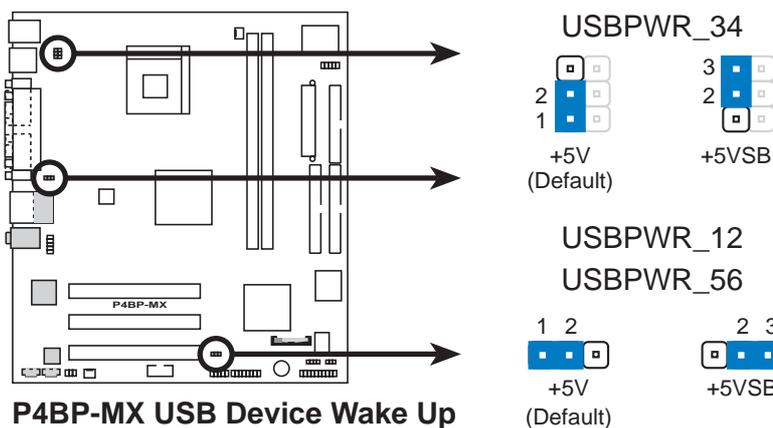
This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) if you wish to wake up the computer when you press a key on the keyboard. This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.



P4BP-MX Keyboard Power Setting

3. USB device wake-up (3-pin USBPWR_12, USBPWR_34, USBPWR_56)

Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).



P4BP-MX USB Device Wake Up

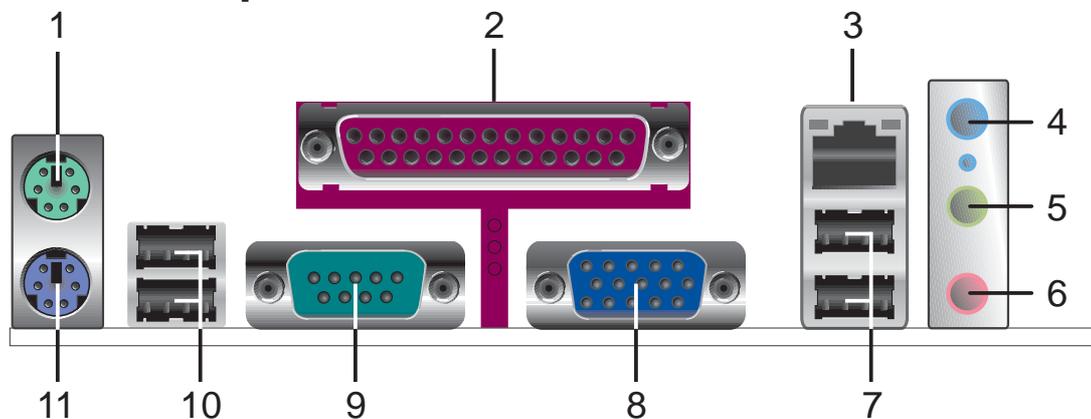


- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port. Otherwise, the system would not power up.
- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

1.10 Connectors

This section describes and illustrates the motherboard rear panel and internal connectors.

1.10.1 Rear panel connectors



1. **PS/2 mouse port.** This green 6-pin connector is for a PS/2 mouse.
2. **Parallel port.** This 25-pin port connects a parallel printer, a scanner, or other devices.
3. **RJ-45 port.** This port allows connection to a Local Area Network (LAN) through a network hub.
4. **Line In jack.** This Line In (light blue) jack connects a tape player or other audio sources. In 6-channel mode, the function of this jack becomes Bass/Center.
5. **Line Out jack.** This Line Out (lime) jack connects a headphone or a speaker. In 6-channel mode, the function of this jack becomes Front Speaker Out.
6. **Microphone jack.** This Mic (pink) jack connects a microphone. In 6-channel mode, the function of this jack becomes Rear Speaker Out.



The functions of the Line Out, Line In, and Microphone jacks change when you select the 6-channel audio configuration as shown in the following table.

Audio 2, 4 or 6-channel configuration

	Headphone/ 2-Speaker	4-Speaker	6-Speaker
Light Blue	Line In	Line In	Bass/Center
Lime	Line Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Rear Speaker Out	Rear Speaker Out

7. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
8. **VGA port.** This port connects to a VGA monitor.
9. **Serial connector.** This port connects to your serial mouse and other serial devices.
10. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
11. **PS/2 keyboard port.** This purple connector is for a PS/2 keyboard.

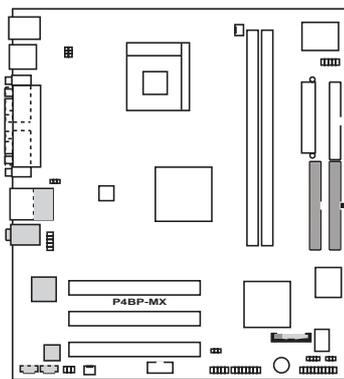
1.10.2 Internal connectors

1. IDE connectors (40-1 pin PRI_IDE, SEC_IDE)

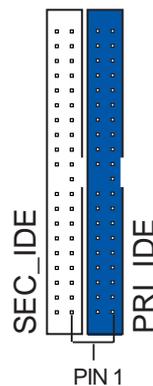
This connector supports the provided Ultra DMA 100/66 IDE hard disk ribbon cable. Connect the cable's blue connector to the primary (recommended) or secondary IDE connector, then connect the gray connector to the Ultra DMA 100/66 slave device (hard disk drive) and the black connector to the Ultra DMA 100/66 master device.



- Follow the hard disk drive documentation when setting the device in master or slave mode.
- Pin 20 on each IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect orientation when you connect the cables.
- The hole near the blue connector on the Ultra DMA cable is intentional.



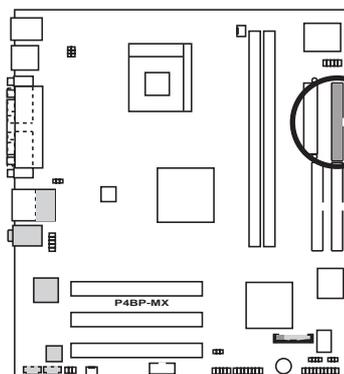
P4BP-MX IDE Connectors



NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.

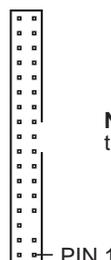
2. Floppy disk drive connector (34-1 pin FLOPPY1)

This connector supports the provided floppy drive ribbon cable. After connecting one end to the motherboard, connect the other end to the floppy drive. (Pin 5 is removed to prevent incorrect insertion when using ribbon cables with pin 5 plug).



P4BP-MX Floppy Disk Drive Connector

FLOPPY1

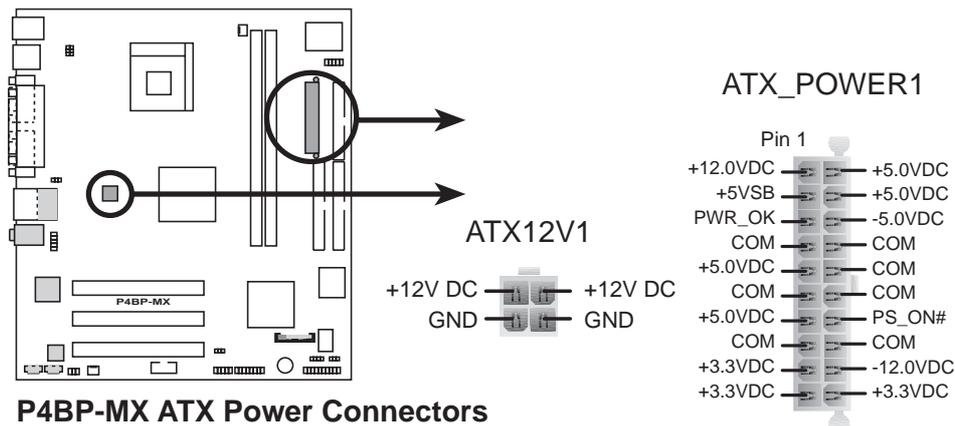


NOTE: Orient the red markings on the floppy ribbon cable to PIN 1.

3. ATX power connectors (20-pin ATX_POWER1, 4-pin ATX12V1)

These connectors connect to an ATX 12V power supply. The plugs from the power supply are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

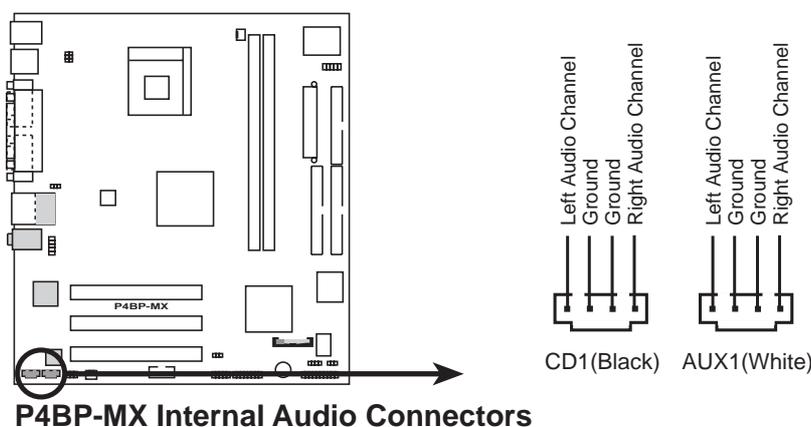
In addition to the 20-pin ATX power connector, this motherboard requires that you connect the 4-pin ATX +12V power plug to provide sufficient power to the CPU.



