P5LD2
Deluxe

Motherboard

E2099

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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.

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

Canadian Department of Communications Statement

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

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

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.

- Seek professional assistance before using an adpater or extension cord. These devices could interrupt the grounding circuit.

- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.

- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.

- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.

- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.

- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.

- Place the product on a stable surface.

- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This guide contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the features of the motherboard and the new technology it supports.

- **Chapter 2: Hardware information**

  This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.

- **Chapter 3: Powering up**

  This chapter describes the power up sequence, the vocal POST messages, and ways of shutting down the system.

- **Chapter 4: BIOS setup**

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

- **Chapter 5: Software support**

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

- **Appendix: CPU features**

  The Appendix describes the CPU features that the motherboard supports.

Where to find more information

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

1. **ASUS websites**

   The ASUS website provides updated information on ASUS hardware and software products. 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.

Conventions used in this guide

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

DANGER/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 help you complete a task.

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.
	Example: <Enter> means that you must press the Enter or Return key.
<Key1+Key2+Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).
	Example: <Ctrl+Alt+D>
Command	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets.
	Example: At the DOS prompt, type the command line:
	afudos /i[filename]
	afudos /iP5LD2E.ROM

P5LD2 Deluxe specifications summary

CPU	LGA775 socket for Intel® Pentium® D/Intel® Pentium® 4 or Intel® Celeron® processors Compatible with Intel® PCG 05B/05A and 04B/04A processors Supports Intel® Enhanced Memory 64 Technology (EM64T) Supports Enhanced Intel SpeedStep® Technology (EIST) Supports Intel® Hyper-Threading Technology
Chipset	Northbridge: Intel® 945P Memory Controller Hub (MCH) Southbridge: Intel® ICH7R
Front Side Bus	1066/800/533 MHz

Memory	Dual-channel memory architecture
	4 x 240-pin DIMM sockets support unbuffered non-ECC
	    DDR2-667 (FSB 1066/800),
	    DDR2-533 (FSB 1066/800/533), or
	    DDR2-400 (FSB 800/533) memory modules
	Supports up to 4 GB system memory

Expansion slots	1 x PCI Express x16 slot for discrete graphics card 1 x Universal PCI Express™ x16 slot (at x4 mode) 1 x PCI Express x1 slots 3 x PCI slots

Storage	Intel® ICH7R SouthBridge supports:
	    - 1 x Ultra DMA 100/66/33 hard disk
	    - 4 x Serial ATA 3Gb/s with Intel® Matrix Storage Technology including RAID 0, RAID 1, RAID 5, and RAID 10 configuration
	Silicon Image 3132 SATA controller supports:
	    - 1 x Internal Serial ATA 3Gb/s hard disk drive
	    - 1 x External Serial ATA 3Gb/s SATA On-The-Go
	    - RAID 0, RAID 1, RAID 10*, RAID 5* and CONCATENATION*
	    (* *Setup with a Serial ATA port multiplier*)
	ITE 8211F IDE controller supports:
	    - 2 x UltraDMA 133/100/66 hard disks

AI Audio	Realtek® ALC882M High-Definition Audio 8-CH CODEC 1 x Coaxial S/PDIF out port 1 x Optical S/PDIF out port Supports Universal Audio Jack (UAJ®) Technology Supports Audio Sensing and Enumeration Technology Features the Dolby® Master Studio

IEEE 1394	TI 1394a controller supports:
	    - 1 x Internal IEEE 1394a connector
	    - 1 x IEEE 1394a connector at the rear panel

(continued on the next page)

P5LD2 Deluxe specifications summary

USB	Supports up to 10 USB 2.0 ports
LAN	Marvell® 88E8053 PCI Express™ Gigabit LAN controller Supports AI NET 2

Overclocking features	CPU Lock Free
	ASUS AI Overclocking (Intelligent Frequency Tuner)
	ASUS NOS (Non-delay Overclocking System)
	ASUS PEG Link for single/dual graphics cards
	ASUS HyperPath 3
	Precision Tweaker supports:
	  - DIMM voltage: 8-step DRAM voltage control
	  - Core voltage: Adjustable CPU voltage at 0.0125 V
	  - PCI Express Frequency: Allows 1MHz increment from 100MHz to 200MHz
	  - Stepless Frequency Selection(SFS) allows 1MHz increment from 100MHz to 400 MHz
	ASUS C.P.R. (CPU Parameter Recall)
	Adjustable FSB/DDR2 frequencies with fixed PCI/PCI-E frequencies

ASUS AI Life	WiFi-TV PCI card (optional) supports:
	  - Digital TV (DVB-T only), Analog TV, FM
	  - WiFi@Home 802.11 a/b/g
	Stack Cool 2
	SATA On-The-Go
	AI Quiet

Special features	ASUS SATA On-The-Go ASUS EZ Plug ASUS AI Q-Fan ASUS CrashFree BIOS 2 ASUS Multi-language BIOS ASUS MyLogo2 ASUS EZ Flash
Rear panel	1 x Parallel port 1 x IEEE 1394a port 1 x LAN (RJ-45) port 4 x USB 2.0 ports 1 x External SATA port (SATA On-The-Go) 1 x Optical S/PDIF Out port 1 x Coaxial S/PDIF Out port 1 x PS/2 keyboard port (purple) 1 x PS/2 mouse port (green) 8-channel audio ports

(continued on the next page)

P5LD2 Deluxe specifications summary

BIOS features	8 MB Flash ROM, AMI BIOS, PnP, DMI2.0, SM BIOS 2.3, WfM2.0
Internal connectors	1 x Floppy disk drive connector 1 x Primary IDE connector 2 x IDE connectors 5 x Serial ATA RAID connectors 1 x CPU fan connector 1 x Power fan connector 2 x Chassis fan connectors 1 x Serial port connector (COM port) 1 x 24-pin ATX power connector 1 x 8-pin ATX 12 V power connector 1 x 4-pin ASUS EZ Plug™ connector 2 x USB connectors for 4 additional USB 2.0 ports 1 x Optical drive audio connector 1 x IEEE 1394a connector 1 x GAME/MIDI connector 1 x Chassis intrusion connector 1 x Front panel High-Definition audio connector System panel connector
Power Requirement	ATX power supply (with 24-pin and 8-pin 12 V plugs) ATX 12 V 2.0 compliant ASUS EZ Plug* (*When using two graphics cards and a 20-pin ATX PSU)
Form Factor	ATX form factor: 12 in x 9.6 in (30.5 cm x 24.4 cm)
Support CD contents	Device drivers ASUS PC Probe II ASUS Update ASUS AI Booster Microsoft® DirectX 9.0c Anti-Virus Utility (OEM version) WinDVD Suite (OEM version) Adobe Acrobat Reader ASUS Screensaver

Specifications are subject to change without notice.

This chapter describes the motherboard features and the new technologies it supports.

Product introduction

1

Chapter summary

1

1.1 Welcome!

Thank you for buying an ASUS® P5LD2 Deluxe motherboard!

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

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

1.2 Package contents

Check your motherboard package for the following items.

Motherboard	ASUS P5LD2 Deluxe motherboard
I/O modules	IEEE1394 1-port module
	Serial (COM2) port module
	USB 2.0 (2 ports) and GAME (1 port) module
Cables	5 x Serial ATA signal cables
	2 x Serial ATA power cables (dual plugs)
	1 x Serial ATA power cable (single plug)
	2 x Ultra DMA/133 cables
	40-conductor IDE cable
	Floppy disk drive cable
Accessories	I/O shield
Application CDs	ASUS motherboard support CD
	InterVideo® WinDVD Suite® (OEM version)
Documentation	User guide

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

1.3   Special features

1.3.1   Product highlights

Latest processor technology

The motherboard comes with a 775-pin surface mount Land Grid Array (LGA) socket designed for the Intel® Pentium® D, Intel® Pentium® 4 or Intel® Celeron® processor in the 775-land package. The motherboard supports the Intel® Pentium® 4 or Intel® Pentium® D processor with 1066/800/533 MHz Front Side Bus (FSB). The motherboard also supports the Intel® Hyper-Threading Technology and is fully compatible with Intel® 04B/04A and 05B/05A processors. See page 2-7 for details.

Intel® 945P chipset

The Intel® 945P chipset is the latest and one of the most powerful chipsets in personal computing. It supports 1066MHz Front Side Bus (FSB), PCI Express technology, dual-channel DDR2 memory, and Intel's 800 MHz series Dual-Core™ technology processors for lightning speed multi-tasking. Combined with the Intel® ICH7R that supports four Serial ATA II ports with Intel® Matrix Technology including RAID 0, RAID 1, RAID 5, and RAID 10 making it an excellent foundation for a powerful desktop computer.

Intel® EM64T

The motherboard supports Intel® Pentium® D or Intel® Pentium® 4 processors with the Intel® EM64T (Extended Memory 64 Technology). The Intel® EM64T feature allows your computer to run on 64-bit operating systems and access larger amounts of system memory for faster and more efficient computing. See the Appendix for details.

Enhanced Intel SpeedStep® Technology (EIST)

The Enhanced Intel SpeedStep® Technology (EIST) intelligently manages the CPU resources by automatically adjusting the CPU voltage and core frequency depending on the CPU loading and system speed or power requirement. See page 4-26 and the Appendix for details.

DDR2 memory support

The motherboard supports DDR2 memory which features data transfer rates of 667 MHz (FSB 1066/800), 533 MHz (FSB 1066/800/533) or 400 MHz (FSB 800/533) to meet the higher bandwidth requirements of the latest 3D graphics, multimedia, and Internet applications. The dual-channel DDR2 architecture doubles the bandwidth of your system memory to boost system performance, eliminating bottlenecks with peak bandwidths of up to 8.5 GB/s. See pages 2-14 to 2-17 for details.

PCI Express™ interface ![PCI EXPRESS logo]

The motherboard fully supports PCI Express, the latest I/O interconnect technology that speeds up the PCI bus. PCI Express features point-to-point serial interconnections between devices and allows higher clockspeeds by carrying data in packets. This high speed interface is software compatible with existing PCI specifications. See page 2-20 for details.

Universal PCI Express™ slot (x4 mode)

The Universal PCI Express slot allows users to set up a dual graphics card platform on a single motherboard. The ASUS Smart Switch detects PCI Express devices installed, and intelligently reroutes the PCI Express lanes to optimize bandwidth allocation. See page 2-20 for details.

Dual RAID solution

Onboard RAID controllers provide the motherboard with dual-RAID functionality that allows you to select the best RAID solution using IDE or Serial ATA devices.

The Intel® ICH7R allows RAID 0, RAID 1, RAID 5, and RAID 10 configuration for four SATA connectors and supports the Intel® Matrix Storage Technology. See pages 2-27 and 5-19 for details.

The Silicon Image® 3132 Serial ATA controller supports two additional Serial ATA connectors for RAID 0, RAID 1 and JBOD functionality. You can also configure a RAID 10, RAID 5 and CONCATENATION sets using a Serial ATA port multiplier. See pages 2-23, 2-24, 2-28 and 5-29 for details.

Theatre-level audio
(designed for Dolby® Master Studio)

This motherboard offers theatre-level 7.1 surround sound and audio specifications higher than that of DVD. Enjoy true home theatre experience with the following advanced sound technologies: Dolby Prologic IIx, Dolby Headphone, Dolby Virtual Speaker, and Dolby Digital Live. See pages 2-23 and 5-12 for details.

S/PDIF digital sound ready

The motherboard supports the S/PDIF technology through the S/PDIF interfaces on the rear panel and at midboard. The S/PDIF technology turns your computer into a high-end entertainment system with digital connectivity to powerful audio and speaker systems. See page 2-24 for details.

IEEE 1394a support

The IEEE 1394a interface provides high-speed and flexible PC connectivity to a wide range of peripherals and devices compliant to the IEEE 1394a standard. The IEEE 1394a interface allows up to 400 Mbps transfer rates through simple, low-cost, high-bandwidth asynchronous (real-time) data interfacing between computers, peripherals, and consumer electronic devices such as camcorders, VCRs, printers, TVs, and digital cameras. See pages 2-23 for details.

USB 2.0 technology

The motherboard implements the Universal Serial Bus (USB) 2.0 specification, dramatically increasing the connection speed from the 12 Mbps bandwidth on USB 1.1 to a fast 480 Mbps on USB 2.0. USB 2.0 is backward compatible with USB 1.1. See page 2-24 for details.

Temperature, fan, and voltage monitoring

The CPU temperature is monitored by the ASIC (integrated in the Winbond Super I/O) to prevent overheating and damage. The system fan rotations per minute (RPM) is monitored for timely failure detection. The ASIC monitors the voltage levels to ensure stable supply of current for critical components. See page 4-36 for details.

1.3.2   ASUS AI Life features

AI Quiet

The ASUS AI Quiet function dynamically controls CPU speed and reduces temperature and fan speeds, thus minimizing noise and ensuring quiet operation.

ASUS Stack Cool 2

Stack Cool 2 is a fan-less and zero-noise cooling solution that lowers the temperature of critical heat generating components by 20°C. The motherboard uses a special design on the printed circuit board (PCB) to dissipate heat that critical components generate. See page 2-3 for details.

WiFi-TV Card (optional)

ASUS WiFi-TV card complies with the IEEE 802.11 a/b/g wireless LAN adapter that allows data transmission of up to 54 Mbps using the 2.4 GHz frequency band. ASUS provides full software application support and a user-friendly wizard to help you set up your wireless local area network effortlessly. You can share photos, videos, and MP3 files with other wireless devices without tangling cables and wires.

The ASUS WiFi-TV card also offers digital TV (for DVB-T only) connection, which presents higher TV resolution and more functions compared to the traditional analog TV standard. This multi-functional card also supports FM radio.

Serial ATA II and SATA-on-the-Go

The motherboard supports the Serial ATA 3 Gb/s technology through the Serial ATA interfaces and the Intel® 945P MCH chipset. The Serial ATA 3 Gb/s specification provides twice the bandwidth of the current Serial ATA products with a host of new features, including Native Command Queuing (NCQ), Power Management (PM) Implementation Algorithm, and Hot Swap. Serial ATA allows thinner, more flexible cables with lower pin count and reduced voltage requirements.

Leveraging these Serial ATA II features is the Serial ATA on the Go. This external port on the rear panel I/O provides smart setup, hot-plug and support for up to 16 devices with port-multiplier functions. See pages 2-23 and 2-28 for details.

1.3.3 Innovative ASUS features

AI NOS™ (Non-Delay Overclocking System)

ASUS Non-delay Overclocking System™ (NOS) is a technology that auto-detects the CPU loading and dynamically overclocks the CPU speed only when needed. See page 4-19 for details.

PEG Link Mode

This feature enhances your PCI Express graphics card performance. It allows the motherboard to automatically adjust the PCI Express graphics link mode to the correct frequency based on the system configuration. Four additional settings are available for overclocking the PEG Link Mode.

AI NET 2

AI NET2 is a BIOS-based diagnostic tool that detects and reports Ethernet cable faults and shorts. With this utility, you can easily monitor the condition of the Ethernet cable connected to the LAN (RJ-45) port. During the bootup process, AI NET2 immediately diagnoses the LAN cable and reports shorts and faults up to 100 meters at 1 meter accuracy. See pages 4-23 and 5-11 for details.

CrashFree BIOS 2

This feature allows you to restore the original BIOS data from the support CD in case when the BIOS codes and data are corrupted. This protection eliminates the need to buy a replacement ROM chip. See page 4-5 for details.

AI Q-Fan

The ASUS AI Q-Fan technology smartly adjusts the fan speeds according to the system loading to ensure quiet, cool, and efficient operation.
See pages 4-36 for details.

ASUS Multi-language BIOS

The multi-language BIOS allows you to select the language of your choice from the available options. The localized BIOS menus allow easier and faster configuration. See page 4-14 for details.

ASUS MyLogo2™

This new feature present in the motherboard allows you to personalize and add style to your system with customizable boot logos. See page 5-9 for details.

ASUS HyperPath 3 technology

The ASUS Hyper Path 3 technology optimizes the full potential of the Intel® chipset by shortening the latency time between the CPU and the system memory. Enabling Hyper Path 3 on system improves memory performance without affecting system stability. See page 4-27 for details.

Fanless Design

The ASUS fanless design allows multi-directional heat flow from major thermal sources in the motherboard to lower overall system temperature.

This chapter lists the hardware setup
procedures that you have to perform
when installing system components.
It includes description of the jumpers
and connectors on the motherboard.

Hardware information

2

Chapter summary

2

2.1   Before you proceed

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

⚠️

- Unplug the power cord from the wall socket before touching any component.

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

- 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.

- **Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply.** Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

Onboard LED

The motherboard comes with a standby power LED. The green LED lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.

SB_PWR

ON
Standby
Power

OFF
Powered
Off

P5LD2 DELUXE Onboard LED
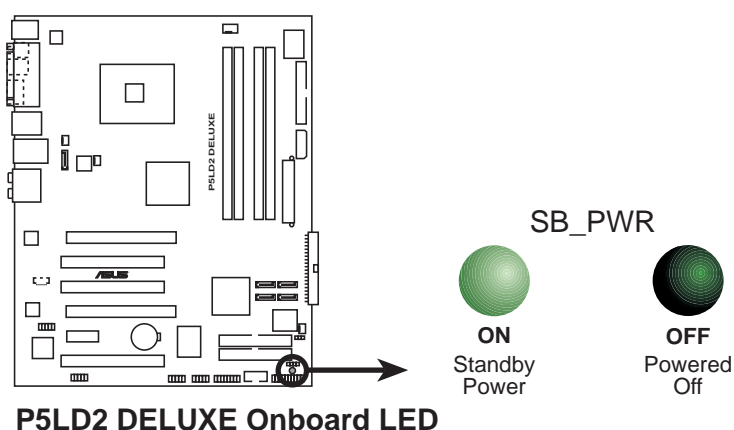
2.2 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

2.2.1 Placement direction

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

2.2.2 Screw holes

Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.

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

Place this side towards the rear of the chassis
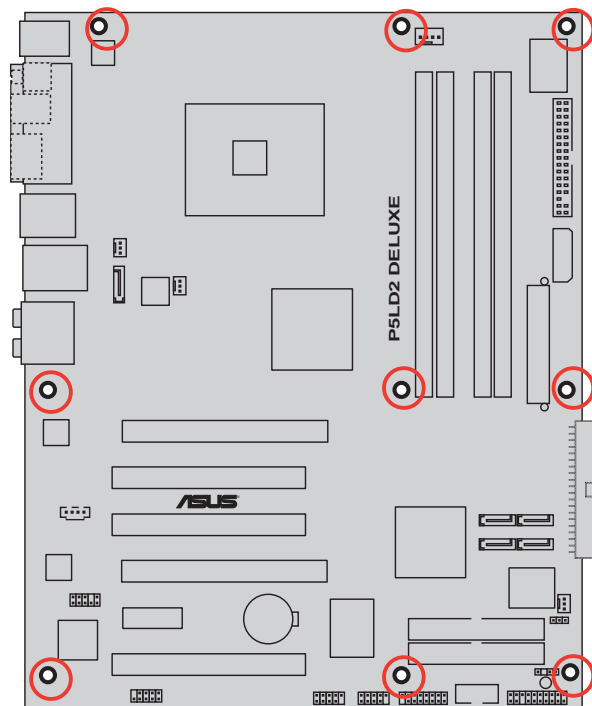
2.2.3 ASUS Stack Cool 2

The motherboard comes with the ASUS Stack Cool 2 cooling solution that lowers the temperature of critical heat generating components by 20ºC. The motherboard uses a special design on the printed circuit board (PCB) to dissipate heat that critical components generate.
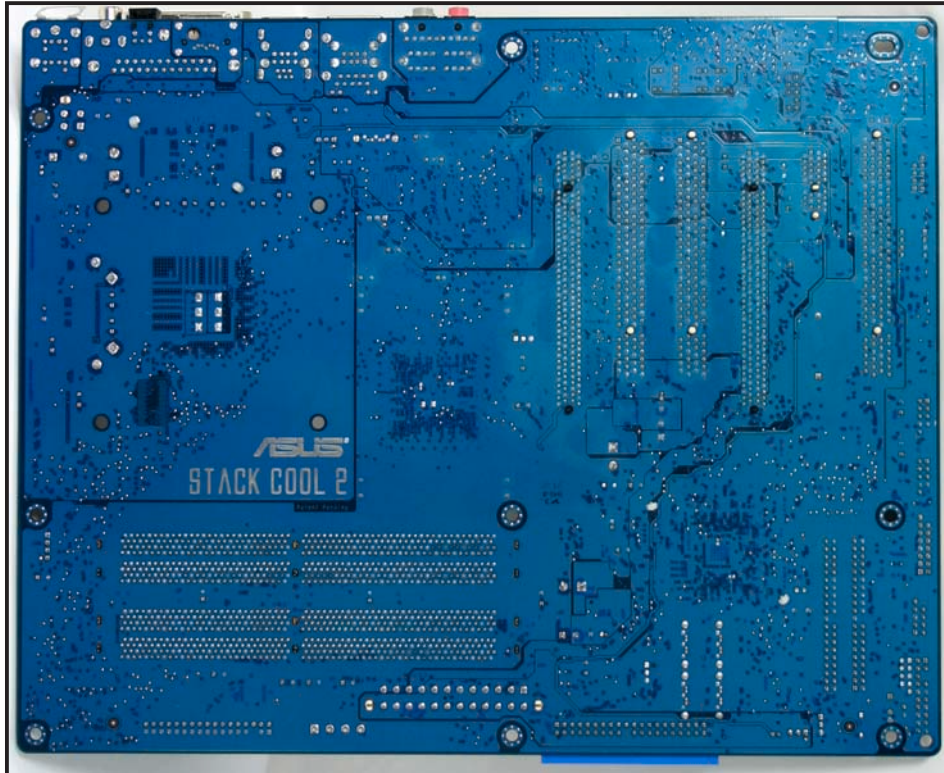
2.2.4 Motherboard layout

24.5cm (9.6in)

30.5cm (12.0in)

P5LD2 DELUXE

PS/2KBMS
T: Mouse
B: Keyboard

SPDIF_O

SPDIF_O2

PARALLEL PORT

EX_SATA1

EATX12V

Bottom: | Top:
USB1 | 1394
USB2

USB2.0
T: USB3
B: USB4

Top:
LAN port

AUDIO

Marvell
88E8053

ALC882M

AAFP

TSB43AB22A

CPU_FAN

LGA775

CHA_FAN1

SATA Link | PWR_FAN

SATA_RAID2

Intel
MCH 945P

Super
I/O

DDR2 DIMM_A1 (64 bit,240-pin module)
DDR2 DIMM_A2 (64 bit,240-pin module)
DDR2 DIMM_B1 (64 bit,240-pin module)
DDR2 DIMM_B2 (64 bit,240-pin module)

FLOPPY

EZ_PLUG

EATXPWR

PCIEX16_1

PCI1

CD

PCI2

PCIEX16_2

PCIEX1_1

CR2032 3V
Lithium Cell
CMOS Power

ITE
IT8211F

Intel
ICH7R

SATA4 | SATA3

SATA1 | SATA2

PRI_IDE

8Mb
BIOS

CHA1_FAN2

CLRTC

PCI3

IE_1394_2

USB56 | USB78

GAME

SEC_EIDE
PRI_EIDE

COM1

CHASSIS

PANEL

SB_PWR

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15. System panel connector (20-pin PANEL) System power LED (Green 3-pin PLED) Hard disk drive activity LED (Red 2-pin IDE_LED) System warnsing speaker (Orange 4-pin SPEAKER) ATX power button/soft-off button (Light Green 2-pin PWRSW) Reset button (Blue 2-pin RESET)	2-34

2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA775 socket designed for the Intel® Pentium® D, Intel® Pentium® 4, and Intel® Celeron® processors in the 775-land package.

