ASUS

V-Series P5G965

ASUS PC (Desktop Barebone)

E2835

First Edition V1
September 2006

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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.

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.

WARNING! 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 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 devices into the system, carefully read all the documentation 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.

Lithium-Ion Battery Warning

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

VORSICHT: Explosionsgetahr bei unsachgemäßen Austausch der Batterie. Ersatz nur durch denselben oder einem vom Hersteller empfohlenem ähnljchen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

LASER PRODUCT WARNING

CLASS 1 LASER PRODUCT

About this guide

Audience

This guide provides general information and installation instructions about the ASUS V-Series P5G965 barebone system. This guide is intended for experienced users and integrators with hardware knowledge of personal computers.

How this guide is organized

This guide contains the following parts:

1. **Chapter 1: System introduction**

    This chapter gives a general description of the ASUS V-Series P5G965 barebone system. The chapter lists the system features, including introduction on the front and rear panel, and internal components.

2. **Chapter 2: Basic installation**

    This chapter provides step-by-step instructions on how to install components in the system.

3. **Chapter 3: Starting up**

    This chapter helps you power up the system and install drivers and utilities from the support CD.

4. **Chapter 4: Motherboard information**

    This chapter gives information about the motherboard that comes with the system. This chapter includes the motherboard layout, jumper settings, and connector locations.

5. **Chapter 5: BIOS setup**

    This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.

Conventions used in this guide

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: Instructions 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. Refer to the ASUS contact information.

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.

System package contents

Check your ASUS V-Series P5G965 barebone system package for the following items.

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

Item description
1. **ASUS V-Series P5G965 barebone system** with
• ASUS motherboard
• 250 W PFC power supply unit
• ASUS chassis
2. **Cable**
• AC power cable
3. **Support CD**
4. **User guide**
5. **Telecom Adapter Card (Optional)**

Chapter 1

This chapter gives a general description of the ASUS V-Series P5G965 Barebone System. The chapter lists the system features including introduction on the front and rear panel, and internal components.
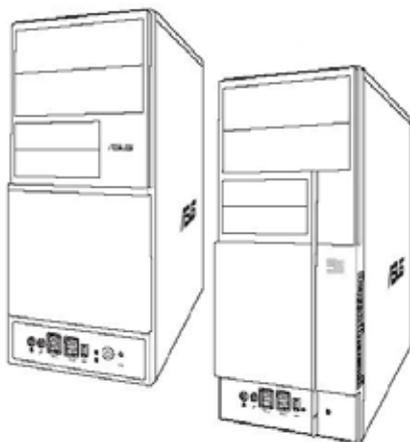
System introduction

1.1 Welcome!

Thank you for choosing the ASUS V-Series P5G965!

The ASUS V-Series P5G965 is an all-in-one barebone system with a versatile home entertainment feature.

The system comes in a stylish mini-tower casing and powered by the ASUS motherboard that supports the Intel® Pentium® D, Intel® Pentium® 4 or Intel® Celeron® processor in the 775-land package.

The system supports up to 4 GB of system memory using DDR2-533/667/800 DIMMs. ATI integrated graphics, Serial ATA, USB 2.0, and 8-channel audio feature the system and take you ahead in the world of power computing.

1.2 Front panel

The front panel includes the optical drive bays, floppy disk drive slot, power button, and several I/O ports are located at the front panel.
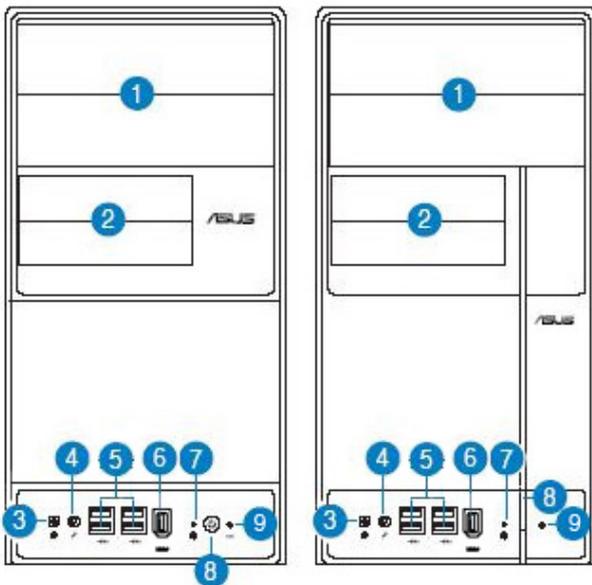
1. **5.25-inch drive bay covers.** These bays are for IDE optical drives.
2. **3.5-inch drive bay covers.** These slots are for 3.5-inch floppy or hard disk drives.
3. **Headphone port.** This Line In (green) port connects a headphone with a stereo mini-plug.
4. **Microphone port.** This Mic (pink) port connects a microphone.
5. **USB 2.0 ports.** These Universal Serial Bus 2.0 (USB 2.0) ports are available for connecting USB 2.0 devices such as a mouse, printer, scanner, camera, PDA, and others.
6. **IEEE 1394 port.** This 6-pin IEEE 1394 port provides high-speed connectivity for audio/video devices, storage peripherals, PCs, or portable devices.
7. **HDD LED.** This LED lights up when data is read from or written to the hard disk drive.
8. **Power button.** Press this button to turn the system on.
9. **Reset button.** Press this button to reboot the system without turning off the power.

1.3 Rear panel

The system rear panel includes the power connector and several I/O ports that allow convenient connection of devices.
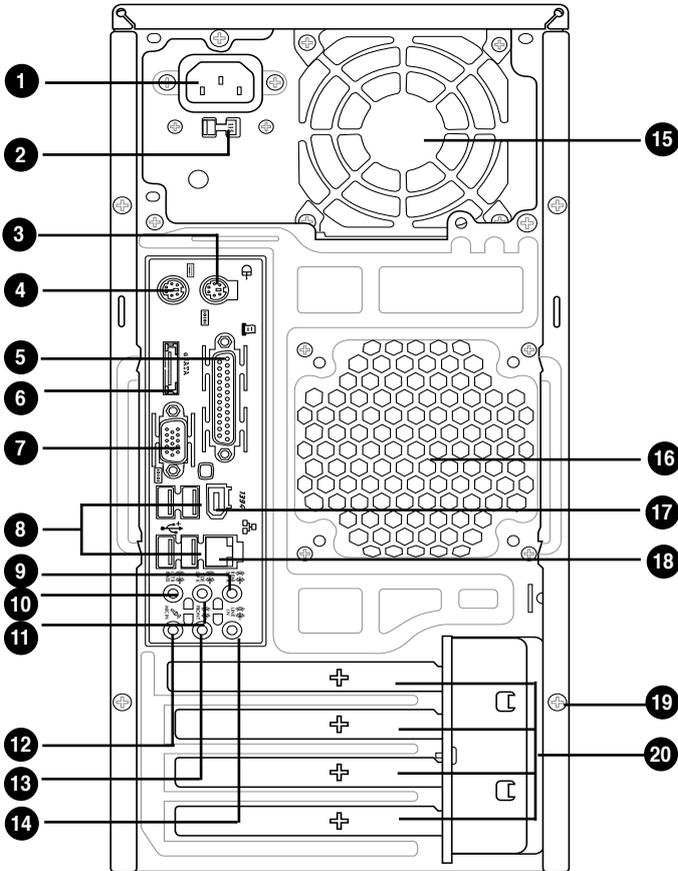
1. **Power connector.** This connector is for the power cable and plug.
2. **Voltage selector.** This switch allows you to adjust the system input voltage according to the voltage supply in your area. See the section "Voltage selector" on page 1-6 before adjusting this switch.
3. **PS/2 mouse port.** This port is for a PS/2 mouse.
4. **PS/2 keyboard port.** This port is for a PS/2 keyboard.
5. **Parallel port.** This 25-pin port connects a parallel printer, a scanner, or other devices.

6. **External SATA port.** This port connects to an external SATA box or a Serial ATA port multiplier. This port supports a Serial ATA hard disk drive that you can combine with an external Serial ATA 3.0 Gb/s device to configure a RAID 0, RAID 1, or JBOD set through the onboard JMicron SATA RAID controller.

7. **VGA port.** This port is for a VGA monitor or other VGA-compatible devices.

8. **USB 2.0 ports 1, 2, 3 and 4.** These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

9. **Center/Subwoofer port (orange).** This port connects the center/subwoofer speakers.

10. **Side Speaker Out port (gray).** This port connects the side speakers in an 8-channel audio configuration.

11. **Rear Speaker Out port (black).** This port connects the rear speakers in a 4-channel, 6-channel, or 8-channel audio configuration.

12. **Microphone port (pink).** This port connects a microphone.

13. **Line Out port (lime).** This port connects a headphone or a speaker. In 4-channel and 6-channel configuration, the function of this port becomes Front Speaker Out.

14. **Line In port (light blue).** This port connects the tape, CD, DVD player, or other audio sources.

> Refer to the audio configuration table below for the function of the audio ports in 2, 4, 6, or 8-channel configuration.

Audio 2, 4, 6, or 8-channel configuration

Port	Headset 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Line In
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Orange	–	–	Center/Subwoofer	Center/Subwoofer
Black	–	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Gray	–	–	–	Side Speaker Out

15. **Power supply unit fan vent.** This vent is for the PSU fan that provides ventilation inside the power supply unit.

16. **Chassis fan vent.** This vent is for the fan that provides ventilation inside the system chassis.

17. **IEEE 1394 port.** This 6-pin IEEE 1394 port provides high-speed connectivity for audio/video devices, storage peripherals, PCs, or portable devices.

18. **LAN (RJ-45) port.** Supported by Realtek® Gigabit LAN controller, this port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

19. **Cover screw.** Remove the cover screws on the rear panel when installing expansion cards.

20. **Expansion slot metal brackets.** Remove these brackets when installing expansion cards.

Voltage selector

The system's power supply unit has a 115 V/230 V voltage selector switch located beside the power connector. Use this switch to select the appropriate system input voltage according to the voltage supply in your area.

If the voltage supply in your area is 100-127 V, set this switch to 115 V.

If the voltage supply in your area is 200-240 V, set this switch to 230 V.
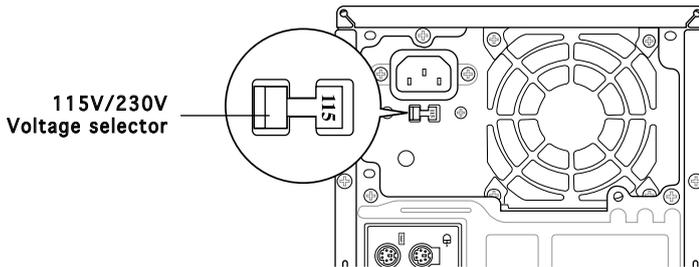
Setting the switch to 115V in a 230V environment or 230V in a 115V environment will seriously damage the system!

1.4   Internal components

The illustration below is the internal view of the system when you remove the top cover and the power supply unit. The installed components are labeled for your reference. Proceed to Chapter 2 for instructions on installing additional system components.
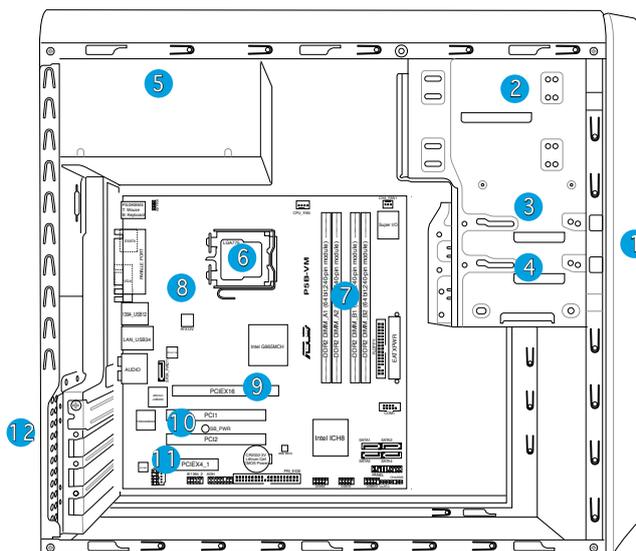
1.   Front panel cover
2.   5.25-inch optical drive bays
3.   Hard disk drive bay
4.   Floppy disk drive bay
5.   Power supply unit
6.   CPU socket

7.   DIMM sockets
8.   ASUS motherboard
9.   PCI Express x16 slot
10.   PCI slots
11.   PCI Express x4 slot
12.   Metal bracket lock

Chapter 2

This chapter provides step-by-step instructions on how to install components in the system.
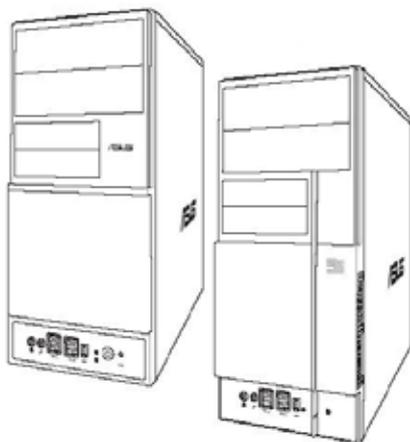
2.1   Preparation

Before you proceed, make sure that you have all the components you plan to install in the system.

Basic components to install

1. Central Processing Unit (CPU)
2. DDR2 Dual Inline Memory Module (DIMM)
3. Expansion card(s)
4. Hard disk drive
5. Optical drive
6. Floppy disk drive

Tool

Phillips (cross) screw driver

2.2   Before you proceed

Take note of the following precautions before you install components into the system.

• Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.

• Hold components by the edges to avoid touching the ICs on them.

• Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

The motherboard comes with an onboard standby power LED. This LED lights up to indicate that the system is ON, in sleep mode or in soft-off mode, and not powered OFF. Unplug the power cable from the power outlet and make sure that the standby power LED is OFF before installing any system component.

SB_PWR

ON
Standby
Power

OFF
Powered
Off

Onboard LED
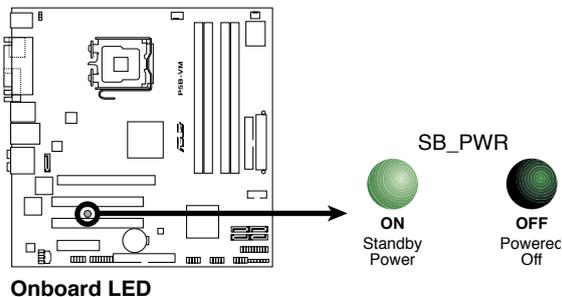
2.3 Removing the side cover and front panel assembly

1. Remove the cover screws on the rear panel.
2. Pull the side cover toward the rear panel until its hooks disengage from the chassis tab holes. Set the side cover aside.
3. Locate the front panel assembly hooks, then lift them until they disengage from the chassis.
4. Swing the front panel assembly to the right, until the hinge-like tabs on the right side of the assembly are exposed.
5. Remove the front panel assembly, then set aside.
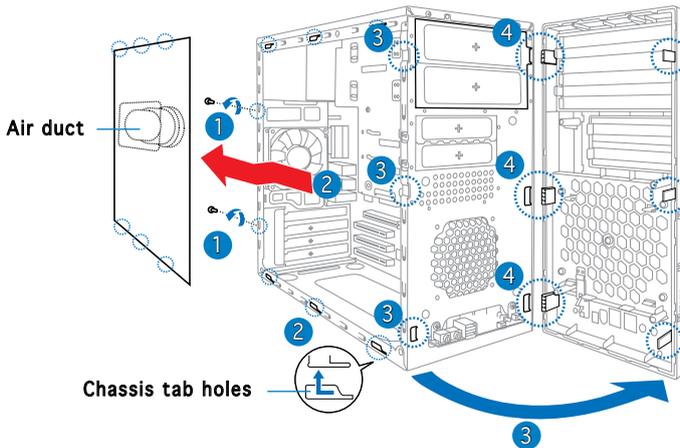
2.4   Central Processing Unit (CPU)

2.4.1 Overview

The motherboard comes with a surface mount LGA775 socket designed for the Intel® Core™2/Pentium® D/Pentium® 4/Pentium® Extreme and Celeron® D processors.