Make sure that your ATX 12V power supply can provide 8A on the +12V lead and at least 1A on the +5-volt standby lead (+5VSB). The minimum recommended wattage is 230W, or 300W for a fully configured system. The system may become unstable and may experience difficulty powering up if the power supply is inadequate.

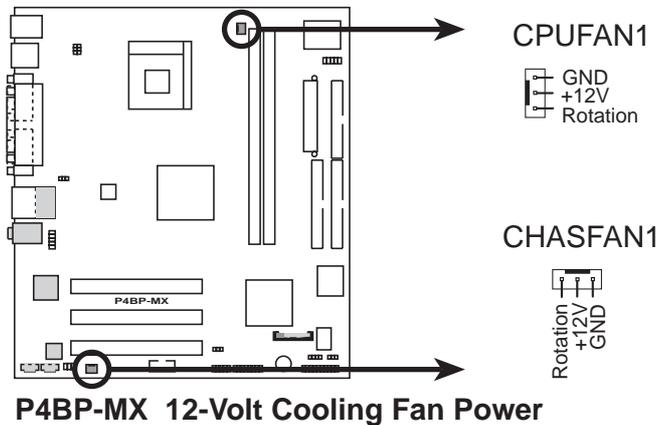
4. Internal audio connectors (4-pin CD1, AUX1)

These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.



5. CPU and chassis fan connectors (3-pin CUFAN2, CHASFAN1)

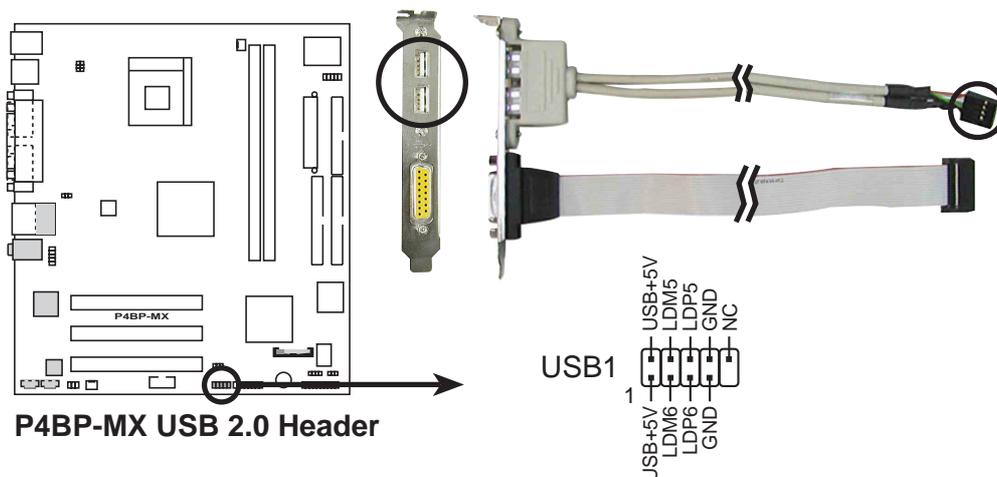
The fan connectors support cooling fans of 350mA~740mA (8.88W max.) or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.



Do not forget to connect the fan cables to the fan connectors. Lack of sufficient air flow within the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!

6. USB header (10-1 pin USB1)

If the USB ports on the rear panel are inadequate, a USB header is available for additional USB ports. Connect the USB cable of the USB 2.0 module to this header. You may install the USB module in the chassis front panel. The module has two USB 2.0 ports for connecting next generation USB peripherals such as high resolution cameras, scanners, and printers.

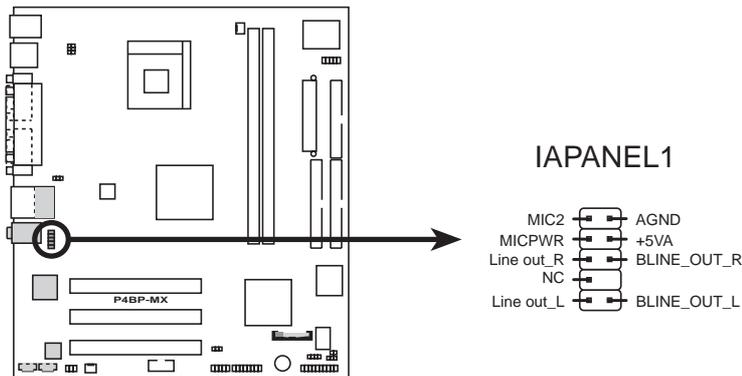


- The USB 2.0 module is purchased separately.
- Install the USB 2.0 driver before using the USB 2.0 feature.

7. Front panel audio connector (10-1 pin IAPANEL1)

This is an interface for the front panel cable that allows convenient connection and control of audio devices.

By default, the pins labeled LINE OUT_R/BLINE_OUT_R and the pins LINE OUT_L/BLINE_OUT_L are shorted with jumper caps. Remove the caps only when you are connecting the front panel audio cable.

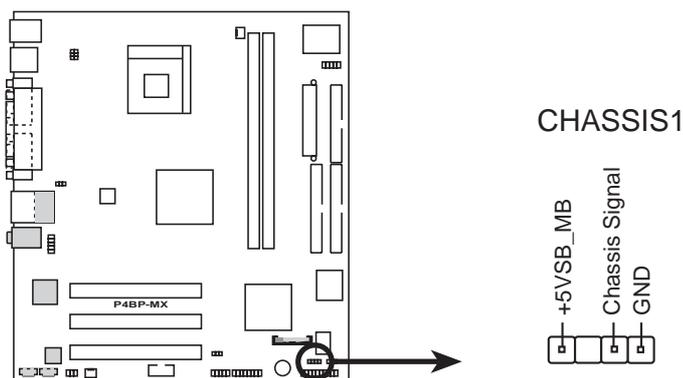


P4BP-MX Front Panel Audio Connector

8. Chassis intrusion connector (4-1 pin CHASSIS1)

This lead is for a chassis designed with intrusion detection feature. This requires an external detection mechanism such as a chassis intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to this lead to record a chassis intrusion event.

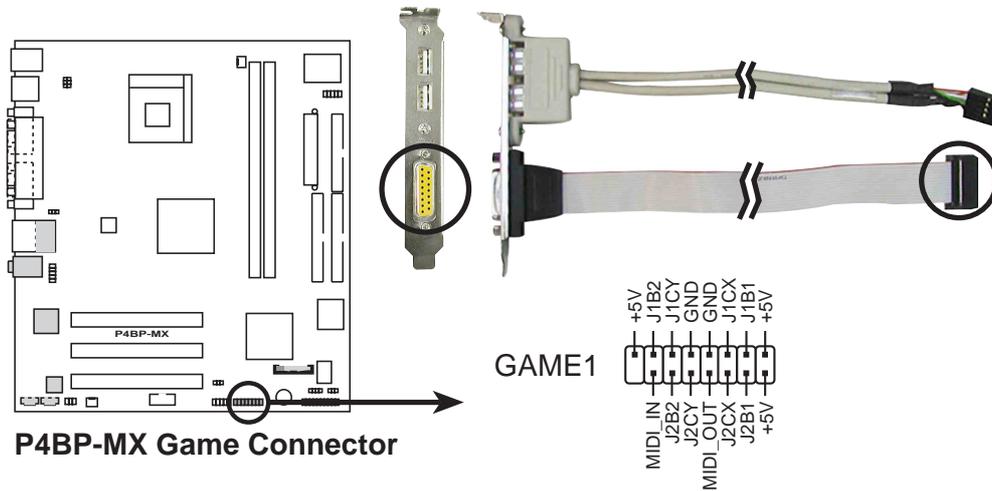
By default, the pins labeled "Chassis Signal" and "Ground" are shorted with a jumper cap. If you wish to use the chassis intrusion detection feature, remove the jumper cap from the pins.