> ⚠ • Your boxed Intel® LGA775 processor package should come with installation instructions for the CPU, fan and heatsink assembly. If the instructions in this section do not match the CPU documentation, follow the latter.
>
> • Upon purchase of the motherboard, make sure that the PnP cap is on the socket and the socket pins are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket pins/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 pins resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

2.3.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.
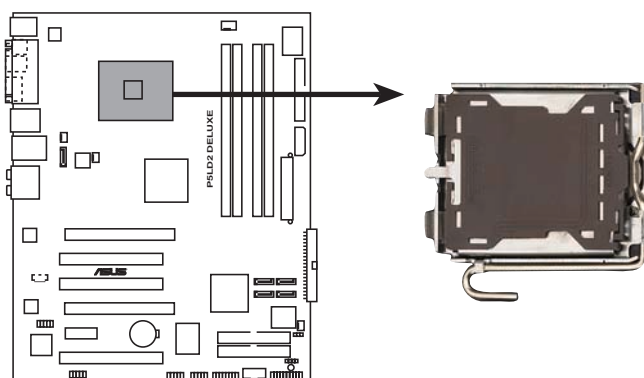
P5LD2 DELUXE CPU Socket 775

> ✎ Before installing the CPU, make sure that the cam 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.

Retention tab
Load lever
A
B
PnP cap
This side of the socket box should face you.
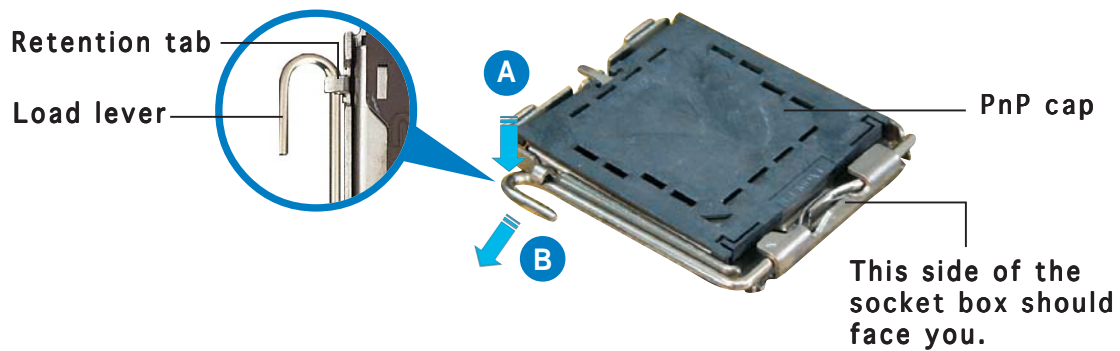
To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

3. Lift the load lever in the direction of the arrow to a 135° angle.
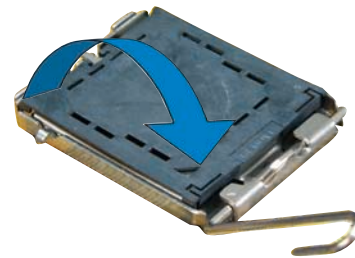
4. Lift the load plate with your thumb and forefinger to a 100° angle (A), then push the PnP cap from the load plate window to remove (B).

B
A
Load plate
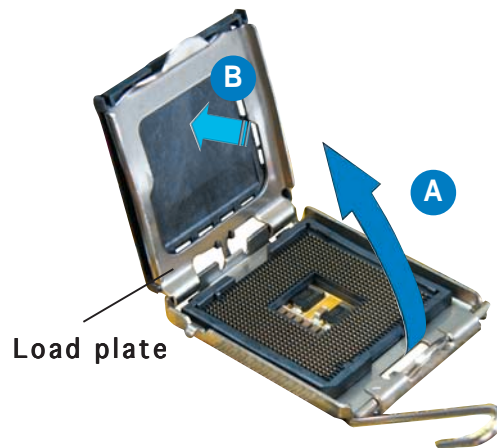
5. Position the CPU over the socket, making sure that the gold triangle is on the bottom-left corner of the socket. The socket alignment key should fit into the CPU notch.

Alignment key
Gold triangle mark
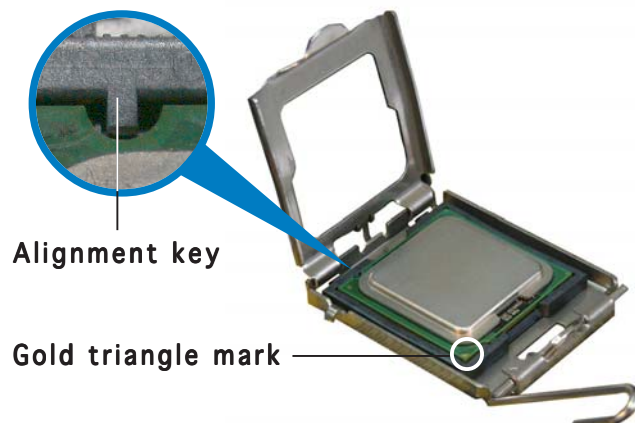
The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!

6. Close the load plate (A), then push the load lever (B) until it snaps into the retention tab.
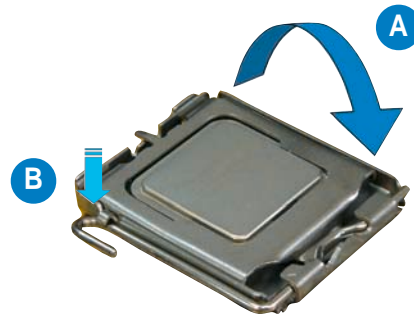
The motherboard supports Intel® Pentium® 4 LGA775 processors with the Intel® Enhanced Memory 64 Technology (EM64T), Enhanced Intel SpeedStep® Technology (EIST), and Hyper-Threading Technology. Refer to the Appendix for more information on these CPU features.

2.3.2   Installing the CPU heatsink and fan

The Intel® processor in the 775-land package requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.

- When you buy a boxed Intel® 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® processor 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 you have properly applied Thermal Interface Material to the CPU heatsink or CPU before you install the heatsink and fan assembly.

Make sure that you have installed the motherboard to the chassis before you install the CPU fan and heatsink 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.

Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.
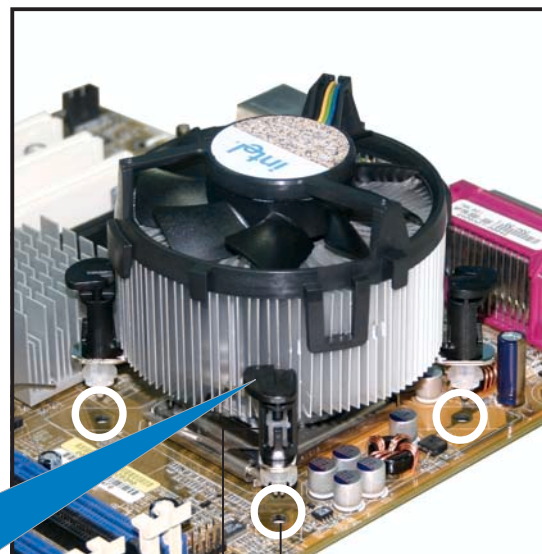
Motherboard hole

Fastener

Narrow end
of the groove

Make sure to orient each fastener with the narrow end of the groove pointing outward. (The photo shows the groove shaded for emphasis.)

2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.
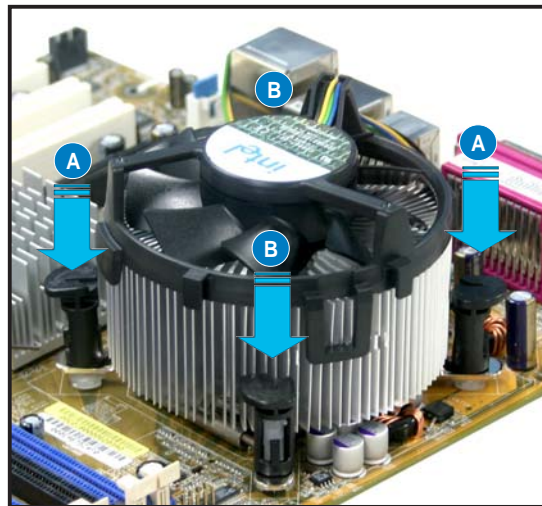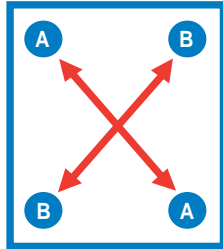
3. Connect the CPU fan cable to the connector on the motherboard labeled CPU_FAN.

CPU_FAN

GND
CPU FAN PWR
CPU FAN IN
CPU FAN PWM
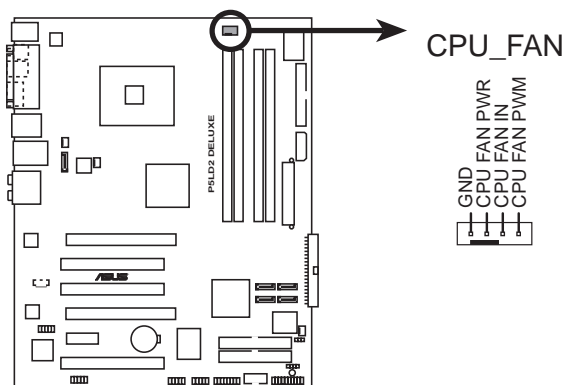
P5LD2 DELUXE CPU fan connector

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

2.3.3 Uninstalling the CPU heatsink and fan

To uninstall the CPU heatsink and fan:

1. Disconnect the CPU fan cable from the connector on the motherboard.

2. Rotate each fastener counterclockwise.

3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard.
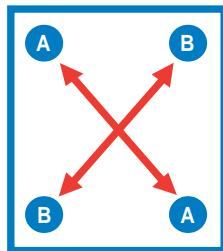
4. Carefully remove the heatsink and fan assembly from the motherboard.
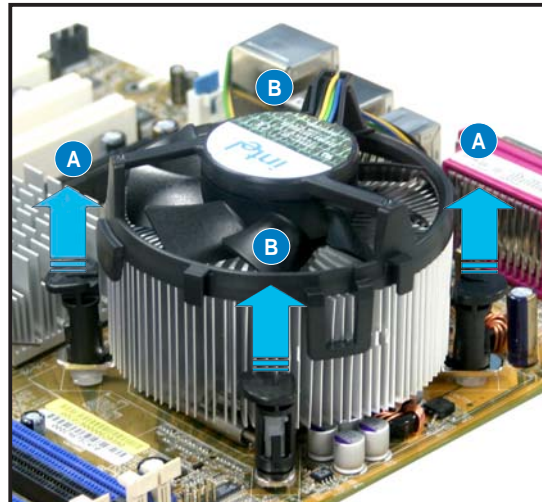
5. Rotate each fastener clockwise to ensure correct orientation when reinstalling.
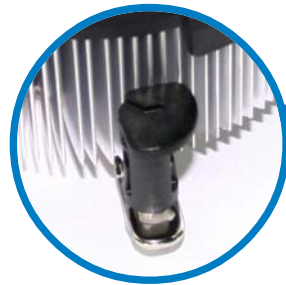
Narrow end of the groove

The narrow end of the groove should point outward after resetting. (The photo shows the groove shaded for emphasis.)
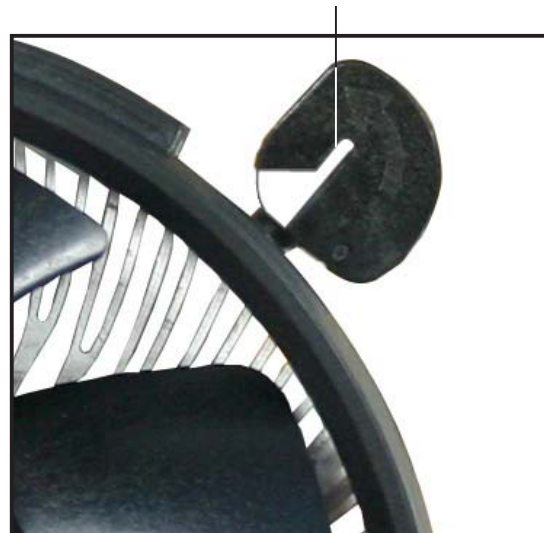
Refer to the documentation in the boxed or stand-alone CPU fan package for detailed information on CPU fan installation.

2.4 System memory

2.4.1 Overview

The motherboard comes with four Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets.

A DDR2 module has the same physical dimensions as a DDR DIMM but has a 240-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched differently to prevent installation on a DDR DIMM socket.

The figure illustrates the location of the DDR2 DIMM sockets:
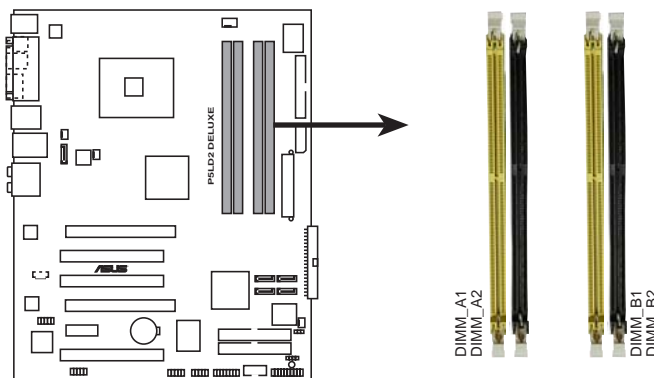
P5LD2 DELUXE 240-pin DDR DIMM sockets

Channel	Sockets
Channel A	DIMM_A1 and DIMM_A2
Channel B	DIMM_B1 and DIMM_B2

2.4.2 Memory configurations

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

- For dual-channel configuration, the total size of memory module(s) installed per channel must be the same (DIMM_A1 + DIMM_A2 = DIMM_B1 + DIMM_B2).

- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor. Refer to the DDR2 Qualified Vendors List on the next page for details.

- Due to chipset resource allocation, the system may detect less than 4 GB system memory when you installed four 1 GB DDR2 memory modules.

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

Qualified Vendors Lists (QVL)

DDR2-667

Size	Vendor	Model	Brand	Side(s)	Component	DIMM support A	B	C
256MB	SAMSUNG	M378T3253FZ0-CE6	SAMSUNG	SS	K4T56083QF-ZCE6	•	•	•
512MB	SAMSUNG	M378T6453FZ0-CE6	SAMSUNG	DS	K4T56083QF-ZCE6	•	•	•
256MB	Kingston	HYB18T512800AF3S	Kingston	SS	KVR667D2N5/512	•	•	•
1024MB	Kingston	E5108AE-GE-E	Kingston	DS	KVR667D2N5/1G	•	•	•
512MB	Hynix	HYMP564U64AP8-Y5	Hynix	SS	HY5PS12821AFP-Y5	•	•	•
1024MB	Hynix	HYMP512U64AP8-Y5	Hynix	DS	HY5PS12821AFP-Y5	•	•	
1024MB	Hynix	HYMP512U64AP8-Y4	Hynix	DS	HY5PS12821AFP-Y4	•	•	•
512MB	Hynix	HYMP564U64AP8-Y4	Hynix	SS	HY5PS12821AFP-Y4	•	•	•
512MB	MICRON	MT16HTF6464AY-667B4	MICRON	DS	4VB41D9CZM	•	•	•
1024MB	MICRON	MT16HTF12864AY-667A2	MICRON	DS	4UAIID9CWX	•	•	
256MB	MICRON	MT8HTF3264AY-667B5	MICRON	SS	4SB42D9CZM	•	•	•
512MB	MICRON	MT16HTF6464AY-667B3	MICRON	DS	4TB41D9CZM	•	•	•
512MB	MICRON	MT16HTF6464AY-667B3	MICRON	DS	4UB41D9CZM	•	•	
512MB	MICRON	MT16HTF6464AY-667B3	MICRON	DS	4SB41D9CZM	•	•	
512MB	MICRON	MT16HTF6464AY-667B3	MICRON	DS	4SB42D9CZM	•	•	•
512MB	Infineon	HYS64T64000HU-3S-A	Infineon	SS	HYB18T512800AF3S	•	•	•
256MB	ELPIDA	EBE25UC8ABFA-6E-E	ELPIDA	SS	E2508AB-GE-E	•	•	•
512MB	ELPIDA	EBE51UD8AEFA-6E-E	ELPIDA	SS	E5108AE-GE-E	•	•	•
1024MB	ELPIDA	EBE11UD8AEFA-6E-E	N/A	DS	N/A	•	•	•

Side(s): SS - Single-sided   **DS** - Double-sided

DIMM support:

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

B - Supports one pair of modules inserted into either the yellow slots or the black slots as one pair of Dual-channel memory configuration.

C - Supports two pairs of modules inserted into the yellow and black slots as two pairs of Dual-channel memory configuration.

Visit the ASUS website for the latest DDR2-667 MHz (FSB 1066/800) QVL.

DDR2-533

Size	Vendor	Model	Brand	Side(s)	Component	DIMM support A	B	C
512MB	SAMSUNG	M378T6553BG0-CD5	N/A	SS	K4T51083QB-GCD5	•	•	•
1024MB	SAMSUNG	M378T2953BG0-CD5	N/A	DS	K4T51083QB-GCD5	•	•	•
256MB	SAMSUNG	M378T3253FG0-CD5	N/A	SS	K4T56083QF-GCD5	•	•	•
512MB	SAMSUNG	M378T6453FG0-CD5	N/A	DS	K4T56083QF-GCD5	•	•	•
1024MB	SAMSUNG	M391T2953BG0-CD5	N/A	DS	K4T51083QB-GCD5(ECC)	•	•	•
512MB	SAMSUNG	M391T6453FG0-CD5	N/A	DS	K4T56083QF-GCD5(ECC)	•	•	•
512MB	Infineon	HYS72T64000HU-3.7-A	Infineon	SS	HYB18T512800AF3(ECC)	•	•	•
512MB	Infineon	HYS64T64000GU-3.7-A	Infineon	SS	HYB18T512800AC37	•	•	•
256MB	Infineon	HYS64T32000HU-3.7-A	Infineon	SS	HYB18T512160AF-3.7	•	•	•
1024MB	Infineon	HYS64T128020HU-3.7-A	Infineon	DS	HYB18T512800AF37	•	•	•
512MB	Infineon	HYS64T64000HU-3.7-A	Infineon	SS	HYB18T512800AF37	•	•	•
512MB	CORSAIR	CM2X512-4200	N/A	DS	N/A	•	•	•
512MB	MICRON	MT16HTF6464AG-53EB2	MICRON	DS	4FBIID9BQM	•	•	•
1024MB	MICRON	MT16HTF12864AY-53EA1	MICRON	DS	4JAIID9CRZ	•	•	•
256MB	MICRON	MT8HTF3264AY-53EB3	MICRON	SS	4FBIID9CHM	•	•	•
512MB	MICRON	MT16HTF6464AY-53EB2	MICRON	DS	4FBIID9CHM	•	•	•
256MB	MICRON	N/A	MICRON	SS	4DBIIZ9BQT	•	•	•
1024MB	MICRON	MT18HTF12872AY-53EA1	MICRON	DS	4MAIID9CRZ(ECC)	•	•	•
1024MB	MICRON	MT16HTF12864AY-53EA1	MICRON	DS	4MAIID9CRZ	•	•	•
1024MB	Kingston	KVR533D2N4/1G	N/A	DS	E5108AB-5C-E	•	•	•
256MB	Kingston	KVR533D2N4/256	N/A	SS	HYB18T512160AC-3.7	•	•	•
512MB	Kingston	KVR533D2N4/512	ELPIDA	SS	E5108AB-5C-E	•	•	•
512MB	Hynix	HYMP564U648-C4	N/A	SS	HY5PS12821F-C4	•	•	•
512MB	Hynix	HYMP564U728-C4	N/A	SS	HY5PS12821F-C4(ECC)	•	•	•
1024MB	Hynix	HYMP512U728-C4	N/A	DS	HY5PS12821F-C4(ECC)	•	•	•
1024MB	Hynix	HYMP512U648-C4	N/A	DS	HY5PS12821F-C4	•	•	•
512MB	Hynix	HYMP564U728-C4	N/A	SS	HY5PS12821FP-C4(ECC)	•	•	•
1024MB	Hynix	HYMP512U648-C4	N/A	DS	HY5PS12821FP-C4	•	•	•
1024MB	Hynix	HYMP512U728-C4	N/A	DS	HY5PS12821F-E3(ECC)	•	•	•
512MB	ELPIDA	EBE51ED8ABFA-5C-E	ELPIDA	DS	E5108AB-5C-E (ECC)	•	•	•
512MB	ELPIDA	EBE51UD8ABFA-5C	ELPIDA	DS	E5108AB-5C-E	•	•	•
512MB	ELPIDA	EBE51UD8ABFA-5C-E	ELPIDA	DS	E5108AB-5C-E	•	•	•
1024MB	ELPIDA	EBE11UD8ABFA-5C-E	ELPIDA	DS	E5108AB-5C-E	•	•	•

Side(s): **SS** - Single-sided   **DS** - Double-sided

DIMM support:
A   -   Supports one module inserted into either slot, in Single-channel memory configuration.
B   -   Supports one pair of modules inserted into either the yellow slots or the black slots as one pair of Dual-channel memory configuration.
C   -   Supports two pairs of modules inserted into the yellow and black slots as two pairs of Dual-channel memory configuration.

Visit the ASUS website for the latest DDR2-533 MHz (FSB 1066/800/533) QVL.

2.4.3 Installing a DIMM

⚠️ Unplug the power supply before adding or removing DIMMs or other system components. Failure to do so can cause severe damage to both the motherboard and the components.

To install a DIMM:

1. Unlock a DIMM socket by pressing the retaining clips outward.

2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.

3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.
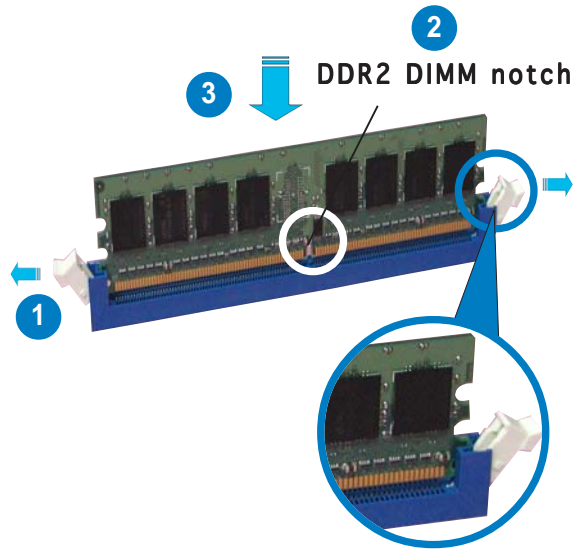
DDR2 DIMM notch

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.

- The DDR2 DIMM sockets do not support DDR DIMMs. DO not install DDR DIMMs to the DDR2 DIMM sockets.

2.4.4 Removing a DIMM

Follow these steps to remove a DIMM.

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

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

DDR2 DIMM notch
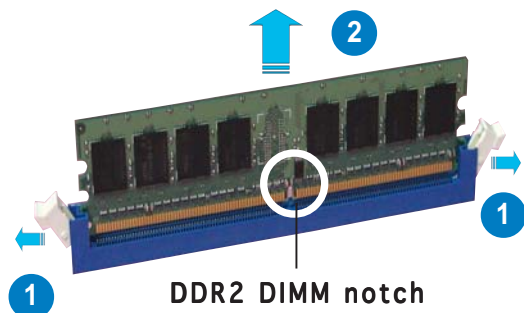
2. Remove the DIMM from the socket.

