P4BGV-MX

User Guide

ASUS®

Motherboard

E1213

First Edition V1
January 2003

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FCC/CDC statements

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:

- Reorient 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.

> 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.

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 adpater 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.

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/DANGER: 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.

Where to find more information

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

1. **ASUS Websites**

   The ASUS websites worldwide provide updated information on ASUS hardware and software products. The ASUS websites are listed in the ASUS Contact Information on page viii.

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.

ASUS contact information

ASUSTeK COMPUTER INC. (Asia-Pacific)

Address: 150 Li-Te Road, Peitou, Taipei, Taiwan 112
General Tel: +886-2-2894-3447
General Fax: +886-2-2894-3449
General Email: info@asus.com.tw

Technical Support

MB/Others (Tel):   +886-2-2890-7121 (English)
Notebook (Tel):   +886-2-2890-7122 (English)
Desktop/Server (Tel):   +886-2-2890-7123 (English)
Support Fax: +886-2-2890-7698
Support Email: tsd@asus.com.tw
Web Site: www.asus.com.tw
Newsgroup: cscnews.asus.com.tw

ASUS COMPUTER INTERNATIONAL (America)

Address: 6737 Mowry Avenue, Mowry Business Center,
                    Building 2, Newark, CA 94560, USA
General Fax: +1-510-608-4555
General Email: tmd1@asus.com

Technical Support

Support Fax: +1-510-608-4555
General Support: +1-502-933-8713
Web Site: www.asus.com
Support Email: tsd@asus.com

ASUS COMPUTER GmbH (Germany and Austria)

Address: Harkortstr. 25, 40880 Ratingen, BRD, Germany
General Fax: +49-2102-442066
General Email: sales@asuscom.de (for marketing requests only)

Technical Support

Support Hotline: MB/Others: +49-2102-9599-0
Notebook (Tel):   +49-2102-9599-10
Support Fax: +49-2102-9599-11
Support (Email):   www.asuscom.de/de/support (for online support)
Web Site: www.asuscom.de

P4BGV-MX specifications summary

CPU	Socket 478 ofr Intel Pentium 4 Northwood/Willamette processors with frequency up to 2.4+ GHz
Chipset	Northbridge: Intel 845GV Southbridge: Intel ICH4 (FW82801DB)
Front Side Bus (FSB)	533/400 MHz
Memory	2 x DDR DIMM Sockets Max. 2 GB unbuffered PC2100/1600 non-ECC DDR SDRAM
Expansion slots	3 x PCI
IDE	2 x UltraDMA 100/66
Audio	RealTek 2-channel CODEC
LAN	RealTek 8101L PCI LAN integrated 10/100Mbps Fast Ethernet
Special Features	Power Loss Restart ASUS JumperFree BIOS write protections CPU Throttle
Back Panel I/O Ports	1 x Parallel 1 x Serial 1 x VGA 1 x PS/2 Keyboard 1 x PS/2 Mouse 4 x USB 2.0 1 x RJ-45 Port
Internal I/O Connectors	CPU/Chassis FAN connector 20 pin ATX power connector 4-pin AUX power connector COM2 port CD/AUX audio in (on audio model only) Front panel audio connector (on audio model only)

P4BGV-MX specifications summary

BIOS features	2Mb Flash ROM, EEPROM, ASUS JumperFree, Award BIOS with ACPI, DMI2.0, PnP, WfM2.0, Green, TCAV (Trend Chip Away Virus)
Industry standard	PCI 2.2, USB 2.0.
Manageability	WfM2.0, DMI2.0, WOR by PME, WOL by BME
Form Factor	Micro-ATX form factor: 8.6 in x 9.6 in
Support CD contents	Device drivers ASUS PC Probe Trend Micro^{tm} PC-cillin 2002 anti-virus software ASUS LiveUpdate Utility
Accessories	User's manual Support CD 1 x USB Bracket IDE cable FDD cable

* Specifications are subject to change without notice.

This chapter gives information about the ASUS P4BGV-MX motherboard that came with the system.This chapter includes the motherboard layout, jumper settings, and connector locations.

Motherboard Info

1.1   Welcome!

Thank you for buying the ASUS® P4BGV-MX motherboard!

The ASUS P4BGV-MX motherboard is loaded with new features and the most advanced technologies making it another standout in the long line of ASUS quality motherboards!

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 ASUS P4BGV-MX package for the following items.

✓   ASUS P4BGV-MX motherboard
        Micro-ATX form factor: 8.6 in x 9.6 in

✓   ASUS P4BGV-MX series support CD

✓   40-conductor IDE cable

✓   Ribbon cable for a 3.5-inch floppy drive

✓   Bag of extra jumper caps

✓   User Guide

✓   I/O Shield

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

1.3 Introduction

The ASUS P4BGV-MX motherboard is yet another high-quality motherboard from ASUS. This motherboard is loaded with value-added features for guaranteed consumer satisfaction. For future upgrades or system reconfiguration, this chapter provides technical information about the motherboard.

1.4 Motherboard components
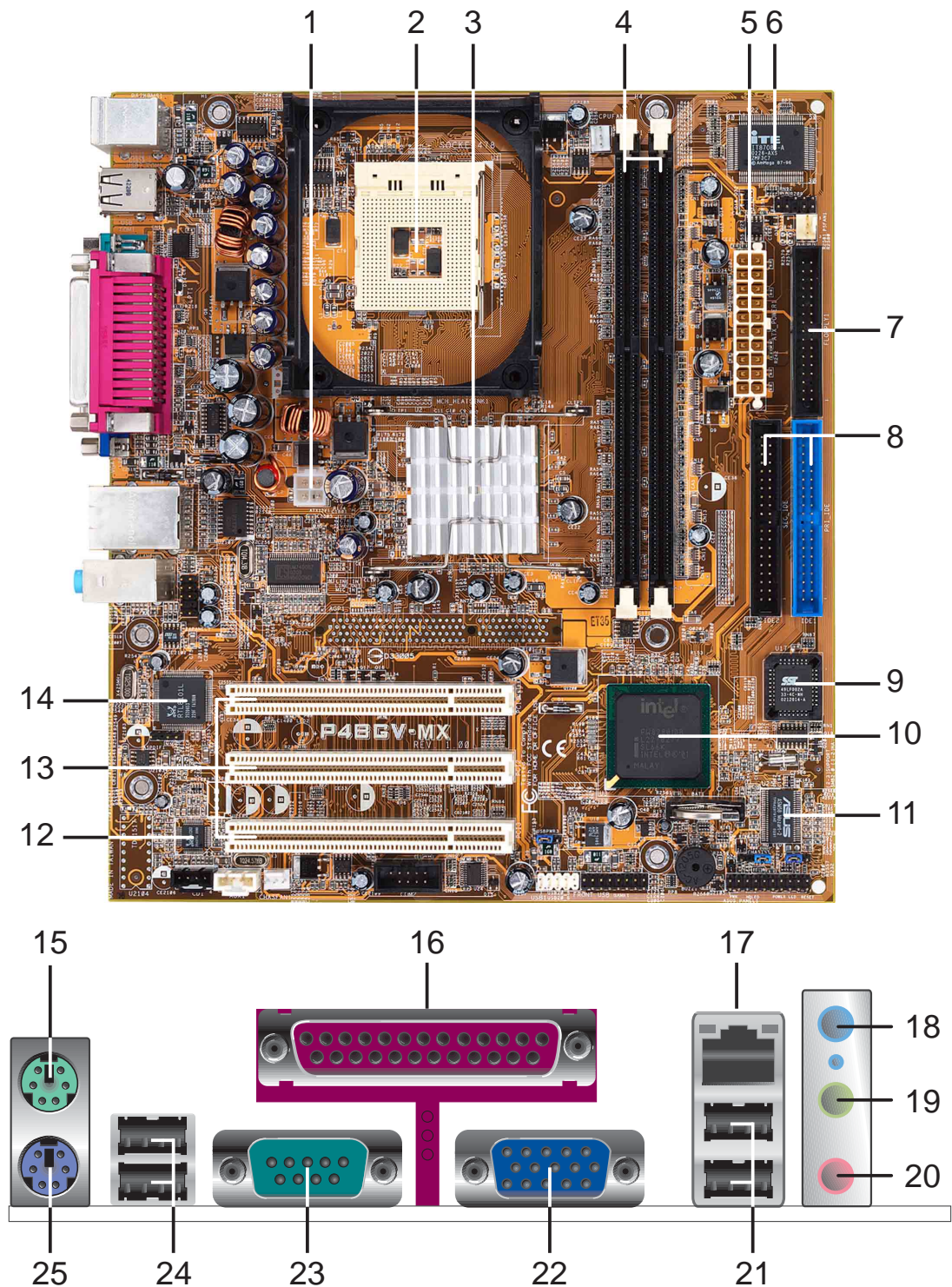
1   **ATX 12V connector.** This power connector connects the 4-pin 12V plug from the ATX 12V power supply.