P4BP-MX Chassis Alarm Lead

9. GAME/MIDI connector (16-1 pin GAME1)

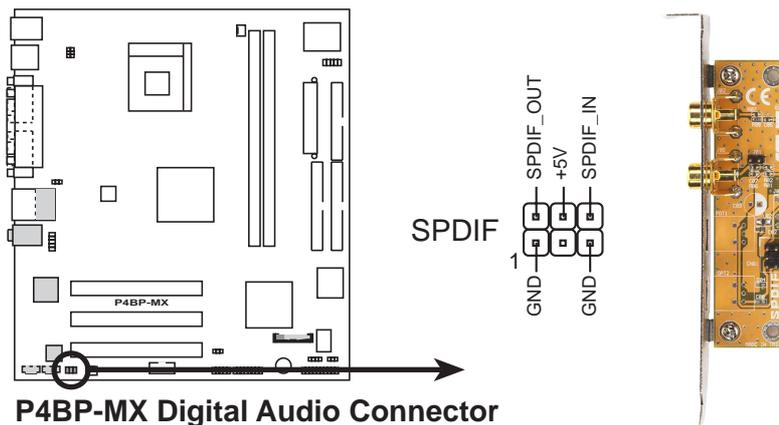
This connector supports a GAME/MIDI module. If a GAME/MIDI module is available, connect the GAME/MIDI cable to this connector. The GAME/MIDI port on the module connects a joystick or a game pad for playing games, and MIDI devices for playing or editing audio files.



The GAME/MIDI module is purchased separately.

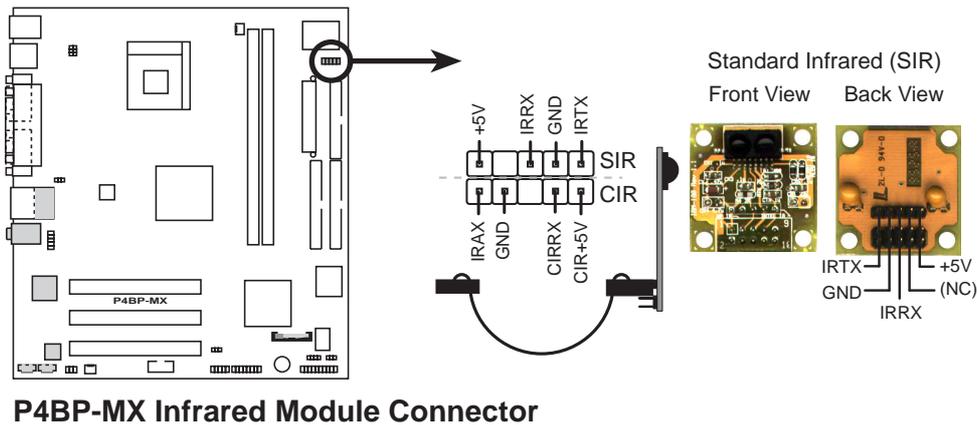
10. Digital Audio connector (6-1 pin SPDIF)

This connector is for the S/PDIF audio module to allow digital sound output. Connect one end of the S/PDIF audio cable to this connector and the other end to the S/PDIF module.



11. Infrared connector (10-pin IR1)

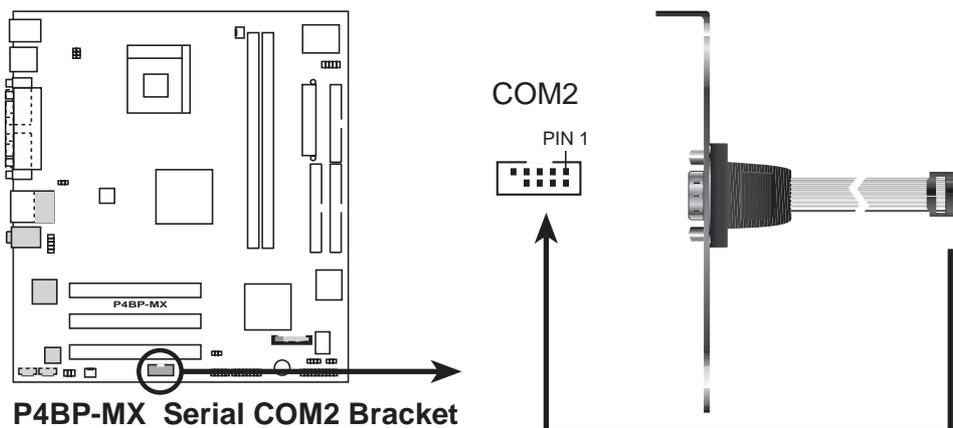
These connectors support an optional wireless transmitting and receiving infrared module. The module mounts to a small opening on the system chassis that supports this feature. You must also configure the UART2 Use As parameter in BIOS to set UART2 for use with IR. Use the ten pins as shown in Back View and connect a ribbon cable from the module to the motherboard IR connector according to the pin definitions.



The IR module is purchased separately.

12. Serial connector (9-pin COM2)

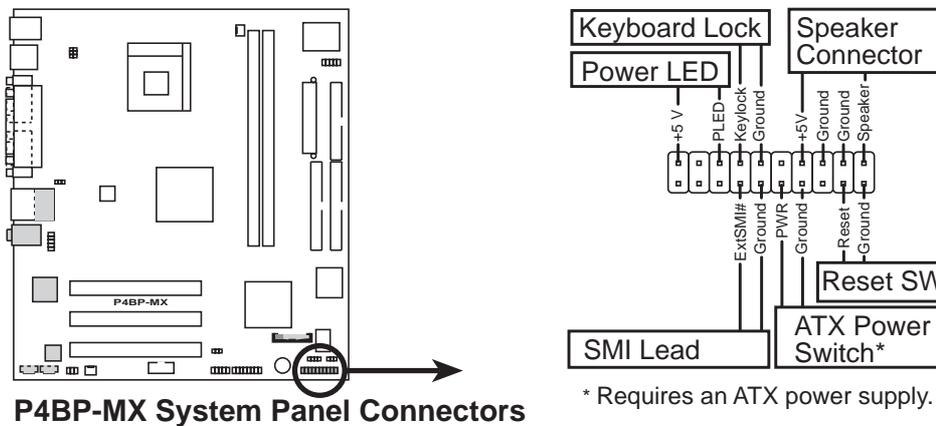
This 9-pin connector connects to a COM2 bracket. Connect the COM2 cable to this connector and install the bracket on an available slot in the rear panel of the chassis.



The COM2 bracket is purchased separately.

13. System panel connector (20-1 pin PANEL)

This connector accommodates several system front panel functions.



- **System Power LED Lead (2-pin PLED)**

This 2-pin connector connects to the system power LED. The LED lights up when you turn on the system power.

- **Keyboard Lock Lead (2-pin KEYLOCK)**

This 2-pin connector connects to a chassis-mounted switch to allow the use of the keyboard lock feature.

- **System Warning Speaker Lead (4-pin SPEAKER)**

This 4-pin connector connects to the case-mounted speaker and allows you to hear system beeps and warnings.

- **Reset Switch (2-pin RESET)**

This 2-pin connector connects to the case-mounted reset switch for rebooting the system without turning off the power switch.

- **ATX Power Switch / Soft-Off Switch Lead (2-pin PWRBTN)**

This connector connects a switch that controls the system power. Pressing the power switch turns the system between ON and SLEEP, or ON and SOFT OFF, depending on the BIOS or OS settings. Pressing the power switch while in the ON mode for more than 4 seconds turns the system OFF.

- **System Management Interrupt Lead (2-pin ExtSMI#)**

This 2-pin connector permits switching to suspend mode, or “Green” mode, in which system activity is instantly decreased to save power and to expand the life of certain system components.

Chapter 2

This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

BIOS information

2.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup.

1. ASUS EZ Flash - Updates the BIOS using a floppy disk during POST.
2. ASUS AFLASH - Updates the BIOS using a bootable floppy disk in DOS mode.
3. ASUS CrashFree BIOS - Updates the BIOS using a bootable floppy disk.

Refer to the corresponding sections for details on these utilities.

Important notes



- It is recommended that you save a copy of the **original motherboard BIOS file** to a **bootable floppy disk** in case you need to restore the BIOS in the future.
- Visit the ASUS website and download the latest BIOS file for this motherboard.

2.1.1 Using ASUS EZ Flash to update the BIOS

The ASUS EZ Flash feature allows you to easily update the BIOS without having to go through the long process of booting from a diskette and using a DOS-based utility. The EZ Flash is built-in the BIOS firmware so it is accessible by simply pressing **<Alt + F2>** during the Power-On Self Test (POST).

To update the BIOS using ASUS EZ Flash:

1. Visit the ASUS website (www.asus.com) to download the latest BIOS file for your motherboard. Save the BIOS file to a floppy disk.
2. Reboot the system.
3. To launch EZ Flash, press **<Alt+F2>** during POST to display the following.

```
ASUS EZ Flash V1.00
Copyright (C) 2002, ASUSTeK COMPUTER INC.

[Onboard BIOS Information]
BIOS Version      : ASUS P4BP-MX ACPI BIOS Revision 1002
BIOS Model        : P4BP-MX
BIOS Built Date   : 01/28/04

Please Enter File Name for NEW BIOS: _
*Note: EZ Flash will copy file from A:\, Press [ESC] to reboot
```



The BIOS information in the above screen is for reference only. What you see on your screen may not be exactly the same as shown.