- Your boxed Intel® Pentium® 4 LGA775 processor package should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.

- Check your motherboard to make sure that the PnP cap is on the CPU socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/ transit-related.

- Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA775 socket.

- The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

2.4.2 Installing CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

Before installing the CPU, make sure that the socket box is facing towards you and the load lever is on your left.

---

2. Press the load lever with your thumb (A), then move it to the left (B) until it is released from the retention tab.

To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

Retention tab

Ⓐ

Ⓑ
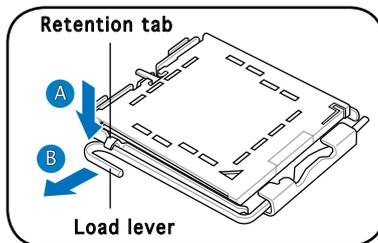
Load lever

3. Lift the load lever in the direction of the arrow to a 135º angle.

4. Lift the load plate with your thumb and forefinger to a 100º angle (4A), then push the PnP cap from the load plate window to remove (4B).

PnP cap
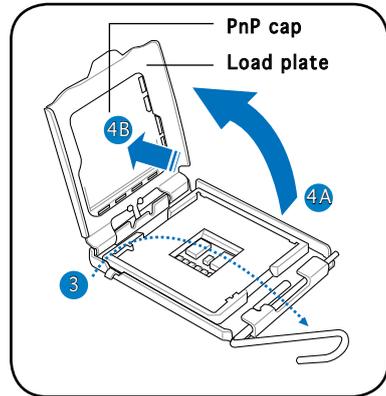
Load plate

5. Position the CPU over the socket, making sure that the gold triangle is on the bottom-left corner of the socket. Fit the socket alignment key into the CPU notch.

CPU notch

Gold triangle mark

Alignment key
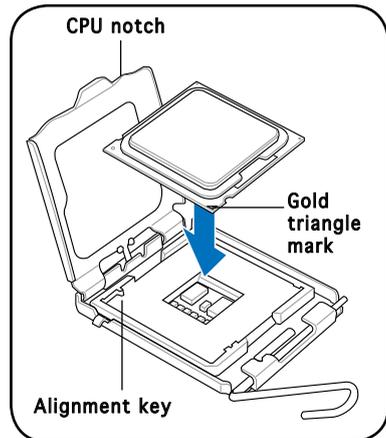
6. Apply Thermal Interface Material
    on the CPU before closing the
    load plate.

    ⚡ **DO NOT** eat the Thermal
        Interface Material. If it gets
        into your eyes or touches
        your skin, make sure to wash
        it off immediately, and seek
        professional medical help.
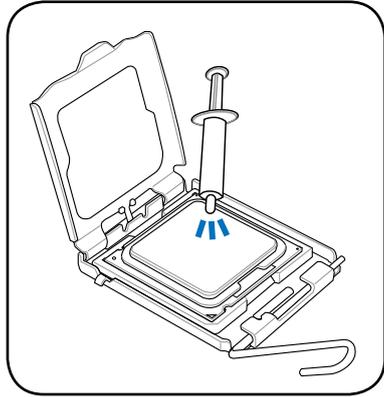
7. Close the load plate (A), then
    push the load lever (B) until it
    snaps into the retention tab.
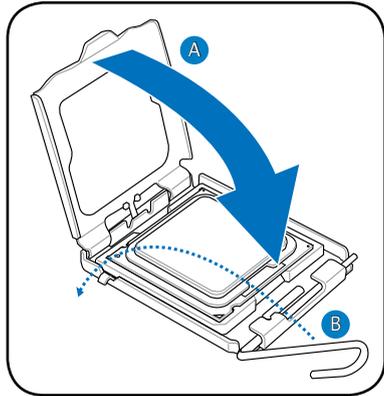
2.4.3 Installing the CPU fan and heatsink assembly

The Intel® Pentium® 4 LGA775 processor requires a specially designed
heatsink and fan assembly to ensure optimum thermal condition and
performance.

✎   • When you buy a boxed Intel® Pentium® 4 processor, the package
       includes the CPU fan and heatsink assembly. If you buy a
       CPU separately, make sure that you use only Intel®-certified
       multi-directional heatsink and fan.

    • Your Intel® Pentium® 4 LGA775 heatsink and fan assembly comes in
       a push-pin design and requires no tool to install.

If you purchased a separate CPU heatsink and fan assembly, make sure that the Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.

To install the CPU heatsink and fan:

1. Place the heatsink on top of the installed CPU, making sure that the four fasteners match the holes on the motherboard.

2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.
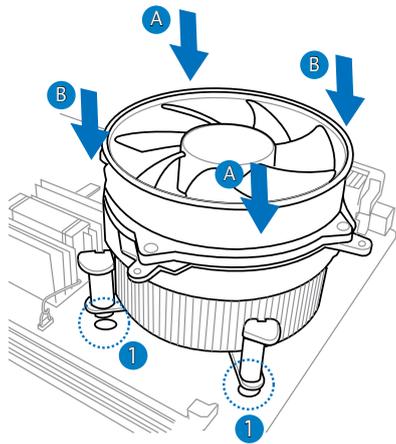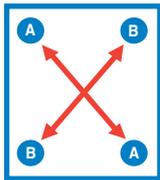
3. When the fan and heatsink assembly is in place, connect the CPU fan cable to the connector on the motherboard.

CPU_FAN
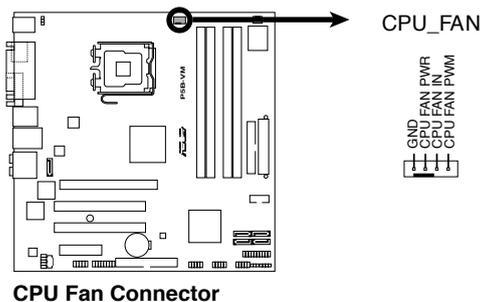
CPU Fan Connector

Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.

2.5 Installing a DIMM

The system motherboard comes with two Double Data Rate 2 (DDR2) Dual Inline Memory Module (DIMM) sockets.

The following figure illustrates the location of the sockets:
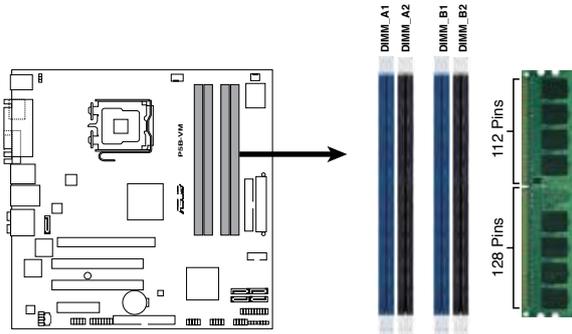
240-pin DDR2 DIMM Sockets

2.5.1 Memory configurations

You may install 256 MB, 512 MB, 1 GB, and 2 GB unbuffered non-ECC DDR2 DIMMs into the DIMM sockets.

- • You may install varying memory sizes in Channel A and Channel B. The system maps the total size of the lower-sized channel for the dual-channel configuration. Any excess memory from the higher-sized channel is then mapped for single-channel operation.

- • Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.

- • If you install four 1 or 2GB memory modules, the system may only recognize less than 3GB because the address space is reserved for other critical functions. This limitation appears on Windows® XP 32-bit operation system which does not support Physical Address Extension (PAE).

- • If you install Windows® XP 32-bit operation system, a total memory of less than 3GB is recommended.

- • This motherboard does not support memory modules made up of 128 Mb chips or double sided x16 memory modules.

Notes on memory limitations

• Due to chipset limitation, this motherboard can only support up to 8 GB on the operating systems listed below. You may install a maximum of 2 GB DIMMs on each slot, but only DDR2-533 and DDR2-667 2 GB density modules are available for this configuration.

32-bit	64-bit
Windows® 2000 Advanced Server	Windows® XP Professional x64 Edition

• Some old-version DDR2-800/667 DIMMs may not match Intel®'s On-Die-Termination (ODT) requirement and will automatically downgrade to run at DDR2-533. If this happens, contact your memory vendor to check the ODT value.

• Due to chipset limitation, DDR2-800 with CL=4 will be downgraded to run at DDR2-667 by default setting. If you want to operate with lower latency, adjust the memory timing manually.

• Due to chipset limitation, DDR2-667 with CL=3 will be downgraded to run at DDR2-533 by default setting. If you want to operate with lower latency, adjust the memory timing manually. There will be 8MB reduction in total memory when enabling ASUS Thermostat function under Single Channel mode, and 16MB reduction under Dual Channel Mode.

• The total memory may has 8MB reduction under Single Channel mode, and 16MB reduction under Dual Channel mode because the address space is reserved for Intel® Quiet System Technology.

Qualified Vendors Lists (QVL)
DDR2 800

Size	Vendor	Chip No.	Side(s)	Part No.	DIMM support A	B	C
512MB	KINGSTON	K4T51083QC	SS	KVR800D2N5/512	•	•	•
1024MB	KINGSTON	K4T51083QC	DS	KVR800D2N5/1G	•	•	
512MB	Qimonda	HYB18T256800AF25F	DS	HYS64T64020HU-25F-A	•	•	
256MB	Qimonda	HYB18T512160BF-25F	SS	HYS64T32000HU-25F-B	•	•	
512MB	Qimonda	HYB18T512800BF25F	SS	HYS64T64000HU-25F-B	•	•	
1024MB	Qimonda	HYB18T512800BF25F	DS	HYS64T128020HU-25F-B	•	•	•
512MB	SAMSUNG	EDD339XX	SS	M378T6553CZ3-CE7	•	•	•
256MB	SAMSUNG	K4T51163QC-ZCE7	SS	M378T3354CZ3-CE7	•	•	
512MB	Hynix	HY5PS12821BFP-S5	SS	HYMP564U64BP8-S5	•	•	
1024MB	Hynix	HY5PS12821BFP-S5	DS	HYMP512U64BP8-S5		•	
512MB	MICRON	5JAIIZ9DQQ	SS	MT8HTF6464AY-80EA3	•	•	
1024MB	MICRON	5JAIIZ9DQQ	DS	MT16HTF12864AY-80EA3	•	•	
512MB	MICRON	5ZD22D9GKX	SS	MT8HTF6464AY-80ED4	•		
1024MB	MICRON	5ZD22D9GKX	DS	MT16HTF12864AY-80ED4	•	•	
512MB	MICRON	6CD22D9GKX	SS	MT8HTF6464AY-80ED4	•	•	
1024MB	MICRON	6CD22D9GKX	DS	MT16HTF12864AY-80ED4		•	
1024MB	CORSAIR	Heat-Sink Package	DS	CM2X1024-6400C4		•	
512MB	Crucial	Heat-Sink Package	SS	BL6464AA804.8FD	•	•	
1024MB	Crucial	Heat-Sink Package	DS	BL12864AA804.16FD	•		

DDR2 667

Size	Vendor	Chip No	Side(s)	Part No.	DIMM support A	B	C
512MB	KINGSTON	E5108AE-6E-E	SS	KVR667D2N5/512	•	•	
1024MB	KINGSTON	E5108AE-6E-E	DS	KVR667D2N5/1G	•	•	
512MB	KINGSTON	E5108AE-6E-E	SS	KVR667D2E5/512	•	•	
256MB	KINGSTON	HYB18T256800AF3	SS	KVR667D2N5/256	•	•	
256MB	Qimonda	HYB18T512160AF-3S	SS	HYS64T32000HU-3S-A	•	•	
512MB	Qimonda	HYB18T512800AF3S	SS	HYS64T64000HU-3S-A	•	•	
1024MB	Qimonda	HYB18T512800AF3S	DS	HYS64T128020HU-3S-A	•	•	
256MB	Qimonda	HYB18T512160BF-3S	SS	HYS64T32000HU-3S-B	•	•	
512MB	Qimonda	HYB18T512800BF3S	SS	HYS64T64000HU-3S-B	•	•	
1024MB	Qimonda	HYB18T512800BF3S	DS	HYS64T128020HU-3S-B	•		
256MB	SAMSUNG	K4T51163QC-ZCE6	SS	M378T3354CZ0-CE6	•	•	
512MB	SAMSUNG	ZCE6K4T51083QC	SS	M378T6553CZ0-CE6	•		
1024MB	SAMSUNG	ZCE6K4T51083QC	DS	M378T2953CZ0-CE6	•	•	
512MB	Hynix	HY5PS12821AFP-Y5	SS	HYMP564U64AP8-Y5	•	•	•
512MB	Hynix	HY5PS12821AFP-Y4	SS	HYMP564U64AP8-Y4	•	•	
256MB	ELPIDA	E2508AB-6E-E	SS	EBE25UC8ABFA-6E-E	•	•	
512MB	ELPIDA	E5108AE-6E-E	SS	EBE51UD8AEFA-6E-E	•	•	
512MB	A-DATA	AD29608A8B-3EG	SS	M20AD5Q3H3163J1C52	•	•	
512MB	Transcend	E5108AE-6E-E	SS	TS64MLQ64V6J	•	•	
1024MB	Transcend	E5108AE-6E-E	DS	TS128MLQ64V6J	•		
1024MB	Transcend	J12Q3AB-6	DS	JM388Q643A-6	•		

DDR2 533

Size	Vendor	Chip No.	Side(s)	Part No.	DIMM support A	B	C
256MB	KINGSTON	E5116AF-5C-E	SS	KVR533D2N4/256	•		•
512MB	KINGSTON	HYB18T512800AF37	SS	KVR533D2N4/512	•	•	
1024MB	KINGSTON	5YDIID9GCT	DS	KVR533D2N4/1G	•	•	
256MB	Qimonda	HYB18T512160AF-3.7	SS	HYS64T32000HU-3.7-A	•	•	
512MB	Qimonda	HYB18T512800AF37	SS	HYS64T64000HU-3.7-A	•		•
1024MB	Qimonda	HYB18T512800AF37	DS	HYS64T128020HU-3.7-A	•	•	
256MB	Qimonda	HYB18T5121608BF-3.7	SS	HYS64T32000HU-3.7-B	•	•	•
512MB	Qimonda	HYB18T512800BF37	SS	HYS64T64000HU-3.7-B	•	•	•
1024MB	Qimonda	HYB18T512800BF37	DS	HYS64T128020HU-3.7-B	•		
512MB	Hynix	HY5PS12821F-C4	SS	HYMP564U648-C4	•		
1024MB	Hynix	HY5PS12821F-C4	DS	HYMP512U648-C4	•	•	
512MB	Hynix	HY5PS12821AFP-C3	SS	HYMP564U64AP8-C3	•	•	
1024MB	Hynix	HY5PS12821AFP-C3	DS	HYMP512U64AP8-C3	•	•	
512MB	ELPIDA	E5108AB-5C-E	SS	EBE51UD8ABFA-5C-E	•	•	
256MB	Apacer	E5116AB-5C-E	SS	78.81077.420	•	•	
512MB	KINGMAX	E5108AE-5C-E	SS	KLBC28F-A8EB4	•	•	•
1024MB	KINGMAX	E5108AE-5C-E	DS	KLBD48F-A8EB4		•	
512MB	KINGMAX	KKEA88E4AAK-37	SS	KLBC28F-A8KE4	•		
1024MB	KINGMAX	5MB22D9DCN	DS	KLBD48F-A8ME4	•		

Visit the ASUS website (www.asus.com) for the latest QVL.