2   **CPU Sockets.** A 478-pin surface mount, Zero Insertion Force (ZIF) socket for the Intel® Pentium® 4 478/Northwood Processor with 533/400 MHz system bus that allows 3.2 GB/s data transfer rates.

3   **NorthBridge Controller.** This Intel 845GV controller integrates a high performance host interface for the Intel® Pentium® 4 processor, a memory controller and an integrated graphics interface.

4   **DDR DIMM Sockets.** These two 184-pin DIMM sockets support up to 2GB using non-ECC PC2100/1600 DDR SDRAM DIMMs with 2.1GBytes/sec of transfer rate.

5   **ATX power connector.** This standard 20-pin connector connects to an ATX 12V power supply. The power supply must have at least 1A on the +5V standby lead (+5VSB).

6   **Super I/O chipset.** This interface provides the commonly used Super I/O functionality. The chipset supports a high-performance floppy disk controller for a 360K/720K/1.44M/2.88M floppy disk drive, a PS/2 keyboard and mouse port, a multi-mode parallel port, a game port and two serial ports.

7   **Floppy Disk connector.** This connector connects the provided ribbon cable for the floppy disk drive. One side of the connector is slotted to prevent incorrect insertion of the floppy disk cable.

8   **IDE Connectors.** These dual-channel bus master IDE connectors support up to four Ultra DMA 100/66, PIO Modes 3 & 4 IDE devices. Both the primary(blue) and secondary(black) connectors are slotted to prevent incorrect insertion of the IDE ribbon cable.

9   **Flash ROM.** This 2Mb firmware contains the programmable BIOS program.

10   **South bridge controller.** This Intel ICH4 FW82801DB controller integrates the AC'97 Interface, six Universal Serial Bus 2.0, two IDE Master/Slave controllers, the ITE 8708F Super I/O, Flash BIOS, and PCI bus for two PCI Slots.

11   **ASUS ASIC.** This chip performs multiple system functions that include hardware and system voltage monitoring among others.

12 **Audio/Modem CODEC.** This audio CODEC is AC '97 compliant.

13 **PCI slots.** These 32-bit PCI 2.2 expansion slots support bus master PCI cards like SCSI and LAN cards with 133MB/s maximum output.

14 **Single-Chip Fast Ethernet controller.** The RealTek 8101L PCI LAN Fast Ethernet controller allows connection to a Local Area Network (LAN) through a network hub.

15 **PS/2 mouse port.** This green 6-pin connector is for a PS/2 mouse.

16 **Parallel port.** This 25-pin port connects a parallel printer, a scanner, or other devices.

17 **RJ-45 port.** This port allows connection to a Local Area Network (LAN) through a network hub.

18 **Line In jack.** This Line In (light blue) jack connects a tape player or other audio sources.

19 **Line Out jack.** This Line Out (lime) jack connects a headphone or a speaker.

20 **Microphone jack.** This Mic (pink) jack connects a microphone.

21 **USB 2.0 ports.** These two 4-pin Universal Serial Bus 2.0 (USB 2.0) ports are available for connecting USB devices such as a mouse and PDA.

22 **Video port.** This port connects a VGA monitor.

23 **Serial port.** This port connects to your serial mouse and other serial devices.

24 **USB 2.0 ports.** These two 4-pin Universal Serial Bus 2.0 (USB 2.0) ports are available for connecting USB devices such as a mouse and PDA.

25 **PS/2 keyboard port.** This purple 6-pin connector is for a PS/2 keyboard.

1.5   Motherboard layout

21.9cm (8.6in)

PS/2KBMS
T: Mouse
B: Keyboard

Bottom:
USB20-3
USB20-4

USBPWR_34   KBPWR1

CPUFAN1

Socket 478

Super
I/O

IR1

COM1

PARALLEL PORT

ATX Power Connector

DDR DIMM1 (64/72 bit, 184-pin module)

DDR DIMM2 (64/72 bit, 184-pin module)

FLOPPY1

24.4cm (9.6in)

VGA1

USBPWR_12

Intel 845GV
Graphic
Memory
Controller
Hub (GMCH)

USB2.0
T: USB20_1
B: USB20_2

Top:
RJ-45

ATX12V1

0   1   2   3

SEC_IDE

PRI_IDE

Top:Line In
Center:Line Out
Below:Mic In

IAPANEL1

2Mbit
Firmware
Hub

RTL8101L

PCI1

LED2   **P4BGV-MX**

Intel I/O
Controller
Hub
(ICH4)

PCI2

Audio
Codec

PCI3

BAT1

ASUS
Mozart

IDE_LED1

USBPWR_56

BUZZ1

J1

CHASSIS1

CD1   AUX1   CHASFAN1

COM2

USB20_5
USB20_6

GAME1

ASUS PANEL1

The audio and LAN features are optional. These components are grayed out in the above motherboard layout.

1.6 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 to a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.

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.

1.7 Central Processing Unit (CPU)

The motherboard comes with a surface mount 478-pin Zero Insertion Force (ZIF) socket. This socket is specifically designed for the Intel® Pentium® 4 478/Northwood Processor.

Gold Arrow

P4BGV-MX Socket 478
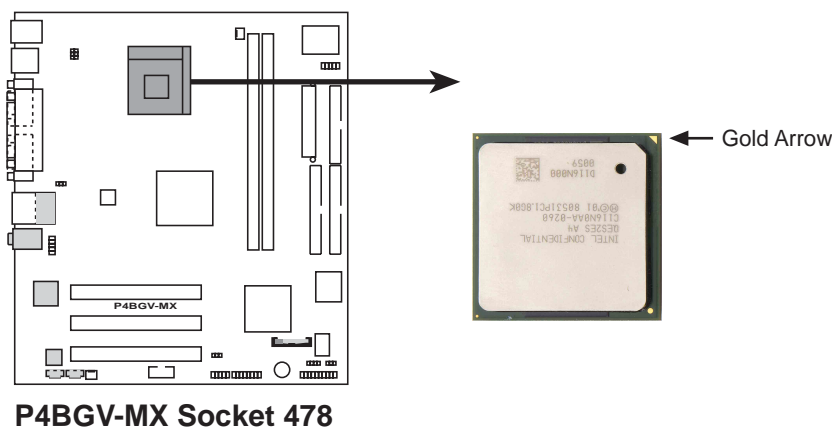
1.8   System memory

The motherboard has two Double Data Rate (DDR) DIMM sockets that supports up to 2GB non-ECC PC2100/1600 DDR.