4. Insert the floppy disk that contains the new BIOS file into the floppy drive.

- At the prompt, “**Please Enter File Name for NEW BIOS: _**”, type in the BIOS file name that you downloaded from the ASUS website, then press **<Enter>**. EZ Flash will automatically access drive A to look for the file name that you typed. When found, the following message appears on screen.

```
[BIOS Information in File]
BIOS Version: P4BP-MX Boot Block

WARNING! Continue to update the BIOS (Y/N)? _
```

If you accidentally typed in a wrong BIOS file name, the error message, “**WARNING! File not found.**” appears. Press **<Enter>** to remove the message, then type in the correct file name and press **<Enter>**.

- At the above prompt, type **<Y>** to continue with the update process or press **<N>** to exit EZ Flash and reboot the system without updating the BIOS. The following prompt appears if you typed **<Y>**.

```
Flash Memory: SST 39SF020

Update Main BIOS area (Y/N)? _
```

- Press **<Y>** to update the main BIOS area.



DO NOT shutdown or reset the system while updating the BIOS area! Doing so may cause system boot failure.

- When finished, the message, “**Press a key to reboot**” appears. Press any key to reboot the system with the new BIOS.

2.1.2 Using AFLASH to update the BIOS

Creating a bootable disk

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.

To create a bootable floppy disk:

- Insert a floppy disk to the floppy disk drive.
- At the DOS prompt, type the command line:

```
FORMAT A: /S then press <Enter>.
```

Wait for a few minutes to complete format process.

- Copy AFLASH.EXE to the boot disk you created. To copy, type the command line:

```
COPY D:\AFLASH.EXE\AFLASH.EXE A: \ then press <Enter>.
```



- The AFLASH.EXE utility works only in DOS mode. It does not work with certain memory drivers that may be loaded when you boot from the hard drive. It is recommended that you reboot using a floppy disk.
- DO NOT copy AUTOEXEC.BAT and CONFIG.SYS to the disk.

4. Reboot the computer from the floppy disk.



BIOS setup must specify “Floppy” as the first item in the boot sequence.

5. To run AFLASH, at the DOS prompt type:

A: \AFLASH then press **<Enter>**

```
ASUS ACPI BIOS
FLASH MEMORY WRITER V2.0
Copyright (C) 1994-2001 ASUSTeK COMPUTER INC.

Flash Memory: Winbond W29C020 or SST 29EE020 or Intel 82802AB

Current BIOS Version: ASUS XXX-XX ACPI BIOS Revision 100X
BIOS Model          : XXX-XX
BIOS Built Date     : 12/25/01

Choose one of the followings:
1. Save Current BIOS To File
2. Update BIOS Including Boot Block and ESCD

Enter choice: [1]

Press ESC To Exit
```



If the word “unknown” appears 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.

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

```
Save Current BIOS To File

Flash Memory: Winbond W29C020 or SST 29EE020 or Intel 82802AB

Current BIOS Version: ASUS XXX-XX ACPI BIOS Revision 100X
BIOS Model          : XXX-XX
BIOS Built Date     : 12/25/01

Please Enter File Name to Save: XXX-XX.XXX

BIOS Saved Successfully

Press ESC To Continue
```

7. When asked to enter a filename to save, type a filename and the path. For example, **A: \xxx-xx.xxx**, then press **<Enter>**.

Updating the BIOS



Update the BIOS only if you are sure that the new BIOS revision will solve your problems. Careless updating may result to more problems with the motherboard!

1. Download an updated ASUS BIOS file from the ASUS website (www.asus.com) and save to the boot floppy disk you created earlier.
2. Boot from the floppy disk.
3. At the DOS prompt, type **AFLASH** then press **<Enter>**.
4. From the Main Menu, type **<2>** 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**, then press **<Enter>**.

To cancel this operation, press **<Enter>**.

```
Update BIOS Including Boot Block and ESCD
Flash Memory: Winbond W29C020 or SST 29EE020 or Intel 82802AB
Current BIOS Version: ASUS XXX-XX ACPI BIOS Revision 100X
BIOS Model          : XXX-XX
BIOS Built Date     : 12/25/01
Please Enter File Name for NEW BIOS: A:\XXX-XX.XXX
```

6. When prompted to confirm the BIOS update, press **<Y>** to start the update.

```
Update BIOS Including Boot Block and ESCD
Flash Memory: Winbond W29C020 or SST 29EE020 or Intel 82802AB
BIOS Version
[CURRENT ] ASUS XXX-XX ACPI BIOS Revision 100X
[Test.awd] ASUS XXX-XX ACPI BIOS Revision 100X
BIOS Model
[CURRENT ] XXX-XX
[Test.awd] XXX-XX
Date of BIOS Built
[CURRENT ] 09/25/99
[XXXX.XXX] 05/29/00
Check sum of 1001.010 is F266.
Are you sure (Y/N) ? [Y]
Press ESC To Return to Main Menu
```

7. The utility starts to program the new BIOS information into the Flash ROM. The boot block is updated automatically only when necessary. When the programming is done, the message *“Flashed Successfully”* appears.

```
Update BIOS Including Boot Block and ESCD

Flash Memory: Winbond W29C020 or SST 29EE020 or Intel 82802AB

BIOS Version
[CURRENT] ASUS XXX-XX ACPI BIOS Revision 100X
[Test.awd] ASUS XXX-XX ACPI BIOS Revision 100X

BIOS Model
[CURRENT] XXX-XX
[Test.awd] XXX-XX

Date of BIOS Built
[CURRENT] 12/25/01
[XXXX.XXX] 05/29/00

Check sum of 1001.010 is F266.

Are you sure (Y/N) ? [Y]
Block Erasing -- Done
Programming -- 3FFFF
Flashed Successfully

Press ESC To Continue
```

8. Follow the succeeding screen instructions to continue.

```
ASUS ACPI BIOS
FLASH MEMORY WRITER V2.0
Copyright (C) 1994-2001 ASUSTeK COMPUTER INC.

Flash Memory: Winbond W29C020 or SST 29EE020 or Intel 82802AB

Current BIOS Version: ASUS XXX-XX ACPI BIOS Revision 100X
BIOS Model : XXX-XX
BIOS Built Date : 12/25/01

Choose one of the followings:

1. Save Current BIOS To File
2. Update BIOS Including Boot Block and ESCD

Enter choice: [1]

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
```



DO NOT turn off the system while updating the BIOS. This may cause boot problems. Just repeat the process, and if the problem persists, load the original BIOS file you saved to the boot disk. If the Flash Memory Writer utility is not able to successfully update a complete BIOS file, call the ASUS service center for support.

2.1.3 Recovering the BIOS with CrashFree BIOS

The CrashFree BIOS auto recovery tool allows you to restore BIOS from a floppy disk that contains the BIOS file, in case the current BIOS on the motherboard fails or gets corrupted.



- Prepare the **floppy disk that contains the motherboard BIOS** before proceeding with the BIOS update process.
- If you have saved a copy of the original motherboard BIOS to a bootable floppy disk, you may also use this disk to restore the BIOS. See section “2.1.2 Using AFLASH to update the BIOS”

To recover the BIOS using CrashFree BIOS:

1. Boot the system.
2. When a corrupted BIOS is detected, the following screen message appears.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

3. Insert a floppy disk that contains the original or the latest BIOS file for this motherboard. If all the necessary files are found in the floppy disk, the BIOS update process continues.