Side(s): SS - Single-sided

DS - Double-sided

CL: CAS Latency

DIMM support:

A -Supports one module inserted into either slot, in Single-channel memory configuration.

B -Supports one pair of modules inserted into both slots as one pair of Dual-channel memory configuration.

2.5.2 Installing a DDR2 DIMM

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. Unlock a DDR2 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.

DDR2 DIMM notch

Unlocked retaining clip
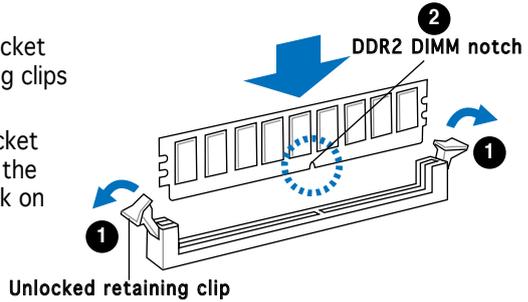
A DDR2 DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.

Locked Retaining Clip
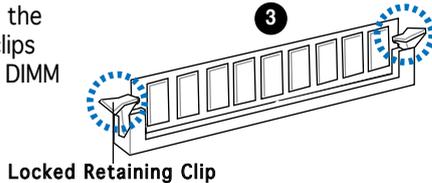
2.5.3 Removing a DDR2 DIMM

Follow these steps to remove a DIMM.

1. Simultaneously press the retaining clips outward to unlock the DIMM.

DDR2 DIMM notch
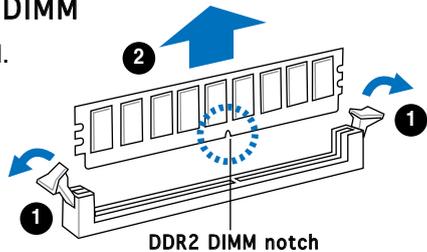
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

2.6   Expansion slots

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.

Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

2.6.1   Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

2.6.2   Configuring an expansion card

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

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 5 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

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. Refer to the table on the next page for details.

Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	—	Re-direct to IRQ#9
3	12	IRQ holder for PCI steering*
4	13	Communications Port (COM1)*
5	14	IRQ holder for PCI steering*
6	15	Floppy Disk Controller
7	16	Printer Port (LPT1)*
8	3	System CMOS/Real Time Clock
9	4	ACPI*
10	5	SMBus Controller*
11	6	IRQ holder for PCI steering*
12	7	PS/2 Compatible Mouse Port*
13	8	Numeric Data Processor
14	9	IDEIRQ (legacy mode, combined mapped as primary), SMasterATA1 (Master), SATA3 (Secondary)
15	10	IDEIRQ (legacy mode, combined mapped as secondary), SATA2 (Master), SATA4 (Secondary)

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

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI1	shared	—	—	—	—	—	—	—
PCI2	—	shared	—	—	—	—	—	—
PCIEX16_1	shared	—	—	—	—	—	—	—
PCIEX4_1	shared	—	—	—	—	—	—	—
On-board ESATA, SATA_RAID	shared	—	—	—	—	—	—	—
On-board PRI_IDE	shared	—	—	—	—	—	—	—
On-board HD Audio (AD1988)	—	—	—	—	—	—	shared	—
On-board GbEthernet (RTL8111B)	—	shared	—	—	—	—	—	—
USB 2.0 EHCI#1	—	—	—	—	—	—	—	shared
USB 2.0 EHCI#2	—	—	—	—	—	—	shared	—
USB12 UHCI#1	—	—	—	—	—	—	—	shared
USB34 UHCI#2	—	—	—	shared	—	—	—	—
USB56 UHCI#3	—	—	shared	—	—	—	—	—
USB78 UHCI#4	shared	—	—	—	—	—	—	—
USB910 UHCI#5	shared	—	—	—	—	—	—	—
SATA1, SATA2 (ICH8)	—	—	shared	—	—	—	—	—
SATA3, SATA4 (ICH8)	—	—	—	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.

2.6.3 PCI Express x4 slot

This motherboard supports PCI Express x4 network cards, SCSI cards and other cards that comply with the PCI Express specifications. The following figure shows a network card installed on the PCI Express x4 slot.
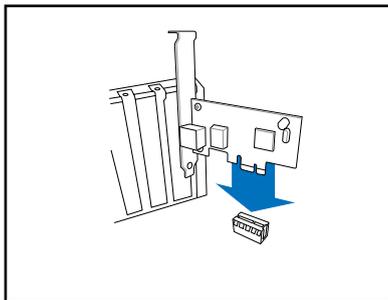
2.6.4 PCI slots

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

Before using a PCI VGA card, make sure to set the **Boot Graphics Adapter Priority** to PCI/IGD in the BIOS. See section "5.4.4 Chipset-> NorthBridge Configuration" for details.
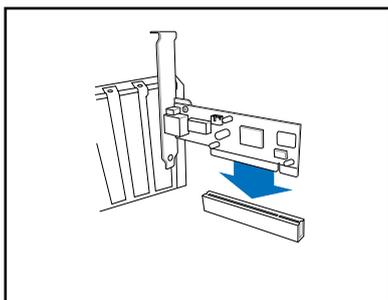
2.6.5 PCI Express x16 slot

This motherboard supports PCI Express x16 graphic cards that comply with the PCI Express specifications. The figure shows a graphics card installed on the PCI Express x16 sloti.
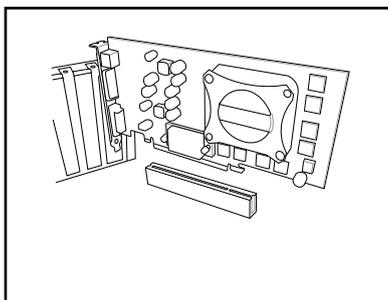
2.7   Installing an optical drive

Refer to the instructions in this section if you wish to install a new optical drive.

Follow these steps to install an optical drive:

1.   Place the chassis upright.
2.   Remove the drive slot metal plate cover.
3.   Insert the optical drive into the upper 5.25-inch drive bay and carefully push the optical drive into the bay until its screw holes align with the holes on the bay as shown.
4.   Secure the optical drive with two screws on both sides of the bay.
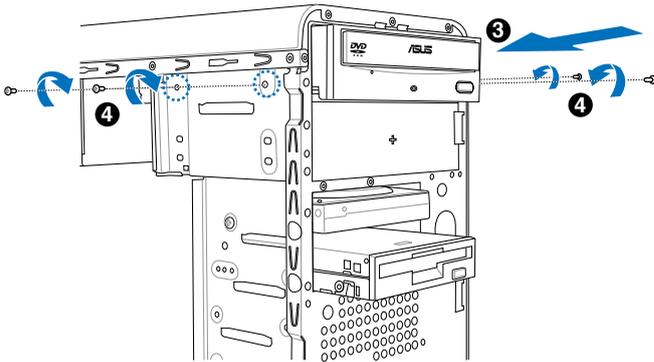
5.   Connect the audio (A), IDE (B), and power (C) plugs to connectors at the back of the drive.
6.   Connect the other end of the IDE ribbon cable to the secondary IDE connector (labeled SEC_IDE) on the motherboard. See page 4-6 for the location of this connector.

Audio cable
IDE ribbon cable
Power cable

7.   Remove the dummy drive slot cover from the front panel.
8.   Replace the front panel. Refer to section "2.11 Removing the bay covers and reinstalling the front panel assembly and side cover" on page 2-22 for details.
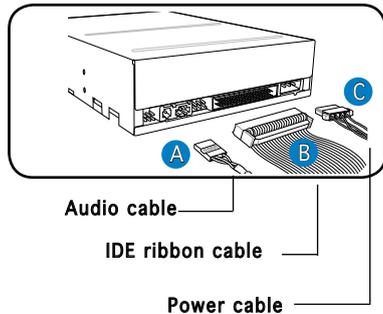
2.8 Installing a hard disk drive

The system may have one pre-installed 3.5-inch Serial ATA or IDE hard disk drive. Refer to this section to install additional Serial ATA or IDE hard disk drive(s).

To install a Serial ATA hard disk drive:

1. Place the chassis upright.
2. Use a screw driver to remove the HDD drive slot metal plate cover.
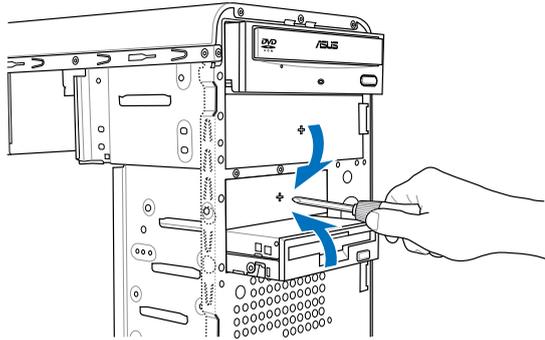
3. With the HDD label side up, carefully insert the drive into the 3.5-inch bay and push the drive into the bay until its screw holes align with the holes on the drive bay.
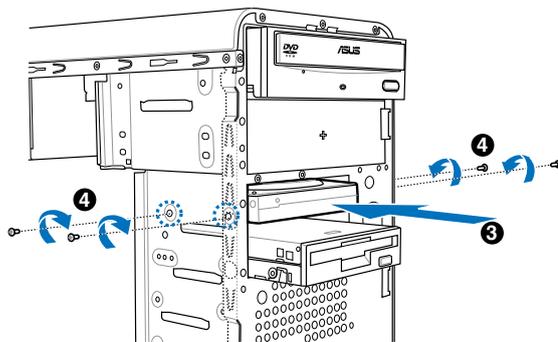
4. Secure the drive with two screws on both sides.

**Serial ATA power
cable**   **Serial ATA cable**
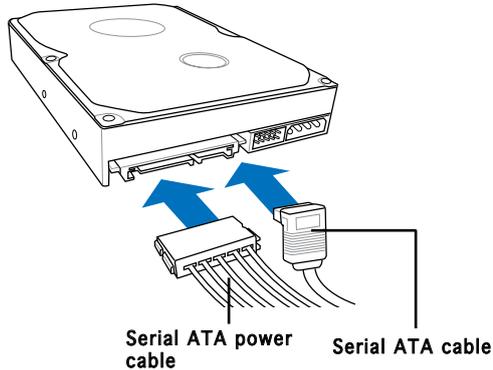
5. Connect one end of the Serial ATA cable to the SATA connector at
    the back of the drive, then connect the other end to a Serial ATA
    connector on the motherboard. See page 4-5 for the location of the
    Serial ATA connectors.

6. Connect a 15-pin Serial ATA power plug from the power supply unit to
    the 15-pin power connector at the back of the drive.

    - OR -

    Connect a 4-pin (female) power plug from the power supply unit to
    the 4-pin (male) power connector at the back of the drive.

> If your Serial ATA HDD has both 4-pin and 15-pin connectors at the
> back, use either the 15-pin SATA power adapter plug **OR** the legacy
> 4-pin power connector. **DO NOT** use both to prevent damage to
> components and to keep the system from becoming unstable.

To install an IDE hard disk drive:

1. Follow steps 1-4 of the previous section.
2. Connect the blue interface of the IDE ribbon cable to the primary IDE connector (blue connector labeled PRI_IDE) on the motherboard. See page 4-6 for the location of the connector.

IDE ribbon cable

Power cable
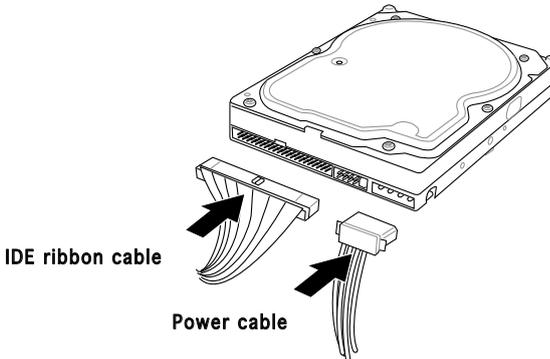
- If you will install only one hard disk drive, make sure to configure your hard disk drive as Master device before connecting the IDE cable and power plug. Refer to the HDD documentation on how to set the drive as a Master device.

- If you will install two IDE hard disk drives, configure the other device as Slave.

---

3. Connect the gray interface of the IDE ribbon cable to the IDE connector on the drive.
4. If you install two IDE hard disk drives, connect the black interface of the IDE ribbon cable to the IDE connector on the second (Slave) IDE hard disk drive.
5. Connect a 4-pin power plug from the power supply unit to the power connector at the back of the drive(s).

2.9   Installing a floppy disk drive

The V-Series P5G965 Barebone system comes with one 3.25-inch drive bay for a floppy disk drive.

To install a floppy disk drive:

1.   Remove the front panel cover.

> For instructions on how to remove the front panel cover, refer to page 2-3 of section "2.3 Removing the side cover and front panel assembly".

2.   Carefully insert the floppy disk drive into the floppy drive bay until the screw holes align with the holes on the bay.
3.   Secure the floppy disk drive with two screws on both sides.
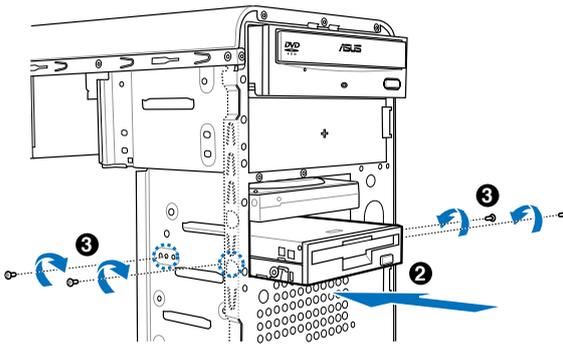
4.   Connect the floppy disk drive signal cable to the signal connector at the back of the drive.