2.5 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.

2.5.1 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.

2.5.2 Configuring an expansion card

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

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 4 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.

2.5.3 Interrupt assignments

Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	—	Re-direct to IRQ#9
4	12	Communications Port (COM1)*
5	13	IRQ holder for PCI steering*
6	14	Floppy Disk Controller
7	15	Printer Port (LPT1)*
8	3	System CMOS/Real Time Clock
9	4	IRQ holder for PCI steering*
10	5	IRQ holder for PCI steering*
11	6	IRQ holder for PCI steering*
12	7	PS/2 Compatible Mouse Port*
13	8	Numeric Data Processor
14	9	Primary IDE Channel
15	10	Secondary IDE Channel

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

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI slot 1	—	—	—	—	—	shared	—	—
PCI slot 2	—	—	—	—	—	—	shared	—
PCI slot 3	—	shared	—	—	—	—	—	—
PCI Express x16 slot	shared	—	—	—	—	—	—	—
PCI Express x4 slot	shared	—	—	—	—	—	—	—
PCI Express x1 slot	—	—	—	shared	—	—	—	—
Onboard USB controller 1	—	—	—	—	shared	—	—	—
Onboard USB controller 2	—	shared	—	—	—	—	—	—
Onboard USB controller 3	—	—	shared	—	—	—	—	—
Onboard USB controller 4	—	—	—	shared	—	—	—	—
Onboard USB 2.0 controller	—	—	—	—	shared	—	—	—
Onboard IDE port	—	—	—	—	—	—	shared	—
Onboard SATA port	—	—	—	—	—	—	—	shared
Onboard HD audio	—	—	—	shared	—	—	—	—
Onboard LAN1	shared	—	—	—	—	—	—	—
Onboard PCIe SATA RAID	—	shared	—	—	—	—	—	—

2.5.4 PCI Express x16 slots

This motherboard has two PCI Express x16 slots that support PCI Express x16 graphic cards complying with the PCI Express specifications. With two graphics cards installed, the motherboard can enable quad-display.
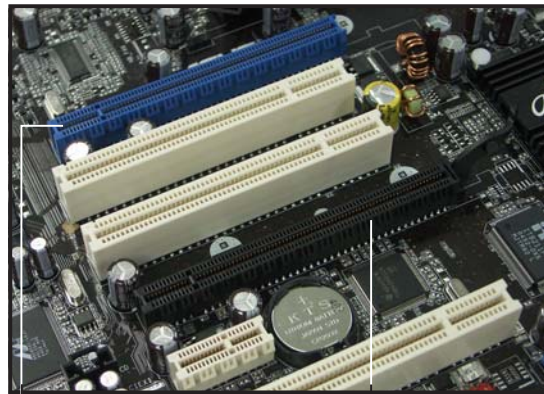
Primary PCI Express x 16 slot for discrete graphics card (blue)

Universal PCI Express slot [x4 mode] (black)

We recommend that you install a VGA card on the primary (blue) PCI Express slot, and install any other PCI Express device on the Universal PCI Express slot (black).

Primary PCI Express x16 slot

The primary PCI Express x16 graphics card supports PCI Express x16 graphic cards that comply with the PCI Express specifications.

Universal PCI Express slot (x4 mode)

This motherboard also supports a Universal PCI Express slot with a maximum speed of 2 GB/s. The operating frequency of this slot changes, depending on the type of PCI Express card you install. Refer to the table on the next page for details.

The figure shows two graphics cards installed on the primary PCI Express x16 slot and the Universal PCI Express slot.
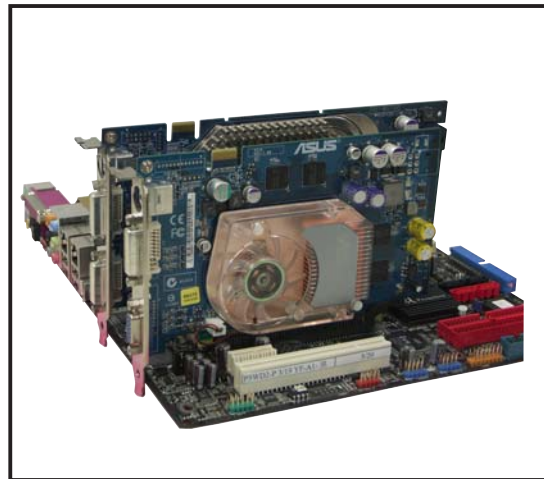
If you install two VGA cards, we recommend that you plug the rear chassis fan cable to the motherboard connector labeled CHA_FAN1 for better thermal environment. See page 2-31 for the connector location.

Options for Universal PCI Express slot	PCI Express operating speed
Auto	Automatically optimizes performance and functionality according to devices installed
x4 mode [Faster]	User gets the best performance but this mode disables the PCI Express x1 slot
x2 mode [Fast]	Always runs at PCI Express x2 speed

- Some PCI Express graphics cards cannot operate on x4/x2 mode. We suggest that you install these cards on the primary PCI Express slot (blue) to increase system stability.

- Some PCI Express devices cannot operate on x4/x2 mode. We suggest that you install these devices on the PCI Express slot x1 slot.

2.5.5 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.
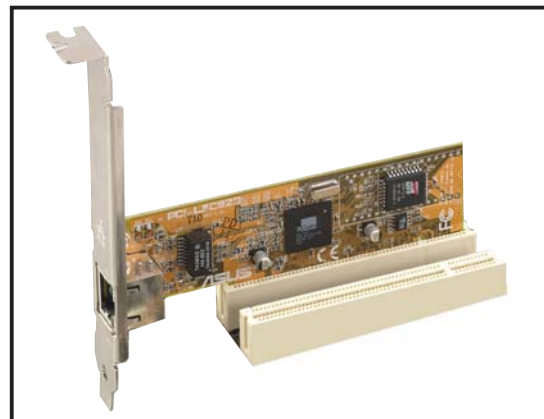
2.5.6 PCI Express x1

This motherboard supports PCI Express x1 network cards, SCSI cards and other cards that comply with the PCI Express specifications. The figure shows a network card installed on the PCI Express x1 slot.
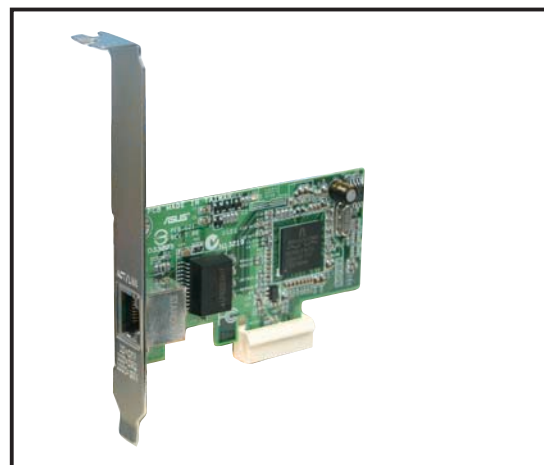
2.6   Jumpers

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. Re-install the battery.

5. Plug the power cord and turn ON the computer.

6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

> 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   Normal (Default)   2 3   Clear CMOS
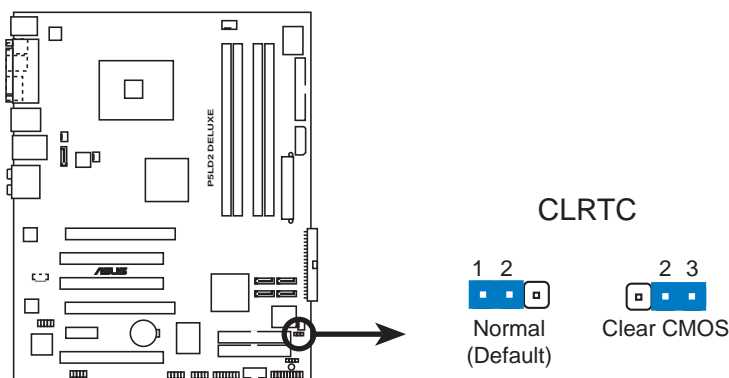
P5LD2 DELUXE Clear RTC RAM

> 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.

2.7 Connectors

2.7.1 Rear panel connectors
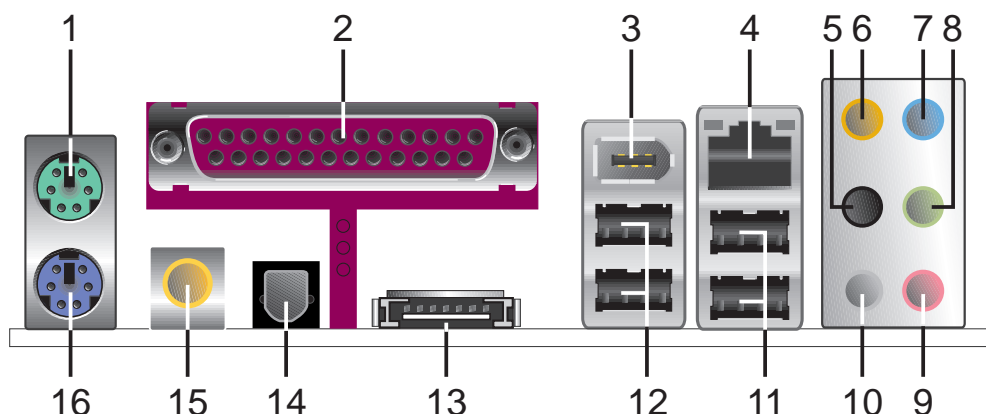
1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.

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

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

4. **LAN (RJ-45) port.** 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.

LAN port LED indications

ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
GREEN	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection

ACT/LINK LED   SPEED LED

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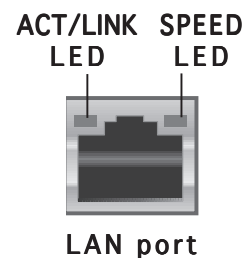
5. **Side Speaker Out port (black).** This port connects the side speakers in an 8-channel audio configuration.

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

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

8. **Line Out port (lime).** This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.

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

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

10. **Rear Speaker Out port (gray).** This port connects the rear speakers on a 4-channel, 6-channel, or 8-channel audio configuration.

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	2-channel (Headset)	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
Gray	—	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Black	—	—	—	Side Speaker Out
Orange	—	—	Center/Subwoofer	Center/Subwoofer

11. **USB 2.0 ports 3 and 4.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

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

13. **External SATA port.** This port connects to an external SATA box or a Serial ATA port multiplier that supports up to 16 devices and enables smart setup and hot-plug function.

14. **Optical S/PDIF Out port.** This port connects an external audio output device via an optical S/PDIF cable.

15. **Coaxial S/PDIF Out port.** This port connects an external audio output device via a coaxial S/PDIF cable.

16. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

2.7.2 Internal 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

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

PIN 1
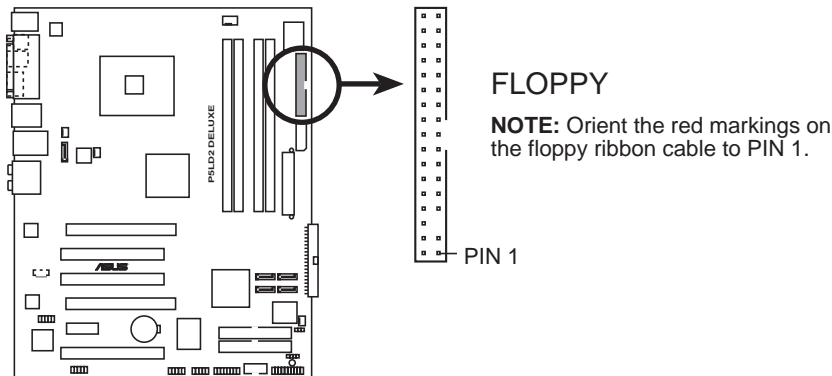
P5LD2 DELUXE Floppy disk drive connector

2. Primary IDE connector (40-1 pin PRI_IDE)

This connector is for an Ultra DMA 100/66 signal cable. The Ultra DMA 100/66 signal cable has three connectors: a blue connector for the primary IDE connector on the motherboard, a black connector for an Ultra DMA 100/66 IDE slave device (optical drive/hard disk drive), and a gray connector for an Ultra DMA 100/66 IDE master device (hard disk drive). If you install two hard disk drives, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.

> • 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 100/66 IDE devices.

PRI_IDE

NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.
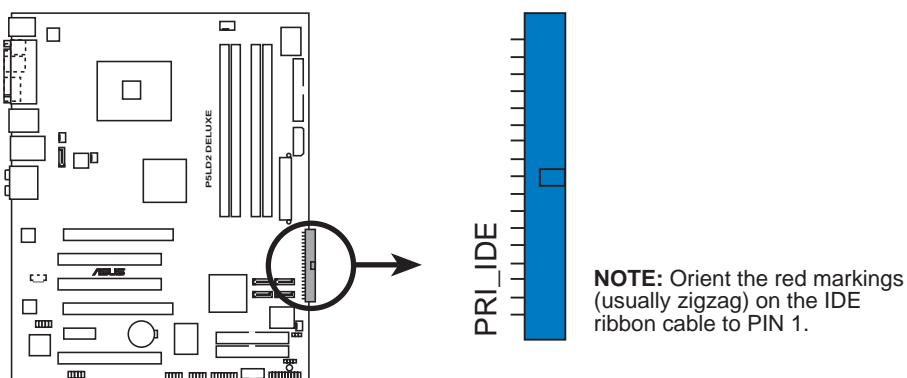
P5LD2 DELUXE IDE connector

3. IDE connectors (40-1 pin PRI_EIDE [red], SEC_EIDE [red])

These connectors are for Ultra ATA 133/100/66 signal cables. The ITE IDE connectors support up to four IDE hard disk drives for easier data storage.

P5LD2 DELUXE IDE connectors

SEC_EIDE — PIN 1

PRI_EIDE — PIN 1

NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.
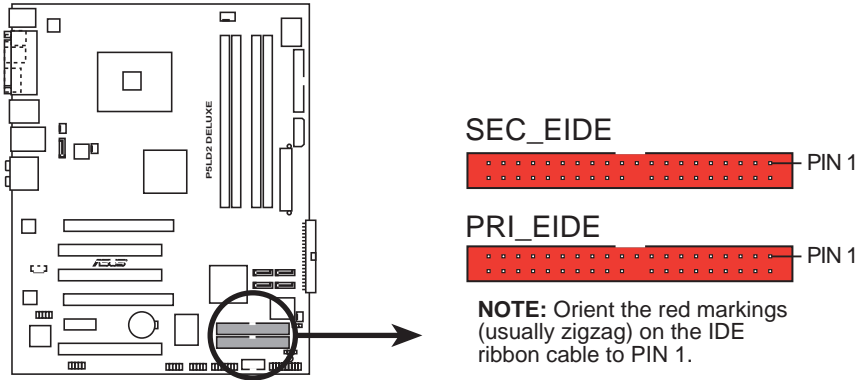
The connectors do not support ATAPI devices.

4. Serial ATA connectors (7-pin SATA1 [red], SATA2 [red], SATA3 [black], SATA4 [black])

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

If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 5, RAID 10 configuration with the Intel® Matrix Storage Technology through the onboard Intel® ICH7R RAID controller. Refer to Chapter 5 for details on how to set up Serial ATA RAID configurations.

These connectors are set to **Standard IDE** mode by default. In **Standard IDE** mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the **Configure SATA As** item in the BIOS to [RAID]. See section "4.3.6 IDE Configuration" on page 4-16 for details.
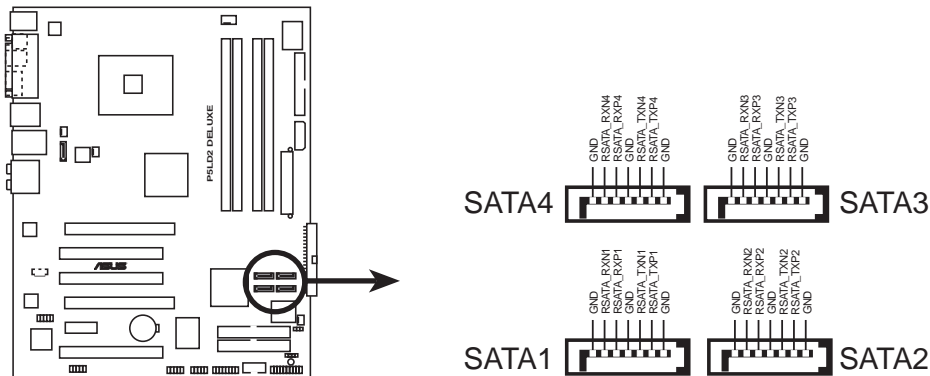
P5LD2 DELUXE SATA connectors

Important notes on Serial ATA

- You must install Windows® 2000 Service Pack 4 or the Windows® XP Service Pack 1 or later versions before using Serial ATA hard disk drives. The Serial ATA RAID feature (RAID 0/RAID 1) is available only if you are using Windows® 2000/XP.

- When using the connectors in **Standard IDE** mode, connect the primary (boot) hard disk drive to the SATA1 or SATA2 connector. Refer to the table on the next page for the recommended SATA hard disk drive connections.

Serial ATA hard disk drive connection

Connector	Color	Setting	Use
SATA1/SATA2	Red	Master	Boot disk
SATA3/SATA4	Black	Slave	Data disk

5. Serial ATA RAID connector (7-pin SATA_RAID2)

This connector is for a Serial ATA signal cable. It supports a Serial ATA hard disk drive that you can combine with an external Serial ATA 3Gb/s device to configure a RAID 0 or RAID 1 set, through the onboard Silicon Image SATA RAID controller. Refer to Chapter 5 for details on how to set up Serial ATA RAID configurations.

> The Silicon 3132 Controller item in the BIOS is set to [SATA2 Mode] by default, allowing you to enable the hot-plug function for the external device. Set to [RAID Mode] to use the connectors to build a RAID set. See section "4.4.6 Onboard Devices Configuration" for details.
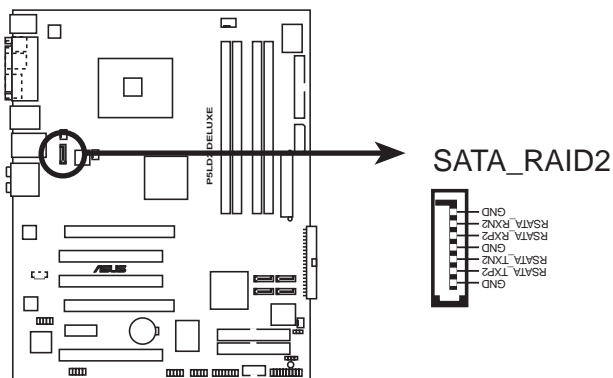
SATA_RAID2

P5LD2 DELUXE SATA RAID connector

> - Before creating a RAID set using Serial ATA hard disks, make sure that you have connected the Serial ATA signal cable and installed Serial ATA hard disk drives; otherwise, you cannot enter the Silicon Image RAID utility and SATA BIOS setup during POST.
>
> - For details on the Silicon Image SATARaid™ RAID configuration, refer to the "Sil3132 User's Manual" in your motherboard support CD.
>
> - Use a Serial ATA port multiplier if you want to configure a RAID 5, RAID 10 or CONCATENATION set.
>
> - Use an external SATA box to configure a RAID 0 or RAID 1 set.
>
> - The Serial ATA port multiplier and external SATA box are purchased separately.
>
> - Make sure to install the Silicon Image SATA Link Sil 3132 driver and the Silicon Image RAID 5 Array Management Utility from the support CD before using RAID 5 configuration.

> Do not unplug the external Serial ATA drive when a RAID 0 or RAID 1 was configured.

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

This connector is for the 4-pin audio cable that connects to the audio connector at the back of the optical drive.
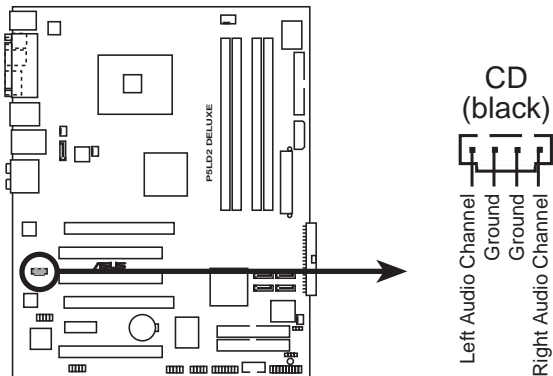
P5LD2 DELUXE Internal audio connector

Enable the CD-IN function in the audio utility when using this connector.

7. 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.
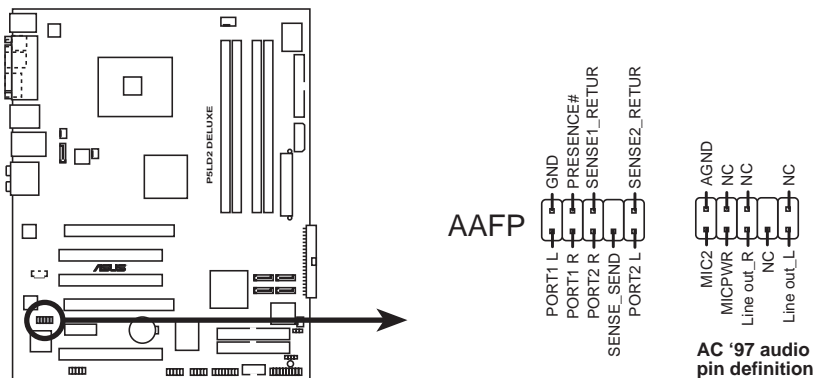
P5LD2 DELUXE Analog front panel connector

It is recommended that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

8. USB connectors (10-1 pin USB56, USB78)

These connectors are for USB 2.0 ports. Connect the USB/GAME 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.

P5LD2 DELUXE USB 2.0 connectors

USB56

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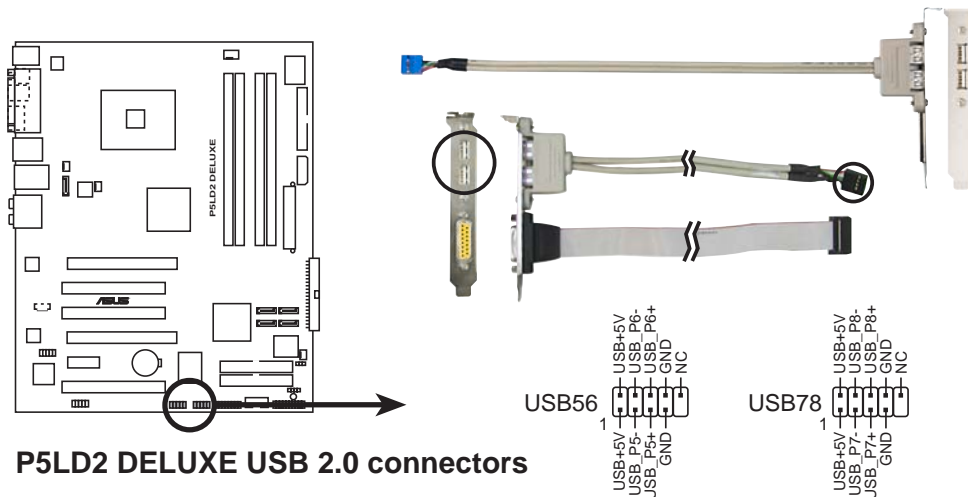
Never connect a **1394 cable** to the USB connectors. Doing so will damage the motherboard!