80 Pins

104 Pins
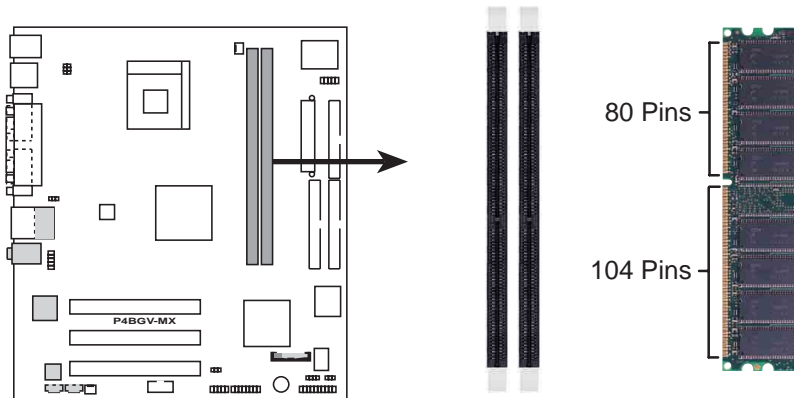
P4BGV-MX 184-Pin DDR DIMM Sockets

1. 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.

1.9   Expansion slots

The P4BGV-MX motherboard has three (3) expansion slots. The following sub-sections describe the slots and the expansion cards that they support.

1.9.1   Configuring an expansion card

After physically installing the expansion card, configure the card by adjusting the software settings.

1.   Turn on the system and change the necessary BIOS settings, if any. See Chapter 2 for information on BIOS setup.

2.   Assign an IRQ to the card. Refer to the tables below.

3.   Install the software drivers for the expansion card.

1.9.2 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.

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 1	shared	—	—	—	—	—	—	—
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 two PCI groups.

1.10 Jumpers

This section describes and illustrates the jumpers on the motherboard.

1. 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 sleep mode (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).

This feature requires a power supply that can provide at least 1A on the +5VSB lead when these jumpers are set to +5VSB. Otherwise, the system does not power up.

The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

P4BGV-MX USB Device Wake Up
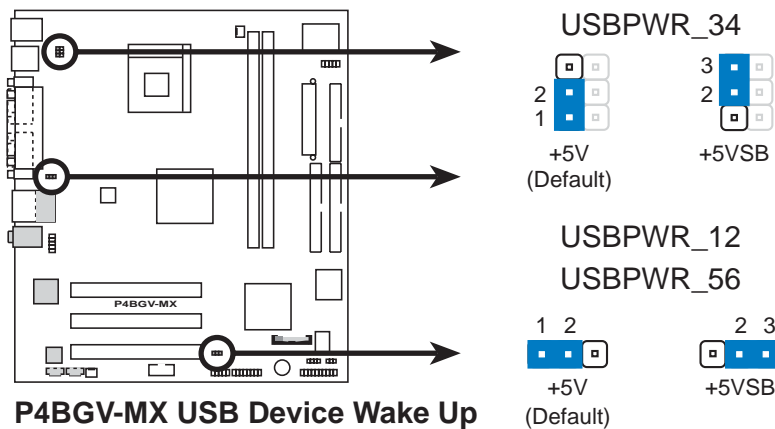
2. Clear RTC RAM (3-pin J1)

These solder points allow 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. Remove the battery.
3. Place the jumper cap to [2-3], then put it back to [1-2]
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

J1

1 2

Normal
(Default)

2 3

Clear CMOS
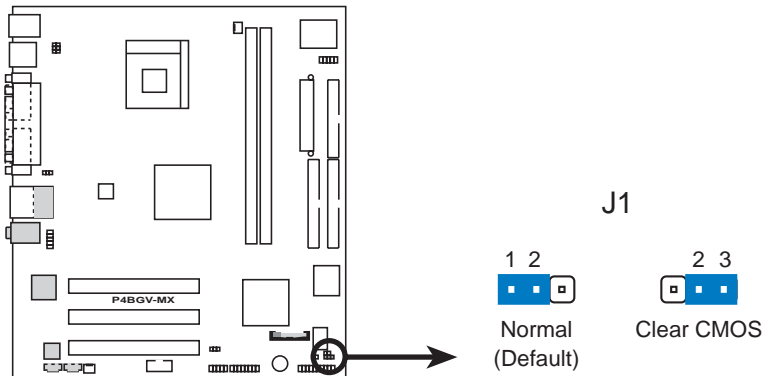
P4BGV-MX Clear RTC RAM

3. 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.

KBPWR1

2
1

+5V

3
2

+5VSB
(Default)
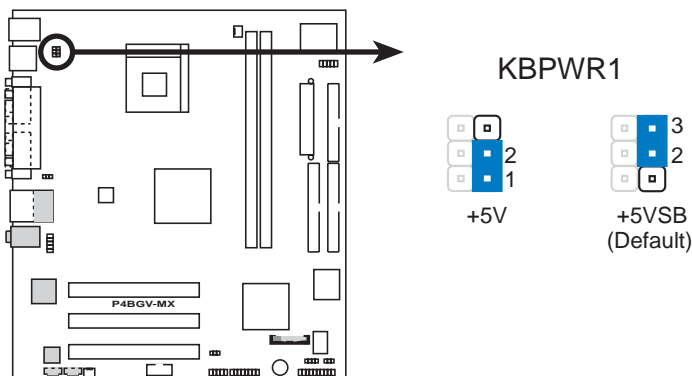
P4BGV-MX Keyboard Power Setting

1.11 Connectors

This section describes and illustrates the connectors on the motherboard.

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

This connector supports the provided UltraDMA100/66 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 UltraDMA100/66 slave device (hard disk drive) and the black connector to the UltraDMA100/66 master device. It is recommended that you connect non-UltraDMA100/66 devices to the secondary IDE connector. If you install two hard disks, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings. BIOS supports specific device bootup. If you have more than two UltraDMA100/66 devices, purchase another UltraDMA100/66 cable. You may configure two hard disks to be both master devices with two ribbon cables – one for the primary IDE connector and another for the secondary IDE connector.

> Pin 20 on each IDE connector is removed to match the covered hole on the UltraDMA cable connector. This prevents incorrect orientation when you connect the cables.
>
> For UltraDMA100/66 IDE devices, use an 80-conductor IDE cable.
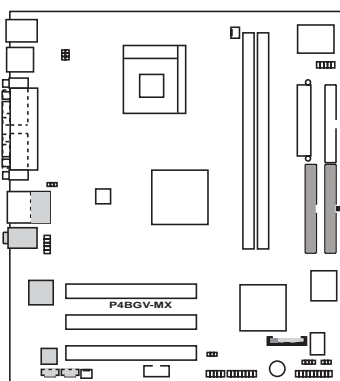
P4BGV-MX IDE Connectors

SEC_IDE   PRI_IDE
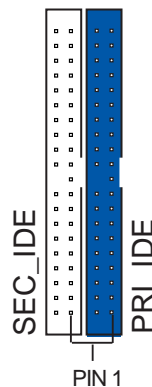
PIN 1

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).