Power cable

Floppy ribbon cable
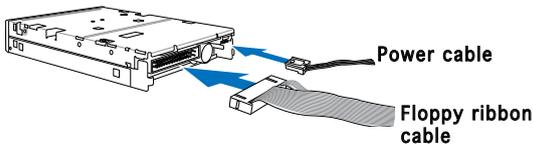
5.   Connect the other end of the signal cable to the floppy disk drive connector on the motherboard. See page 4-6 for the location of the floppy disk drive connector.
6.   Connect a 4-pin power cable from the power supply unit to the power connector at the back of the floppy disk drive.

2.10 Re-connecting cables

You may have disconnected some cables when you were installing components. You must re-connect these cables before you replace the chassis cover.

LED cables
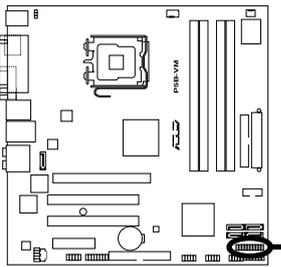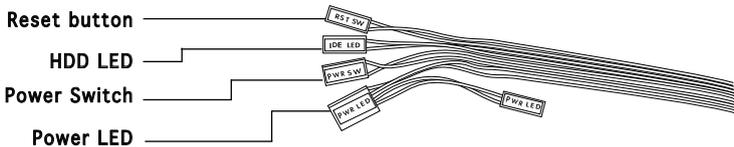
System Panel Connector
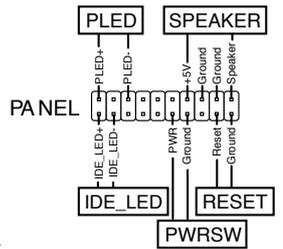
* Requires an ATX power supply

Connect the **reset button**, **power switch**, **power LED**, and **HDD LED** cables to their respective leads in the system panel connector on the motherboard. See page 4-11 for the system panel descriptions.

2.11 Removing the bay covers and reinstalling the front panel assembly and side cover

If you installed an optical and/or floppy disk drive, remove the bay cover(s) on the front panel assembly before reinstalling it to the chassis. To do this:

1. Locate the bay cover locks.
2. Press the locks outward to release the bay cover.
3. Push the bay cover inward, then set it aside.
4. Follow the same instructions to remove the 3.5" drive bay cover.
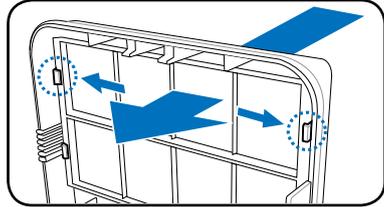
To reinstall the front panel assembly and side cover:

1. Insert the front panel assembly hinge-like tabs to the holes on the right side of the chassis.
2. Swing the front panel assembly to the left, then insert the hooks to the chassis until the front panel assembly fits in place.
3. Insert the six side cover hooks into the chassis tab holes .
4. Push the side cover to the direction of the front panel until it fits in place.
5. Secure the cover with two screws you removed earlier.

If the air duct interferes with the CPU fan, adjust the air duct accordingly.

Air duct

Chassis tab holes
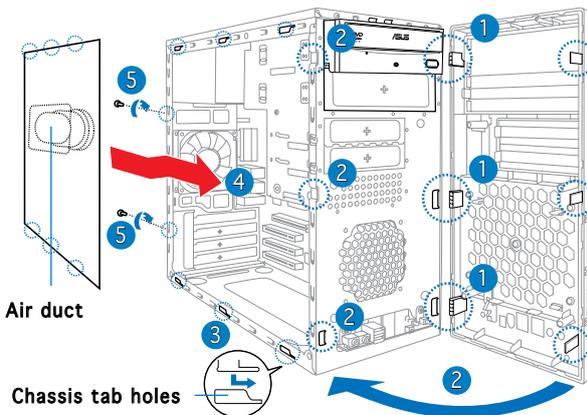
Chapter 3

This chapter helps you power up the system and install drivers and utilities from the support CD.
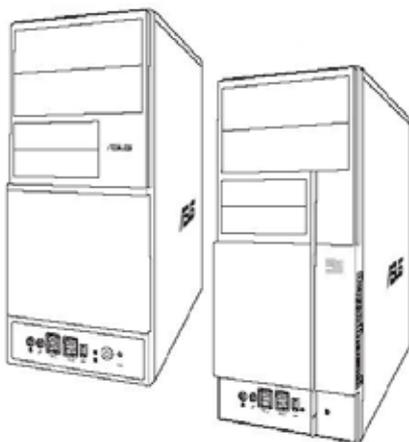
Starting up

3.1 Installing an operating system

The barebone system supports Windows® 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.

> • Windows XP OS setup cannot recognize Serial ATA hard drives without the necessary drivers. Use the bundled floppy disk when installing Windows XP OS to a Serial ATA hard drive.
>
> • From the Windows XP setup screen, press F6 when prompted then follow succeeding screen instructions to install the SATA drivers.

3.2 Powering up

Press the system power button (⏻) to enter the OS.

Press to turn ON the system

Press to turn ON the system
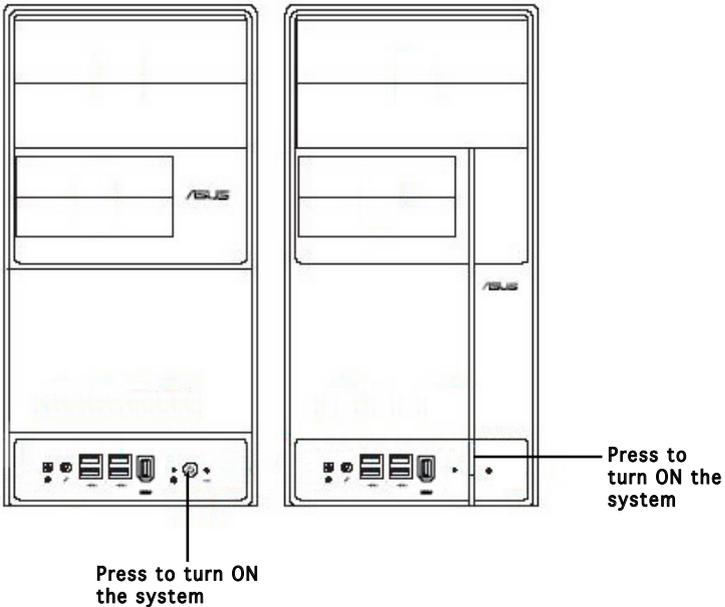
3.3 Support CD information

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

> • Screen display and driver options may not be the same for different operating system versions.
>
> • The contents of the support CD are subject to change at any time without notice. Visit the ASUS website for updates.

3.3.1 Running the support CD

To begin using the support CD, place the CD in your optical drive. The CD automatically displays the Drivers menu if Autorun is enabled in your computer.

Click an icon to display support CD/motherboard information

Click an item to install

> 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.

3.3.2 Drivers menu

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

ASUS InstAll-Drivers Installation Wizard

Installs the ASUS InstAll-Drivers Installation Wizard.

Intel Chipset Inf Update Program

Installs the Intel® chipset Inf update program.

Intel Graphics Accelerator Driver

Installs the Intel Graphics Accelerator driver.

SoundMAX ADI1988A Audio Driver

Installs the SoundMAX® ADI1988A audio driver and application.

JMicron JMB36X RAID Controller Driver

Installs the JMicron® JMB36X Serial ATA RAID controller driver.

Realtek RTL 8111b Ethernet Driver

Installs the Realtek RTL 8111b Ethernet driver and application.

USB 2.0 Driver

Installs the USB 2.0 Driver.

3.3.3 Utilities menu

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

ASUS InstAll-Installation Wizard for Utilities

Install the ASUS InstAll-Installation Wizard.

ASUS Update

The ASUS Update utility allows you to update the motherboard BIOS in Windows® environment. This utility requires an Internet connection either through a network or an Internet Service Provider (ISP)

AI Gear

AI Gear provides four modes that adjust the CPU frequency and Vcore voltage minimizing system noise and power consumption. You can choose the mode that best suits your computing needs.

AI Nap

With AI Nap, the system can continue running at minimum power and noise when you are temporarily away. To wake the system and return to the OS environment, simply click the mouse or press a key.

ASUS PC Probe II

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

Anti-Virus Utility

The anti-virus application scans, identifies, and removes computer viruses. View the online help for detailed information.

ADOBE Acrobat Reader V7.0

Installs the Adobe® Acrobat® Reader that allows you to open, view, and print documents in Portable Document Format (PDF).

Microsoft DirectX 9.0c

Installs the Microsoft® DirectX 9.0c driver. The Microsoft DirectX® 9.0c is a multimedia technology that enhances computer graphics and sound. DirectX® improves the multimedia features of you computer so you can enjoy watching TV and movies, capturing videos, or playing games in your computer. Visit the Microsoft website (www.microsoft.com) for updates.

3.3.4   Make Disk menu

The Make Disk menu contains items to create JMicron® JMB363 SATA/ PATA RAID driver disk.

Make JMicron JMB36X 32bit RAID Driver

Allows you to create a JMicron® JMB36X 32bit RAID driver.

Make JMicron JMB36X 64bit RAID Driver

Allows you to create a JMicron® JMB36X 64bit RAID driver.

3.3.5 Manuals menu

The Manuals menu contains a list of supplementary user manuals. Click an item to open the folder of the user manual.

Most user manual files are in Portable Document Format (PDF). Install the Adobe® Acrobat® Reader from the **Utilities** menu before opening a user manual file.

3.3.6 ASUS Contact information

Click the Contact tab to display the ASUS contact information. You can also find this information on the inside front cover of this user guide.

3.4   Software information

Most of the applications in the support CD have wizards that will conveniently guide you through the installation. View the online help or readme file that came with the software for more information.

3.4.1   SoundMAX® High Definition Audio utility

The ADI AD1988A High Definition Audio CODEC provides 8-channel audio capability through the SoundMAX® audio utility with AudioESP™ software to deliver the ultimate audio experience on your PC. The software implements high quality audio synthesis/rendering, 3D sound positioning, and advanced voice-input technologies.

Follow the installation wizard to install the ADI AD1988A Audio Driver from the support CD that came with the motherboard package to activate the SoundMAX® audio utility.

- • You must use 4-channel, 6-channel or 8-channel speakers for this setup.

- • SoundMAX® requires Microsoft® Windows® 2000/XP or later version. Make sure that one of these operating systems is installed before installing SoundMAX®.

- • Jack Retasking function works on High Definition front panel audio ports only.

If the SoundMAX® audio utility is correctly installed, you will find the SoundMAX® icon on the taskbar.

From the taskbar, double-click on the SoundMAX® icon to display the SoundMAX® Control Panel.

Audio preferences

Click the [icon] icon to go to the Preferences page. This page allows you to change various audio settings.

Enhanced Microphone Features

Voice recording
Enables Noise Filter function. Detects repetitive and stationary noises like computer fans, air conditioners, and other background noises then eliminates it in the incoming sudio stream while recording. You can enable it for a better recording quality.

3.4.2 ASUS AI Gear

ASUS AI Gear provides four system performance options that allows you to select the best performance setting for your computing needs. This easy-to-use utility adjusts the processor frequency and vCore voltage to minimize system noise and power consumption.

Shift the gear to the performance setting that you like.

Maximum
Performance

Medium
Performance

High
Performance

Maximum Power
Saving
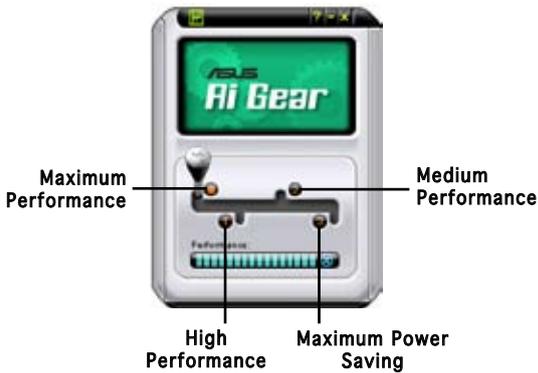
3.4.3 ASUS AI Nap

This feature allows you to minimize the power consumption of your computer whenever you are away. Enable this feature for minimum power consumption and a more quiet system operation.

Click Yes on the confirmation screen.
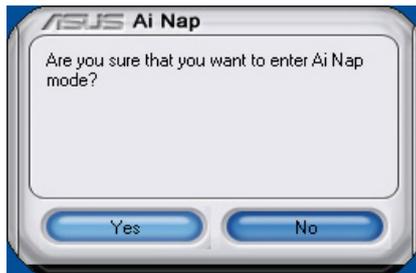
To exit AI Nap mode, press the system power or mouse button then click Yes on the confirmation screen.
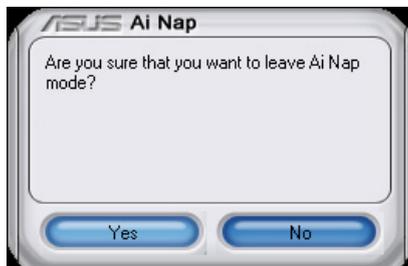
This chapter gives information about the motherboard that comes with the system. This chapter includes the motherboard layout, jumper settings, and connector locations.

Motherboard information
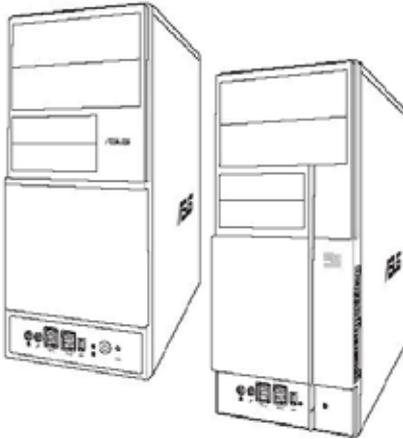
4.1 Introduction

The V-Series P5G965 barebone system comes with an ASUS motherboard. This chapter provides technical information about the motherboard for future upgrades or system reconfiguration.

4.2 Motherboard layout
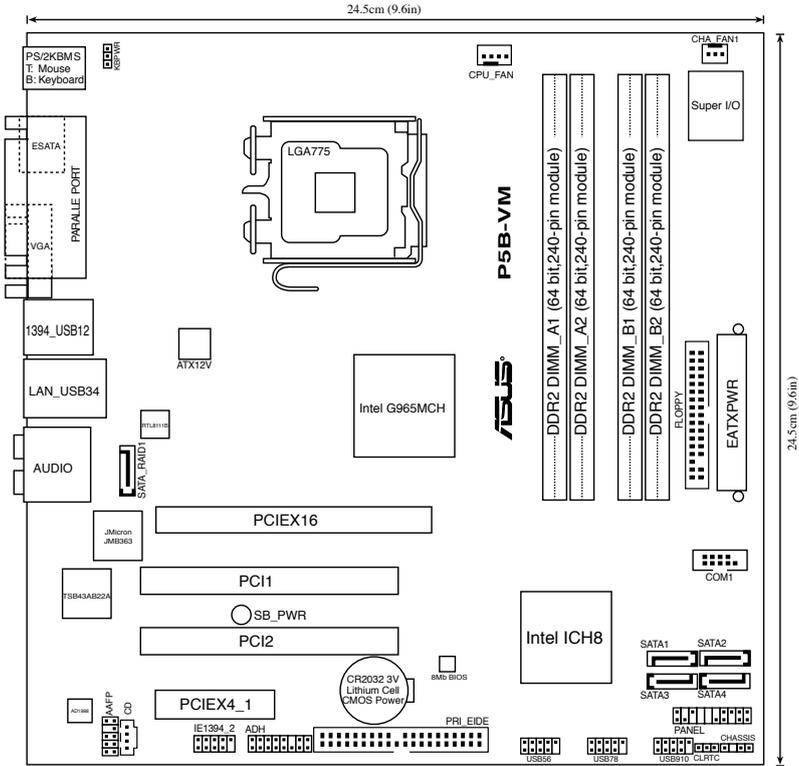
4.3 Jumpers

1. Clear RTC RAM (CLRTC)

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 onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. 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.
4. Reinstall 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.