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

This connector is for a GAME/MIDI port. Connect the USB/GAME module cable to this connector, then install the module to a slot opening at the back of the system chassis. The GAME/MIDI port connects a joystick or game pad for playing games, and MIDI devices for playing or editing audio files.

P5LD2 DELUXE Game connector

GAME
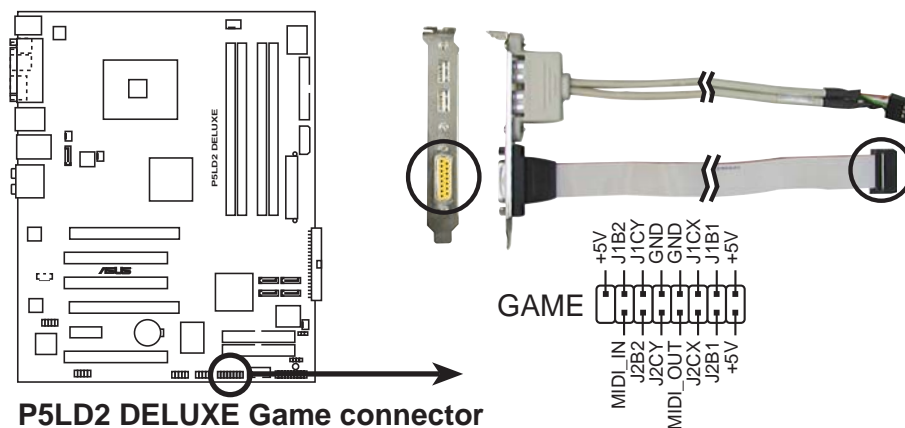
11. Serial port connector (10-1 pin COM1)

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

P5LD2 DELUXE COM port connector
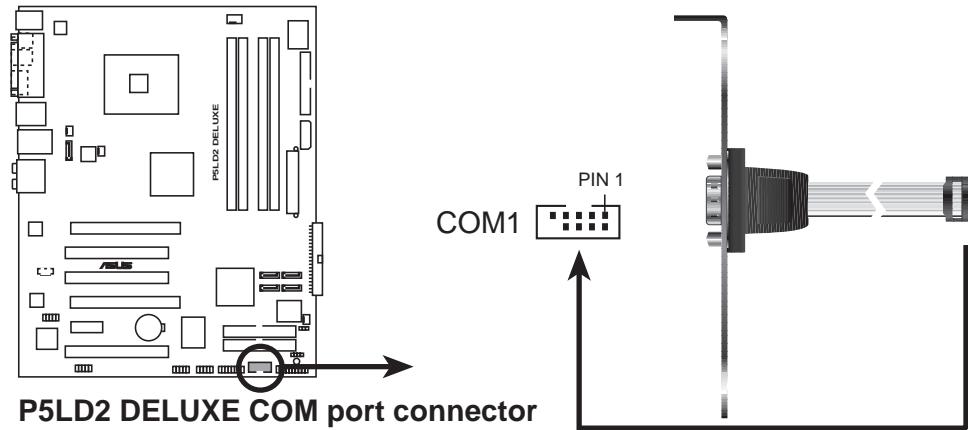
12. CPU, Power, and Chassis fan connectors (4-pin CPU_FAN, PWR_FAN, CHA_FAN1, CHA_FAN2)

The fan connectors support cooling fans of 350 mA ~ 2000 mA (24 W max.) or a total of 1 A ~ 3.48 A (41.76 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.

> 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!

CPU_FAN — CPU_FAN

GND
CPU FAN PWR
CPU FAN IN
CPU FAN PWM

PWR_FAN — PWR_FAN

GND
+12V
Rotation

CHA_FAN1 — CHA_FAN1

GND
+12V
Rotation

CHA_FAN2 — CHA_FAN2

GND
+12V
Rotation

P5LD2 DELUXE Fan connectors
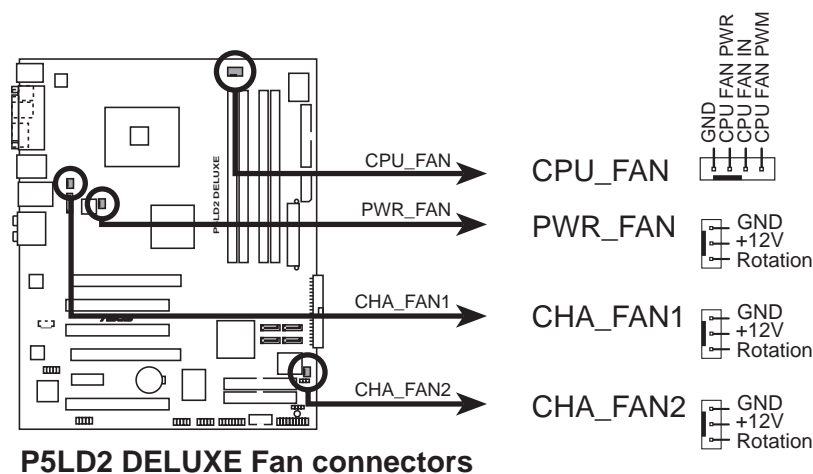
> • Only the CPU_FAN and CHA_FAN1 connectors support the ASUS Q-Fan 2 feature.
>
> • If you install two VGA cards, we recommend that you plug the rear chassis fan cable to the motherboard connector labeled CHA_FAN1 for better heat dissipation.

14. 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 pins 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.
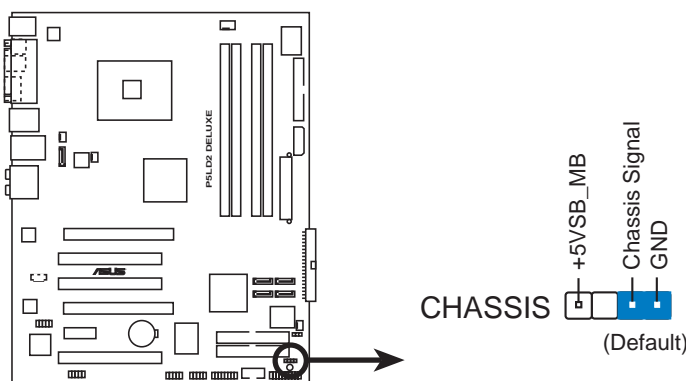
P5LD2 DELUXE Chassis intrusion connector

15. IEEE 1394 connector (10-1 pin IE1394_2)

This connector is for an additional IEEE 1394 port. Connect the IEEE 1394 module cable (orange) to this connector, then install the module to a slot opening at the back of the system chassis.
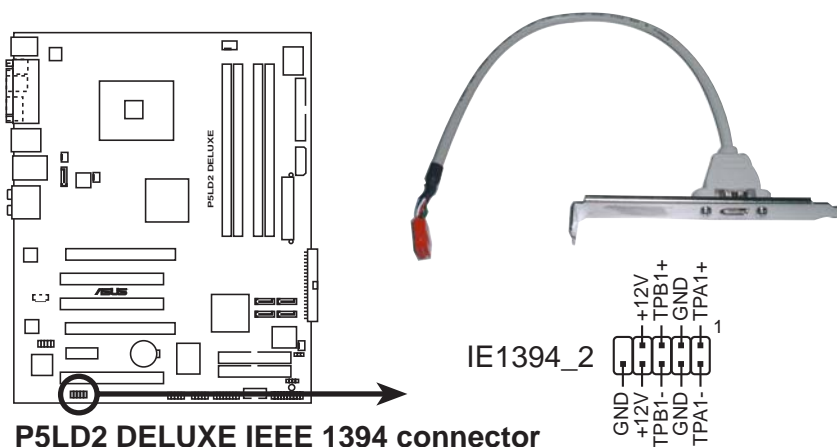
P5LD2 DELUXE IEEE 1394 connector

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

16. ATX power connectors
(24-pin EATXPWR, 8-pin EATX12V, 4-pin EZ_PLUG)

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

+12V DC +12V DC +12V DC +12V DC

GND GND GND GND

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

EZ_PLUG

+5V
EZ_DET
GND
+12V
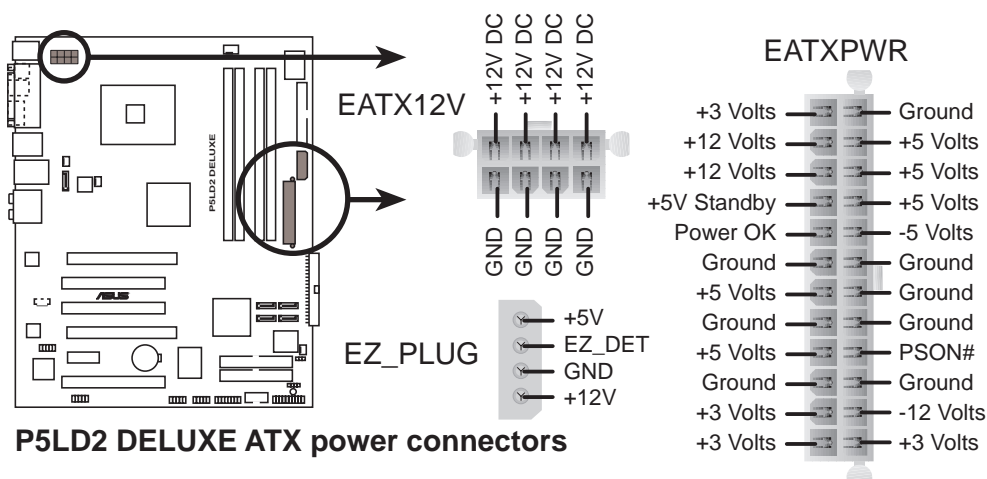
P5LD2 DELUXE ATX power connectors

- You may use a 4-pin ATX12V power plug for this connector.

- Make sure to remove the cap on the connector before connecting an 8-pin EPS +12V power plug.

- Use only either a 4-pin ATX12V or an 8-pin EPS +12V power plug. Connecting other power plug types may serious damage to the system.

EATX12V
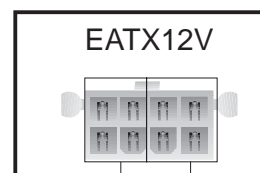
Remove the cap before using an 8-pin power plug

Connect a 4-pin power plug here

Important notes on motherboard power requirements

- When installing two VGA cards using a 20-pin ATX PSU with +12V capability, we recommend that you connect the EZ Plug for sufficient power. Refer to the PSU documentation for dual VGA power requirements.

- 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 350 W.

- Do not forget to connect the 8-pin/4-pin ATX12 V power plug; otherwise, the system will not boot up.

- 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.

17. System panel connector (20-pin PANEL)

This connector supports several chassis-mounted functions.
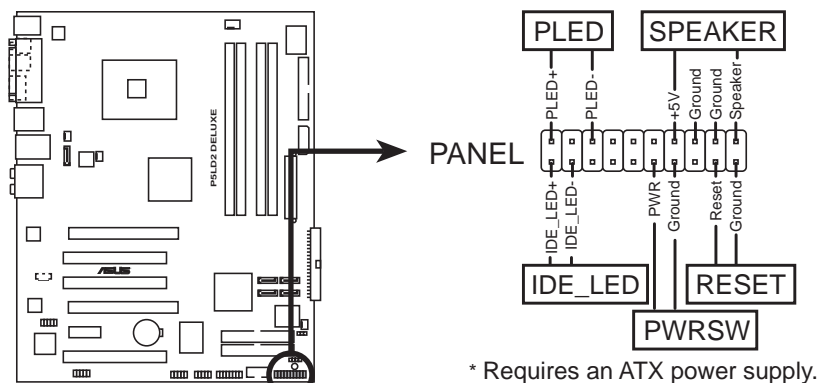
P5LD2 DELUXE System panel connector

* 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 (Green 3-pin PLED)**
  This 3-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 (Red 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 (Orange 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 (Light green 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 (Blue 2-pin RESET)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

This chapter describes the power up
sequence, the vocal POST messages,
and ways of shutting down the
system.

Powering up 3

Chapter summary

3

3.1   Starting up for the first time

1. After making all the connections, replace the system case cover.

2. Be sure that all switches are off.

3. Connect the power cord to the power connector at the back of the system chassis.

4. Connect the power cord to a power outlet that is equipped with a surge protector.

5. Turn on the devices in the following order:

    a. Monitor

    b. External SCSI devices (starting with the last device on the chain)

    c. System power

6. After applying power, the system power LED on the system front panel case lights up. For systems withATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with "green" standards or if it has a "power standby" feature, the monitor LED may light up or switch between orange and green after the system LED turns on.

    The system then runs the power-on self tests or POST. While the tests are running, the BIOS beeps (see BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

AMI BIOS beep codes

Beep Description	Error
One beep	Keyboard controller error Refresh Time error No master drive detected
Two continuous beeps followed by two short beeps	Floppy controller failure
Two continuous beeps followed by four short beeps	Hardware component failure

7. At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 4.

3.2   Powering off the computer

3.2.1   Using the OS shut down function

If you are using Windows® 2000:

1.   Click the **Start** button then click **Shut Down...**
2.   Make sure that the **Shut Down** option button is selected, then click the **OK** button to shut down the computer.
3.   The power supply should turn off after Windows® shuts down.

If you are using Windows® XP:

1.   Click the **Start** button then select **Turn Off Computer.**
2.   Click the **Turn Off** button to shut down the computer.
3.   The power supply should turn off after Windows® shuts down.

3.2.2   Using the dual function power switch

While the system is ON, pressing the power switch for less than four seconds puts the system to sleep mode or to soft-off mode, depending on the BIOS setting. Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting. Refer to section "4.5 Power Menu" in Chapter 4 for details.

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

BIOS setup

Chapter summary

4

4.1 Managing and updating your BIOS

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

1. **ASUS AFUDOS** (Updates the BIOS in DOS mode using a bootable floppy disk.)
2. **ASUS CrashFree BIOS 2** (Updates the BIOS using a bootable floppy disk or the motherboard support CD when the BIOS file fails or gets corrupted.)
3. **ASUS EZ Flash** (Updates the BIOS in DOS mode using a floppy disk or the motherboard support CD.)
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 in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

4.1.1 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. **Windows® XP users:** 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. In the **Open** field, type **D:\bootdisk\makeboot a:**

       assuming that D is your optical drive letter.

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

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

4.1.2 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 1.2 MB free space to save the file.
>
> • The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be 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 /iP5LD2E.ROM
```

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

```
A:\>afudos /iP5LD2E.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 /iP5LD2E.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:\>
```

4.1.3 ASUS CrashFree BIOS 2 utility

The ASUS CrashFree BIOS 2 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 or the floppy disk that contains the updated BIOS file.

> • Prepare the motherboard support CD 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 to **P5LD2E.ROM**.

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 "P5LD2E.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 "P5LD2E.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.

> 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.

4.1.4 ASUS EZ Flash utility

The ASUS EZ Flash 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 utility is built-in the BIOS chip so it is accessible by pressing <Alt> + <F2> during the Power-On Self Tests (POST).

To update the BIOS using EZ Flash:

1. Visit the ASUS website (www.asus.com) to download the latest BIOS file for the motherboard and rename the same to **P5LD2E.ROM**.

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

3. Press <Alt> + <F2> during POST to display the following.

```
EZFlash starting BIOS update
Checking for floppy...
```

4. Insert the floppy disk that contains the BIOS file to the floppy disk drive. When the correct BIOS file is found, EZ Flash performs the BIOS update process and automatically reboots the system when done.

```
EZFlash starting BIOS update
Checking for floppy...
Floppy found!
Reading file "P5LD2E.ROM". Completed.
Start erasing.......|
Start programming...|
Flashed successfully. Rebooting.
```

⚠ • Do not shutdown or reset the system while updating the BIOS to prevent system boot failure!

• A "Floppy not found!" error message appears if there is no floppy disk in the drive. A "P5LD2E.ROM not found!" error message appears if the correct BIOS file is not found in the floppy disk. Make sure that you rename the BIOS file to P5LD2E.ROM.

4.1.5 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 VX.XX.XX**. See page 5-4 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.
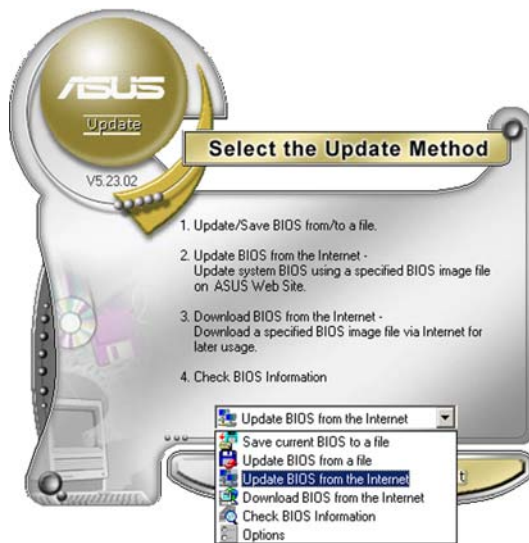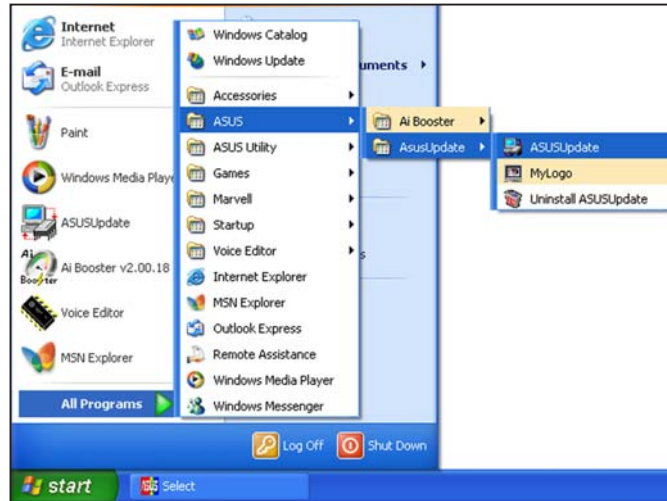
2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.

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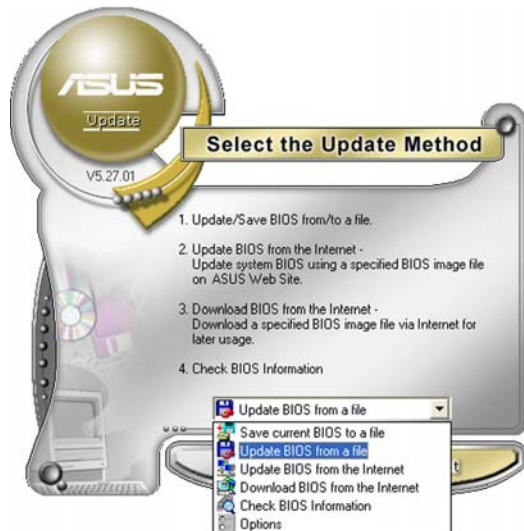
3.   Locate the BIOS file from the
       Open window, then click **Save**.

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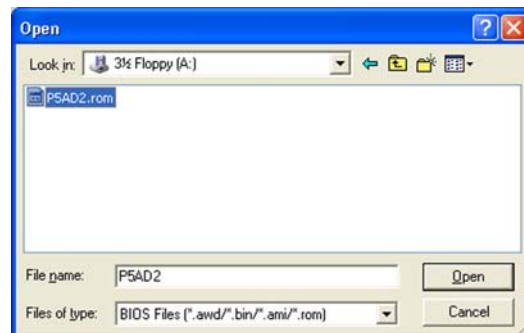
4.2   BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section "4.1 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 firmware hub.

The firmware hub 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, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

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 Default Settings** item under the Exit Menu. See section "4.7 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.

4.2.1   BIOS menu screen

Menu items Menu bar Configuration fields General help

```
                      BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit

  System Time            [11:10:19]            Use [ENTER], [TAB]
  System Date            [Thu 03/27/2003]      or [SHIFT-TAB] to
  Legacy Diskette A      [1.44M, 3.5 in]       select a field.
  Language               [English]
                                               Use [+] or [-] to
  ▶ Primary IDE Master   :[ST320413A]          configure system time.
  ▶ Primary IDE Slave    :[ASUS CD-S340]
  ▶ Secondary IDE Master :[Not Detected]
  ▶ Secondary IDE Slave  :[Not Detected]
  ▶ Third IDE Master     :[Not Detected]
  ▶ Fourth IDE Master    :[Not Detected]       ←    Select Screen
  ▶ IDE Configuration                          ↑↓   Select Item
                                               +-   Change Field
  ▶ System Information                         Tab  Select Field
                                               F1   General Help
                                               F10  Save and Exit
                                               ESC  Exit

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```

Sub-menu items   Navigation keys

4.2.2   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

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.

4.2.3   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.

4.2.4 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.
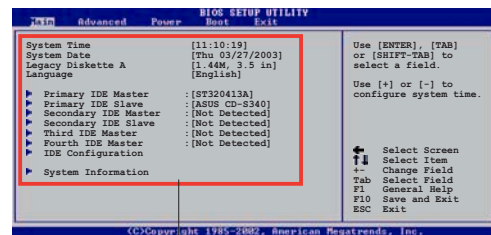
Main menu items

4.2.5 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>.

4.2.6 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 "4.2.7 Pop-up window."

4.2.7 Pop-up window

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

4.2.8 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.

4.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.
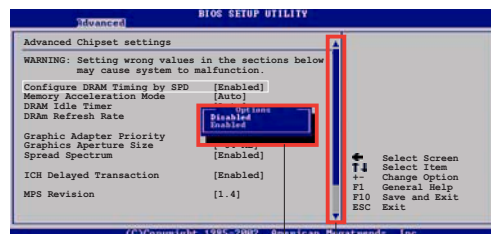
Pop-up window

Scroll bar

4.3 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 "4.2.1 BIOS menu screen" for information on the menu screen items and how to navigate through them.

```
                        BIOS SETUP UTILITY
   Main    Advanced    Power    Boot    Exit

  System Time              [11:51:19]              Use [ENTER], [TAB]
  System Date              [Thu 05/07/2004]        or [SHIFT-TAB] to
  Legacy Diskette A        [1.44M, 3.5 in]         select a field.
  Language                 [English]
                                                   Use [+] or [-] to
  ▶ Primary IDE Master   : [ST320413A]             configure system time.
  ▶ Primary IDE Slave    : [ASUS CD-S520/A]
  ▶ Third IDE Master     : [Not Detected]
  ▶ Third IDE Slave      : [Not Detected]
  ▶ Fourth IDE Master    : [Not Detected]
  ▶ Fourth IDE Slave     : [Not Detected]          ←    Select Screen
  ▶ IDE Configuration                              ↑↓   Select Item
                                                   +-   Change Field
  ▶ System Information                             Tab  Select Field
                                                   F1   General Help
                                                   F10  Save and Exit
                                                   ESC  Exit

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```

4.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

4.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

4.3.3 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.]

4.3.4 Language [English]

Allows you to choose the BIOS language version from the options. Configuration options: [English] [Français] [Deutsch] [Japanese] [Chinese (GB)] [Chinese BIG5]

4.3.5 Primary, Third and Fourth IDE Master/Slave

The BIOS automatically detects the connected 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

 Primary IDE Master                             Select the type
 Device         : Hard Disk                     of device connected
 Vendor         : ST320413A                     to the system.
 Size           : 20.0GB
 LBA Mode       : Supported
 Block Mode     : 16 Sectors
 PIO Mode       : Supported
 Async DMA      : MultiWord DMA-2
 Ultra DMA      : Ultra DMA-5
 SMART Monitoring: Supported

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

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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) [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]

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]

4.3.6   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.