FLOPPY1

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

PIN 1
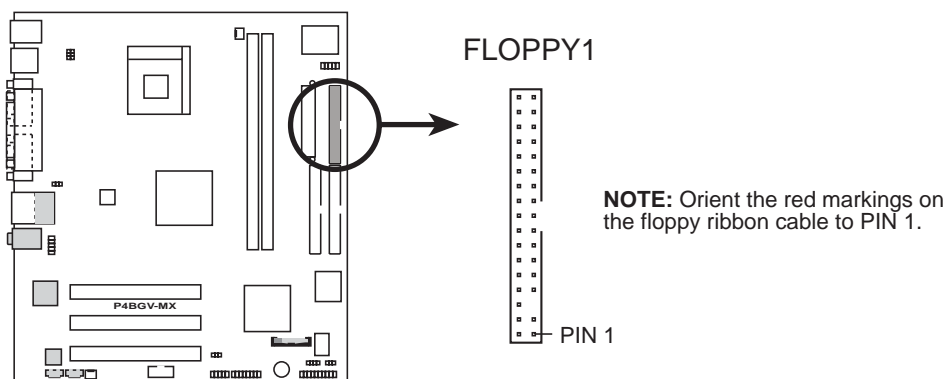
P4BGV-MX Floppy Disk Drive Connector

3. Chassis Alarm (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 "GND" are shorted with a jumper cap. If you wish to use the chassis intrusion detection feature, remove the jumper caps from the pins.

CHASSIS1

+5VSB_MB
Chassis Signal
GND
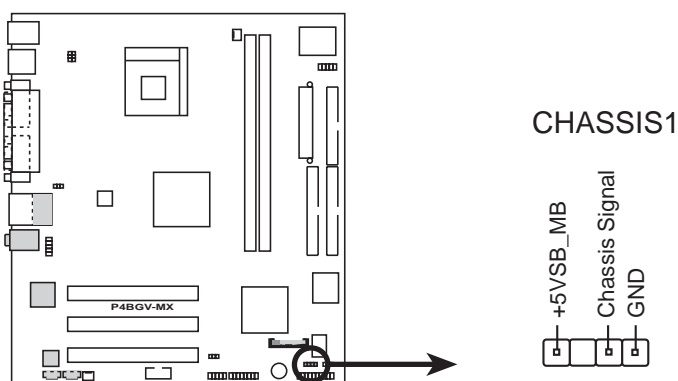
P4BGV-MX Chassis Alarm Lead

4. ATX power connectors (20-pin ATX_POWER1)

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 ATXPWR connector, this motherboard requires that you connect the 4-pin ATX +12V power plug to provide sufficient power to the CPU.
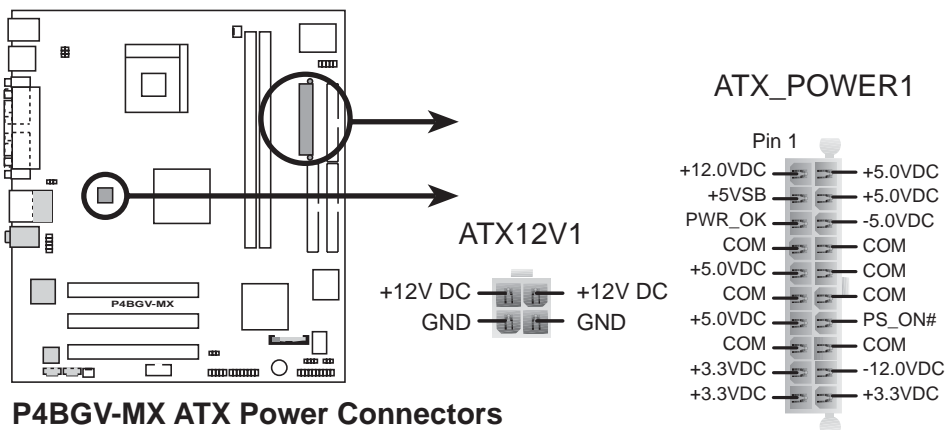
P4BGV-MX ATX Power Connectors

If you will need to replace the power supply in the future, make sure that your new 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.

5. USB headers (10-1 pin USB1)

USB1 is for the internal USB header that you can connect to the front USB ports.
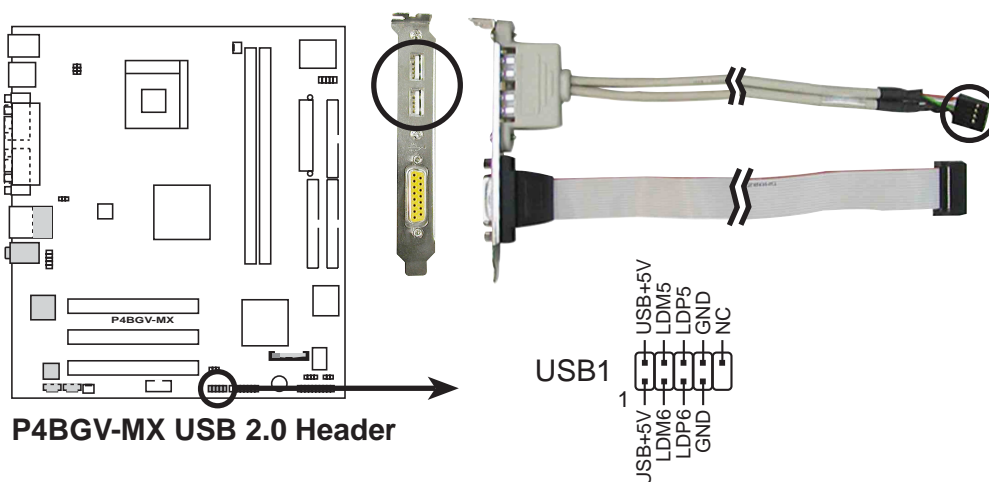
P4BGV-MX USB 2.0 Header

6. CPU and Chassis Fan Connectors (3-pin CPUFAN1, CHASFAN1)

The two fan connectors support cooling fans of 350mA (4.2 Watts) or a total of 1A (12W) at +12V. Orient the fans so that the heat sink fins allow air flow to go across the onboard heat sinks instead of the expansion slots. The fan wiring and plug may vary depending on the fan manufacturer. Connect the fan cable to the connector matching the black wire to the ground pin.

CPUFAN1

GND
+12V
Rotation

CHASFAN1

Rotation
+12V
GND

P4BGV-MX 12-Volt Cooling Fan Power
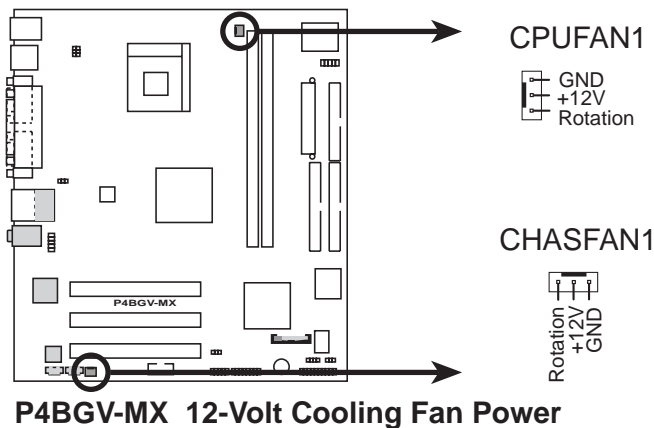
Do not forget to connect the fan cables to the fan connectors. Lack of sufficient air flow within the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!