Make sure that the BIOS file in the floppy disk is renamed as “**1016BPMX.BIN**”.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "1016BPMX.BIN". Completed.
Start flashing...
```



DO NOT shut down or reset the system while updating the BIOS! Doing so may cause system boot failure!

2. When the BIOS update process is complete, reboot the system.

2.2 BIOS Setup program

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to “Run Setup”. This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you may want to change the configuration of your computer in the future. For example, you may want to enable the security password feature or make changes to the power management settings. This requires you 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. Press **** during the Power-On Self Test (POST) to enter the Setup utility, otherwise, POST continues with its test routines.

The Setup program is 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.



Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purposes only, and may not exactly match what you see on your screen.

2.2.1 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 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.

2.2.2 Legend bar

At the bottom of the Setup screen is 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 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
Left or Right arrow	Selects the menu item to the left or right
Up or Down arrow	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 high-lighted 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

General help

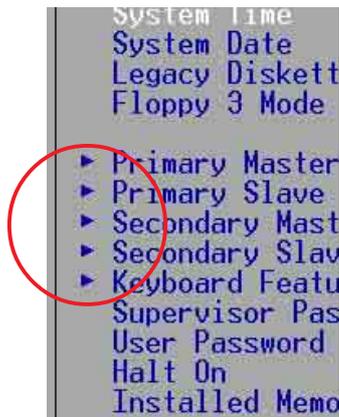
In addition to the Item Specific Help window, the BIOS setup program also provides a General Help screen. You may launch this screen from any menu by simply pressing <F1> or the <Alt+H> combination. The General Help screen lists the legend keys and their corresponding functions.

Saving changes and exiting the Setup program

See “2.7 Exit Menu” for detailed information on saving changes and exiting the setup program.

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

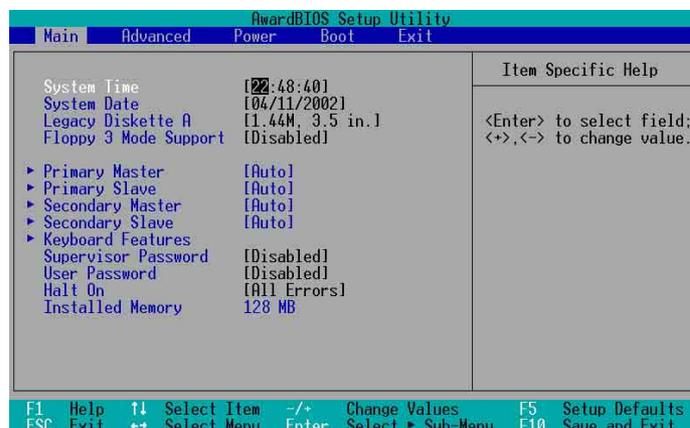


Note that a right pointer symbol (as shown on the left) appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press **<Enter>**. The sub-menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the **<Esc>** key to return to the main menu. Take some time to familiarize yourself with 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>** to load the Setup default values. 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.

2.3 Main Menu

When you enter the Setup program, the following screen appears.



System Time [XX:XX:XX]

Sets the 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 the 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: (up to 2099). Use the **<Tab>** or **<Shift+Tab>** keys to move between the month, day, and year fields.

Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive 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. The Floppy 3 Mode feature allows reading and writing of 1.2MB (as opposed to 1.44MB) on a 3.5-inch diskette. Configuration options: [Disabled] [Enabled]

Supervisor Password [Disabled] / User Password [Disabled]

These fields allow you to set passwords. To set a password, highlight the appropriate field and press **<Enter>**. Type in a password then press **<Enter>**. You can type up to eight alphanumeric characters. Symbols and other characters 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 menus. To clear the password, highlight this field and press **<Enter>**. The same dialog box as above appears. Press **<Enter>**. The password is set to [Disabled].

A note about passwords

The BIOS Setup program allows you to specify passwords in the Main menu. The passwords control access to the BIOS during system startup. Passwords are not case sensitive, meaning, passwords typed in either uppercase or lowercase letters are accepted. The BIOS Setup program allows you to specify two different passwords: a Supervisor password and a User password. If you did not set a Supervisor password, anyone can access the BIOS Setup program. If you did, the Supervisor password is required to enter the BIOS Setup program and to gain full access to the configuration fields.

Forgot the password?

If you forget your password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. The RAM data containing the password information is powered by the onboard button cell battery. If you need to erase the CMOS RAM, unplug the all the power cables and remove the button cell battery. Re-install the battery after about 2 seconds, then power up the system.

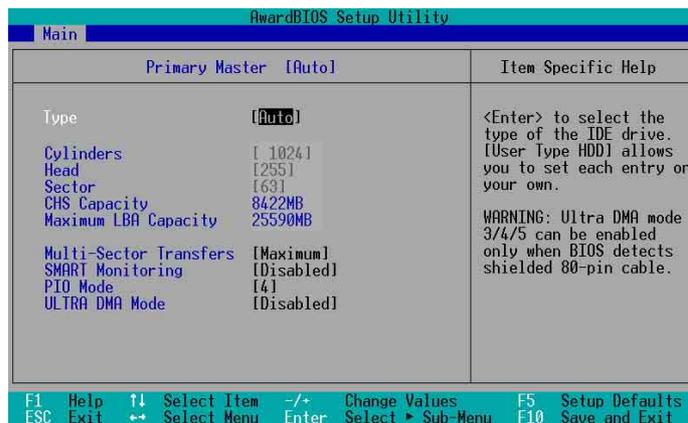
Halt On [All Errors]

This field specifies the types of errors that 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 automatically displays the amount of conventional memory detected by the system during the boot process.

2.3.1 Primary and Secondary Master/Slave



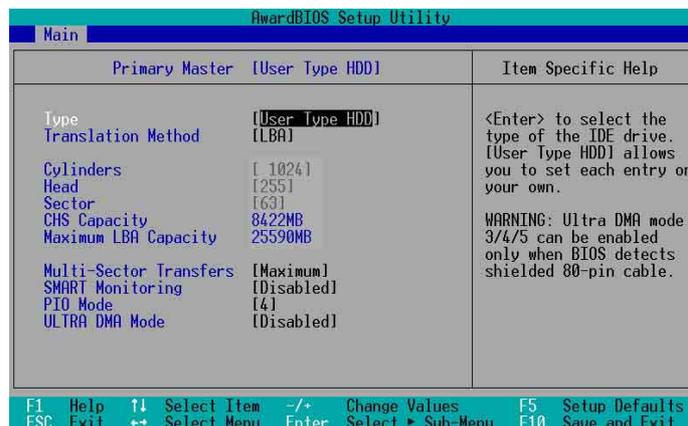
Type [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic detection is successful, Setup automatically fills in the correct values for the remaining fields on this sub-menu. If automatic detection fails, select [User Type HDD] to manually enter the IDE hard disk drive parameters. Refer to the next section for details.



Before attempting to configure a hard disk drive, make sure you have the correct configuration information supplied by the drive manufacturer.

[User Type HDD]



Manually enter the number of cylinders, heads and sectors per track for the drive. Refer to the drive documentation or label for this information.

If no drive is installed or if you are removing a drive and not replacing it, select [None].

Other options for the Type field are:

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

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

[ZIP] - for ZIP-compatible disk drives

[MO] - for IDE magneto optical disk drives

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

After making your selections on this sub-menu, press **<Esc>** key to return to the Main menu. When the Main menu appears, the hard disk drive field displays the size for the hard disk drive that you configured.

Translation Method [LBA]

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

Cylinders

This field configures the number of cylinders. Refer to the drive documentation to determine the correct value. To make changes to this field, set the Type field to [User Type HDD] and the Translation Method field to [Manual].

Head

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

Sector

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

CHS Capacity

This field shows the drive's maximum CHS capacity as calculated by the BIOS based on the drive information you entered.

Maximum LBA Capacity

This field shows the drive's maximum LBA capacity as calculated by the BIOS based on the drive information you entered.

Multi-Sector Transfers [Maximum]