```
                          BIOS SETUP UTILITY
  Main

  IDE Configuration                              When in AHCI/RAID
  Configure SATA As          [Standard IDE]      mode SATA
  Onboard IDE Operate Mode   [Enhanced Mode]     controller is
     Enhanced Mode Support On [S-ATA]            forced to Native
                                                 mode.
  IDE Detect Time Out (Sec)  [35]
```
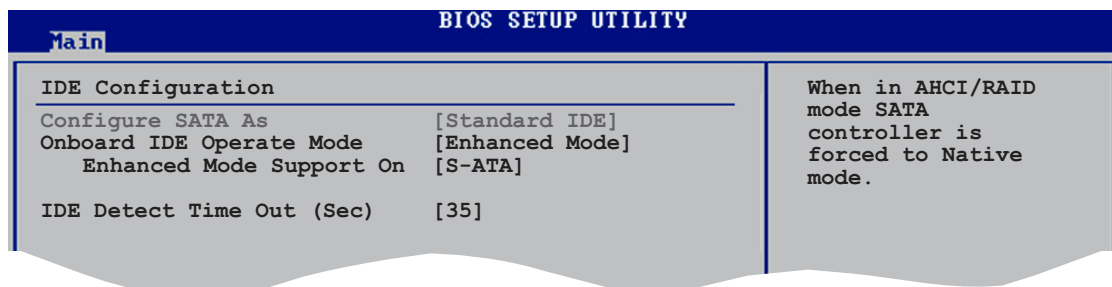
Configure SATA As [Standard IDE]

Sets the configuration for the Serial ATA connectors supported by the Southbridge chip.

The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.

If you want to create a RAID 0, RAID 1, or the Intel® Matrix Storage Technology configuration from the Serial ATA hard disk drives, set this item to [RAID].

If you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices, set this item to [Standard IDE].

If you want the Serial ATA hard disk drives to use the Advanced Host Controller Interface (AHCI), set this item to [AHCI]. For details on AHCI, go
to: www.intel.com/support/chipsets/imst/sb/CS-012304.htm
         www.intel.com/support/chipsets/imst/sb/CS-012305.htm

The SATA controller is set to Native mode when this item is set to [RAID] or [AHCI].

Onboard IDE Operate Mode [Enhanced Mode]

Disables or allows selection of the IDE operation mode depending on the installed operating system (OS). Set to [Enhanced Mode] if you are using native OS including Windows® 2000/XP. Configuration options: [Disabled] [Compatible Mode] [Enhanced Mode]

Enhanced Mode Support On [S-ATA]

Allows you to use native OS on Serial ATA and Parallel ATA ports. It is recommend that you do not change the default setting for better OS compatibility. In this setting, you may use legacy OS on the Parallel ATA ports only if you do not install any Serial ATA device.

The P-ATA+S-ATA and P-ATA options are for advanced users only. If you set to any of these options and encountered problems, revert to the default setting **S-ATA**. Configuration options: [S-ATA+P-ATA] [S-ATA] [P-ATA]

> The **Onboard IDE Operate Mode** and its sub-menu items appear only when the **Configure SATA As** item is set to [Standard IDE].

Onboard Serial-ATA BOOTROM [Disabled]

Enables or disables the onboard Serial ATA boot ROM. This item appears only when the Configure SATA As item is set as RAID. Configuration options: [Disabled] [Enabled]

> The **Onboard Serial-ATA BOOTROM** appears only when the **Configure SATA As** item is set to [RAID].

ALPE and ASP [Disabled]

Allows you to enable or disable the Agressive Link Power Management (ALPE) and Aggressive Slumber/Partial (ASP) management features. Configuration options: [Disabled] [Enabled]

AHCI Port 3 Interlock Switch [Disabled]

Enables or disables the Advanced Host Controller Interface (AHCI) Port 3 interlock switch. Configuration options: [Disabled] [Enabled]

> The **ALPE and ASP** and its sub-menu items appear only when the **Configure SATA As** item is set to [AHCI].

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]

4.3.7 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    : 0118
   Build Date : 04/19/05

   Processor
   Type       : Genuine Intel(R) CPU 2.80GHz
   Speed      : 2800 MHz
   Count      : 2

   System Memory
   Size         : 1024MB
   Appropriated : 0MB                      ←    Select Screen
   Available    : 1024MB                   ↑↓   Select Item
                                           +-   Change Option
                                           F1   General Help
                                           F10  Save and Exit
                                           ESC  Exit

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```

AMI BIOS

Displays the auto-detected BIOS information

Processor

Displays the auto-detected CPU specification

System Memory

Displays the auto-detected system memory

4.4 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
    Advanced

  ▶ JumperFree Configuration                      Adjust system
  ▶ LAN Cable Status                              frequency/voltage.
  ▶ USB Configuration

  ▶ CPU Configuration
  ▶ Chipset
  ▶ Onboard Devices Configuration
  ▶ PCIPnP












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```

4.4.1 JumperFree Configuration

```
                        BIOS SETUP UTILITY
    Advanced

  Configure System Frequency/Voltage

  AI Overclocking            [Auto]

  Performance Mode           [Auto]
```
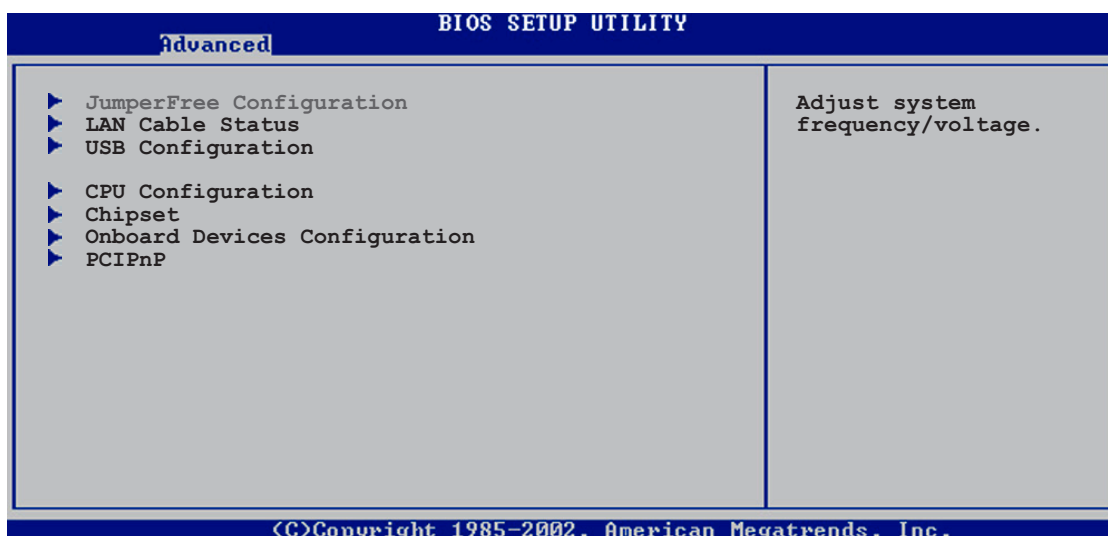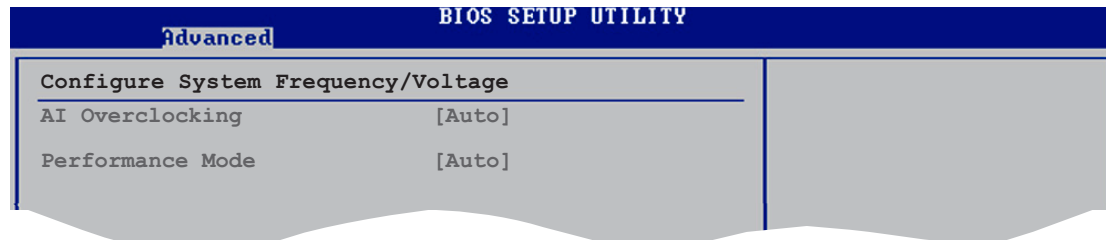
AI Overclocking [Auto]

Allows you to select the overclocking options to achieve the desired CPU internal frequency. Select either one of the preset overclocking configiuration options.

Manual	Allows you to individually set overclocking parameters.
Auto	Loads the optimal settings for the system.
Extreme	Loads the standard settings for the system.
AI Overclock	Loads overclocking profiles with optimal parameters for stability when overclocking.
AI N.O.S.	The ASUS AI Non-delay Overclocking System feature intelligently determines the system load and automatically boost the performance for the most demanding tasks.

Performance Mode [Auto]

Allows enhanced system performance. Setting to [Turbo] may cause the system to become unstable. If this happens, revert to the default setting [Auto]. Configuration options: [Auto] [Standard] [Turbo]

The following item appears only when you set the **AI Overclocking** item to [Manual].

CPU Frequency [XXX]

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 450. 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 DDR2 operating frequency.
Configuration options: [Auto] [DDR2-400MHz] [DDR2-533MHz] [DDR2-600MHz] [DDR-667MHz]

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

PCI Express Frequency [Auto]

Allows you to set the PCI Express frequency. This item is set to [Auto] by default. Configuration options: [Auto] [90]...[150]

PCI Clock Synchronization Mode [Auto]

Allows you to synchronize the PCI frequency with the PCI Express or CPU frequency. Configuration options: [To CPU] [33.33MHz] [Auto]

The following items also appear when the **AI Overclocking** item is set to [Manual] or [AI NOS].

Memory Voltage [Auto]

Allows you to select the DDR2 reference voltage.
Configuration options: [Auto] [1.80V] [1.90V] [1.95V] [2.00V] [2.10V]
[2.15V] [2.20V] [2.30V]

Refer to the DDR2 documentation before adjusting the memory voltage.
Setting a very high memory voltage may damage the memory module(s)!

CPU VCore Voltage [Auto]

Sets the operating VCore voltage. Configuration options: [Auto]
[1.7000V] [1.6875V] [1.6750V] [1.6625V] [1.6500V] [1.6375V]
[1.6250V] [1.6125V] [1.6000V] [1.5875V] [1.5750V] [1.5625V]
[1.5500V] [1.5375V] [1.5250V] [1.5125V] [1.5000V] [1.4875V]
[1.4750V] [1.4625V] [1.4500V] [1.4375V] [1.4250V] [1.4125V]
[1.4000V] [1.3875V] [1.3750V] [1.3625V] [1.3500V] [1.3375V]
[1.3250V] [1.3125V] [1.3000V] [1.2875V] [1.2750V]

Setting to a very high CPU VCore voltage can damage the CPU or may cause the system to become unstable. If this happens, revert to default settings.

FSB Termination Voltage [Auto]

Allows you to select the front side bus termination voltage.
Configuration options: [Auto] [1.20V] [1.30V] [1.40V] [1.50V]

MCH Chipset Voltage [Auto]

Allows you to select the memory controller hub (MCH) voltage.
Configuration options: [Auto] [1.50V] [1.55V] [1.60V] [1.65V]

ICH Chipset Voltage [Auto]

Allows you to select the I/O controller hub (ICH) voltage.
Configuration options: [Auto] [1.05V] [1.20V]

The following item appears only when the **AI Overclocking** item is set to [Overclock Profile].

Overclock Options [Overclock 5%]

Allows you to overclock the CPU speed through the available preset values. Configuration options: [Overclock 5%] [Overclock 10%] [Overclock 15%] [Overclock 20%] [Overclock 30%] [FSB888/DDR2-667] [FSB960/DDR2-800] [FSB1280/DDR2-800] [FSB1333/DDR2-667] [FSB1333/DDR2-834]

The following item appears only when the **AI Overclocking** item is set to [AI NOS].

N.O.S. Mode [Auto]

Sets the Non-Delay Overclocking System mode. Select either of the following configuration options: [Auto] [Manual]

Sensitivity [Sensitive]

Sets the Non-Delay Overclocking System mode sensitivity. Select either of the following configuration options:

Normal - activates overclocking on a threshold between light and heavy CPU loading.

Sensitive - activates overclocking on a light CPU loading.

Less-Sensitive - activates overclocking on a heavy CPU loading.

Target Frequency [Overclock 3%]

Allows you to set the target frequency.
Configuration options: [Overclock 3%] [Overclock 5%] [Overclock 7%] [Overclock 10%] [Overclock 15%] [Overclock 20%] [Overclock 30%]

4.4.2 LAN Cable Status

This menu displays the status of the Local Area Network (LAN) cable connected to the LAN (RJ-45) port.

```
                            BIOS SETUP UTILITY
         Advanced

 POST Check LAN Cable       [Disabled]              Check LAN cable
                                                    during POST.
 LAN Cable Status
 Pair     Status        Length

 1-2      Open          0.0M
 3-6      Open          0.0M
 4-5      Open          0.0M
 7-8      Open          0.0M




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```

POST Check LAN Cable [Disabled]

Allows you to enable or disable LAN cable check during POST. When enabled, the menu reports the cable faults or shorts, and displays the point (length) where the fault or short is detected.
Configuration options: [Disabled] [Enabled]

4.4.3 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                              Enables USB host
                                                  controllers.
   Module Version - 2.24.0-F.4

   USB Devices Enabled: None

   USB Function                [Enabled]
   Legacy USB Support          [Auto]
   USB 2.0 Controller          [Disabled]
   USB 2.0 Controller Mode     [HiSpeed]
   BIOS EHCI Hand-Off          [Disabled]
```

The **Module Version** and **USB Devices Enabled** items show the
auto-detected values. If no USB device is detected, the item shows
None.

USB Function [Enabled]

Enables or disables the USB function.
Configuration options: [Disabled] [Enabled]

Legacy USB Support [Auto]

Allows you to enable or disable support for legacy USB devices. 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]

USB 2.0 Controller [Disabled]

Allows you to enable or disable the USB 2.0 controller.
Configuration options: [Enabled] [Disabled]

USB 2.0 Controller Mode [HiSpeed]

Allows you to set the USB 2.0 controller mode to HiSpeed (480 Mbps) or
FullSpeed (12 Mbps). Configuration options: [FullSpeed] [HiSpeed]

BIOS EHCI Hand-Off [Disabled]

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

4.4.4 CPU Configuration

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

```
                         BIOS SETUP UTILITY
   Advanced

   Configure Advanced CPU settings                   ▲     Sets the ratio
                                                            between CPU Core
   Manufacturer: Intel                                      Clock and the FSB
   Brand String: Genuine Intel(R) CPU 3.20GHz               Frequency.
   Frequency   : 2800 MHz                                   NOTE: If an invalid
   FSB Speed   : 800 MHz                                    ratio is set in CMOS
                                                            then actual and
   Cache L1    : 16 KB                                      setpoint values may
   Cache L2    : 1024 KB                                    differ.
   Cache L3    : 0 KB
   Ratio Status: Unlocked (Max:14, Min:14)
   Ratio Actual Value : 14
      Ratio CMOS Setting:        [ 14]                ←      Select Screen
      VID CMOS Setting:          [ 62]               ↑↓      Select Item
      CPU Lock Free            [Auto]                +-      Change Option
   Microcode Updation          [Enabled]             F1      General Help
   Max CPUID Value Limit:      [Disabled]            F10     Save and Exit
   Enhanced C1 Control          [Auto]               ESC     Exit
   CPU Internal Thermal Control [Auto]               ▼

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```

Ratio CMOS Setting [14]

Sets the ratio between the CPU core clock and the Front Side Bus frequency. The BIOS auto-detects the default value of this item. Use the <+> or <-> keys to adjust the values. Configuration options: [8]...[28]

> You can only adjust the **Ratio CMOS** if you installed an unlocked CPU. Refer to the CPU documentation for details.

VID CMOS Setting [62]

Allows you to set the VID CMOS setting at which the processor is to run. The BIOS auto-detects the default value of this item. Use the <+> or <-> keys to adjust the values.

> The following item appears only when you install a CPU that supports the lock free feature. Only some latest CPUs support this feature.

CPU Lock Free [Auto]

Allows you to adjust the CPU multiplier to 14x. Setting this item to [Auto] allows the motherboard to automatically reduce the CPU multiplier value for more flexibility when increasing the external FSB.
Configuration options: [Auto] [Disabled] [Enabled]

Microcode Updation [Enabled]

Allows you to enable or disable the microcode updation.
Configuration options: [Disabled] [Enabled]

Max CPUID Value Limit [Disabled]

Setting this item to [Enabled] allows legacy operating systems to boot even without support for CPUs with extended CPUID functions. Configuration options: [Disabled] [Enabled]

Enhanced C1 Control [Auto]

When set to [Auto], the BIOS automatically checks the CPU's capability to enable the C1E support. In C1E mode, the CPU power consumption is lower when idle. Configuration options: [Auto] [Disabled]

CPU Internal Thermal Control [Auto]

Allows you to disable or set to auto the CPU Internal Thermal Control function. Configuration options: [Auto] [Disabled]

Scroll down the screen to display the following items.

Hyper-Threading Technology [Enabled]

Allows you to enable or disable the processor Hyper-Threading Technology. Refer to the Appendix for more information on the Hyper-Threading Technology. Configuration options: [Disabled] [Enabled]

> The following item appears only when you installed an Intel® Pentium® D or Intel® Pentium® 4 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 [Automatic], you can adjust the system power settings in the operating system to use the EIST feature.

Set this item to [Maximum] or [Disabled] if you <u>do not</u> want to use the EIST. The CPU constantly operates at a lower internal frequency when you set this item to [Minimum].

Configuration options: [Maximum] [Minimum] [Automatic] [Disabled]

> • Refer to the Appendix for details on how to use the EIST feature.
> • The motherboard comes with a BIOS file that supports EIST.

4.4.5 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

  Advanced Chipset Settings                          Enable or disable
                                                     DRAM timing.
  Configure DRAM Timing by SPD    [Enabled]
  Hyper Path 3                    [Auto]

  Boot Graphic Adapter Priority   [PCI Express/Int-VG]
  Internal Graphics Mode Select   [Disabled]


  PEG Buffer Length               [Auto]
  Link Latency                    [Auto]
  PEG Root Control                [Auto]
  PEG Link Mode                   [Auto]         ←    Select Screen
  Slot Power                      [Auto]         ↑↓   Select Item
  High Priority Port Select       [Disabled]     +-   Change Option
  2nd PCI-E slot mode             [Auto]         F1   General Help
                                                 F10  Save and Exit
```

Advanced Chipset Settings

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.
The following sub-items appear when this item is Disabled.
Configuration options: [Disabled] [Enabled]

DRAM CAS# Latency [5 Clocks]

Controls the latency between the SDRAM read command and the time
the data actually becomes available.
Configuration options: [6 Clocks] [5 Clocks] [4 Clocks] [3 Clocks]

DRAM RAS# Precharge [4 Clocks]

Controls the idle clocks after issuing a precharge command to the DDR
SDRAM. Configuration options: [2 Clocks] [3 Clocks] [4 Clocks]
[5 Clocks] [6 Clocks]

DRAM RAS# to CAS# Delay [4 Clocks]

Controls the latency between the DDR SDRAM active command and
the read/write command. Configuration options: [2 Clocks] [3 Clocks]
[4 Clocks] [5 Clocks] [6 Clocks]

DRAM RAS# Activate to Precharge Delay [15 Clocks]

Configuration options: [4 Clocks] [5 Clocks] ~ [18 Clocks]

DRAM Write Recovery Time [4 Clocks]

Configuration options: [2 Clocks] [3 Clocks] [4 Clocks] [5 Clocks]
[6 Clocks]

Hyper Path 3 [Auto]

Allows you to enable or disable the ASUS Hyper Path 3 feature.
Configuration options: [Disabled] [Enabled] [Auto]

Boot Graphic Adapter Priority [PCI Express/PCI]

Allows selection of the graphics controller to use as primary boot device.
Configuration options: [PCI Express/PCI] [PCI/PCI Express]

Internal Graphics Mode Select [Disabled]

Allows you to disable or select the internal graphics mode.
Configuration options: [Disabled] [Enabled, 1MB] [Enabled, 8MB]

PEG Buffer Length [Auto]

Sets the length of the PCI Express graphics card buffer.
Configuration options: [Auto] [Long] [Short]

Link Latency [Auto]

Sets the PCI Express graphics card link latency.
Configuration options: [Auto] [Slow] [Normal]

PEG Root Control [Auto]

Allows you to enable, disable, or set to automatic the PCI Express graphics
card root control. Configuration options: [Auto] [Disabled] [Enabled]

PEG Link Mode [Auto]

Sets the PCI Express graphics link mode. Setting this item to [Auto] allows
the motherboard to automatically adjust the PCI Express graphics link mode
to the correct frequency based on the system configuration. Four
additional settings are available for overclocking the PEG Link Mode.
Configuration options: [Auto] [Slow] [Normal] [Fast] [Faster]

Slot Power [Auto]

Sets the PCI Express graphics card slot power.
Configuration options: [Auto] [Light] [Normal] [Heavy] [Heavier]

High Priority Port Select [Disabled]

Disables or sets the priority port based on the ICHT PCI Express port.
Configuration options: [Disabled] [PCI Express Port 5] [PCI Express Port 6]

2nd PCI-E slot mode [Auto]

Sets the 2nd PCI Express slot mode.
Configuration options: [Auto] [x2 Mode [Fast]] [x4 Mode [Faster]]

4.4.6   Onboard Devices Configuration

```
                          BIOS SETUP UTILITY
     Advanced

  Configure Win627EHF Super IO Chipset              Enable or disable
                                                    High Definition Audio
  HD Audio Controller        [Enabled]              Controller.
   Front Panel Support Type  [HD Audio]
  Onboard 1394 Controller    [Enabled]
  Onboard PCIEX GbE LAN      [Enabled]
    LAN Option ROM           [Disabled]
  Silicon 3132 Controller    [SATA2 Mode]
  ITE8212F Controller        [Enabled]
     Detecting Device Time   [Quick Mode]

  Serial Port1 Address       [3F8/IRQ4]
  Parallel Port Address      [378]
  Parallel Port Mode         [ECP]
     ECP Mode DMA Channel    [DMA3]
    Parallel Port IRQ        [IRQ7]
  Onboard Game/MIDI Port     [Disabled]



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```

HD Audio Controller [Enabled]

Allows you to enable or disable the high-definition audio CODEC.
Configuration options: [Enabled] [Disabled]

Front Panel Support Type [HD Audio]

Allows you to set the front panel audio connector (AAAF) mode to legacy
AC'97 or high–definition audio depending on the audio standard that the front
panel audio module supports. Configuration options: [AC97] [HD Audio]

OnBoard 1394 Controller [Enabled]

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

OnBoard PCIEX GbE LAN [Enabled]

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

> The Gigabit LAN controller does not support S5 Wake-On-LAN function
> under DOS mode or Windows® ME.

LAN Option ROM [Disabled]

This item allows you to enable or disable the option ROM in the
onboard LAN controller. This item appears only when the **Onboard
PCIEX Gbe LAN** items are set to Enabled.
Configuration options: [Disabled] [Enabled]

Silicon 3132 Controller [SATA2 Mode]

Allows you to set the onboard Silicon Image SATA RAID controller mode.
Configuration options: [SATA2 Mode] [RAID Mode] [Disabled]

ITE8211F Controller [Enabled]

Allows you to enable or disable the onboard ITE® 8211F IDE controller.
Configuration options: [Disabled] [Enabled]

Detecting Device Time [Quick Mode]

Sets the time the ITE8211F IDE RAID controller detects devices
connected to the IDE RAID connectors.
Configuration options: [Standard Mode] [Quick Mode]

Serial Port1 Address [3F8/IRQ4]

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

Onboard Game/MIDI Port [Disabled]

Allows you to select the Game Port address or to disable the port.
Configuration options: [Disabled] [200/300] [200/330] [208/300]
[208/330]

4.4.7 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.