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

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

Left Audio Channel
Ground
Ground
Right Audio Channel

Left Audio Channel
Ground
Ground
Right Audio Channel

CD1(Black)   AUX1(White)

P4BGV-MX Internal Audio Connectors
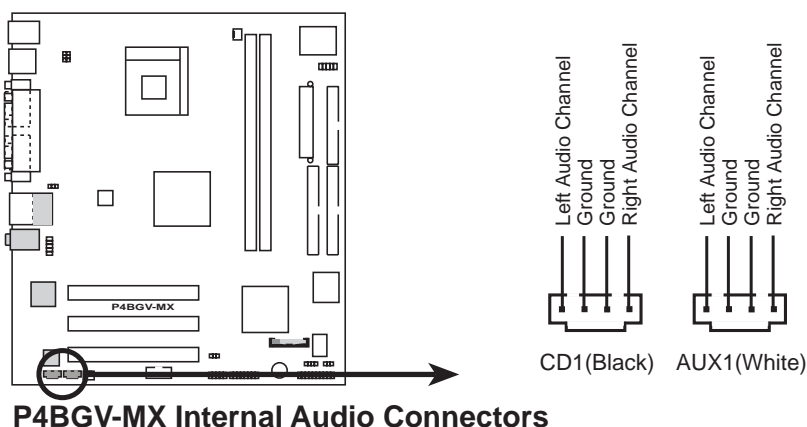
8. Front panel audio connectors (10-1 pin IAPANEL1)

This connector connects to the front panel audio module using an audio cable.
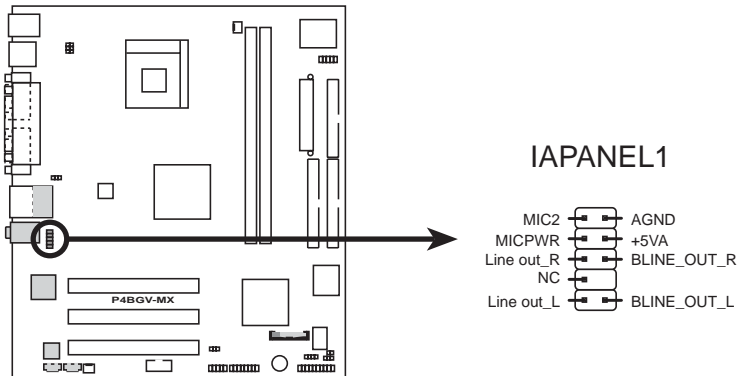
P4BGV-MX Front Panel Audio Connector

IAPANEL1

MIC2	AGND
MICPWR	+5VA
Line out_R	BLINE_OUT_R
NC	
Line out_L	BLINE_OUT_L

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

This connector supports a GAME/MIDI module. If your package came with the USB 2.0/GAME module, 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.

P4BGV-MX Game Connector

GAME1

+5V J1B2 J1CY GND GND J1CX J1B1 +5V
MIDI_IN J2B2 J2CY MIDI_OUT J2CX J2B1 +5V
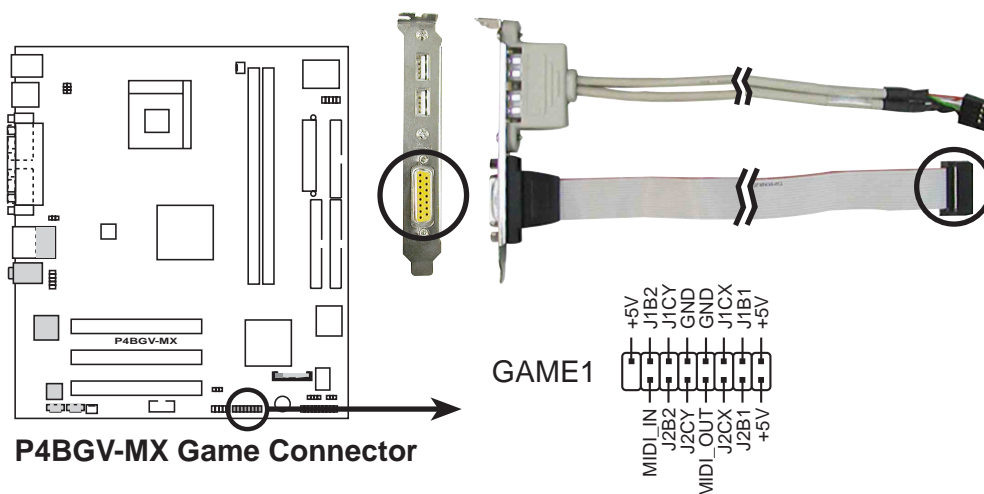
10. infrared connector (10-pin IR1)

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 IR1 connector according to the pin definitions.
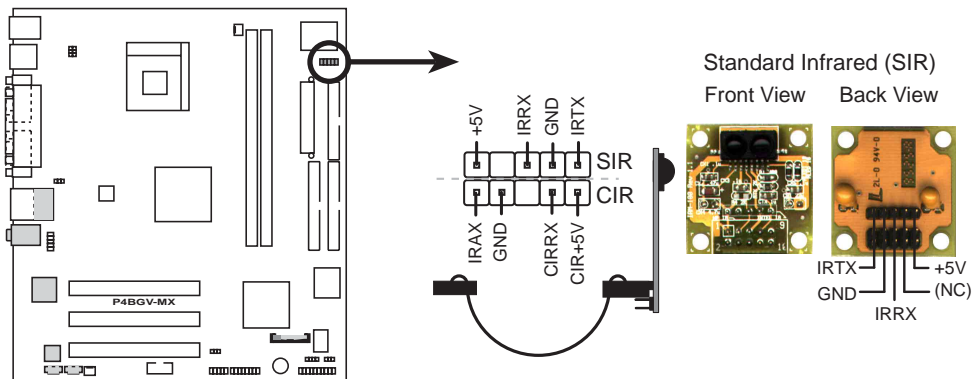
P4BGV-MX Infrared Module Connector

11. Serial connector (9-pin COM2)

This 9-pin connector connects to the Serial COM2 bracket. Connect the COM2 cable to this connector and install the bracket on an available slot in the rear panel of the chassis.
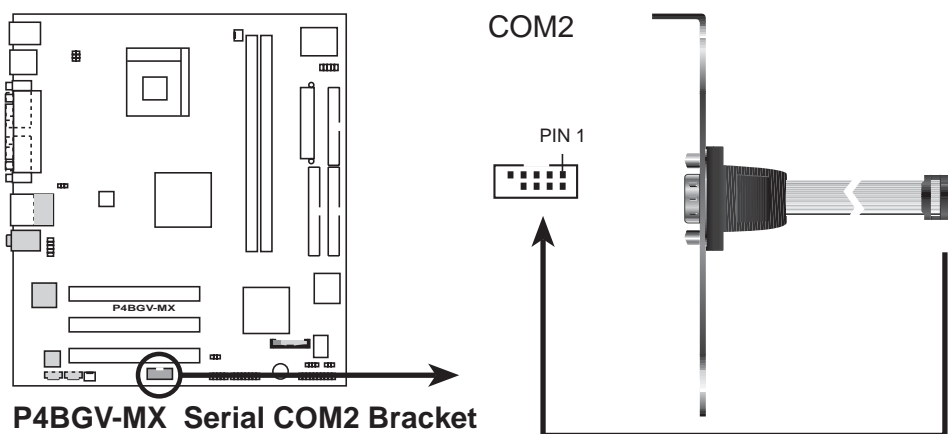
P4BGV-MX Serial COM2 Bracket

12. System panel connector (20-pin PANEL1)

This connector accommodates several system front panel functions.