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

SMART Monitoring [Disabled]

This field allows you to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system that utilizes internal hard disk drive monitoring technology. This parameter is normally disabled because the resources used in the SMART monitoring feature may decrease system performance. Configuration options: [Disabled] [Enabled]

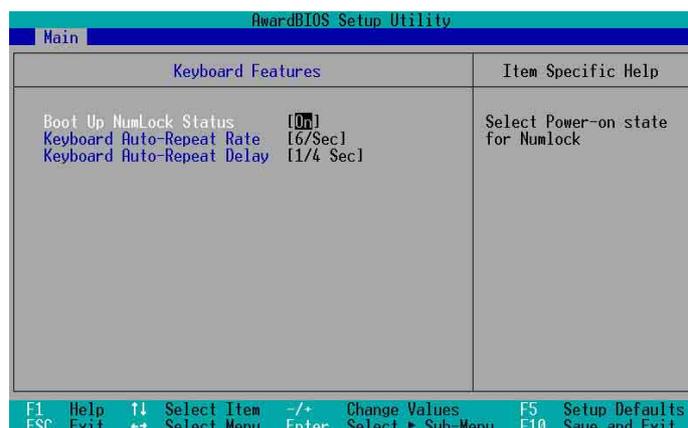
PIO Mode [4]

This option lets you set a PIO (Programmed Input/Output) mode for the IDE device. Modes 0 through 4 provide successive increase in 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. To make changes to this field, set the Type field to [User Type HDD]. Configuration options: [0] [1] [2] [3] [4] [5] [Disabled]

2.3.2 Keyboard Features



Boot Up NumLock Status [On]

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

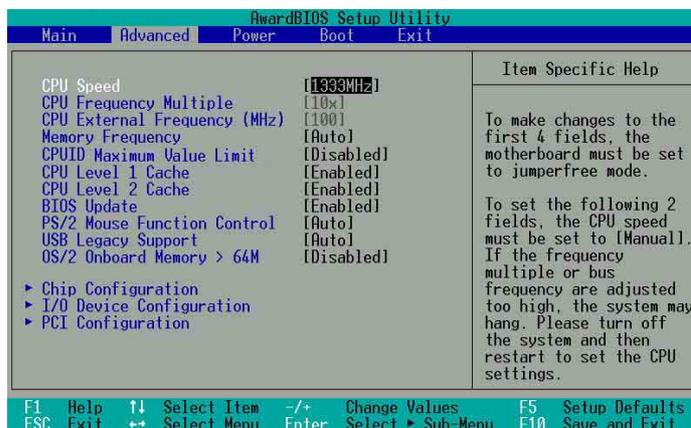
Keyboard Auto-Repeat Rate [6/Sec]

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]

2.4 Advanced Menu



CPU Speed

This displays the current speed of the CPU installed.

CPU Frequency Multiple

This field displays frequency multiple value between the CPU's internal frequency (CPU speed) and external frequency.

CPU External Frequency (MHz)

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.

Memory Frequency [Auto]

This field determines whether the memory clock frequency is set to be in synchronous or asynchronous mode with respect to the system frequency. The options that appear in the popup menu vary according to the CPU Frequency (MHz).

CPUID Maximum Value Limit [Disabled]

Some older operating system (OS), like Windows® NT4.0, do not support CPUID value that exceeds 3. A CPUID value that exceeds 3 may cause an OS installation failure. Enable this item to limit the CPU return value to less 3 to avoid conflicts and installation failure. Configuration options: [Disabled] [Enabled]

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

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

Configuration options: [Disabled] [Enabled]

BIOS Update [Enabled]

This field functions as an update loader integrated into the BIOS to supply the processor with the required data. When set to [Enabled], the BIOS loads the update on all processors during system bootup.

Configuration options: [Disabled] [Enabled]

PS/2 Mouse Function Control [Auto]

The default setting [Auto] allows the system to detect a PS/2 mouse at startup. If a mouse is detected, the BIOS assigns IRQ12 to the PS/2 mouse. Otherwise, IRQ12 can be used for expansion cards. When you set this field to [Enabled], BIOS reserves IRQ12, whether or not a PS/2 mouse is detected at startup.

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 at startup. If detected, the USB controller legacy mode is enabled. If not detected, the USB controller legacy mode is disabled.

When you set this field to [Disabled], the USB controller legacy mode is disabled whether or not you are using a USB device.

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 to the default setting [Disabled]. Configuration options: [Disabled] [Enabled]

2.4.1 Chip Configuration

AwardBIOS Setup Utility		
Advanced		
Chip Configuration	Item Specific Help	
SDRAM Configuration	[By SPD]	<Enter> to select SDRAM configuration. [By SPD] is recommended. [User Defined] allows you to set each configuration on your own.
SDRAM CAS Latency	[1.5T]	
SDRAM RAS to CAS Delay	[3T]	
SDRAM RAS Precharge Delay	[3T]	
SDRAM Active Precharge Delay	[5T]	
SDRAM Idle Timer	[Auto]	
Onboard VGA Share Memory Size	[8MB]	
NTSC/PAL Preference	[NTSC]	
Internal AGP Turbo Mode	[Disabled]	
Graphics Aperture Size	[128MB]	
AGP Capability	[4X Mode]	
Video Memory Cache Mode	[UC]	
Delay Transaction	[Enabled]	
Onboard PCI IDE	[Both]	
USB 2.0 HS Reference Voltage	[Medium]	

F1 Help ↑↓ Select Item -/+ Change Values F5 Setup Defaults
ESC Exit ←→ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

SDRAM Configuration [By SPD]

This parameter allows you to set the optimal timings for items 2–5, depending on the memory modules that you are using. The 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 information about the module, such as memory type, size, speed, voltage interface, and module banks. Configuration options: [User Defined] [By SPD]



The SDRAM parameters (items 2~5) become configurable only when you set the SDRAM Configuration to [User Defined].

SDRAM CAS Latency [2T]

This item controls the latency between the SDRAM read command and the time the data actually becomes available.

SDRAM RAS to CAS Delay [3T]

This item controls the latency between the DDR SDRAM active command and the read/write command.

SDRAM RAS Precharge Delay [3T]

This item controls the idle clocks after issuing a precharge command to the DDR SDRAM.

SDRAM Active Precharge Delay [5T]

This item controls the number of DDR SDRAM clocks used for DDR SDRAM parameters.

SDRAM Idle Timer [Infinite]

Configuration Options: [Infinite] [0T] [8T] [16T] [64T] [Auto]

Onboard VGA Memory Size [8MB]

This field allows you to set the size of shared memory for internal VGA.

NTSC/PAL Preference [NTSC]

This field allows you to select broadcast transmission and reception standards.
Configuration options: [NTSC] [PAL]

Internal AGP Turbo Mode [Disabled]

This field allows you to choose from the default [Enabled] or choose [Disabled] to turn on or off the AGP Turbo Mode. Configuration options: [Enabled] [Disabled]

Graphics Aperture Size [128MB]

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

AGP Capability [4X Mode]

This motherboard supports the AGP 4x interface that transfers video data at 1066MB/s. AGP 4X is backward-compatible, so you may keep the default [4X Mode] even if you are using an AGP 1x video card. When set to [1X Mode], the AGP interface only provides a peak data throughput of 266MB/s even if you are using an AGP 4X card. Configuration options: [1X Mode] [4X Mode]

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 does not support this feature, otherwise the system may not boot.
Configuration options: [UC] [USWC]

Delay Transaction [Disabled]

When set to [Enabled], this feature frees the PCI bus when the CPU is accessing 8-bit ISA cards. This process normally consumes about 50-60 PCI clocks without PCI delayed transaction. Set this field to [Disabled] when using ISA cards that are not PCI 2.1 compliant. Configuration options: [Enabled] [Disabled]

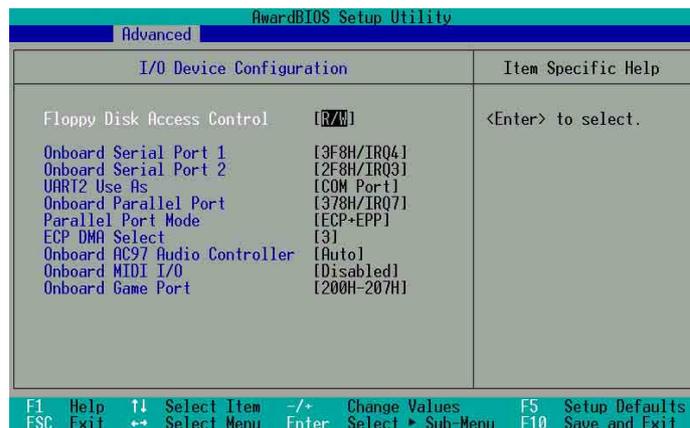
Onboard PCI IDE [Both]

This field allows you to enable either the primary IDE channel or secondary IDE channel, or both. You can also set both channels to [Disabled].
Configuration options: [Both] [Primary] [Secondary] [Disabled]

USB 2.0 HS Reference Voltage [Medium]

This item controls the USB 2.0 high-speed drive strength reference voltage.
Configuration options: [Low] [Medium] [High] [Maximum]

2.4.2 I/O Device Configuration



Floppy Disk Access Control [R/W]

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