⚠ 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                      NO: Lets the BIOS
 ───────────────────────────────────────       confiuge all the
 WARNING: Setting wrong values in below sections  devices in the system.
          may cause system to malfunction.      YES: Lets the
                                                operating system
 Plug And Play O/S         [No]                 configure Plug and
 PCI Latency Timer         [64]                 Play (PnP) devices not
 Allocate IRQ to PCI VGA   [Yes]               required for boot if
 Palette Snooping          [Disabled]           your system has a Plug
                                                and Play operating
 IRQ-3  assigned to        [PCI Device]         system.
 IRQ-4  assigned to        [PCI Device]
 IRQ-5  assigned to        [PCI Device]
 IRQ-7  assigned to        [PCI Device]         ←    Select Screen
 IRQ-9  assigned to        [PCI Device]         ↑↓   Select Item
 IRQ-10 assigned to        [PCI Device]         +-   Change Option
 IRQ-11 assigned to        [PCI Device]         F1   General Help
 IRQ-14 assigned to        [PCI Device]         F10  Save and Exit
 IRQ-15 assigned to        [PCI Device]         ESC  Exit

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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]

IRQ-xx assigned to [PCI Device]

When set to [PCI Device], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices. Configuration options: [PCI Device] [Reserved]

4.5   Power menu

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

```
                        BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit
┌─────────────────────────────────────────────┬──────────────────────────┐
│                                              │  Select the ACPI state   │
│  Suspend Mode            [Auto]              │  used for System         │
│  Repost Video on S3 Resume  [No]             │  Suspend.                │
│  ACPI 2.0 Support        [No]                │                          │
│  ACPI APIC Support       [Enabled]           │                          │
│                                              │                          │
│  ▶ APM Configuration                         │                          │
│  ▶ Hardware Monitor                          │                          │
│                                              │                          │
│                                              │                          │
│                                              │  ←→    Select Screen     │
│                                              │  ↑↓    Select Item       │
│                                              │  Enter Go to Sub Screen  │
│                                              │  F1    General Help      │
│                                              │  F10   Save and Exit     │
│                                              │  ESC   Exit              │
│                                              │                          │
└─────────────────────────────────────────────┴──────────────────────────┘
       vMM.mm (C)Copyright 1985-2002, American Megatrends, Inc.
```
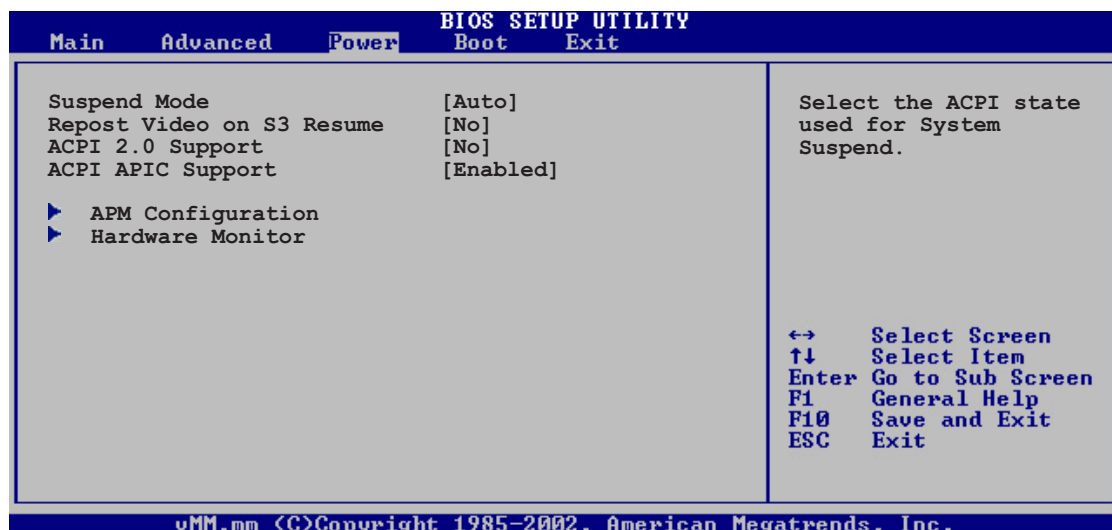
4.5.1   Suspend Mode [Auto]

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]

4.5.2   Repost Video on S3 Resume [No]

Determines whether to invoke VGA BIOS POST on S3/STR resume.
Configuration options: [Yes] [No]

4.5.3   ACPI 2.0 Support [No]

Allows you to add more tables for Advanced Configuration and Power Interface (ACPI) 2.0 specifications. Configuration options: [No] [Yes]

4.5.4   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]

4.5.5 APM Configuration

```
                          BIOS SETUP UTILITY
             Power

APM Configuration                                     Go into On/Off or
                                                      Suspend when Power
Power Button Mode          [On/Off]                   button is pressed.

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]
```

Power Button Mode [On/Off]

Allows the system to go into On/Off mode or suspend mode when the power button is pressed. Configuration options: [On/Off] [Suspend]

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]

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 PCI Express LAN device. 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]

4.5.6 Hardware Monitor

```
                         BIOS SETUP UTILITY
                  Power
  Hardware Monitor
  CPU Temperature           [32.5°C/90.5°F]
  MB Temperature            [36.0°C/96.5°F]

  CPU Fan Speed (RPM)       [3813 RPM]
  CPU Q-Fan Control         [Disabled]
  Chassis Fan1 Speed (RPM)  [N/A]
  Chassis Fan2 Speed (RPM)  [N/A]
  Chassis Q-Fan1 Control    [Disabled]
  Power Fan Speed (RPM)     [N/A]

  VCORE Voltage             [ 1.320V]        ←→    Select Screen
  3.3V Voltage              [ 3.345V]        ↑↓    Select Item
  5V Voltage                [ 5.094V]        +—    Change Option
  12V Voltage               [11.880V]        F1    General Help
                                             F10   Save and Exit
                                             ESC   Exit

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

CPU Temperature [xx.xºC/xx.xºF]
MB Temperature [xx.xºC/xx.xºF]

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

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

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.

CPU Q-Fan Control [Disabled]

Allows you to enable or disable the ASUS Q-Fan feature that smartly adjusts the fan speeds for more efficient system operation. Configuration options: [Disabled] [Enabled]

> The **CPU Q-Fan Mode** and **CPU FAN PROFILE MODE** items appear only when the CPU Q-Fan Control is Enabled.

CPU Q-Fan Mode [PWM]

Allows you to select the type of CPU fan cable connected to the CPU fan connector. Set to [PWM] when using a 4-pin CPU fan cable. Set to [DC] when using a 3-pin CPU fan cable. Configuration options: [PWM] [DC]

> Some CPU fans with a 4-pin cable do not comply with Intel®'s PWM fan specification. When using this type of CPU fan, you can not reduce the CPU fan speed even if you set the CPU Q-Fan Mode to [PWM].

CPU FAN PROFILE MODE [Optimal]

Sets the CPU fan profile mode.
Configuration options: [Optimal] [Silent Mode] [Performance Mode]

Chassis Fan1 Speed [xxxxRPM] or [N/A]
Chassis Fan2 Speed [xxxxRPM] or [N/A]

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

Chassis Q-Fan1 Control [Disabled]

Allows ysou to enable or disable the ASUS Q-Fan feature that smartly adjusts the chassis fan speeds for more efficient system operation. When enabled, the chassis fan ratio is the same with the selected CPU fan ratio.
Configuration options: [Disabled] [Enabled]

The **Chassis FAN PROFILE MODE** item appears only when the **Chassis Q-Fan1 Control** is Enabled.

Chassis FAN PROFILE MODE [Optimal]

Sets the chassis fan profile mode.
Configuration options: [Optimal] [Silent Mode] [Performance Mode]

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

The onboard hardware monitor automatically detects and displays the power fan speed in rotations per minute (RPM). If the fan is not connected to the power fan connector, the specific field shows N/A.

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

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

4.6 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.

```
                         BIOS SETUP UTILITY
   Main    Advanced    Power    Boot    Exit

  APM Configuration

    ▶  Boot Device Priority
    ▶  Hard Disk Drives

    ▶  Boot Settings Configuration
    ▶  Security

                                                ⬅    Select Screen
                                                ↑↓   Select Item
                                                Enter Go to Sub-screen
                                                F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit

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```

4.6.1   Boot Device Priority

```
                         BIOS SETUP UTILITY
   Main    Advanced    Power    Boot    Exit

  Boot Device Priority

    1st Boot Device           [1st FLOPPY DRIVE]
    2nd Boot Device           [PM-ST330620A]
    3rd Boot Device           [PS-ASUS CD-S360]
```

1st ~ xxth Boot Device [1st Floppy Drive]

These items specify the boot device sequence of 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]

4.6.2   Hard Disk Drives

```
                         BIOS SETUP UTILITY
   Main    Advanced    Power    Boot    Exit

  Hard Disk Drives

    1st Drive                 [XXXXXXXXX]
    2nd Drive                 [XXXXXXXXX]
```
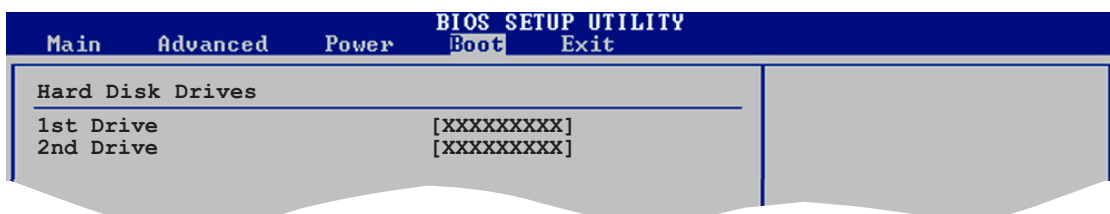
1st ~ xxth Drive [XXXXXX]

These items specify the boot device sequence of available disk drives. The number of disk drives that appear on the screen depends on the number of drives installed in the system. Configuration options: [XXXXXXX] [Disabled]

4.6.3 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]

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]

4.6.4 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

   Boot Sector Virus Protection          [Disabled]



                                                  ←    Select Screen
                                                  ↑↓   Select Item
                                                  +-   Change Option
                                                  F1   General Help
                                                  F10  Save and Exit
                                                  ESC  Exit


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```
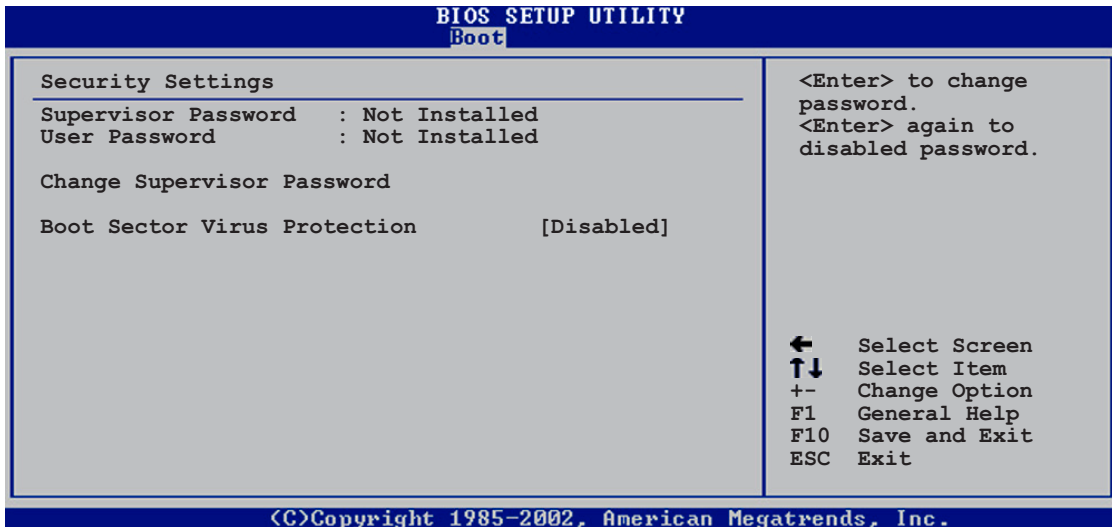
Change Supervisor Password

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, then 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 "2.6 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
                           Boot

 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]

 Boot Sector Virus Protection [Disabled]
                                                  ←    Select Screen
                                                  ↑↓   Select Item
                                                  +-   Change Option
                                                  F1   General Help
                                                  F10  Save and Exit
                                                  ESC  Exit

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```

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.

Clear User Password

Select this item to clear 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]

Boot Sector Virus Protection [Disabled]

Allows you to enable or disable the boot sector virus protection.
Configuration options: [Disabled] [Enabled]

4.7   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     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