P4BGV-MX System Panel Connectors

* Requires an ATX power supply.
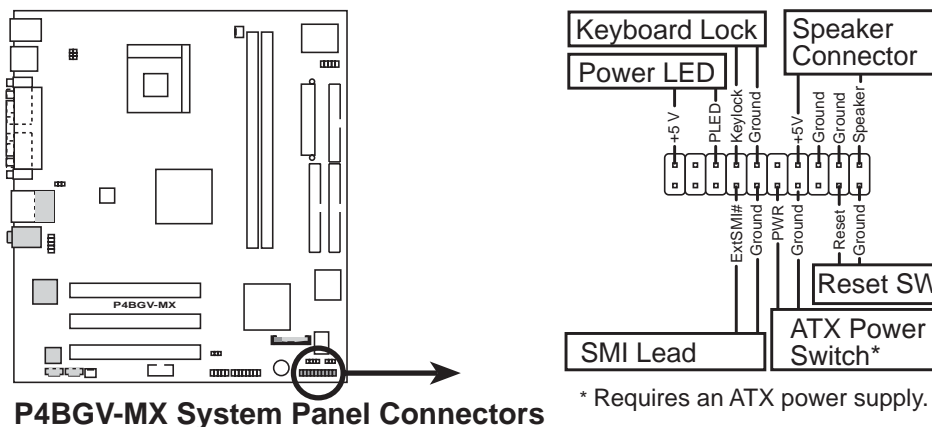
- **System Power LED Lead (2-pin PLED)**

  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.

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

  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.

- **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.

This chapter gives information about the ASUS P4BGV-MX Binary Input/Output System (BIOS).This chapter includes updating the BIOS using the ASUS AFLASH BIOS that is bundled with the support CD.

BIOS Information

2.1   Managing and Updating your BIOS

It is recommended that you save a copy of the motherboard's **original BIOS** to a bootable floppy disk in case you need to reinstall the original BIOS later.

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 Tests (POST).

Follow these steps to update the BIOS using ASUS EZ Flash.

1.   Download the latest BIOS file from the ASUS website (see ASUS contact information on page viii). Save the file to a floppy disk.

Write down the BIOS file name on a piece of paper. You need to type the **exact BIOS file name** at the EZ Flash screen.

2.   Reboot the computer.
3.   To use EZ Flash, press <Alt> + <F2> during POST to display the following screen.

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

[Onboard BIOS Information]
BIOS Version    : ASUS P4BGV-MX ACPI BIOS Revision 001
BIOS Model      : P4BGV-MX
BIOS Built Date : 12/16/02

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 disk that contains the new BIOS file into the floppy drive. You will receive the error message, **"WARNING! Device not ready."** if you proceed to step 5 without the disk in the drive.

5. 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:  P4BGV-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. Press
<Enter>.

6. At the above prompt, type **Y** to continue with the update process.
    Pressing **N** exits the EZ Flash screen and reboots the system without
    updating the BIOS.
    The following prompts appear if you typed **Y**.

```
Flash Memory:  SST 49LF004

1. Update Main BIOS area     (Y/N)? _
2. Update Boot Block area     (Y/N)? _
```

7. Press **Y** for both items to completely update the main BIOS area and
    the boot block area.

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

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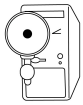
The BIOS information in the above screen is for reference only. What you see on your screen may not be exactly the same as shown.

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.

1. Type FORMAT A:/S at the DOS prompt to create a bootable system disk. DO NOT copy AUTOEXEC.BAT and 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 boot disk you created.

AFLASH 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.

3. Reboot the computer from the floppy disk.

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

4. In DOS mode, type A:\AFLASH <Enter> to run AFLASH.

```
                    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.

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, 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 Internet (WWW or FTP) (see ASUS CONTACT INFORMATION on page x for details) and save to the boot floppy disk you created earlier.

2. Boot from the floppy disk.

3. At the "A:\" prompt, type AFLASH and then press <Enter>.

4. At 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>.

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 onscreen 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.

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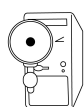
> Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purposes only, and may not exactly match what you see on your screen.

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 any-where 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
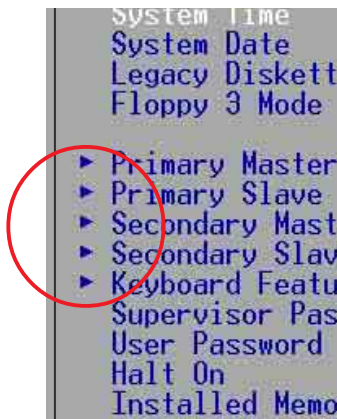
Note that a right pointer symbol (as shown on the left) appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. 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.
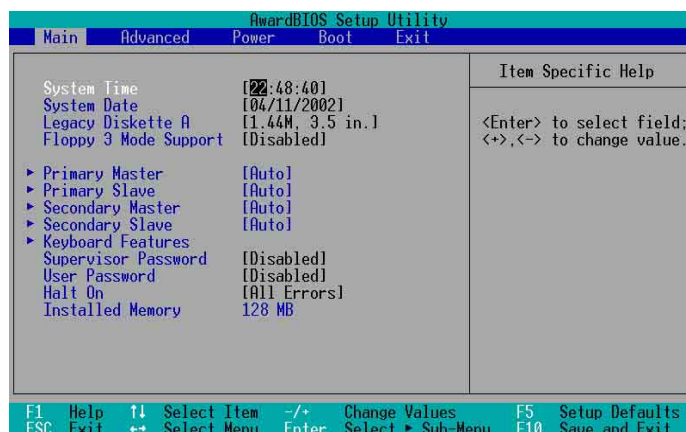
System Time [XX:XX:XX]

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
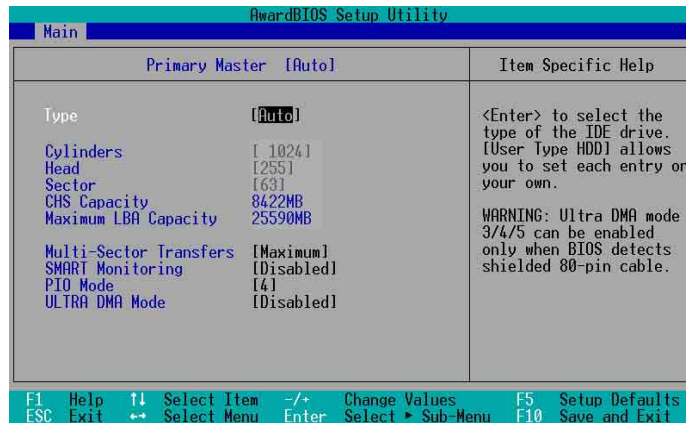
Type [Auto]

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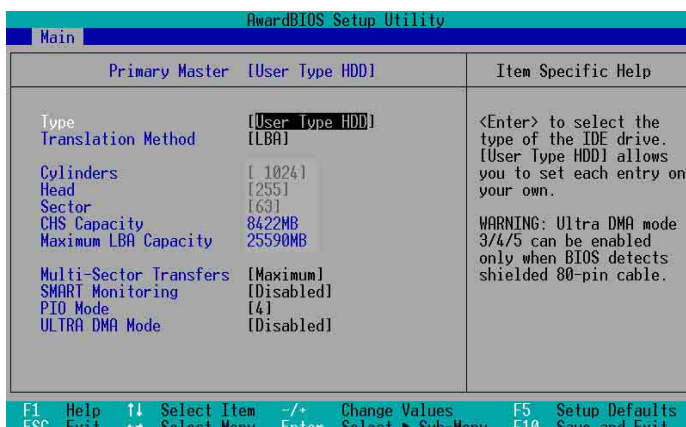
Manually enter the number of cylinders, heads and sectors per track for the drive. Refer to the drive documentation or label for this information.

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 the <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