Configuration options: [R/W] [Read Only]

Onboard Serial Port 1 [3F8H/IRQ4], 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.

UART2 Use As [COM Port]

This field allows you to select the device on which to assign UART2.

Configuration options: [COM Port] [IR]

Onboard Parallel Port [378H/IRQ7]

This field allows you to set the address of the onboard parallel port connector. If you disable this field, the Parallel Port Mode and ECP DMA Select configurations are not 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]

Onboard AC97 Audio Controller [Auto]

[Auto] allows the BIOS to detect whether you are using any audio device. If an audio device is detected, the onboard audio controller is enabled; if no audio device is detected, the controller is disabled. If there are conflicts with the onboard audio controller, set the appropriate field to [Disabled].

Configuration options: [Disabled] [Auto]

Onboard MIDI I/O [Disabled]

This field allows you to select the I/O address for the MIDI port.

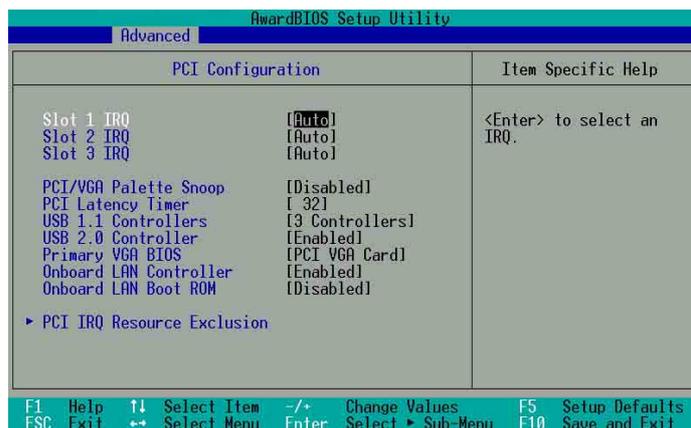
Configuration options: [Disabled] [330H-331H] [300H-301H]

Onboard Game Port [200H-207H]

This field allows you to select the I/O address for the game port.

Configuration options: [Disabled] [200H-207H] [208H-20FH]

2.4.3 PCI Configuration



Slot 1, Slot 2, Slot 3 IRQ [Auto]

These fields assign the IRQ for each PCI slot. The default setting for each field is [Auto], which utilizes auto-routing to determine IRQ assignments.

Configuration options: [Auto] [NA] [3] [4] [5] [7] [9] [10] [11] [12] [14] [15]

PCI/VGA Palette Snoop [Disabled]

Some non-standard VGA cards, like graphics accelerators or MPEG video cards, may not show colors properly. Setting this field to [Enabled] corrects this problem. If you are using standard VGA cards, leave this field to the default setting [Disabled].

Configuration options: [Disabled] [Enabled]

PCI Latency Timer [32]

Leave this field to the default setting [32] for best performance and stability.

USB 1.1 Controller [3 Controllers]

This field allows you to select the number of USB 1.1 controllers that you wish to activate. Configuration options: [Disabled] [3 Controllers]

USB 2.0 Controller [Enabled]

This field allows you to turn on or off the USB 2.0 controller.

Configuration options: [Disabled] [Enabled]

Primary VGA BIOS [PCI VGA Card]

This field allows you to select primary graphics card or onboard VGA as the primary display BIOS. Configuration options: [PCI VGA Card] [Onboard VGA]

Onboard LAN Controller [Enabled]

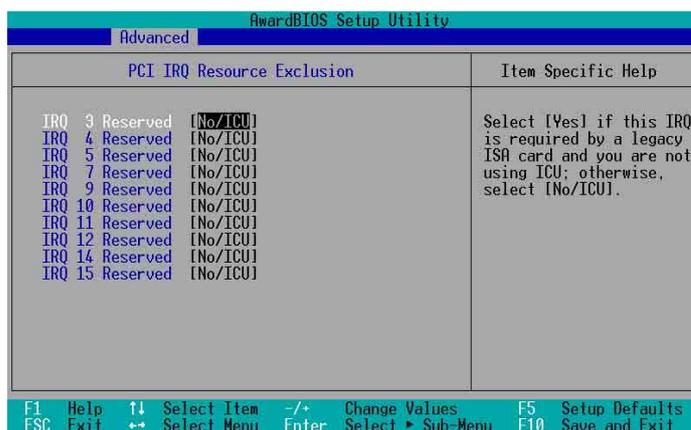
This field allows you to enable or disable the onboard LAN controller. This item appears only when onboard LAN exist. Configuration options: [Disabled] [Enabled]

Onboard LAN Boot ROM [Disabled]

This field allows you to turn on or off the onboard LAN boot ROM. This item appears only when onboard LAN is enabled.

Configuration options: [Disabled] [Enabled]

PCI IRQ Resource Exclusion



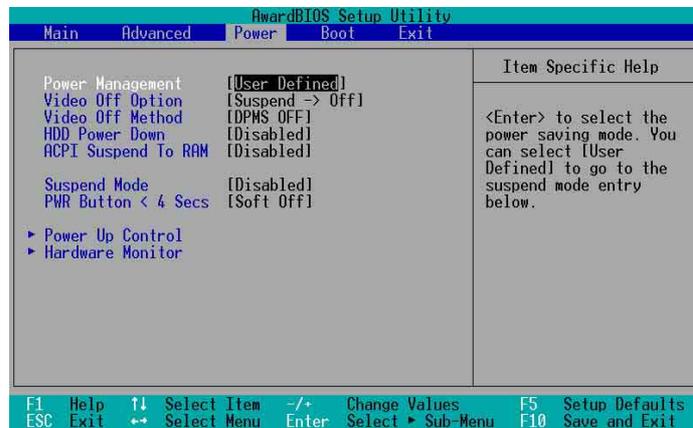
IRQ XX Reserved [No/ICU]

These fields indicate whether or not the displayed IRQ for each field is being used by a legacy (non-PnP) ISA card. The setting [No/ICU] for an IRQ field indicates that you are using the ISA Configuration Utility (ICU), and that this particular IRQ is NOT required by a legacy ISA card. Set the IRQ field to [Yes] if you install a legacy ISA card that requires a unique IRQ and you are NOT using ICU.

Configuration options: [No/ICU] [Yes]

2.5 Power Menu

The Power menu allows you to reduce power consumption. This feature turns off the video display and shuts down the hard disk after a period of inactivity.



Power Management [User Defined]

This field allows you to activate or deactivate the automatic power saving features. When set to [Disabled], the power management features do not function regardless of the other settings on this menu. The [User Defined] option allows you to set the period of inactivity before the system enters suspend mode. Refer to “Suspend Mode” later in this section.

When set to [Max Saving], system power is conserved to its greatest amount. This setting automatically puts the system into suspend mode after a brief period of system inactivity. [Min Saving] allows the least power saving as the system enters suspend mode only after a long period of inactivity. Configuration options: [User Defined] [Disabled] [Min Saving] [Max Saving]



You should install the Advanced Power Management (APM) utility to keep the system time updated even when the computer enters suspend mode. In Windows 3.x and Windows 95, you need to install Windows with the APM feature. In Windows 98 or later, APM is automatically installed as indicated by a battery and power cord icon labeled “Power Management” in the Control Panel. Select the item “Advanced” in the Power Management Properties dialog box.

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 Display Power Management System (DPMS) 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.



Even if installed, your screen saver does not display when you select [Blank Screen] for the above field.

[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]

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]

ACPI Suspend To RAM [Enabled]

This field allows you to enable or disable the ACPI Suspend-to-RAM feature. To support this feature, the +5VSB of the power supply should have the capacity to provide more than 720mA current. Configuration options: [Disabled] [Enabled]

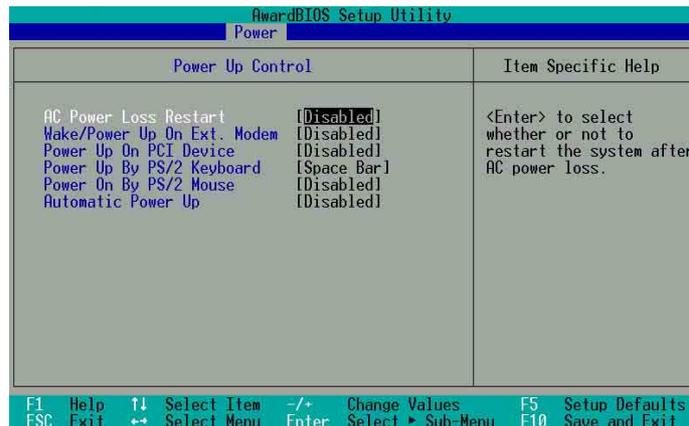
Suspend Mode [Disabled]

Sets the time period before the system goes into suspend mode. Configuration options: [Disabled] [1~2 Min] [2~3 Min] [4~5 min] [8~9 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 puts the system in sleep mode. Regardless of the setting, holding the ATX switch for more than 4 seconds powers off the system. Configuration options: [Soft off] [Suspend]

2.5.1 Power Up Control



AC Power Loss Restart [Disabled]

This allows you to set whether or not to reboot the system after AC power loss. [Disabled] leaves your system off while [Enabled] reboots the system. [Previous State] sets the system back to the state it was before the power interruption. Configuration options: [Disabled] [Enabled] [Previous State]

Wake/Power Up On Ext. Modem [Disabled]

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. Configuration options: [Disabled] [Enabled]

Power Up On PCI Device [Disabled]

When set to [Enabled], this parameter allows you to turn on the system through a PCI LAN or modem card. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Power Up By PS/2 Keyboard [Space Bar]

This parameter allows you to use specific keys on the keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Space Bar] [Ctrl-Esc] [Power Key]

Power On By PS/2 Mouse [Disabled]

When set to [Enabled], this parameter allows you to use the PS/2 mouse to turn on the system. This requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