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

CLRTC

1 2   2 3

Normal (Default)   Clear CMOS

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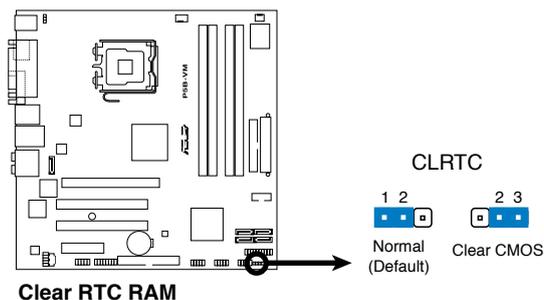
- You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

- Due to the chipset limitation, AC power off is required prior using C.P.R. function. You must turn off and on the power supply or unplug and plug the power cord before reboot the system.

2. Keyboard power (3-pin KBPWR)

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

Keyboard Power Setting

4.4   Connectors

1. **Floppy disk drive connector (34-1 pin FLOPPY)**

    This connector is for the provided floppy disk drive (FDD) signal cable. Insert one end of the cable to this connector, then connect the other end to the signal connector at the back of the floppy disk drive.

    Pin 5 on the connector is removed to prevent incorrect cable connection when using a FDD cable with a covered Pin 5.

    FLOPPY

    PIN 1

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

    Floppy Disk Drive Connector

2. **ICH8 Serial ATA connectors (7-pin SATA1, SATA2, SATA3, SATA4)**

    These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.

    SATA1   SATA2

    SATA3   SATA4

    SATA Connectors

    right angle side

    Connect the right-angle side of SATA signal cable to SATA device. Or you may connect the right-angle side of SATA cable to the onboard SATA port to avoid mechanical conflict with huge graphics cards.

3 IDE connector (40-1 pin PRI_EIDE)

The onboard IDE connector is for the Ultra DMA 133/100/66 signal cable. There are three connectors on each Ultra DMA 133/100/66 signal cable: blue, black, and gray. Connect the blue connector to the motherboard's IDE connector, then select one of the following modes to configure your device.

PRI_EIDE

PIN1

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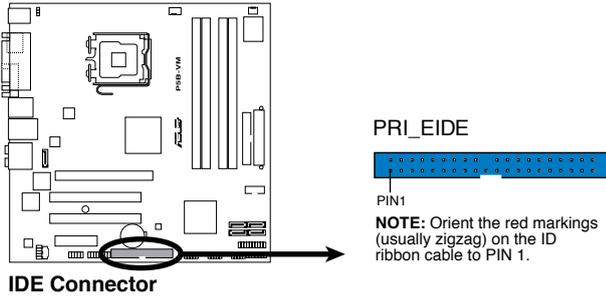
IDE Connector

	Drive jumper setting	Mode of device(s)	Cable connector
Single device	Cable-Select or Master	-	Black
Two devices	Cable-Select	Master	Black
		Slave	Gray
	Master	Master	Black or gray
	Slave	Slave	

• Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.

• Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.

If any device jumper is set as "Cable-Select", make sure all other device jumpers have the same setting.

4. CPU, and chassis fan connectors (4-pin CPU_FAN, 3-pin CHA_FAN1)

The fan connectors support cooling fans of 350 mA ~ 2000 mA (24 W max.) or a total of 1 A ~ 7 A (84 W 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.

CHA_FAN1
GND
+12V
Rotation

CPU_FAN
GND
CPU FAN PWR
CPU FAN IN
CPU FAN PWM

P5B-VM
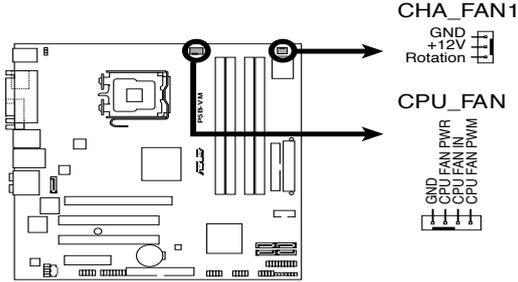
Fan Connectors

Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!

5. USB connectors (10-1 pin USB56, USB 78, USB910)

These connectors are for USB 2.0 ports. Connect the USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.

USB 2.0 Connectors

USB56   USB78   USB910
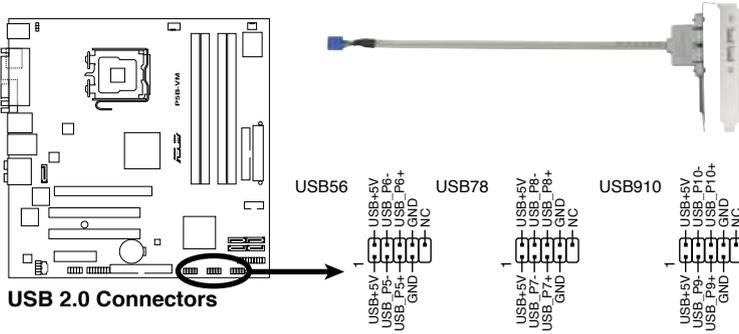
Never connect a **1394 cable** to the USB connectors. Doing so will damage the motherboard!

You can connect the USB cable to ASUS Q-Connector (USB, blue) first, and then install the Q-Connector (USB) to the USB connector onboard.

The USB module is purchased separately.

6. ATX power connectors (24-pin EATXPWR, 4-pin EATX12V)

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

EATX12V

```
GND ──┤  ├── GND
+12V DC ──┤  ├── +12V DC
```

EATXPWR

```
+3 Volts ────        ──── Ground
+12 Volts ────       ──── +5 Volts
+12 Volts ────       ──── +5 Volts
+5V Standby ────     ──── +5 Volts
Power OK ────        ──── -5 Volts
Ground ────          ──── Ground
+5 Volts ────        ──── Ground
Ground ────          ──── Ground
+5 Volts ────        ──── PSON#
Ground ────          ──── Ground
+3 Volts ────        ──── -12 Volts
+3 Volts ────        ──── +3 Volts
```

ATX Power Connector
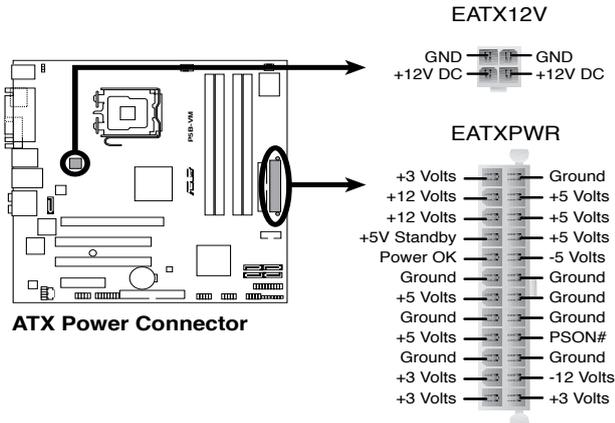
- For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 400 W.
- Do not forget to connect the 4-pin EATX12V power plug; otherwise, the system will not boot.
- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

7. Optical drive audio connector (4-pin CD)

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


```
CD          ── Right Audio Channel
(black)     ── Ground
            ── Ground
            ── Left Audio Channel
```

Internal Audio Connector
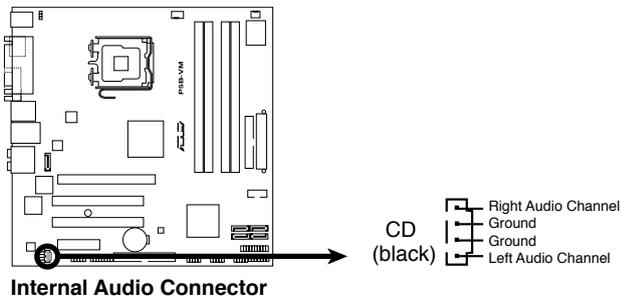
8. Front panel audio connector (10-1 pin AAFP)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC`97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.

Front Panel Audio Connector

Azalia-compliant pin definition

AAFP

HP_HD	HP_L
	Jack_Sense
MIC2_JD	HP_R
PRESENSE#	MIC2_R
AGND	MIC2_L

Legacy AC'97-compliant pin definition

NC	Line out_L
	NC
NC	Line out_R
NC	MIC2_R
AGND	MIC2_L
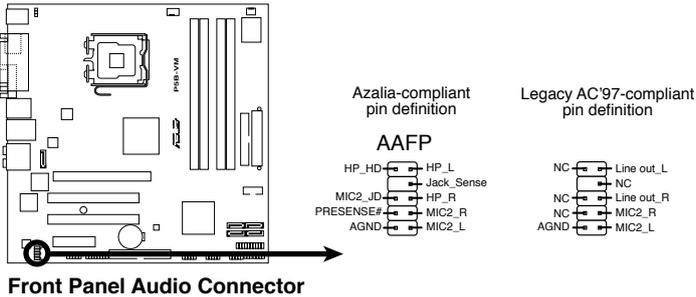
- We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

- By default, this connector is set to HD Audio. If you want to connect a AC' 97 front panel audio module to this connector, set the Front Panel Support Type item in the BIOS setup to [AC97]. See section 5.4. 5 Onboard Device Configuration for details.

---

9. Chassis intrusion connector (4-1 pin CHASSIS)

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

By default , the pin labeled "Chassis Signal" and " Ground" are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.

Chassis Intrusion Connector

CHASSIS

+5VSB_MB
Chassis Signal
GND

(Default)
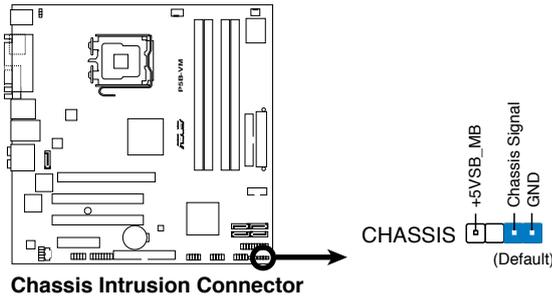
10. IEEE 1394a port connector (10-1 pin IE1394_2)

This connector is for a IEEE 1394a port. Connect the IEEE 1394a module cable to this connector, then install the module to a slot opening at the back of the system chassis.

IEEE 1394a Connector

IE1394_2

TPA1-
GND
TPB1-
+12V
GND

TPA1+
GND
TPB1+
+12V
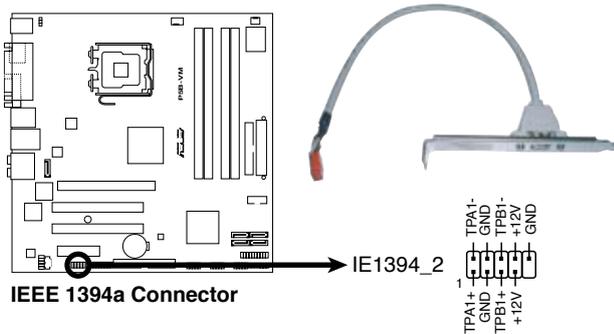
The IEEE 1394a module is purchased separately.

11. JMicron JMB363® Serial ATA RAID connector (7-pin SATA_ RAID)

This connector is for a Serial ATA signal cable. This connector supports a Serial ATA hard disk drive that you can configure for RAID through the onboard Serial ATA RAID controller.

The JMicron controller mode item in the BIOS is set to [AHCI] by default, allowing you to use the connectors to build a RAID set. See section "5.4.5 Onboard Device Configuration" for details.

SATA_RAID1

GND
RSATA_RXN1
RSATA_RXP1
GND
RSATA_TXN1
RSATA_TXP1
GND
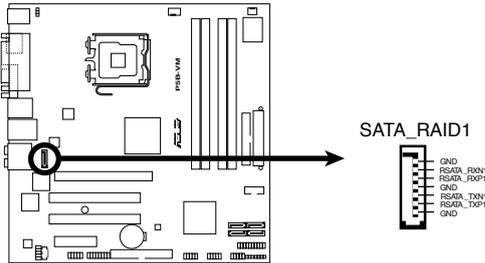
SATA RAID Connector

Before creating a RAID set using Serial ATA hard disks, make sure that you have connected the Serial ATA signal cables and installed Serial ATA hard disk drives; otherwise, you cannot enter the JMicron® JMB363 RAID utility and SATA BIOS setup during POST.

12. Serial port connector (10-1 pin COM1)

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.

COM1

PIN 1
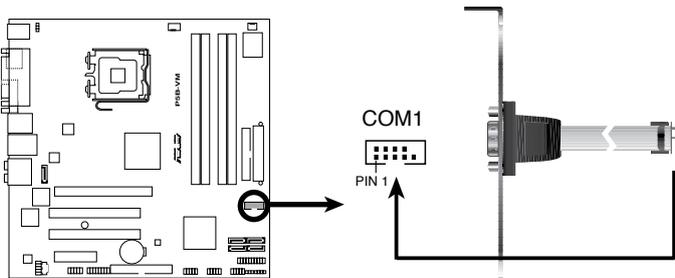
COM Port Connector

The COM module is purchased separately.

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

This connector supports several chassis-mounted functions.

System Panel Connector

PLED   SPEAKER

PANEL

IDE_LED   RESET

PWRSW

* Requires an ATX power supply
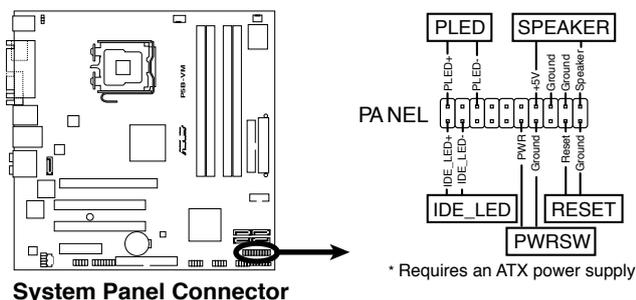
> The sytem panel connector is color-coded for easy connection. Refer to the connector description below for details.