```
                        AwardBIOS Setup Utility
   Main

           Keyboard Features                    Item Specific Help

     Boot Up NumLock Status       [On]          Select Power-on state
     Keyboard Auto-Repeat Rate    [6/Sec]       for Numlock
     Keyboard Auto-Repeat Delay   [1/4 Sec]




   F1   Help    ↑↓  Select Item   -/+   Change Values      F5   Setup Defaults
   ESC  Exit    ↔   Select Menu   Enter Select ► Sub-Menu  F10  Save and Exit
```
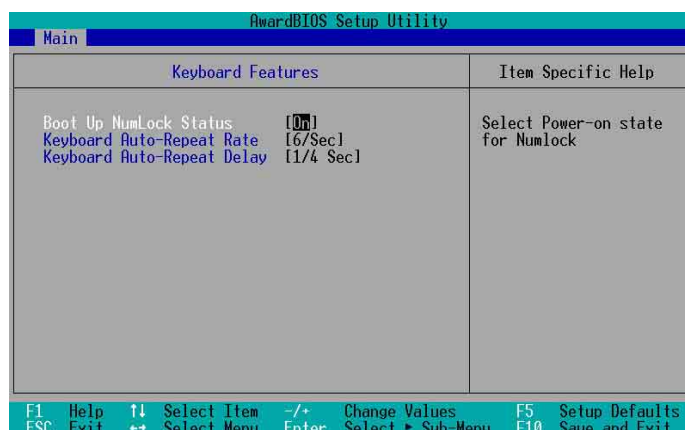
Boot Up NumLock Status [On]

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

```
                    AwardBIOS Setup Utility
    Main    Advanced    Power    Boot    Exit
   ┌─────────────────────────────────────┬──────────────────────┐
   │                                      │  Item Specific Help  │
   │ CPU Speed              [1333MHz]     │                      │
   │ CPU Frequency Multiple [10x]         │ To make changes to the│
   │ CPU External Frequency (MHz) [100]   │ first 4 fields, the  │
   │ Memory Frequency       [Auto]        │ motherboard must be set│
   │ CPU Level 1 Cache      [Enabled]     │ to jumperfree mode.  │
   │ CPU Level 2 Cache      [Enabled]     │                      │
   │ BIOS Update            [Enabled]     │ To set the following 2│
   │ PS/2 Mouse Function Control [Auto]   │ fields, the CPU speed │
   │ USB Legacy Support     [Auto]        │ must be set to [Manual].│
   │ OS/2 Onboard Memory > 64M [Disabled] │ If the frequency     │
   │                                      │ multiple or bus      │
   │ ▶ Chip Configuration                 │ frequency are adjusted│
   │ ▶ I/O Device Configuration           │ too high, the system may│
   │ ▶ PCI Configuration                  │ hang. Please turn off │
   │                                      │ the system and then  │
   │                                      │ restart to set the CPU│
   │                                      │ settings.            │
   ├─────────────────────────────────────┴──────────────────────┤
   │ F1  Help  ↑↓ Select Item  -/+  Change Values  F5  Setup Defaults│
   │ ESC Exit  ↔  Select Menu  Enter Select ▶ Sub-Menu F10 Save and Exit│
   └─────────────────────────────────────────────────────────────┘
```

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). Configuration options: [Auto]

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
SDRAM CAS Latency            [1.5T]          configuration.
SDRAM RAS to CAS Delay       [3T]            [By SPD] is recommended.
SDRAM RAS Precharge Delay    [3T]            [User Defined] allows
SDRAM Active Precharge Delay [5T]            you to set each
SDRAM Idle Timer             [Auto]          configuration on your
Onboard VGA Share Memory Size [8MB]          own.
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

```
                       AwardBIOS Setup Utility
         Advanced

            I/O Device Configuration                    Item Specific Help

     Floppy Disk Access Control        [R/W]           <Enter> to select.

     Onboard Serial Port 1             [3F8H/IRQ4]
     Onboard Serial Port 2             [2F8H/IRQ3]
     UART2 Use As                      [COM Port]
     Onboard Parallel Port             [378H/IRQ7]
     Parallel Port Mode                [ECP+EPP]
     ECP DMA Select                    [3]
     Onboard AC97 Audio Controller     [Auto]
     Onboard MIDI I/O                  [Disabled]
     Onboard Game Port                 [200H-207H]

     F1   Help    ↑↓  Select Item   -/+    Change Values      F5   Setup Defaults
     ESC  Exit    ↔   Select Menu   Enter  Select ► Sub-Menu  F10  Save and Exit
```

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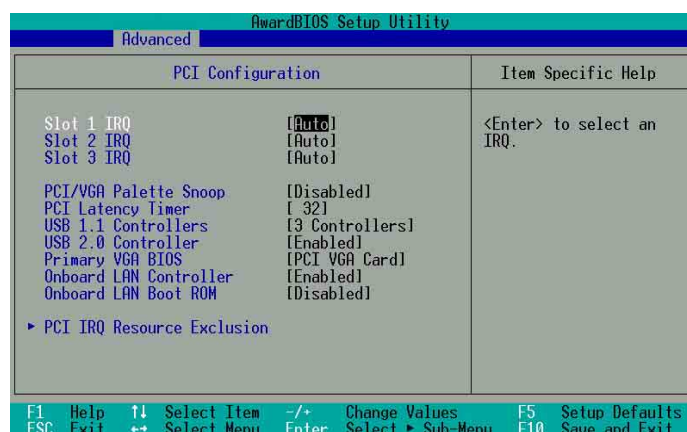
Slot 1, Slot 2, Slot 3 IRQ [Auto]

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]

2.4.3.1   PCI IRQ Resource Exclusion
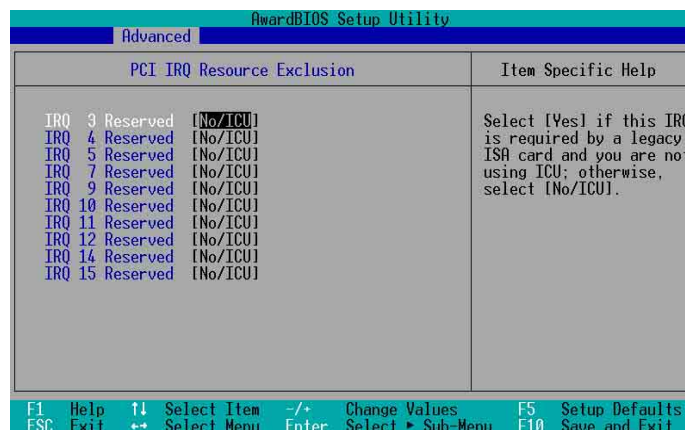
IRQ XX Reserved [No/ICU]

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.