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

                (C)Copyright 1985-2002, American Megatrends, Inc.
```
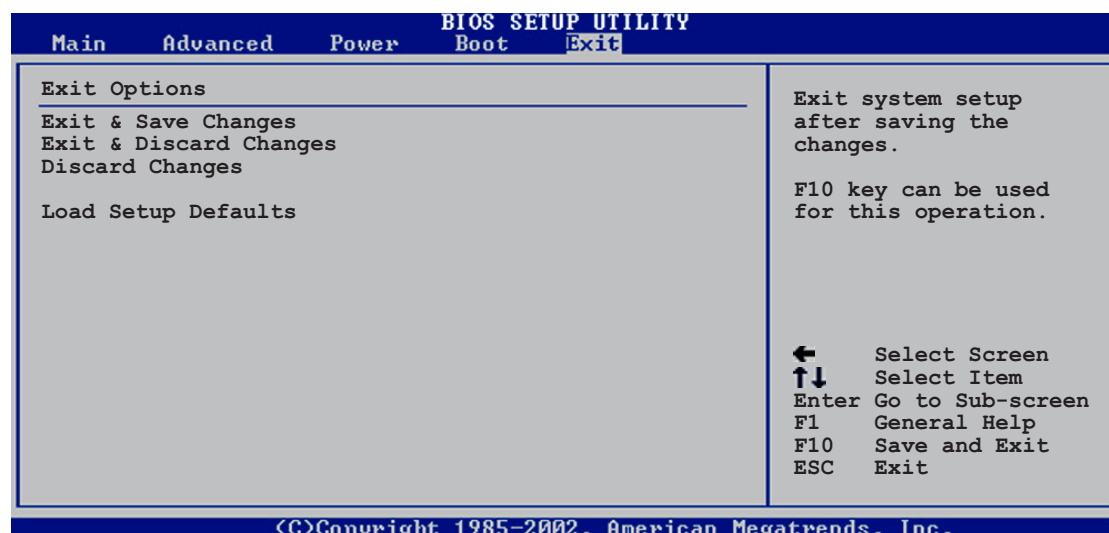
✎ Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

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 computer is turned off. When you select this option, a confirmation window appears. Select **Ok** to save the 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

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

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.

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

Software
support

5

Chapter summary

5

5.1 Installing an operating system

This motherboard supports Windows® 2000/2003 Server/XP operating systems (OS). Always install the latest OS version and corresponding updates to maximize the features of your hardware.

- Motherboard settings and hardware options vary. Use the setup procedures presented in this chapter for reference only. Refer to your OS documentation for detailed information.

- Make sure that you install Windows® 2000 Service Pack 4 or the Windows® XP Service Pack1 or later versions before installing the drivers for better compatibility and system stability.

5.2 Support CD information

The support CD that came with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.

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

5.2.1 Running the support CD

Place the support CD to the optical drive. The CD automatically displays the **Drivers** menu if Autorun is enabled in your computer.
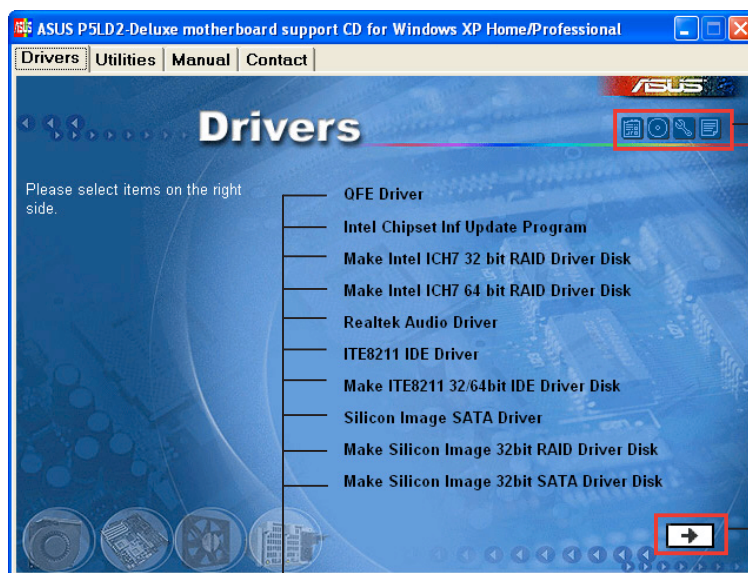
Click an icon to display support CD/motherboard information

Click to view and install additional drivers

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.

5.2.2 Drivers menu

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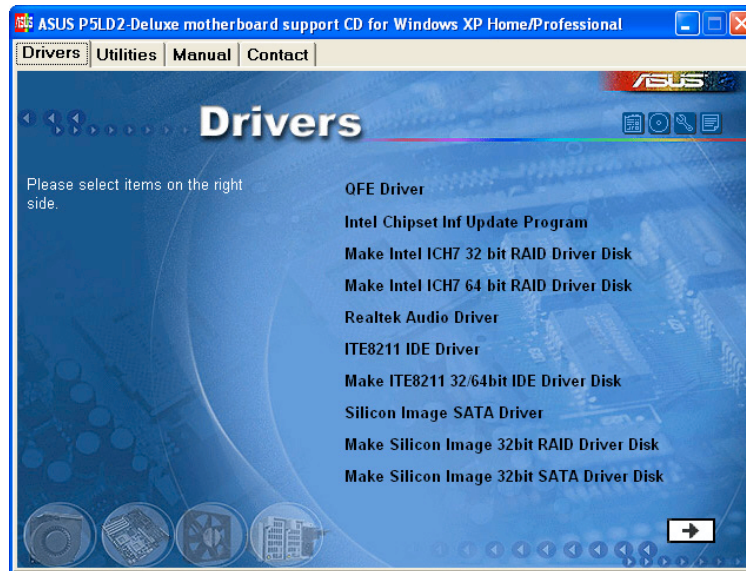
QFE Update

Installs the Windows® XP Service Pack 1 component update for the USB 1.1/2.0 drivers. Install this update before you install the Intel® Chipset Inf Update Program.

Intel Chipset Inf Update Program

This item installs the Intel® Chipset INF Update Program. This driver enables Plug-n-Play INF support for the Intel® chipset components on the motherboard. When installed to the target system, this driver provides the method for configuring the chipset components.

You can install this utility using three different modes: interactive, silent, or unattended preload. Installing the driver in interactive mode requires user input during installation. User input is not required when installing the driver in silent or unattended preload modes. Refer to the online help or readme file that came with the utility for details.

Make ICH7 32 bit RAID Driver Disk
Make ICH7 64 bit RAID Driver Disk

Allows you to create an ICH7R RAID driver disk for a 32/64-bit system.

Realtek Audio Driver

Installs the Realtek® ALC882M audio driver and application. See page 5-12 for details.

Make ITE8211 32/64 bit IDE Driver Disk

Allows you to create an ITE8211 IDE driver disk for a 32/64-bit system.

Make Silicon Image 32bit RAID Driver Disk
Make Silicon Image 32bit SATA Driver Disk

Allows you to create a Silicon Image® RAID/Serial ATA driver disk for a 32-bit system.

Click [➡] to display more items.
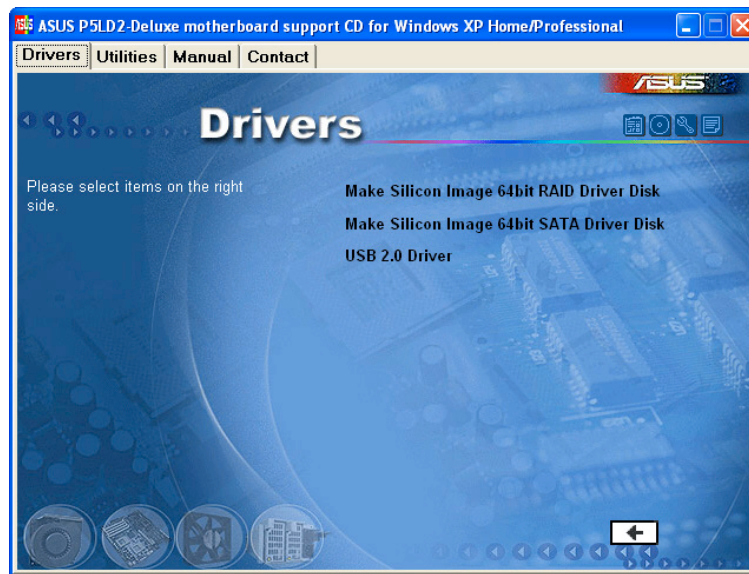
Make Silicon Image 64-bit RAID Driver Disk
Make Silicon Image 64-bit SATA Driver Disk

Allows you to create a Silicon Image® RAID/Serial ATA driver disk for a 64-bit system.

USB 2.0 Driver

Installs the USB 2.0 driver.

Click [⬅] to go back to the previous screen.

5.2.3 Utilities menu

The Utilities menu shows the applications and other software that the motherboard supports.
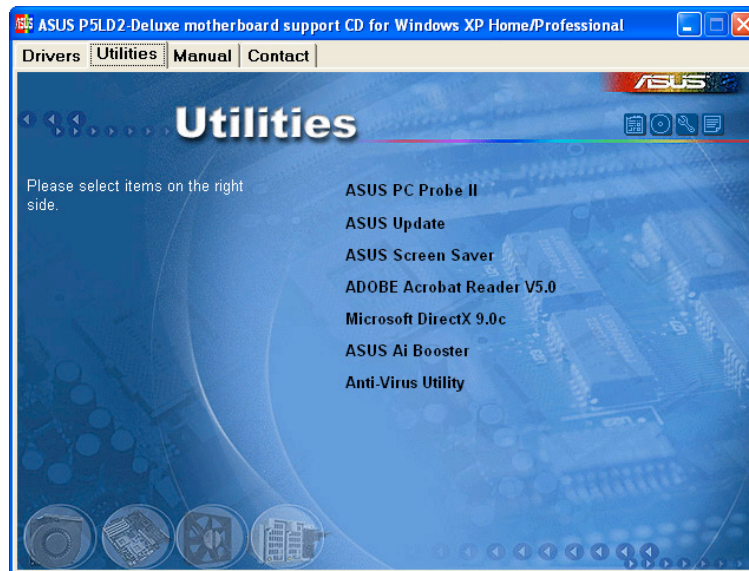
ASUS PC Probe II

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.

ASUS Update

Allows you to download the latest version of the BIOS from the ASUS website.

> Before using the ASUS Update, make sure that you have an Internet connection so you can connect to the ASUS website.

ASUS Screen Saver

Bring life to your computer screen by installing the ASUS screen saver.

ADOBE Acrobat Reader

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

Microsoft DirectX

Installs the Microsoft® DirectX 9.0c driver.

AI Booster

Installs the ASUS AI Booster software.

Anti-virus application

The anti-virus application detects and protects your computer from viruses that destroys data.

5.2.4 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.
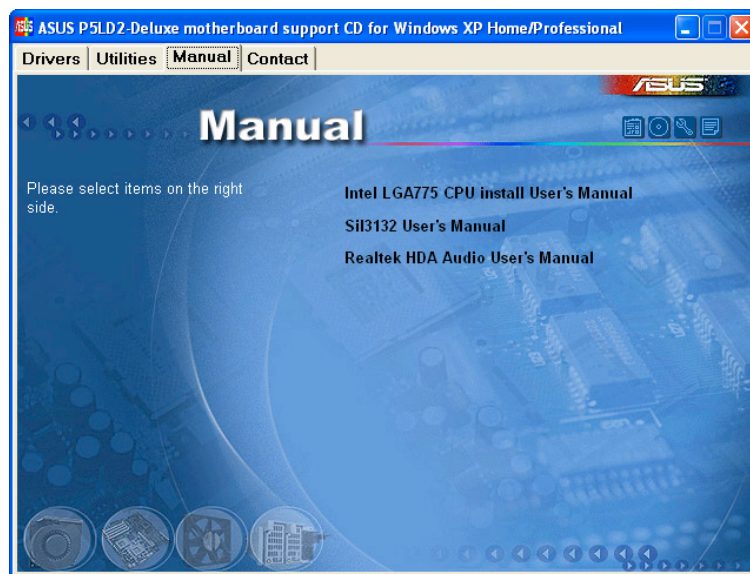
5.2.5 ASUS Contact information

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.
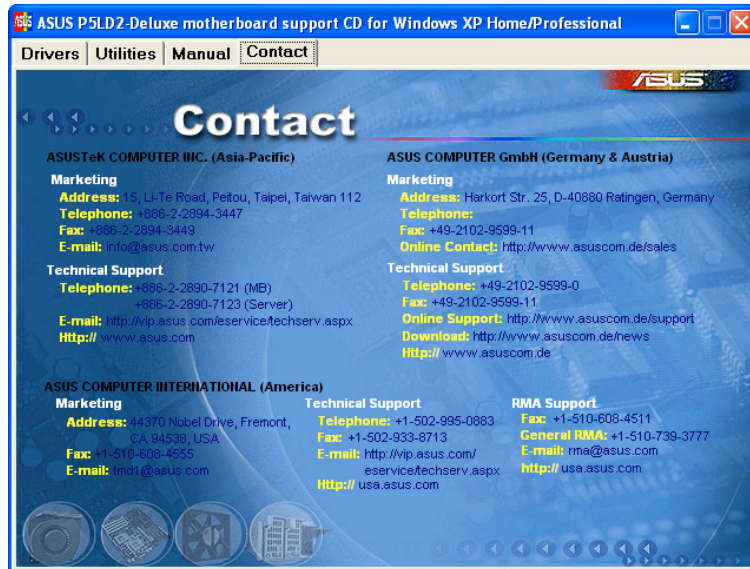
5.2.6 Other information

The icons on the top right corner of the screen give additional information on the motherboard and the contents of the support CD. Click an icon to display the specified information.

Motherboard Info

Displays the general specifications of the motherboard.
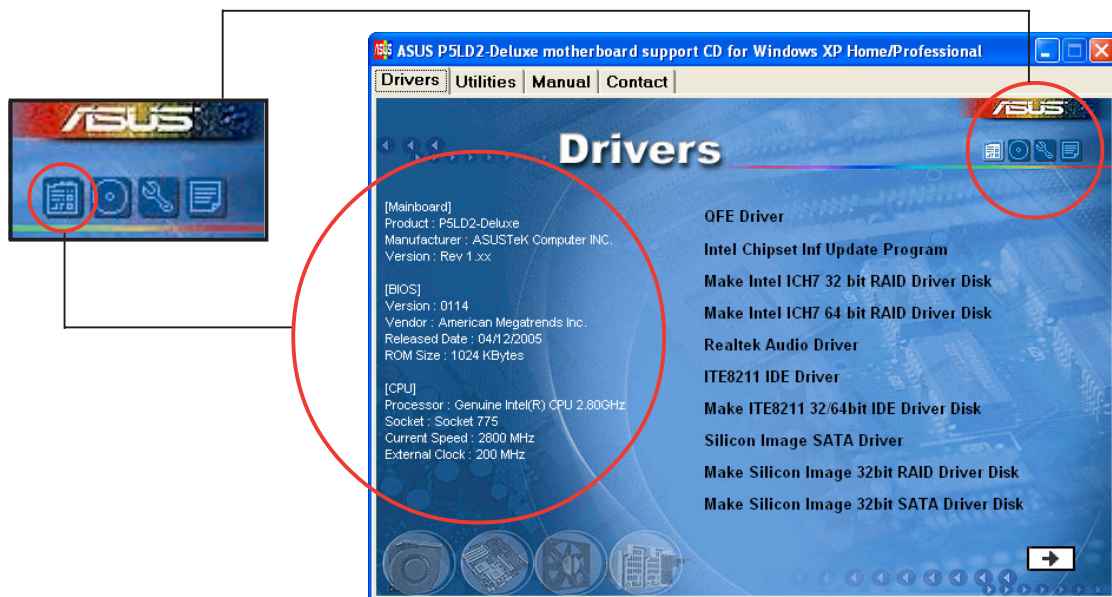
Browse this CD

Displays the support CD contents in graphical format.
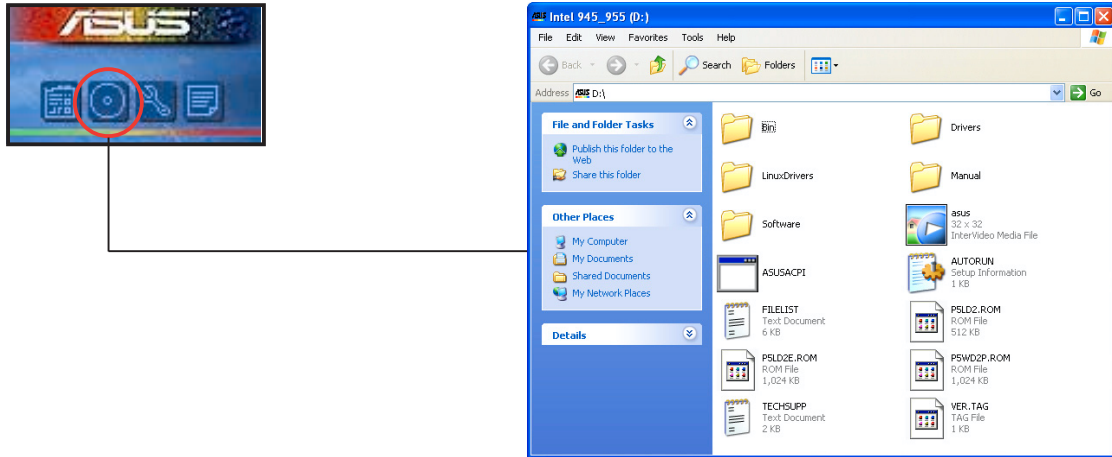
Technical support Form

Displays the ASUS Technical Support Request Form that you have to fill out when requesting technical support.
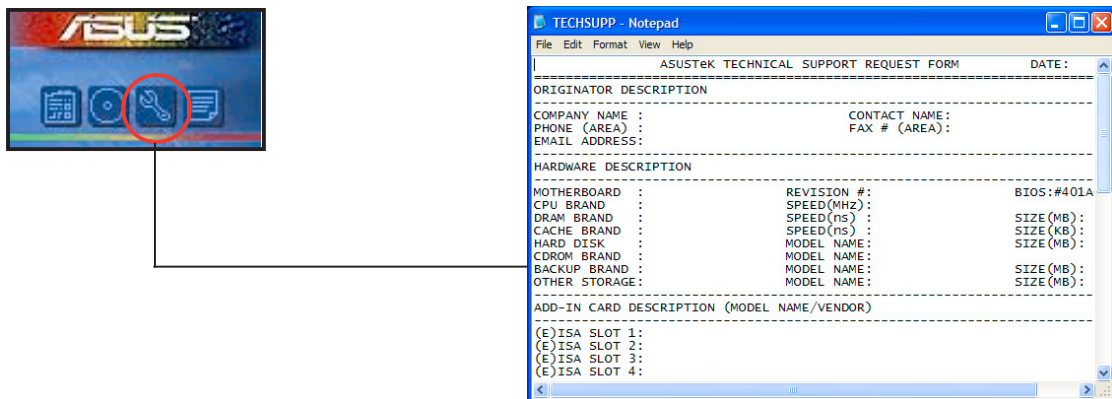
Filelist

Displays the contents of the support CD and a brief description of each in text format.

5.3   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 application for more information.

5.3.1   ASUS MyLogo2™

The ASUS MyLogo2™ utility lets you customize the boot logo. The boot logo is the image that appears on screen during the Power-On Self-Tests (POST). The ASUS MyLogo2™ is automatically installed when you install the **ASUS Update** utility from the support CD. See section "5.2.3 Utilities menu" for details.

> • Before using the ASUS MyLogo2™, use the Award BIOS Flash utility to make a copy of your original BIOS file, or obtain the latest BIOS version from the ASUS website. See section "4.1.2 Updating the BIOS".
>
> • Make sure that the BIOS item **Full Screen Logo** is set to [Enabled] if you wish to use ASUS MyLogo2. See section "4.6.3 Boot Settings Configuration".
>
> • You can create your own boot logo image in GIF, JPG, or BMP file formats.

To launch the ASUS MyLogo2™:

1. Launch the ASUS Update utility. Refer to section "4.1.5 ASUS Update utility" for details.

2. Select **Options** from the drop down menu, then click **Next**.

3. Check the option **Launch MyLogo to replace system boot logo before flashing BIOS**, then click **Next**.

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

5. When prompted, locate the new BIOS file, then click **Next**. The ASUS MyLogo2 window appears.

6. From the left window pane, select the folder that contains the image you intend to use as your boot logo.

7.   When the logo images appear on
      the right window pane, select an
      image to enlarge by clicking on it.

8.   Adjust the boot image to your
      desired size by selecting a value
      on the **Ratio** box.

9.   When the screen returns to the ASUS Update utility, flash the original
      BIOS to load the new boot logo.

10.   After flashing the BIOS, restart the computer to display the new boot
      logo during POST.

5.3.2 AI NET 2

The Marvell® Virtual Cable Tester™ (VCT) is a cable diagnostic utility that reports LAN cable faults and shorts using the Time Domain Reflectometry (TDR) technology. The VCT detects and reports open and shorted cables, impedance mismatches, pair swaps, pair polarity problems, and pair skew problems of up to 100 meters at one meter accuracy.

The VCT feature reduces networking and support costs through a highly manageable and controlled network system. This utility can be incorporated in the network systems sofware for ideal field support as well as development diagnostics.

Using the Virtual Cable Tester™

To use the the Marvell® Virtual Cable Tester™ utility:

1. Launch the VCT utility from the Windows® desktop by clicking **Start > All Programs > Marvell > Virtual Cable Tester**.

2. Click **Virtual Cable Tester** from the menu to display the screen below.
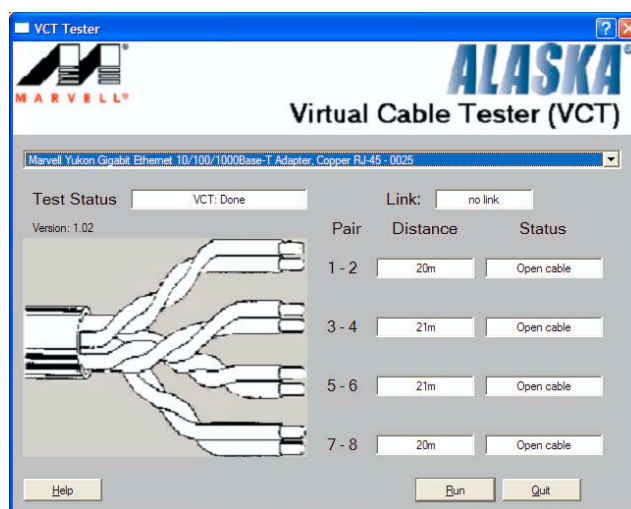
3. Click the **Run** button to perform a cable test.

> • The VCT only runs on systems with Windows® XP or Windows® 2000 operating systems.
>
> • The **Run** button on the Virtual Cable Tester™ main window is disabled if no problem is detected on the LAN cable(s) connected to the LAN port(s).
>
> • If you want the system to check the LAN cable before entering the OS, enable the **POST Check LAN cable** item in the BIOS. See section "4.4.2 LAN Cable Status" for details.

5.3.3 Audio configurations

The Realtek® ALC882M audio CODEC provides 8-channel audio capability to deliver the ultimate audio experience on your PC. The software provides Jack-Sensing function, S/PDIF Out support, and interrupt capability. The ALC882M also includes the Realtek® proprietary UAJ® (Universal Audio Jack) technology for all audio ports, eliminating cable connection errors and giving users plug and play convenience. Enjoy true home theatre experience with the following advanced sound technologies: Dolby Prologic IIx, Dolby Headphone, Dolby Virtual Speaker, and Dolby Digital Live.

Follow the installation wizard to install the **Realtek® Audio Driver** from the support CD that came with the motherboard package.

If the Realtek audio software is correctly installed, you will find the Realtek HD Audio Manager icon on the taskbar.

From the taskbar, double-click on the **SoundEffect** icon to display the **Realtek HD Audio Manager**.

Realtek HD Audio Manager

Realtek HD Audio Manager

Configuration options

Control settings window

Information button

Exit button

Minimize button

Tool button

Dolby® feature launch buttons
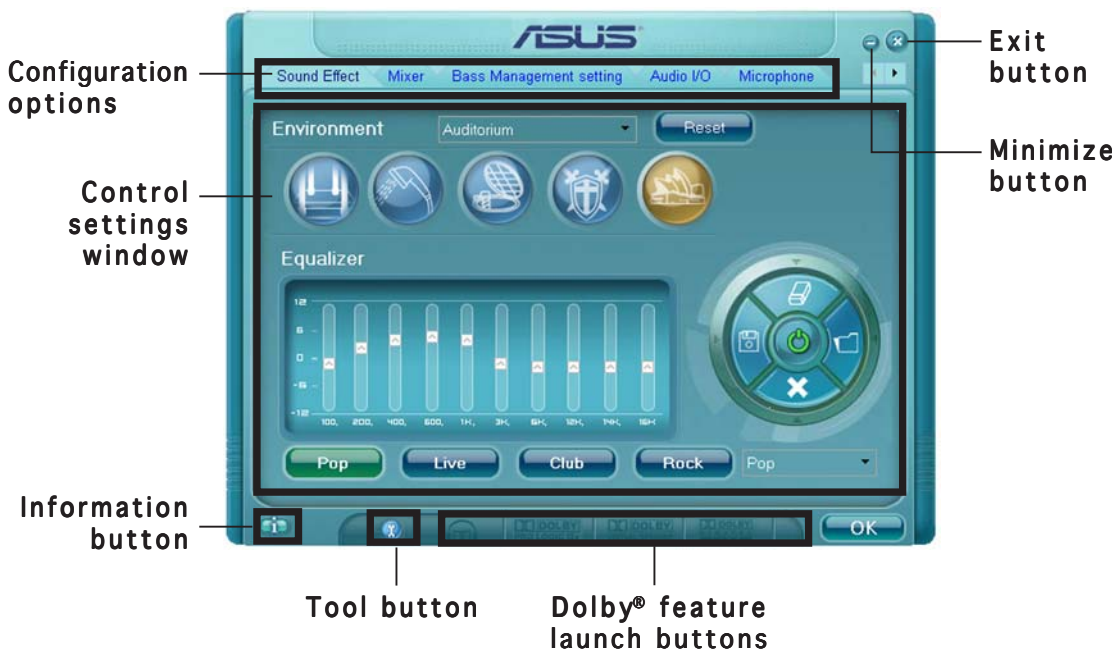
Information

Click the information button (🛈)
to display information about the
audio driver version, DirectX version,
audio controller, audio codec, and
language setting.

Tools

Click the tool button (🔧) to display tools for supported Dolby®
applications.

Dolby® Feature Launch buttons

Click the button of the feature you want to launch.
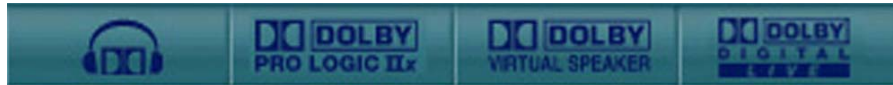
Minimize

Click the minimize button (➖) to minimize the window display.

Exit

Click the exit button (✖) to exit the Realtek HD Audio Manager.

Configuration options

Click any of the tabs in this area to configure your audio settings. Click the
arrow button (▶) to display more options.

Sound Effect

The Realtek® ALC882D Audio CODEC
allows you to set your listening
environment, adjust the equalizer, set
the karaoke, or select
pre-programmed equalizer settings
for your listening pleasure.

To set the sound effect options:

1. From the Realtek HD Audio
    Manager, click the **Sound
    Effect** tab.

2. Click the shortcut buttons or the drop-down menus for options on
    changing the acoustic environment, adjust the equalizer, or set the
    karaoke to your desired settings.

3. Click [OK] to effect the Sound Effect settings and exit.

Mixer

The Mixer option allows you to
configure audio output (playback)
volume and audio input (record)
volume.

To set the mixer options:

1. From the Realtek HD Audio
    Manager, click the **Mixer** tab.

2. Turn the volume buttons to
    adjust the Playback and/or
    Record volume.

> The Mixer option activates voice input from all channels by default. Make
> sure to set all channels to mute ([✖]) if you do not want voice input.

3. Make adjustments to Wave, SW Synth, Front, Rear, Subwoofer, CD
    volume, Mic volume, Line Volume, and Stereo mix by clicking the
    control tabs and dragging them up and down until you get the desired
    levels.

4. Click [OK] to effect the Mixer settings and exit.

Bass Management setting

Click this tab to manage your bass settings.

To set the bass management options:

1. From the Realtek HD Audio Manager, click the **Bass Management setting** tab.

2. Click <M> to display the distance in meters, or <FT> to display the distance in feet.

3. Adjust the values to your desired settings by entering a numeric value in the boxes, or clicking the up/down arrow.

4. Click ► to test your settings.

5. Click OK to effect the Bass Management settings and exit.

Audio I/O

The Audio I/O option allows you configure your input/output settings.

To set the Audio I/O options:

1. From the Realtek HD Audio Manager, click the **Audio I/O** tab.

2. Click the drop-down menu to select the channel configuration.

3. The control settings window displays the status of connected devices. Click 🔧 for analog and digital options.

4. Click <OK> to effect the Audio I/O settings and exit

Microphone

The Microphone option allows you configure your input/output settings and to check if your audio devices are connected properly.

To set the Microphone options:

1. From the Realtek HD Audio Manager, click the **Microphone** tab.

2. Click the Noise Suppression option button to reduce the static background noise when recording.

3. Click the Acoustic Echo Cancellation option button to reduce the echo from the front speakers when recording.

4. Click [OK] to effect the Microphone settings and exit.

3D Audio Demo

The 3D Audio Demo option gives you a demonstration of the 3D audio feature.

To start the 3D Audio Demo:

1. From the Realtek HD Audio Manager, click the **3D Audio Demo** tab.

2. Click the option buttons to change the sound, moving path, or environment settings.

3. Click [▶] to test your settings.

4. Click [OK] to effect the 3D Audio Demo settings and exit.

5.5   RAID configurations

The motherboard comes with the Silicon Image Sil3132 and the Intel®
ICH7R Southbridge RAID controllers that allow you to configure IDE and
Serial ATA hard disk drives as RAID sets. The motherboard supports the
following RAID configurations.

RAID 0 *(Data striping)* optimizes two identical hard disk drives to read and
write data in parallel, interleaved stacks. Two hard disks perform the same
work as a single drive but at a sustained data transfer rate, double that of
a single disk alone, thus improving data access and storage. Use of two
new identical hard disk drives is required for this setup.

RAID 1 *(Data mirroring)* copies and maintains an identical image of data
from one drive to a second drive. If one drive fails, the disk array
management software directs all applications to the surviving drive as it
contains a complete copy of the data in the other drive. This RAID
configuration provides data protection and increases fault tolerance to the
entire system. Use two new drives or use an existing drive and a new drive
for this setup. The new drive must be of the same size or larger than the
existing drive.

RAID 0+1 is *data striping* and *data mirroring* combined without parity
(redundancy data) having to be calculated and written. With the RAID 0+1
configuration you get all the benefits of both RAID 0 and RAID 1
configurations. Use four new hard disk drives or use an existing drive and
three new drives for this setup.

RAID 5 stripes both data and parity information across three or more hard
disk drives. Among the advantages of RAID 5 configuration include better
HDD performance, fault tolerance, and higher storage capacity. The RAID 5
configuration is best suited for transaction processing, relational database
applications, enterprise resource planning, and other business systems. Use
a minimum of three identical hard disk drives for this setup.

RAID 10 is a striped configuration with RAID 1 segments whose segments
are RAID 1 arrays. This configuration has the same fault tolerance as
RAID 1, and has the same overhead for fault-tolerance as mirroring alone.
RAID 10 achieves high input/output rates by striping RAID 1 segments. In
some instances, a RAID 10 configuration can sustain multiple simultaneous
drive failure. A minimum of four hard disk drives is required for this setup.

JBOD *(Spanning)* stands for **Just a Bunch of Disks** and refers to hard
disk drives that are not yet configured as a RAID set. This configuration
stores the same data redundantly on multiple disks that appear as a single
disk on the operating system. Spanning does not deliver any advantage
over using separate disks independently and does not provide fault
tolerance or other RAID performance benefits.

Intel® Matrix Storage. The Intel® Matrix Storage technology supported by the ICH7R chip allows you to create a RAID 0 and a RAID 1 set using only two identical hard disk drives. The Intel® Matrix Storage technology creates two partitions on each hard disk drive to create a virtual RAID 0 and RAID 1 sets. This technology also allows you to change the hard disk drive partition size without losing any data.

> If you want to boot the system from a hard disk drive included in a created RAID set, copy first the RAID driver from the support CD to a floppy disk before you install an operating system to the selected hard disk drive. Refer to section "5.6 Creating a RAID driver disk" for details.

5.5.1   Installing hard disks

The motherboard supports Ultra DMA /133/100/66 and Serial ATA hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

Installing Parallel ATA hard disks

To install IDE hard disks for a RAID configuration:

1.   Set the jumpers of each hard disk as Master/Master or Slave/Slave.
2.   Install the hard disks into the drive bays.
3.   Connect the HDD signal cables.
4.   Connect a 4-pin power cable to the power connector on each drive.

Installing Serial ATA (SATA) hard disks

To install the SATA hard disks for a RAID configuration:

1.   Install the SATA hard disks into the drive bays.
2.   Connect the SATA signal cables.
3.   Connect a SATA power cable to the power connector on each drive.

> Refer to the RAID controllers user manual on the support CD for detailed information on RAID configurations.

5.5.2 Intel® RAID configurations

This motherboard supports RAID 0, RAID 1, RAID 10 (RAID 0+1), RAID 5, and Intel® Matrix Storage configurations for Serial ATA hard disks drives through the Intel® ICH7R SouthBridge chip.

Setting the RAID item in BIOS

You must set the RAID item in the BIOS Setup before you can create a RAID set(s). To do this:

1. Enter the BIOS Setup during POST.
2. Go to the **Main Menu**, select **IDE Configuration**, then press <Enter>.
3. Select the item **Configure SATA As**, then press <Enter> to display the configuration options.
4. Select **RAID** from the **Configure SATA As** item options, then press <Enter>.
5. Select the item **Onboard Serial-ATA BOOTROM**, press <Enter>, then select **Enabled** from the options.
6. Save your changes, then exit the BIOS Setup.

Refer to Chapter 4 for details on entering and navigating through the BIOS Setup.

Intel® Matrix Storage Manager Option ROM Utility

The Intel® Matrix Storage Manager Option ROM utility allows you to create RAID 0, RAID 1, RAID 10 (RAID 0+1), and RAID 5 set(s) from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.

To enter the Intel® Application Accelerator RAID Option ROM utility:

1. Install all the Serial ATA hard disk drives.
2. Turn on the system.
3. During POST, press <Ctrl+I> to display the utility main menu.