- **System power LED (2-pin PLED)**
  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin IDE_LED)**
  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

- **System warning speaker (4-pin SPEAKER)**
  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

- **ATX power button/soft-off button (2-pin PWRSW)**
  This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **Reset button (2-pin RESET)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

Chapter 5

This chapter tells how to change
system settings through the BIOS
Setup menus and describes the
BIOS parameters.
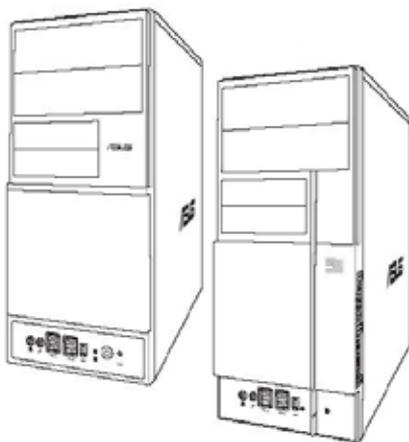
BIOS setup

5.1 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 2** (Updates the BIOS using a floppy disk, USB Flash, or the motherboard support CD during POST.)
2. **ASUS AFUDOS** (Updates the BIOS in DOS mode using a bootable floppy disk.)
3. **ASUS CrashFree BIOS 3** (Updates the BIOS using a bootable floppy, USB Flash disk, or the motherboard support CD when the BIOS file fails or gets corrupted.)
4. **ASUS Update** (Updates the BIOS in Windows® environment.)

Refer to the corresponding sections for details on these utilities.

> Save a copy of the original motherboard BIOS file to a bootable floppy disk or a USB flash disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

5.1.1 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.
   DOS environment

   a. Insert a 1.44MB floppy disk into the drive.

   b. At the DOS prompt, type `format A:/S` then press <Enter>.
   Windows® XP environment

   a. Insert a 1.44 MB floppy disk to the floppy disk drive.

   b. Click **Start** from the Windows® desktop, then select **My Computer**.

   c. Select the 3 1/2 Floppy Drive icon.

   d. Click **File** from the menu, then select **Format**. **A Format 3 1/2 Floppy Disk** window appears.

   e. Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.
   Windows® 2000 environment

   To create a set of boot disks for Windows® 2000:

   a. Insert a formatted, high density 1.44 MB floppy disk into the drive.

   b. Insert the Windows® 2000 CD to the optical drive.

   c. Click **Start**, then select **Run**.

d. From the Open field, type

   D:\bootdisk\makeboot a:

   assuming that D: is your optical drive.

e. Press <Enter>, then follow screen instructions to continue.

2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

5.1.2 ASUS EZ Flash 2 utility

The ASUS EZ Flash 2 feature allows you to update the BIOS without having to go through the long process of booting from a floppy disk and using a DOS-based utility. The EZ Flash 2 utility is built-in the BIOS chip so it is accessible by pressing <Alt> + <F2> during the Power-On Self-Test (POST).

To update the BIOS using EZ Flash 2:

1. Visit the ASUS website (www.asus.com) to download the latest BIOS file for the motherboard.

2. Save the BIOS file to a floppy disk or a USB flash disk, then restart the system.

3. You can launch the EZ Flash 2 by two methods.

   (1) Insert the floppy disk / USB flash disk that contains the BIOS file to the floppy disk drive or the USB port.

       Press <Alt> + <F2> during POST to display the following.
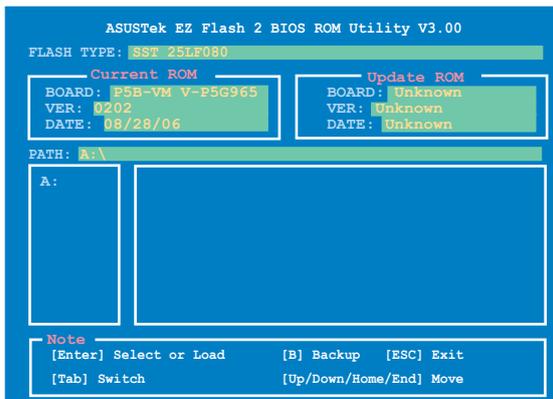
   (2) Enter BIOS setup program. Go to the Tools menu to select EZ Flash 2 and press <Enter> to enable it.

       You can switch between drives by pressing <Tab> before the correct file is found. Then press <Enter>.

4. When the correct BIOS file is found, EZ Flash 2 performs the BIOS update process and automatically reboots the system when done.

⚠️ • This function can support devices such as USB flash disk, or floppy disk with FAT 32/16 format only.
    • Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

5.1.3 AFUDOS utility

The AFUDOS utility allows you to update the BIOS file in DOS environment using a bootable floppy disk with the updated BIOS file. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility:

✏️ • Make sure that the floppy disk is not write-protected and has at least 600 KB free space to save the file.
    • The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be exactly the same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.
2. Boot the system in DOS mode, then at the prompt type:

    afudos /o[filename]

    where the [filename] is any user-assigned filename not more than eight alphanumeric characters for the main filename and three alphanumeric characters for the extension name.

    ```
    A:\>afudos /oOLDBIOS1.ROM
    ```

    Main filename Extension name

3. Press <Enter>. The utility copies the current BIOS file to the floppy disk.

    ```
    A:\>afudos /oOLDBIOS1.rom
    AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
    Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
       Reading flash ..... done
       Write to file...... ok
    A:\>
    ```

    The utility returns to the DOS prompt after copying the current BIOS file.

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1. Visit the ASUS website (www.asus.com) and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable floppy disk.

    Write the BIOS filename on a piece of paper. You need to type the exact BIOS filename at the DOS prompt.

2. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.

3. Boot the system in DOS mode, then at the prompt type:

    afudos /i[filename]

    where [filename] is the latest or the original BIOS file on the bootable floppy disk.

    ```
    A:\>afudos /iP5B-VM.ROM
    ```

4. The utility verifies the file and starts updating the BIOS.

    ```
    A:\>afudos /iP5B-VM.ROM
    AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
    Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

        WARNING!! Do not turn off power during flash BIOS
        Reading file ....... done
        Reading flash ...... done

        Advance Check ......
        Erasing flash ...... done
        Writing flash ...... 0x0008CC00 (9%)
    ```

    Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

    ```
    A:\>afudos /iP5B-VM.ROM
    AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
    Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

        WARNING!! Do not turn off power during flash BIOS
        Reading file ....... done
        Reading flash ...... done

        Advance Check ......
        Erasing flash ...... done
        Writing flash ...... done
        Verifying flash .... done

        Please restart your computer

    A:\>
    ```

5.1.4 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support CD, the USB flash disk, or the floppy disk that contains the updated BIOS file.

- Prepare the motherboard support CD, **the USB flash disk,** or the floppy disk containing the updated motherboard BIOS before using this utility.

- Make sure that you rename the original or updated BIOS file in the floppy disk or the USB flash disk to P5BVMA. ROM**.**

- If your display monitor is connected to the onboard VGA connector, the display monitor will turn-off and the system will beep once while CrashFree BIOS 3 starts updating your system. The system will beep once again while the process is finished, and the display will return after the system restarts.

Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

1. Turn on the system.
2. Insert the floppy disk with the original or updated BIOS file to the floppy disk drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

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

When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "P5RD2VM.ROM". Completed.
Start flashing...
```

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

4. Restart the system after the utility completes the updating process.

Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

1. Remove any floppy disk from the floppy disk drive, then turn on the system.
2. Insert the support CD to the optical drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

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

When no floppy disk is found, the utility automatically checks the optical drive for the original or updated BIOS file. The utility then updates the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy not found!
Checking for CD-ROM...
CD-ROM found!
Reading file "P5BVMA.ROM". Completed.
Start flashing...
```

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

4. Restart the system after the utility completes the updating process.

Recovering the BIOS from the USB flash disk

To recover the BIOS from the USB flash disk:

1. Insert the USB flash disk that contains BIOS file to the USB port.
2. Turn on the system.
3. The utility will automatically checks the devices for the BIOS file when found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

> The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website (www.asus.com) to download the latest BIOS file.

⚠️ • Only the USB flash disk with FAT 32/16 format and single partition can support ASUS CrashFree BIOS 3. The device size should be smaller than 8GB.

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

5.1.5 ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

• Save the current BIOS file

• Download the latest BIOS file from the Internet

• Update the BIOS from an updated BIOS file

• Update the BIOS directly from the Internet, and

• View the BIOS version information.

This utility is available in the support CD that comes with the motherboard package.

🖉 ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

Installing ASUS Update

To install ASUS Update:

1. Place the support CD in the optical drive. The Drivers menu appears.
2. Click the Utilities tab, then click Install ASUS Update. See page 3-5 for the Utilities screen menu.
3. The ASUS Update utility is copied to your system.

🖉 Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

To update the BIOS through the Internet:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate.** The ASUS Update main window appears.

2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.

3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

4. From the FTP site, select the BIOS version that you wish to download. Click **Next**.

5. Follow the screen instructions to complete the update process.

The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.

Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.

2. Select Update BIOS from a file option from the drop-down menu, then click **Next**.

3. Locate the BIOS file from the **Open** window, then click **Open**.

4. Follow the screen instructions to complete the update process.
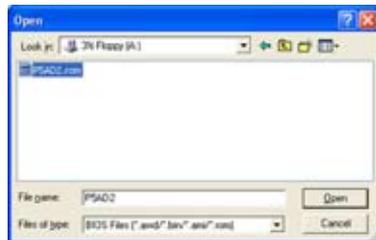
5.2   BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section "5.1 Managing and updating your BIOS."

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 can change the configuration of your computer in the future. For example, you can enable the security password feature or change 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 SPI chip.

The firmware chip 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 <Del> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, reboot the system by doing any of the following procedures:

- Restart using the OS standard shut-down procedure.
- Press <Ctrl>+<Alt>+<Del> simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on.

> ⚠ Using the **power button**, **reset button**, or the **<Ctrl>+<Alt>+<Del>** keys to force reset from a running operating system can cause damage to your data or system. We recommend to always shut-down the system properly from the operating system.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

> • The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit Menu. See section "5.8 Exit Menu."
>
> • The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
>
> • Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

5.2.1 BIOS menu screen

Menu items   Menu bar   Configuration fields   General help

```
                    BIOS SETUP UTILITY
  Main   Advanced   Power   Boot   Tools   Exit

     System Time                 [11:51:19]           Use [ENTER], [TAB]
     System Date                 [Fri 09/08/2006]     or [SHIFT-TAB] to
     Legacy Diskette A           [1.44M, 3.5 in]      select a field.
                                                      Use [+] or [-] to
  ▶    SATA 1                      :[Not Detected      configure system time.
  ▶    SATA 2                      :[Not Detected]
  ▶    SATA 3                      :[Not Detected]
  ▶    SATA 4                      :[Not Detected]
                                                      ←→    Select Screen
  ▶    IDE Configuration                              ↑↓    Select Item
                                                      +-    Change Option
  ▶    System Information                             F1    General Help
                                                      F10   Save and Exit
                                                      ESC   Exit

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```

Sub-menu items   Navigation keys

5.2.2 Menu bar

The menu bar on top of the screen has the following main items:

Main   For changing the basic system configuration
Advanced   For changing the advanced system settings
Power   For changing the advanced power management (APM)
                  configuration
Boot   For changing the system boot configuration
Tools   For setting EZ Flash 2 and O.C. Profile.
Exit   For selecting the exit options and loading default
                  settings

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

5.2.3 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for
that particular menu. Use the navigation keys to select items in the menu
and change the settings.

Some of the navigation keys differ from one screen to another.

5.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.
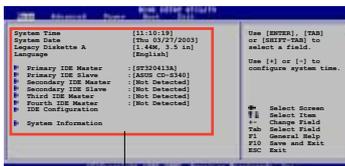
Main menu items

5.2.5 Sub-menu items

A solid triangle before each item on any menu screen means that the iteam has a sub-menu. To display the sub-menu, select the item and press <Enter>.

5.2.6 Configuration fields

These fields show the values for the menu items. If an item is user- configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to "5.2.7 Pop-up window."

5.2.7 Pop-up window

Select a menu item then press <Enter> to display a pop-up window with the configuration options for that item.

5.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> /<Page Down> keys to display the other items on the screen.
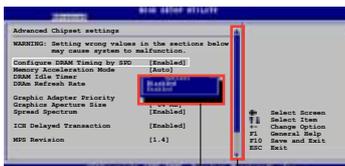
Pop-up window

5.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.

Scroll bar

5.3 Main menu

When you enter the BIOS Setup program, the Main menu screen appears, giving you an overview of the basic system information.

Refer to section "5.2.1 BIOS menu screen" for information on the menu screen items and how to navigate through them.

```
                         BIOS SETUP UTILITY
   Main    Advanced    Power    Boot    Tools    Exit

  System Time                   [11:51:19]         Use [ENTER], [TAB]
  System Date                   [Fri 09/08/2006]   or [SHIFT-TAB] to
  Legacy Diskette A             [1.44M, 3.5 in]    select a field.
                                                   Use [+] or [-] to
  ▶  SATA 1                     :[Not Detected     configure system time.
  ▶  SATA 2                     :[Not Detected]
  ▶  SATA 3                     :[Not Detected]
  ▶  SATA 4                     :[Not Detected]
                                                   ←→    Select Screen
  ▶  IDE Configuration                             ↑↓    Select Item
                                                   +-    Change Option
  ▶  System Information                            F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit

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```

5.3.1 System Time [xx:xx:xxxx]

Allows you to set the system time.

5.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

5.3.3 Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive installed. Configuration options: [Disabled] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

5.3.4 SATA1, SATA2, SATA3, and SATA4

While entering Setup, the BIOS automatically detects the presence of IDE devices. There is a separate sub-menu for each IDE device. Select a device item then press <Enter> to display the IDE device information.

```
                        BIOS SETUP UTILITY
   Main    Advanced   Power    Boot    Tools   Exit

    SATA 1

    Device      : Not Detected

    Type                        [Auto]
    LBA/Large Mode              [Auto]
    Block(Multi-sector Transfer) M    [Auto]
    PIO Mode                    [Auto]
    DMA Mode                    [Auto]
    SMART Monitoring            [Auto]
    32Bit Data Transfer         [Disabled]
                                              ←→   Select Screen
                                              ↑↓   Select Item
                                              +-   Change Option
                                              F1   General Help
                                              F10  Save and Exit
                                              ESC  Exit

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```

The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

Type [Auto]

Selects the type of IDE drive. Setting to Auto allows automatic selection of the appropriate IDE device type. Select CDROM if you are specifically configuring a CD-ROM drive. Select ARMD (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive. Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to Auto enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

Block (Multi-sector Transfer) M [Auto]

Enables or disables data multi-sectors transfers. When set to Auto, the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time. Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Selects the PIO mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

Selects the DMA mode. Configuration options: [Auto] [SWDMA0]
[SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0]
[UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]

SMART Monitoring [Auto]

Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Disabled]

Enables or disables 32-bit data transfer.
Configuration options: [Disabled] [Enabled]

5.3.5   IDE Configuration

The items in this menu allow you to set or change the configurations for
the IDE devices installed in the system. Select an item then press <Enter>
if you wish to configure the item.
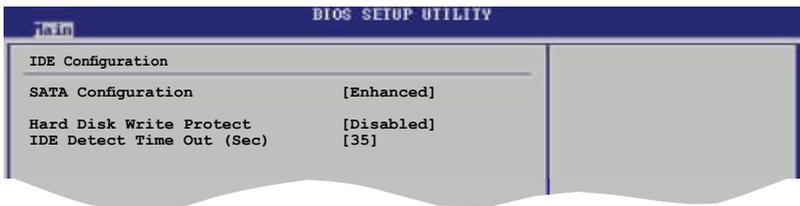
SATA Configuration [Enhanced]

Configuration options: [Compatible] [Enhanced] [Disabled]

Hard Disk Write Protect [Disabled]

Allows you to enable to disable the hard disk write protection. This will be effective only
if device is accessed through BIOS. Configuration options: [Disabled] [Enabled]

IDE Detect Time Out [35]

Selects the time out value for detecting ATA/ATAPI devices.
Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

5.3.6 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.