```
                        AwardBIOS Setup Utility
    Main    Advanced    Power    Boot    Exit

                                              Item Specific Help
    Power Management      [User Defined]
    Video Off Option      [Suspend -> Off]    <Enter> to select the
    Video Off Method      [DPMS OFF]          power saving mode. You
    HDD Power Down        [Disabled]          can select [User
    ACPI Suspend To RAM   [Disabled]          Defined] to go to the
                                              suspend mode entry
    Suspend Mode          [Disabled]          below.
    PWR Button < 4 Secs   [Soft Off]

    ▶ Power Up Control
    ▶ Hardware Monitor




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

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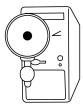
Even if installed, your screen saver does not display when you select [Blank Screen] for the above field.

[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

```
                    AwardBIOS Setup Utility
                        Power

           Power Up Control                     Item Specific Help

AC Power Loss Restart           [Disabled]      <Enter> to select
Wake/Power Up On Ext. Modem     [Disabled]      whether or not to
Power Up On PCI Device          [Disabled]      restart the system after
Power Up By PS/2 Keyboard       [Space Bar]     AC power loss.
Power On By PS/2 Mouse          [Disabled]
Automatic Power Up              [Disabled]




F1   Help   ↑↓  Select Item   -/+    Change Values      F5   Setup Defaults
ESC  Exit   ↔   Select Menu   Enter  Select ► Sub-Menu  F10  Save and Exit
```

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 [xxxC/xxxF]
CPU Temperature [xxxC/xxxF]

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

```
                          AwardBIOS Setup Utility
    Main    Advanced    Power    Boot    Exit

                                                   Item Specific Help

   1. Removable Device    [Legacy Floppy]
   2. IDE Hard Drive      [None]          Boot Sequence:
   3. ATAPI CD-ROM        [None]
   4. Other Boot Device   [INT18 Device (Networ]  <Enter> to select the
                                                   device.
   Plug & Play O/S        [No]
   Reset Configuration Data  [No]         To select the boot
   Boot Virus Detection   [Enabled]       sequence, use the up or
   Quick Power On Self Test  [Enabled]    down arrow. Press <+> to
   Boot Up Floppy Seek    [Enabled]       move the device up the
   Interrupt Mode         [APIC]          list, or <-> to move it
                                          down the list.



   F1   Help    ↑↓  Select Item   -/+     Change Values    F5   Setup Defaults
   ESC  Exit    ↔   Select Menu   Enter   Select ▶ Sub-Menu F10  Save and Exit
```

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. 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)]

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]

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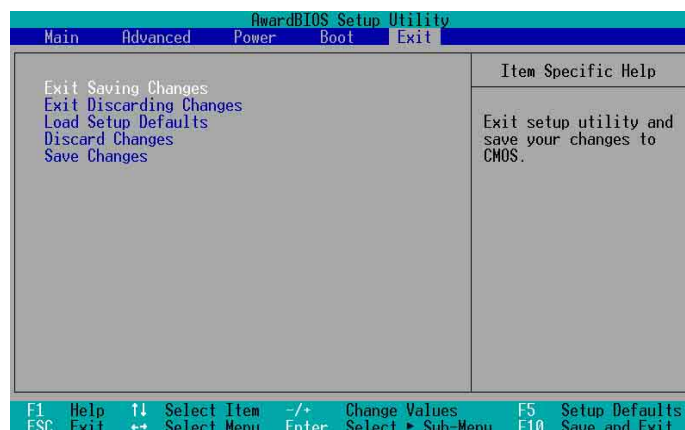
Boot Up Floppy Seek [Enabled]

When enabled, the BIOS will seek the floppy disk drive to determine whether the drive has 40 or 80 tracks. Configuration options: [Disabled] [Enabled]

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.

```
                    AwardBIOS Setup Utility
    Main    Advanced    Power    Boot   Exit
                                              Item Specific Help
   Exit Saving Changes
   Exit Discarding Changes
   Load Setup Defaults                    Exit setup utility and
   Discard Changes                        save your changes to
   Save Changes                           CMOS.




 F1   Help   ↑↓  Select Item   -/+    Change Values    F5   Setup Defaults
 ESC  Exit   ↔   Select Menu   Enter  Select ► Sub-Menu  F10  Save and Exit
```

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 helps you power up your system and install drivers and utilities that came with the support CD.

Starting Up

3.1 Install an operating system

The P4BGV-MX motherboard supports Windows ME/2000/XP operating systems (OS). Always install the latest OS version and corresponding updates so you can maximize the features of your hardware.

> Because motherboard settings and hardware options vary, 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. If Autorun is enabled in your computer, the software and drivers menu automatically appears on your screen.

If the installation menu did not appear automatically, locate and double-click on the file ASSETUP.EXE from the BIN folder in the support CD to display the menu.

3.2.2 Driver installation
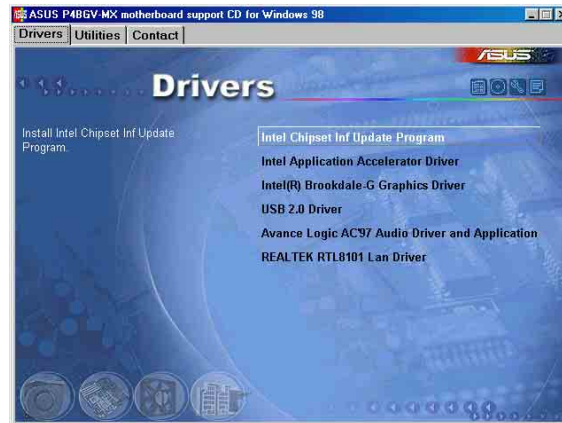
Intel Chipset Inf Update Program

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.

USB 2.0 Driver

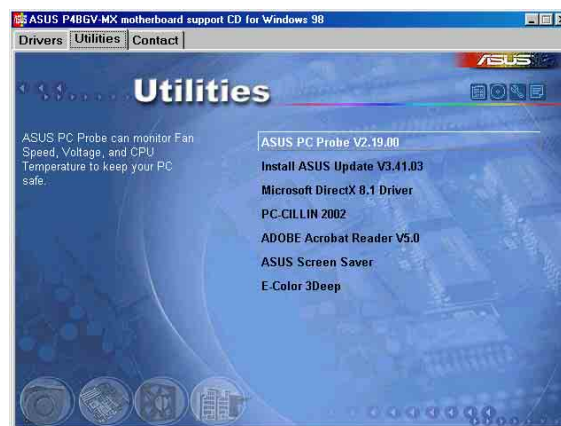This item installs the USB 2.0 driver.

Avance Logic AC'97 Audio Driver and Application

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

REALTEK RTL8101 LAN Driver

This item installs the Realtek LAN driver.

3.2.3 Utilities installation

ASUS PC Probe

Install utility that can monitor Fan, Speed, Voltage, and CPU temperature.

ASUS Update

Installs utility to download and update motherboard BIOS.

Microsoft DirectX 8.1 Driver

This item installs the Microsoft DirectX V8.1 driver.

PC-CILLIN

This item installs the Trend PC-cillin 2002 anti-virus software.

Acrobat Reader

This installs software for viewing files in Portable Document Format (PDF).

ASUS Screen Saver

This item installs the ASUS screen saver.

E-Color 3Deep

This item installs application to optimize 3D graphics output.

3.2.4 ASUS contact information