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]

2.5.2 Hardware Monitor

AwardBIOS Setup Utility		
Power		
Hardware Monitor	Item Specific Help	
MB Temperature	30°C/86°F	<Enter> to select.
CPU Temperature	41°C/105.5°F	
CPU Fan Speed	9820RPM	
Chassis Fan Speed	N/A	
VCORE Voltage	1.50V	
+3.3V Voltage	3.47V	
+5V Voltage	4.91V	
+12V Voltage	12.09V	
F1 Help ↑↓ Select Item -/+ Change Values F5 Setup Defaults		
ESC Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit		

MB Temperature [xxx°C/xxx°F]

CPU Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures.

CPU Fan Speed [xxxxRPM] or [N/A]

Chassis Fan Speed [xxxxRPM] or [N/A]

The onboard hardware monitor automatically detects and displays the CPU and chassis fan speeds in rotations per minute (RPM). If any of the fans is not connected to the motherboard, that field shows N/A.

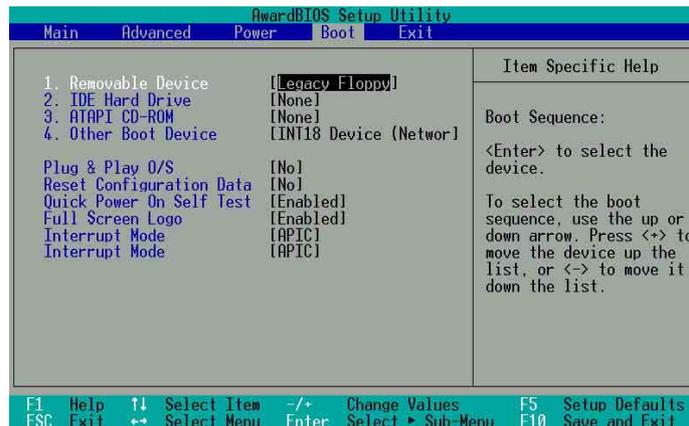
VCORE Voltage, +3.3V Voltage, +5V Voltage, +12V Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.



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

2.6 Boot Menu



Boot Sequence

The Boot menu allows you to select four types of boot devices 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 boot device on system power up. Configuration fields include Removable Devices, IDE Hard Drive, ATAPI CD-ROM, and Other Boot Device.

Removable Device [Legacy Floppy]

Configuration options: [Disabled] [Legacy Floppy] [LS-120] [ZIP] [ATAPIMO]

IDE Hard Drive

This field allows you to select which IDE hard disk drive to use in the boot sequence. Press **<Enter>** to 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. Press **<Enter>** to 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)]

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. If you installed a non-PnP OS or if you want to prevent reassigning of interrupt settings, keep the default setting [No].

Configuration options: [No] [Yes]

Reset Configuration Data [No]

Select [Yes], if you want to clear the Extended System Configuration Data (ESCD). Configuration options: [No] [Yes]

Quick Power On Self Test [Enabled]

This field speeds up the Power-On Self Test (POST) routine by skipping retesting several times. 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. Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

Allows you to enable or disable the full screen logo display feature. Configuration options: [Disabled] [Enabled]



Make sure that the above item is set to [Enabled] if you wish to use the ASUS MyLogo™ feature.

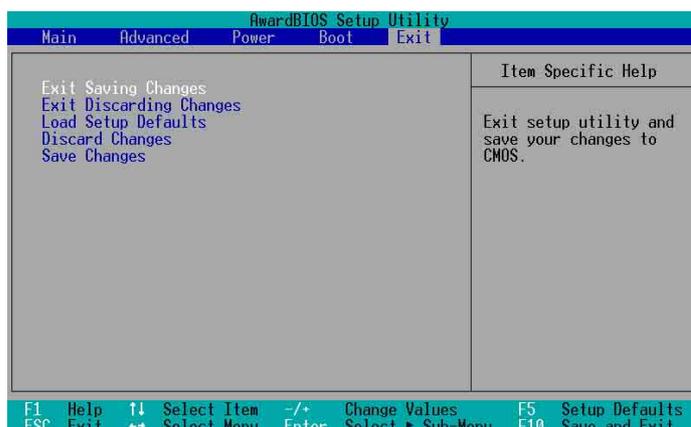
Interrupt Mode [APIC]

The Advanced Programmable Interrupt Controller (APIC) setting allows you to distribute interrupt routings other than the 16 IRQs. The Programmable Interrupt Controller (PIC) setting allows you to use the 16 IRQs only.

Configuration options: [PIC] [APIC]

2.7 Exit Menu

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



Pressing **<Esc>** does not immediately exit this menu. Select one of the options from this menu or **<F10>** from the legend bar to exit.

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. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.



If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Pressing **<Enter>** saves the changes while exiting.

Exit Discarding Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press **<F5>**, a confirmation window appears. Select [Yes] to load default values. 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 previously saved values. After selecting this option, a confirmation appears. 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 further changes. After you select this option, a confirmation window appears. Select [Yes] to save any changes to the non-volatile RAM.

Chapter 3

This chapter describes the contents of the support CD that comes with the motherboard package.

Software support

3.1 Install an operating system

This motherboard supports Windows® 98SE/NT4.0/ME/2000/XP operating system (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.



Motherboard settings and hardware options vary, so use the setup procedures presented in this chapter for general reference only. Refer to your OS documentation for more information.

3.2 Support CD information

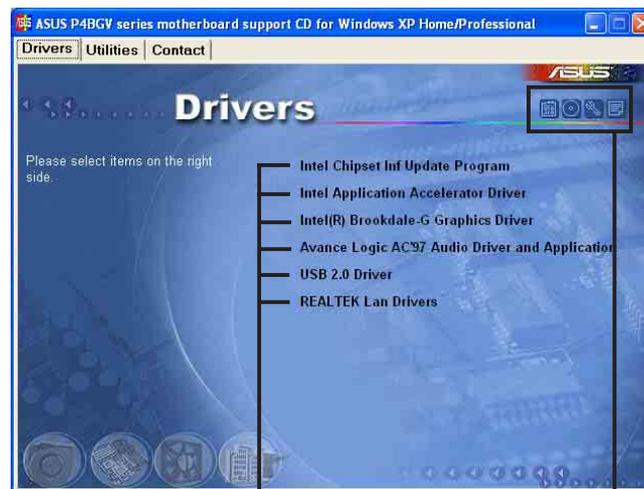
The support CD that came with the motherboard contains useful software and several utility drivers that enhance the motherboard features.



The contents of the support CD are subject to change at any time without notice. Visit the ASUS website for updates.

3.2.1 Running the support CD

To begin using the support CD, simply insert the CD into your CD-ROM drive. The CD automatically displays the **Drivers** menu if Autorun is enabled in your computer. Click on an item to install.



Click an item to install

Click an icon to display more information



If **Autorun** is NOT enabled in your computer, browse the contents of the support CD to locate the file **ASSETUP.EXE** from the **BIN** folder. Double-click the **ASSETUP.EXE** to run the CD.

3.2.2 Drivers menu

The drivers menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to activate the devices.

Intel Chipset Inf Update Program

Click this item to load the installation wizard and install the Intel® Chipset update driver.

Intel Application Accelerator Driver

Click this item to load the installation wizard and install the Intel® Application Accelerator.

Intel Brookdale-G Graphics Driver

Click this item to load the installation wizard and install the Intel® Brookdale-G graphics driver.

Avance Logic AC'97 Audio Driver and Application

This item installs the Avance Logic AC'97 audio driver and applications.

USB 2.0 Driver

This item installs the USB 2.0 driver.

REALTEK LAN Driver

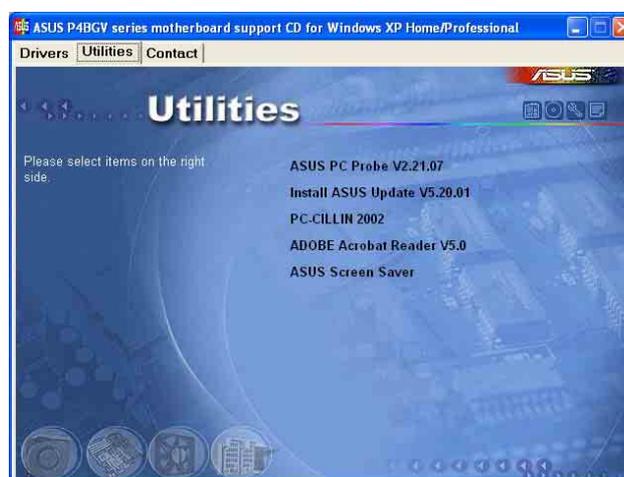
This item installs the Realtek® LAN driver.



For Windows® XP users, make sure to install Windows® XP Service Pack 1 to support USB 2.0.

3.2.3 Utilities menu

The Utilities menu shows the applications and other software that the motherboard supports.



ASUS PC Probe

This smart utility monitors the fan speed, CPU temperature, and system voltages, and alerts you on any detected problems. This utility helps you keep your computer at a healthy operating condition.

Install ASUS Update

This program allows you to download the latest version of the BIOS from the ASUS website. Before using the ASUS Update, make sure that you have an Internet connection so you can connect to the ASUS website. Installing ASUS Update also installs ASUS Mylogo™.

PC-CILLIN

Installs the TrendMicro™ PC-cillin™ anti-virus program. View the PC-cillin™ online help for detailed information.

Acrobat Reader

Installs the Adobe Acrobat® Reader® V5.0. The Acrobat® Reader® software is for viewing files saved in Portable Document Format (PDF).

ASUS Screen Saver

Installs the ASUS screen saver.

3.2.4 ASUS Contact Information

Clicking the ASUS Contact Information tab displays as stated. You may also find this information on the inside front cover of this user guide.