```
                        BIOS SETUP UTILITY
 Main

 AMIBIOS

 Version    : 0202
 Build Date : 08/28/06

 Processor

 Type       : Intel(R) Core(TM)2 CPU 6300 @ 1.86GHz
 Speed      : 1866MHz
 Count      : 2

 System Memory
 Available    : 504MB                ↔    Select Screen
                                      ↑↓   Select Item
                                      +-   Change Option
                                      F1   General Help
                                      F10  Save and Exit
                                      ESC  Exit
```

AMI BIOS
Displays the auto-detected BIOS information

Processor
Displays the auto-detected CPU specification

System Memory
Displays the auto-detected system memory

5.4 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.

⚠️ Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

```
                         BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Tools    Exit

     Jumperfree Configuration
     USB Configuration

     CPU Configuration
     Chipset
     Onboard Devices Configuration
     PCIPnP

                                           ←→    Select Screen
                                           ↑↓    Select Item
                                           Enter  Go to Sub Screen
                                           F1    General Help
                                           F10   Save and Exit
                                           ESC   Exit

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```

5.4.1 Jumperfree Configuration

```
                         BIOS SETUP UTILITY
       Advanced

     Configure System Frequency/Voltage

     AI Tuning                     [Auto]
```
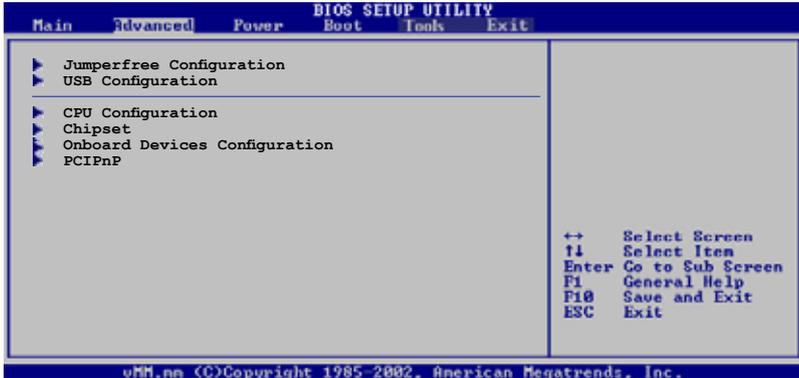
AI Tuning [Standard]

Allows selection of CPU frequency and auto adjustment of relevant parameters. Frequencies higher than CPU manufacturer recommends are not guaranteed to be stable. If the system becomes unstable, return to the default. Configuration options: [Manual] [Standard]

🖉 The following items appear only when the AI Tuning item is set to [Manual].

CPU Frequency [200]

Displays the frequency sent by the clock generator to the system bus and PCI bus. The value of this item is auto-detected by the BIOS. Use the <+> and <-> keys to adjust the CPU frequency. You can also type the desired CPU frequency using the numeric keypad. The values range from 100 to 400. Refer to the table below for the correct Front Side Bus and CPU External Frequency settings.

FSB/CPU External Frequency Synchronization

Front Side Bus	CPU External Frequency
FSB 1066	266 MHz
FSB 800	200 MHz
FSB 533	133 MHz

DRAM Frequency [Auto]

Allows you to set the DDR operating frequency.
Configuration options:

Available DRAM frequency options in various FSB settings

FSB	Configuration options					
	Auto	DDR2-533	DDR2-667	DDR2-800	DDR2-889*	DDR2-1067*
FSB 1066	●	●	●	●	●	●
FSB 800	●	●	●	●		

* Provided for overclocking purpose only.

> ⚠️ Selecting a very high DRAM frequency may cause the system to become unstable! If this happens, revert to the default setting.

> ✎ The DRAM Frequency item also appears when you set the AI Tuning item to [AI NOS].

PCI Express Frequency [Auto]

Allows you to select PCI Express frequency.
Configuration options: [Auto] [90] [91] [92] [93]... [150]

Spread Spectrum [Enabled]

Allows you to enable or disable the clock generator spread spectrum.
Configuration options: [Disabled] [Enabled]

Memory Voltage [Auto]

Allows you to select the memory voltage or set it to auto for safe mode.
Configuration options: [Auto] [1.80V] [1.85V] [1.90V] [1.95V]

CPU VCore Voltage [Auto]

Allows selection of the CPU VCore voltage. The configuration options vary depending on the CPU installed. Setting to Auto allows the BIOS to detect the VCore voltage of the CPU installed.

> ⚠️ Refer to the CPU documentation before setting the CPU VCore voltage. A very high Vcore voltage can severely damage the CPU!

5.4.2 USB Configuration

The items in this menu allows you to change the USB-related features.
Select an item then press <Enter> to display the configuration options.

```
                          BIOS SETUP UTILITY
    Advanced

    USB Configuration

    Module Version - 2.24.0-11.4

    USB Devices Enabled:
              None

    Legacy USB Support              [Auto]
    Port 64/60 Emulation            [Disabled]
    USB 2.0 Controller Mode         [HiSpeed]
    BIOS EHCI Hand-Off              [Enabled]
                                                ↔    Select Screen
```
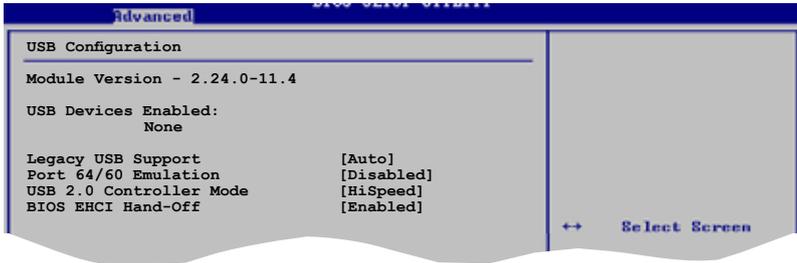
> The Module Version and USB Devices Enabled items show the
> auto-detected values. If no USB device is detected, the item shows
> None.

Legacy USB Support [Auto]

Allows you to enable or disable support for USB devices on legacy
operating systems (OS). Setting to Auto allows the system to detect the
presence of USB devices at startup. If detected, the USB controller legacy
mode is enabled. If no USB device is detected, the legacy USB support is
disabled. Configuration options: [Disabled] [Enabled] [Auto]

Port 64/60 Emulation [Disabled]

Allows you to disable or enable the I/O port 60h/64h emulation support.
This should be enabled for the complete USB keyboard legacy support for
non-USB aware OSes. Configuration options: [Disabled] [Enabled]

USB 2.0 Controller Mode [HiSpeed]

Allows you to configure the USB 2.0 controller in HiSpeed (480 Mbps) or
Full Speed (12 Mbps). Configuration options: [HiSpeed] [Full Speed]

BIOS EHCI Hand-Off [Enabled]

Allows you to enable support for operating systems without an EHCI
hand-off feature. Configuration options: [Disabled] [Enabled]

5.4.3 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.

```
                        BIOS SETUP UTILITY
   Main   Advanced   Power   Boot   Tools   Exit

  Configure advanced CPU settings
  Module Version: 3C.0E

  Manufacturer: Intel
  Brand String: Intel(R) Pentium(R) 4 CPU 3.00GHz
  Frequency   : 3.00GHz
  FSB Speed   : 800MHz
  Cache L1    : 16 KB
  Cache L2    : 2048 KB
  Ratio Actual Value: 15

  Hardware Prefetcher          [Enabled]
  Adjacent Cache Line Prefetch [Enabled]          ←→   Select Screen
  Max CPUID Value Limit:       [Disabled]         ↑↓   Select Item
  Execute Disable Bit          [Enabled]          Enter Go to Sub Screen
  Hyper Threading Technology   [Enabled]          F1   General Help
  Intel(R) SpeedStep(tm) tech. [Automatic]        F10  Save and Exit
  Intel(R) C-STATE tech.       [Enabled]          ESC  Exit

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```

Hardware Prefetcher [Enabled]

Enables or disables the Hardware Prefetcher feature.
Configuration options: [Disabled] [Enabled]

Adjacent Cache Line Prefetch [Enabled]

Enables or disables the Adjacent Cache Line Prefetch feature.
Configuration options: [Disabled] [Enabled]

Max CPUID Value Limit [Disabled]

Enable this item to boot legacy operating systems that cannot support CPUs with extended CPUID functions. Configuration options: [Disabled] [Enabled]

CPU TM function [Enabled]

Allows you to enable or disable the CPU internal thermal control function. In TM mode, the CPU power consumption is reduced. Configuration options: [Disabled] [Enabled]

Execute Disable Function [Enabled]

Allows you to Enable/disable Execute Disable Function.
Configuration options: [Disabled] [Enabled]

Hyper-Threading Technology [Enabled]

Allows you to enable or disable the processor Hyper-Threading Technology. Configuration options: [Disabled] [Enabled]

> The following item appears only when you installed an Intel® Pentium® 4 or later CPU that supports the Enhanced Intel SpeedStep® Technology (EIST).

Intel(R) SpeedStep Technology [Automatic]

Allows you to use the Enhanced Intel® SpeedStep® Technology. When set to [Enabled], you can adjust the system power settings in the operating system to use the EIST feature. Set this item to [Disabled] if you do not want to use the EIST. Configuration options: [Automatic] [Disabled]

Intel(R) C-STATE Technology [Enabled]

Allows you to enable or disable the C-STATE technology. Configuration options: [Enabled] [Disabled]

5.4.4 Chipset

The Chipset menu allows you to change the advanced chipset settings. Select an item then press <Enter> to display the sub-menu.

```
                        BIOS SETUP UTILITY
        Advanced

   Chipset Settings
   WARNING: Setting wrong values in below sections

   ▶   NorthBridge Configuration
```

NorthBridge Configuration
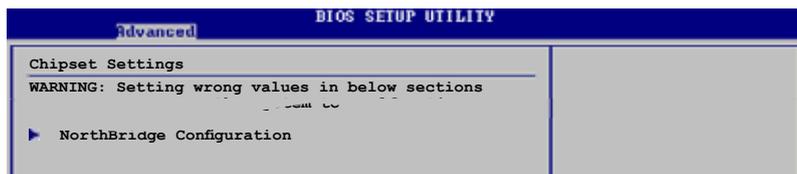
```
                        BIOS SETUP UTILITY
        Advanced

   North Bridge chipset Configuration

   Memory Remap Feature           [Disabled]
   Configure DRAM Timing by SPD   [Enabled]

   Initiate Graphic Adapter       [PEG/PCI]
   Initiate Graphic Mode Select   [Enabled, 8MB]


   DVMT Mode Select               [Fixed Mode]
   DVMT/FIXED Memory              [128MB]

   PEG Port Configuration                              ←→   Select Screen
      PEG Force x1                [Disabled]           ↑↓   Select Item
                                                       +-   Change Option
                                                       F1   General Help
```

Memory Remapping Feature [Disabled]

Allows you to enable or disable the remapping of the overlapped PCI memory above the total physical memory. Enable this option only when you install 64-bit operating system.
Configuration options: [Disabled] [Enabled]

Configure DRAM Timing by SPD [Enabled]

When this item is enabled, the DRAM timing parameters are set according to the DRAM SPD (Serial Presence Detect). When disabled, you can manually set the DRAM timing parameters through the DRAM sub-items.
Configuration options: [Enabled] [Disabled]

Initiate Graphic Adapter [PEG/PCI]

Allows you to select the graphics controller as the primary boot device.
Configuration options: [IGD] [PCI/IGD] [PCI/PEG] [PEG/IGD] [PEG/PCI]

Initiate Graphic Mode Select [Enabled, 8MB]

Allows you to select the amount of system memory used by the Internal graphics device. Configuration options: [Disabled] [Enabled,1MB] [Enabled, 8MB]

DVMT Mode Select [Fixed Mode]

Allows you to select the DVMT mode.
Configuration options: [Fixed Mode] [DVMT Mode]

DVMT/FIXED Memory [128MB]

Allows you to select the DVMT/FIXED graphic memory size.
Configuration options: [128MB] [256MB] [Maximum DVMT]

> • The option of "Maximum DVMT" is for "DVMT Mode" only.

PEG Force x1 [Disabled]

Configuration options: [Enabled] [Disabled]

5.4.5 Onboard Devices Configuration

```
                     BIOS SETUP UTILITY
  Advanced

  HD Audio Controller          [Enabled]
  Onboard 1394 Controller      [Enabled]
  Onboard PCIE GbE LAN         [Enabled]
   LAN Option ROM              [Disabled]
  JMicron SATA/PATA Controller [Enabled]
  JMicron Controller Mode      [BASIC]

  Serial Port1 Address         [3F8/IRQ4]
  Parallel Port Address        [378]
  Parallel Port Mode           [ECP]
    ECP Mode DMA Channel        [DMA3]
   Parallel Port IRQ            [IRQ7]
                                             ←→    Select Screen
                                             ↑↓    Select Item
                                             +-    Change Option
```

HD Audio Controller [Enabled]

Allows you to enable or disable the High Definition Audio controller.
Configuration options: [Disabled] [Enabled]

Front Panel Support Type [HD Audio]

Allows you to set the Front Panel Support Type.
Configuration options: [AC97] [HD Audio]

Onboard 1394 Controller [Enabled]

Allows you to enable or disable the onboard 1394 controller.
Configuration options: [Disabled] [Enabled]

Onboard PCIE Gb LAN [Enabled]

Allows you to enable or disable the onboard PCIE Gigabit LAN controller.
Configuration options: [Disabled] [Enabled]

> *LAN Option ROM [Disabled]*
> Allows you to enable or disable the boot ROM in the onboard LAN
> controller. This item appears only when the Onboard LAN item is set
> to Enabled. Configuration options: [Disabled] [Enabled]

JMicron SATA/PATA Controller [Enabled]

Allows you to enable or disable the JMicron SATA/PATA controller.
Configuration options: [Disabled] [Enabled]

JMicron Controller Mode [BASIC]

Allows you to set the JMicron Controller Mode.
Configuration options: [RAID] [BASIC] [AHCI]

Must load the JMB363 driver when create RAID sets, even if all the drivers of the RAID sets are used as data drivers.

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address. Configuration options: [Disabled] [3F8/IRQ4][2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Parallel Port Address [378]

Allows you to select the Parallel Port base addresses.
Configuration options: [Disabled] [378] [278] [3BC]

Parallel Port Mode [ECP]

Allows you to select the Parallel Port mode.
Configuration options: [Normal] [Bi-directional] [EPP] [ECP]

> *ECP Mode DMA Channel [DMA3]*
> Appears only when the Parallel Port Mode is set to [ECP]. This item allows you to set the Parallel Port ECP DMA.
> Configuration options: [DMA0] [DMA1] [DMA3]

> *Parallel Port IRQ [IRQ7]*
> Configuration options: [IRQ5] [IRQ7]

5.4.6   PCI PnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel resources for either PCI/PnP or legacy ISA devices, and setting the memory size block for legacy ISA devices.

![warning icon] Take caution when changing the settings of the PCI PnP menu items. Incorrect field values can cause the system to malfunction.

```
                        BIOS SETUP UTILITY
         Advanced

  Advanced PCI/PnP Settings

  WARNING: Setting wrong values in below sections
           may cause system to malfunction.

  Plug And Play O/S              [No]
  PCI Latency Timer              [64]
  Allocate IRQ to PCI VGA        [Yes]
  Palette Snooping               [Disabled]

  IRQ-3 assigned to              [PCI Device]
  IRQ-4 assigned to              [PCI Device]
  IRQ-5 assigned to              [PCI Device]          ←    Select Screen
  IRQ-7 assigned to              [PCI Device]          ↑↓   Select Item
  IRQ-9 assigned to              [PCI Device]          +-   Change Option
  IRQ-10 assigned to             [PCI Device]          F1   General Help
  IRQ-11 assigned to             [PCI Device]          F10  Save and Exit
  IRQ-14 assigned to             [PCI Device]          ESC  Exit
  IRQ-15 assigned to             [PCI Device]

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```

Plug and Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot. Configuration options: [No] [Yes]

PCI Latency Timer [64]

Allows you to select the value in units of PCI clocks for the PCI device latency timer register. Configuration options: [32] [64] [96] [128] [160] [192] [224] [248]

Allocate IRQ to PCI VGA [Yes]

When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested. Configuration options: [No] [Yes]

Palette Snooping [Disabled]

When set to [Enabled], the pallete snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Configuration options: [Disabled] [Enabled]

5.5   Power menu

The Power menu items allow you to change the settings for the Advanced Configuration and Power Interface (ACPI) and the Advanced Power Management (APM). Select an item then press <Enter> to display the configuration options.

```
                          BIOS SETUP UTILITY
   Main    Advanced    Power    Boot    Tools    Exit

   Suspend Mode                  [Auto]
   Repost Video on S3 Resume     [Disabled]
   ACPI 2.0 Support              [Disabled]
   ACPI APIC Support             [Enabled]

   ▶  APM Configuration
   ▶  Hardware Monitor

```
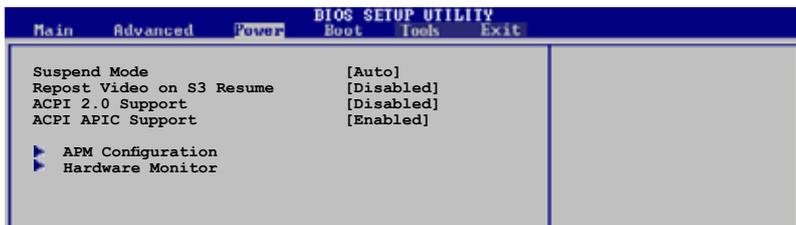
5.5.1   Suspend Mode [Auto]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend. Configuration options: [S1(POS) Only] [S3 Only] [Auto]

5.5.2   Repost Video on S3 Resume [Disabled]

Allows you to determines whether to invoke VGA BIOS POST on S3/STR resume. Configuration options: [Disabled] [Enabled]

5.5.3   ACPI 2.0 Support [Disabled]

Allows you to add more tables for Advanced Configuration and Power Interface (ACPI) 2.0 specifications. Configuration options: [Disabled] [Enabled]

5.5.4   ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

5.5.5 APM Configuration

```
                    BIOS SETUP UTILITY
                 Power

   APM Configuration                               Enabled or disable
                                                   APM.
   Restore on AC Power Loss        [Power Off]
   Power On By RTC Alarm           [Disabled]
   Power On By External Modems     [Disabled]
   Power On By PCI Devices         [Disabled]
   Power On By PCIE Devices        [Disabled]
   Power On By PS/2 Keyboard       [Disabled]
   Power On By PS/2 Mouse          [Disabled]
```

Restore on AC Power Loss [Power Off]

When set to Power Off, the system goes into off state after an AC power loss. When set to Power On, the system goes on after an AC power loss. When set to Last State, the system goes into either off or on state, whatever the system state was before the AC power loss. Configuration options: [Power Off] [Power On] [Last State]

Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to Enabled, the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values. Configuration options: [Disabled] [Enabled]

Power On By External Modems [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]

> The computer cannot receive or transmit data until the computer and applications are fully running. Thus, connection cannot be made on the first try. Turning an external modem off and then back on while the computer is off causes an initialization string that turns the system power on.

Power On By PCI Devices [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 On By PCIE Devices [Disabled]

When set to [Enabled], this parameter allows you to turn on the system through a PCIE 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 On By PS/2 Keyboard [Disabled]

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 feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

5.5.6   Hardware Monitor

```
                       BIOS SETUP UTILITY
               Power

  Hardware Monitor

  CPU Temperature              [48°C/118°F]
  MB Temperature               [38°C/100°F]

  CPU Fan Speed (RPM)          [Ignored]
  Chassis Fan1 Speed           [N/A]

  VCORE Voltage                [ 1.320V]
  3.3V Voltage                 [ 3.345V]
  5V Voltage                   [ 5.094V]
  12V Voltage                  [11.880V]                ←→    Select Screen
                                                        ↑↓    Select Item
  ASUS Advanced Q-Fan Control                           +-    Change Option
                                                        F1    General Help
  Fan Profile                  [Silent]                 F10   Save and Exit
                                                        ESC   Exit


        vMM.mn (C)Copyright 1985-2002, American Megatrends, Inc.
```

CPU Temperature [xxxºC/xxxºF]
MB Temperature [xxxºC/xxxºF]

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures. Select Ignored if you do not wish to display the detected temperatures.

CPU Fan Speed (RPM) [xxxxRPM] or [N/A] or [Ignored]

The onboard hardware monitor automatically detects and displays the CPU fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows N/A. Select Ignored if you do not wish to display the detected speed.

Chassis Fan1 Speed [xxxxRPM] or [N/A] or [Ignored]

The onboard hardware monitor automatically detects and displays the chassis fan speed in rotations per minute (RPM). If the fan is not connected to the chassis, the specific field shows N/A. Select Ignored if you do not wish to display the detected speed.

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

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

ASUS Advanced Q-Fan Control [Disabled]

Allows you to enable or disable the ASUS Advanced Q-Fan control. Configuration options: [Disabled] [Performance] [Optimal] [Silent] [Ultra Silent]

> The option of "Ultra Silent" is for Intel® Core™2 processors only.

5.6   Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press <Enter> to display the sub-menu.
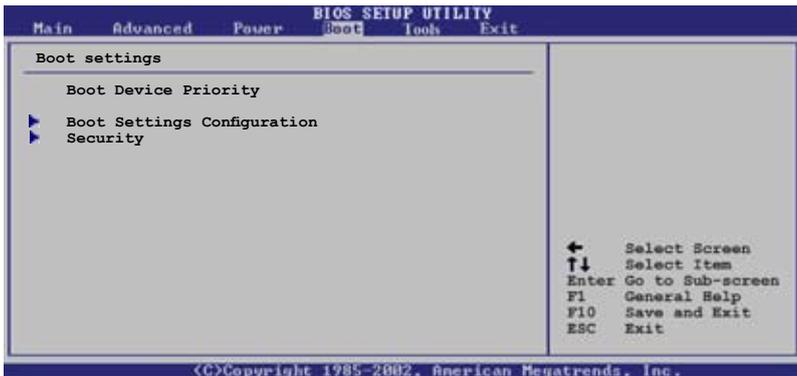
5.6.1   Boot Device Priority
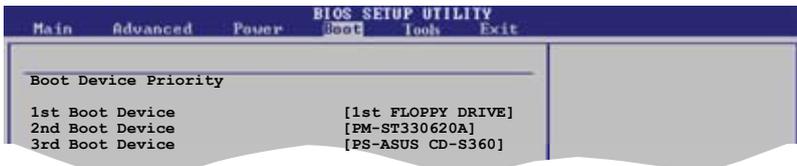
1st ~ xxth Boot Device [1st Floppy Drive]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.
Configuration options: [xxxxx Drive] [Disabled]

5.6.2 Boot Settings Configuration

```
                    BIOS SETUP UTILITY
                         Boot

 Boot Settings Configuration                    Allows BIOS to skip
                                                certain tests while
 Quick Boot                    [Enabled]        booting. This will
 Full Screen Logo              [Enabled]        decrease the time
 AddOn ROM Display Mode         [Force BIOS]     needed to boot the
 Bootup Num-Lock               [On]             system.
 PS/2 Mouse Support            [Auto]
 Wait For 'F1' If Error        [Enabled]
 Hit 'DEL' Message Display     [Enabled]
 Interrupt 19 Capture          [Disabled]

```

Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.
Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

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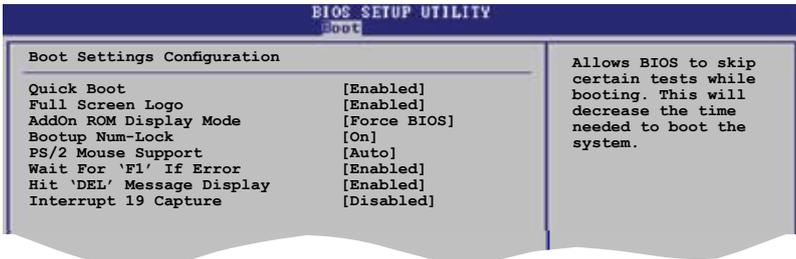Configuration options: [Disabled] [Enabled]

Set this item to [Enabled] to use the ASUS MyLogo2™ feature.

Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.
Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.
Configuration options: [Off] [On]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.
Configuration options: [Disabled] [Enabled] [Auto]

Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for the F1 key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]
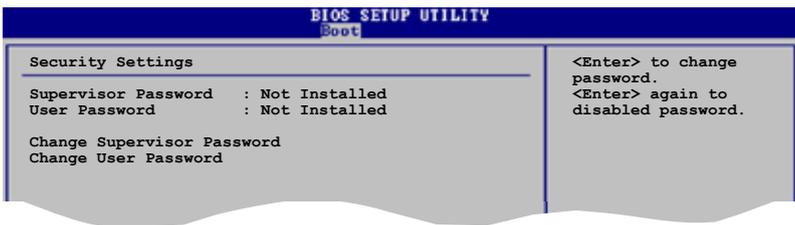
Hit 'DEL' Message Display [Enabled]

When set to Enabled, the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

Interrupt 19 Capture [Disabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19. Configuration options: [Disabled] [Enabled]

5.6.3 Security

The Security menu items allow you to change the system security settings. Select an item then press <Enter> to display the configuration options.

```
                         BIOS SETUP UTILITY
                            Boot

    Security Settings                      <Enter> to change
                                           password.
    Supervisor Password   : Not Installed  <Enter> again to
    User Password         : Not Installed  disabled password.

    Change Supervisor Password
    Change User Password
```

Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a Supervisor Password:

1.   Select the Change Supervisor Password item and press <Enter>.
2.   From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.
3.   Confirm the password when prompted.

The message "Password Installed" appears after you successfully set your password.

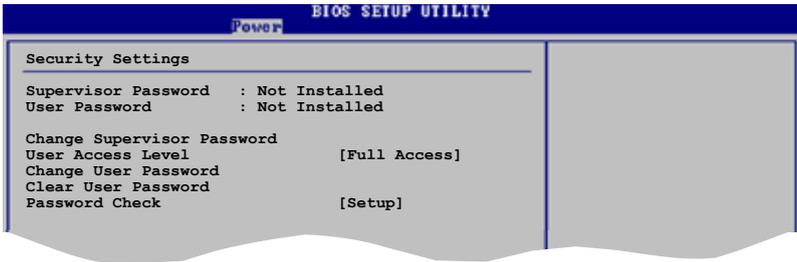To change the supervisor password, follow the same steps as in setting a user password.

To clear the supervisor password, select the Change Supervisor Password then press <Enter>. The message "Password Uninstalled" appears.

If you forget your BIOS password, you can clear clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section "4.3 Jumpers" for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.

```
                          BIOS SETUP UTILITY
                   Power

   Security Settings

   Supervisor Password    : Not Installed
   User Password          : Not Installed

   Change Supervisor Password
   User Access Level               [Full Access]
   Change User Password
   Clear User Password
   Password Check                  [Setup]
```

User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

No Access prevents user access to the Setup utility.

View Only allows access but does not allow change to any field.

Limited allows changes only to selected fields, such as Date and Time.

Full Access allows viewing and changing all the fields in the Setup utility.

Change User Password

Select this item to set or change the user password. The User Password item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a User Password:

1. Select the Change User Password item and press <Enter>.
2. On the password box that appears, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message "Password Installed" appears after you set your password successfully.

To change the user password, follow the same steps as in setting a user password.

Change User Password

Select this item to set or change the user password.

Password Check [Setup]

When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system.
Configuration options: [Setup] [Always]

5.7   Tools menu

5.7.1   ASUS EZ Flash 2

Allows you to run ASUS EZ Flash 2. When you press <Enter>, a confirmation message appears. Use the left/right arrow key to select between [Yes] or [No], then press <Enter> to confirm your choice. Please see page 5-3, section 5.1.2 for details.
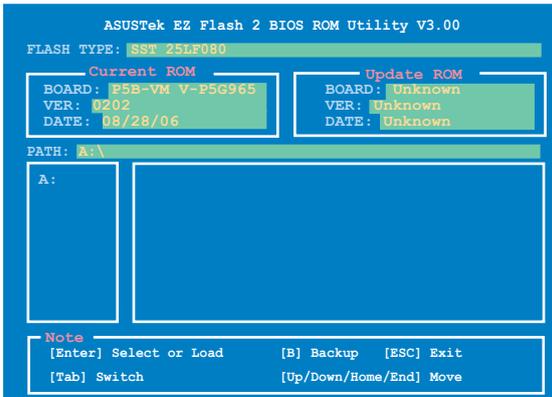
5.8   Exit menu

The Exit menu items allow you to load the optimal or failsafe default values
for the BIOS items, and save or discard your changes to the BIOS items.

```
                        BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Tools   Exit

 Exit Options                                  Exit system setup
                                               after saving the
 Exit & Save Changes                           changes.
 Exit & Discard Changes
 Discard Changes                               F10 key can be used
                                               for this operation.
 Load Setup Defaults
```

> 🖉 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 & Save 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.
An onboard backup battery sustains the CMOS RAM so it stays on even
when the PC is turned off. When you select this option, a confirmation
window appears. Select **OK** 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. Press <Enter> to save the changes while
> exiting.

Exit & Discard 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.

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 **OK** to discard any changes and load the previously saved values.

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 **OK** to load default
values. Select **Exit & Save Changes** or make other changes before saving
the values to the non-volatile RAM.