```
        Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH7R wRAID5
             Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
    ===============================[ MAIN MENU ]================================
                          1. Create RAID Volume
                          2. Delete RAID Volume
                          3. Reset Disks to Non-RAID
                          4. Exit


    =======================[ DISK/VOLUME INFORMATION ]=========================
     RAID Volumes:
     None defined.

     Physical Disks:
     Port Drive Model        Serial #              Size      Type/Status(Vol ID)
     0    XXXXXXXXXXX        XXXXXXXX              XX.XXGB   Non-RAID Disk
     1    XXXXXXXXXXX        XXXXXXXX              XX.XXGB   Non-RAID Disk
     2    XXXXXXXXXXX        XXXXXXXX              XX.XXGB   Non-RAID Disk
     3    XXXXXXXXXXX        XXXXXXXX              XX.XXGB   Non-RAID Disk




            [↑↓]-Select            [ESC]-Exit            [ENTER]-Select Menu
```

The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.

> The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

Creating a RAID 0 set (striped)

To create a RAID 0 set:

1. From the utility main menu, select **1. Create RAID Volume**, then press <Enter>. This screen appears.

```
        Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH7R wRAID5
           Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
    ==============================[ CREATE ARRAY MENU ]==============================

                            Name:   Volume0
                      RAID Level:   RAID0(Stripe)
                           Disks:   Select Disks
                      Strip Size:   128KB
                        Capacity:   0.0    GB

                                    Create Volume


    ===========================[ DISK/VOLUME INFORMATION ]==========================



              Enter a string between 1 and 16 characters in length that can be used
              to uniquely identify the RAID volume. This name is case sensitive and
                                cannot contain special characters.




    ================================================================================
         [↑↓]-Change      [TAB]-Next       [ESC]-Previous Menu      [Enter]-Select
```

2. Enter a name for the RAID 0 set, then press <Enter>.

3. When the **RAID Level** item is highlighted, press the up/down arrow key to select **RAID 0(Stripe)**, then press <Enter>.

4. When the **Disks** item is highlighted, press <Enter> to select the hard disk drives to configure as RAID. This pop-up screen appears.

```
    =================================[ SELECT DISKS ]=================================

    Port Drive Model           Serial #              Size Status
      0 XXXXXXXXXXXX           XXXXXXXX           XX.XGB Non-RAID Disk
      1 XXXXXXXXXXXX           XXXXXXXX           XX.XGB Non-RAID Disk
      2 XXXXXXXXXXXX           XXXXXXXX           XX.XGB Non-RAID Disk
      3 XXXXXXXXXXXX           XXXXXXXX           XX.XGB Non-RAID Disk


              Select 2 to 4 disks to use in creating the volume.

      [↑↓]-Previous/Next   [SPACE]-Selects   [ENTER]-Selection Complete
```
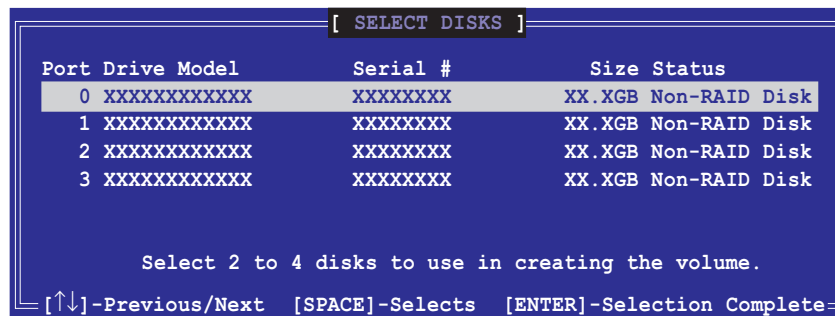
5. Use the up/down arrow key to highlight a drive, then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.

6. Use the up/down arrow key to select the stripe size for the RAID 0 array, then press <Enter>. The available stripe size values range from 4 KB to 128 KB. The default stripe size is 128 KB.

> **TIP:** We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

7. Key in the RAID volume capacity that you want, then press <Enter>. The default value indicates the maximum allowed capacity.

8. Press <Enter> when the **Create Volume** item is highlighted. This warning message appears.

```
        WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

    Are you sure you want to create this volume? (Y/N):
```

9. Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the Create Volume menu.

Creating a RAID 1 set (mirrored)

To create a RAID 1 set:

1. From the utility main menu, select **1. Create RAID Volume**, then press <Enter>. This screen appears.

```
        Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH7R wRAID5
            Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
    ============================[ CREATE ARRAY MENU ]============================

                          Name:   Volume1
                    RAID Level:   RAID1(Mirror)
                         Disks:   Select Disks
                    Strip Size:   N/A
                      Capacity:   XX.X  GB

                                  Create Volume


    ==========================[ DISK/VOLUME INFORMATION ]=========================



             Enter a string between 1 and 16 characters in length that can be used
             to uniquely identify the RAID volume. This name is case sensitive and
                             cannot contain special characters.




            [↑↓]-Change      [TAB]-Next      [ESC]-Previous Menu      [Enter]-Select
```

2. Enter a name for the RAID 1 set, then press <Enter>.

3. When the **RAID Level** item is highlighted, press the up/down arrow key to select **RAID 1(Mirror)**, then press <Enter>.

4. When the **Capacity** item is highlighted, key in the RAID volume capacity that you want, then press <Enter>. The default value indicates the maximum allowed capacity.

5. Press <Enter> when the **Create Volume** item is highlighted. This warning message appears.

```
            WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

        Are you sure you want to create this volume? (Y/N):
```

6. Press <Y> to create the RAID volume and return to main menu or <N> to go back to Create Volume menu.

Creating a RAID 10 set (RAID 0+1)

To create a RAID 10 set:

1. From the utility main menu, select **1. Create RAID Volume**, then press <Enter>. This screen appears.

```
        Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH7R wRAID5
           Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
        ================================[ CREATE ARRAY MENU ]================================

                           Name:    Volume10
                     RAID Level:    RAID10(RAID0+1)
                          Disks:    Select Disks
                     Strip Size:    128KB
                       Capacity:    XXX.X GB

                                    Create Volume

        ==============================[ DISK/VOLUME INFORMATION ]==============================


              Enter a string between 1 and 16 characters in length that can be used
              to uniquely identify the RAID volume. This name is case sensitive and
                              cannot contain special characters.



             [↑↓]-Change      [TAB]-Next       [ESC]-Previous Menu       [Enter]-Select
```

2. Enter a name for the RAID 10 set, then press <Enter>.

3. When the **RAID Level** item is highlighted, press the up/down arrow key to select **RAID 10(RAID0+1)**, then press <Enter>.

4. When the **Stripe Size** item is highlighted, press the up/down arrow key to select the stripe size for the RAID 10 array, then press <Enter>. The available stripe size values range from 4 KB to 128 KB. The default stripe size is 64 KB.

> **TIP:** We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

5. Key in the RAID volume capacity that you want then press <Enter> when the **Capacity** item is highlighted. The default value indicates the maximum allowed capacity.

6. Press <Enter> when the **Create Volume** item is highlighted. This warning message appears.

```
WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

Are you sure you want to create this volume? (Y/N):
```

7. Press <Y> to create the RAID volume and return to the main menu or <N> to go back to the Create Volume menu.

Creating a RAID 5 set (parity)

To create a RAID 5 set:

1. From the utility main menu, select **1. Create RAID Volume**, then press <Enter>. This screen appears.

```
        Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH7R wRAID5
              Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
    ============================[ CREATE ARRAY MENU ]============================

                         Name:   Volume5
                   RAID Level:   RAID5(Parity)
                        Disks:   Select Disks
                   Strip Size:   64KB
                     Capacity:   0.0  GB


                                 Create Volume


    ==========================[ DISK/VOLUME INFORMATION ]=========================



            Enter a string between 1 and 16 characters in length that can be used
            to uniquely identify the RAID volume. This name is case sensitive and
                             cannot contain special characters.




         [↑↓]-Change      [TAB]-Next      [ESC]-Previous Menu      [Enter]-Select
```

2. Enter a name for the RAID 5 set, then press <Enter>.
3. When the **RAID Level** item is highlighted, press the up/down arrow key to select **RAID 5(Parity)**, then press <Enter>.

4. The Disks item is highlighted, press <Enter> to select the hard disk drives to configure as RAID. The following pop-up screen appears.

```
╔══════════════════[ SELECT DISKS ]══════════════════╗
║                                                     ║
║  Port Drive Model        Serial #        Size Status║
║    0 XXXXXXXXXXXX        XXXXXXXX      XX.XGB Non-RAID Disk ║
║    1 XXXXXXXXXXXX        XXXXXXXX      XX.XGB Non-RAID Disk ║
║    2 XXXXXXXXXXXX        XXXXXXXX      XX.XGB Non-RAID Disk ║
║    3 XXXXXXXXXXXX        XXXXXXXX      XX.XGB Non-RAID Disk ║
║                                                     ║
║                                                     ║
║         Select 2 to 4 disks to use in creating the volume. ║
║                                                     ║
╠[↑↓]-Previous/Next   [SPACE]-Selects   [ENTER]-Selection Complete╣
```

5. Use the up/down arrow key to highlight the drive you want to set, then press <Space> to select. A small triangle marks the selected drive. Press <Enter> after completing your selection.

6. When the **Stripe Size** item is highlighted, press the up/down arrow key to select the stripe size for the RAID 5 array, then press <Enter>. The available stripe size values range from 4KB to 128KB. The default stripe size is 64 KB.

> **TIP:** We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

7. Key in the RAID volume capacity that you want, then press <Enter> when the **Capacity** item is highlighted. The default value indicates the maximum allowed capacity.

8. Press <Enter> when the **Create Volume** item is highlighted. This warning message appears.

```
╔═════════════════════════════════════════════════════╗
║                                                     ║
║      WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST. ║
║                                                     ║
║     Are you sure you want to create this volume? (Y/N): ║
║                                                     ║
╚═════════════════════════════════════════════════════╝
```

9. Press <Y> to create the RAID volume and return to the main menu or <N> to go back to the Create Volume menu.

Deleting a RAID set

⚠️ Take caution when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1. From the utility main menu, select **2. Delete RAID Volume**, then press <Enter> to display this screen.

```
     Intel(R) Matrix Storage Manager Option ROM v5.0.0.1032 ICH7R wRAID5
           Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
    ================================[ DELETE VOLUME MENU ]==========================
    Name              Level            Drives     Capacity   Status       Bootable
    Volume0           RAIDX(xxxxx)     X           XXX.XGB   Normal           Yes



    =====================================[ HELP ]==================================




            Deleting a volume will destroy the volume data on the drive(s) and
              cause any member disks to become available as non-RAID disks.

      WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.




            [↑↓]-Select         [<ESC>]-Previous Menu      [<Del>]-Delete Volume
```

2. Use the up/down arrow key to select the RAID set you want to delete, then press <Del>. This window appears.

```
    =============[ DELETE VOLUME VERIFICATION ]============

              ALL DATA IN THE VOLUME WILL BE LOST!

       Are you sure you want to delete volume "VolumeX"? (Y/N):
```

3. Press <Y> to delete the RAID set and return to the utility main menu; otherwise, press <N> to return to the Delete Volume menu.

Resetting Disks to Non-RAID

⚠️ Take caution before you reset a RAID volume HDD to non-RAID. Resetting a RAID volume HDD deletes all internal RAID structure on the drive.

To reset a RAID set hard disk drive:

1. From the utility main menu, select **3. Reset Disks to Non-RAID**, then press <Enter> to display this screen.

```
                            [ RESET RAID DATA ]
        Resetting RAID data will remove internal RAID structures
        from the selected RAID disks. By removing these structures,
        the drive will revert back to a non-RAID disk.

        WARNING: Resetting a disk causes all data on the disk to be lost.

     Port Drive Model          Serial #          Size Status
        0 XXXXXXXXXXXX         XXXXXXXX         XX.XGB Member Disk
        1 XXXXXXXXXXXX         XXXXXXXX         XX.XGB Member Disk


              Select the disks that should be reset.


     [↑↓]-Previous/Next   [SPACE]-Selects   [ENTER]-Selection Complete
```

2. Use the up/down arrow key to highlight the RAID set drive you want to reset, then press <Space> to select.

3. Press <Enter> to reset the RAID set drive. A confirmation message appears.

4. Press <Y> to reset the drive or press <N> to return to the utility main menu.

Exiting the Intel® Matrix Storage Manager utility

To exit the utility:

1. From the utility main menu, select **4. Exit**, then press <Enter>. This window appears.

```
                        [ CONFIRM EXIT ]
              Are you sure you want to exit? (Y/N):
```

2. Press <Y> to exit or press <N> to return to the utility main menu.

5.5.3 Silicon Image RAID configurations

The Silicon Image RAID controller supports RAID 0, RAID 1, RAID 10, JBOD, and RAID 5 configurations. Use the Silicon Image RAID utility to configure a disk array.

Setting the BIOS RAID items

After installing the hard disk drives, make sure to set the necessary RAID items in the BIOS before setting your RAID configuration.

To set the BIOS RAID items:

1. Boot the system and press <Del> during the Power-On Self-Test (POST) to enter the BIOS Setup Utility.
2. From the **Advanced > Onboard Devices Configuration** menu item in the BIOS set the **Silicon Image Controller** item to RAID Mode. See section "4.4.6 Onboard Devices Configuration" for details.
3. Save your changes and Exit Setup.

Launching the Silicon Image RAID 5 Manager

Launch the Silicon Image RAID 5 Manager from Windows® XP by clicking the **Start** button and selecting **All Programs > Silicon Image > RAID5SATA**

> •   For details on the Silicon Image SATARaid™ RAID configuration, refer to the "Sil3132 User's Manual" in your motherboard support CD.
>
> •   Use a Serial ATA port multiplier if you want to configure a RAID 5, RAID 10 or CONCATENATION set.
>
> •   Use an external SATA box to configure a RAID 0 or RAID 1 set.
>
> •   The Serial ATA port multiplier and external SATA box are purchased separately.
>
> •   Make sure to install the Silicon Image SATA Link Sil 3132 driver and the Silicon Image RAID 5 Array Management Utility from the support CD before using RAID 5 configuration.

> Do not unplug the external Serial ATA external box when a RAID 0 or RAID 1 was configured.

Entering the Silicon Image BIOS RAID Configuration Utility

To enter the Silicon Image BIOS RAID configuration utility:

1. Boot up your computer.
2. During POST, press <Ctrl+S> or <F4>.

> The RAID BIOS setup screens shown in this section are for reference only, and may not exactly match the items on your screen.

```
       RAID Configuration Utility - Silicon Image Inc. Copyright (C) 2004

┌ MAIN MENU ──────────────────────┐  ┌ HELP ──────────────────────────┐
│                                  │  │                                │
│  Create RAID set                 │  │  Press "Enter" to create       │
│  Delete RAID set                 │  │  RAID set                      │
│  Rebuild Raid1 set               │  │                                │
│  Resolve Conflicts               │  │                                │
│  Low Level Format                │  │                                │
│  Logical Drive Info              │  │                                │
│                                  │  │                                │
└──────────────────────────────────┘  └────────────────────────────────┘
┌ PHYSICAL DRIVE ──────────────────┐  ┌ LOGICAL DRIVE ─────────────────┐
│                                  │  │                                │
│  0  XXXXXXXXXXX      XXXXXXMB     │  │  STXXXXXXXXX      XXXXXXMB      │
│  1  XXXXXXXXXXX      XXXXXXMB     │  │  STXXXXXXXXX      XXXXXXMB      │
│  2  XXXXXXXXXXX      XXXXXXMB     │  │  STXXXXXXXXX      XXXXXXMB      │
│  3  XXXXXXXXXXX      XXXXXXMB     │  │  STXXXXXXXXX      XXXXXXMB      │
│                                  │  │                                │
│                                  │  │                                │
│                                  │  │                                │
└──────────────────────────────────┘  └────────────────────────────────┘
↑↓:Select Menu   ESC:Previous Menu   Enter:Select   Ctrl-E:Exit
```

The Main Menu on the upper left corner allows you to select an operation to be performed. The Main Menu options include the following:

Create RAID set - creates a new legacy RAID set or allocates spare drives.

Delete RAID set - deletes a RAID set or deallocates a spare drive.

Rebuild RAID1 set - rebuilds a RAID 1 set (e.g. swapped drives).

Resolve Conflicts - automatically restores disrupted drives on a RAID set.

Low Level Format - creates a pattern of reference marks on a drive. Formatting the disks erases all data previously stored in the drive.

Logical Drive Info -shows the current configuration of each RAID set.

On the upper right corner of the screen is the Help message box. The message describes the function of each menu item. At the bottom of the screen is the legend box. The keys on the legend box allow you to navigate through the setup menu options. The following lists the keys found in the legend box and their corresponding functions.

↑, ↓	:	Select/Move to the next item
ESC	:	Previous Menu
Enter	:	Select
Ctrl-E	:	Exit

Creating a RAID 0 set (Striped)

To create a RAID set:

1. From the Silicon Image configuration utility main menu, select **Create RAID set** then press <Enter> to display an option menu.

```
┌─ MAIN MENU ──────────────────────────────────────┐
│                                                   │
│   Create RAID set        ┌──────────────────┐    │
│   Delete RAID set        │     RAID0        │    │
│   Rebuild Raid1 set      │     RAID1        │    │
│   Resolve Conflicts      │     RAID5        │    │
│   Low Level Format       │     RAID10       │    │
│   Logical Drive Info     │   SPARE DRIVE    │    │
│                          │  CONCATENATION   │    │
│                          └──────────────────┘    │
│                                                   │
└───────────────────────────────────────────────────┘
```
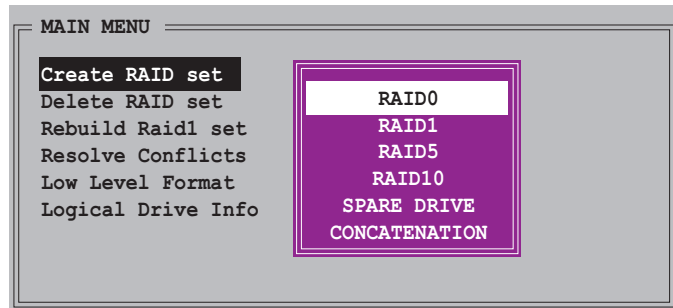
2. Select **RAID 0** then press <Enter> to display the following.
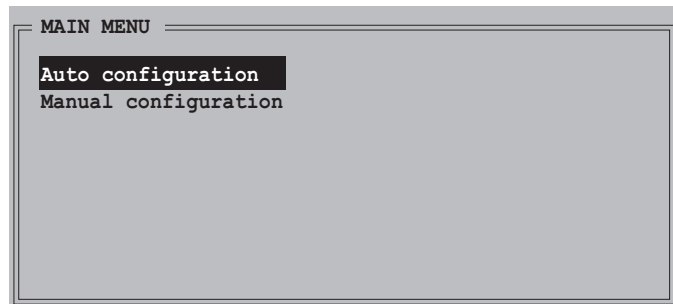
```
┌─ MAIN MENU ──────────────────────────────────────┐
│                                                   │
│   Auto configuration                              │
│   Manual configuration                            │
│                                                   │
│                                                   │
│                                                   │
│                                                   │
└───────────────────────────────────────────────────┘
```

3. Select your desired method of configuration.

    ### Auto configuration
    a. Select Auto Configuration the press <Enter>.

    b. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.

    c. Press <Y> to confirm or <N> to return to the Main Menu.

> By default, Auto configuration sets the stripe size to 64K and sets the logical drives based on the physical drives installed.

Manual configuration
a. Select **Manual configuration** and press <Enter>. The following pop-up menu appears.

b. Use the up or down arrow keys to select a chunk size appropriate to your drive usage then press <Enter>.

```
┌─ MAIN MENU ──────────────────────────────────────┐
│                                                   │
│   Auto configuration      ┌──────────────┐       │
│   Manual configuration    │  chunk size  │       │
│                           │      4K       │       │
│                           │      8K       │       │
│                           │     16K       │       │
│                           │     32K       │       │
│                           │     64K       │       │
│                           │    128K       │       │
│                           └──────────────┘       │
└───────────────────────────────────────────────────┘
```

TIP: We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

c. The selection bar moves to the Physical Drive menu. Using the up or down arrow keys, select a drive then press <Enter> to set the first drive of the RAID set.

```
 ┌ PHYSICAL DRIVE ─────────────────────────┐
 │                                          │
 │ 0  XXXXXXXXXXX            XXXXXXMB        │
 │ 1  XXXXXXXXXXX            XXXXXXMB        │
 │ 2  XXXXXXXXXXX            XXXXXXMB        │
 │ 3  XXXXXXXXXXX            XXXXXXMB        │
 │                                          │
 └──────────────────────────────────────────┘
```

d. Repeat step c to set the second, third, and fourth drive. The number of available drives depend on the installed and enabled physical drives in the system.

e. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.

f. Press <Y> to confirm or <N> to return to the Main Menu.

Creating a RAID 1 set (Mirrored)

To create a RAID 1 set:

1. From the Silicon Image configuration utility main menu, select **Create RAID set** then press <Enter>. The following sub-menu appears.

```
 ┌ MAIN MENU ──────────────────────────────┐
 │                                          │
 │  Create RAID set      ┌──────────────┐   │
 │  Delete RAID set      │    RAID0     │   │
 │  Rebuild Raid1 set    │    RAID1     │   │
 │  Resolve Conflicts    │    RAID5     │   │
 │  Low Level Format     │    RAID10    │   │
 │  Logical Drive Info   │  SPARE DRIVE │   │
 │                       │ CONCATENATION│   │
 │                       └──────────────┘   │
 └──────────────────────────────────────────┘
```

2. Select **RAID 1** then press <Enter> to display the following.

```
 ┌ MAIN MENU ──────────────────────────────┐
 │                                          │
 │  Auto configuration                      │
 │  Manual configuration                    │
 │                                          │
 └──────────────────────────────────────────┘
```

3. Select your desired method of configuration.

Auto configuration

a. Select Auto Configuration then press <Enter>.

b. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.

c. Press <Y> to confirm or <N> to return to the Main Menu.

> • Auto-configuration creates a RAID 1 set without a backup copy of the current source disk data.
>
> • When migrating a single hard disk drive to a RAID 1 set, use of the Manual configuration is recommended.

Manual configuration

a. Select **Manual configuration** and press <Enter>. The selection bar moves to the Physical Drives menu.

```
┌─ PHYSICAL DRIVE ──────────────────────┐
│                                        │
│ 0  XXXXXXXXXXX            XXXXXXMB      │
│ 1  XXXXXXXXXXX            XXXXXXMB      │
│ 2  XXXXXXXXXXX            XXXXXXMB      │
│ 3  XXXXXXXXXXX            XXXXXXMB      │
│                                        │
│                                        │
│                                        │
└────────────────────────────────────────┘
```

b. Using the up or down arrow keys, select the *source drive* and press <Enter>.

c. Repeat step b to select the *target drive*.

d. After selecting the source and target drives, the following pop-up menu appears.

```
┌─ MAIN MENU ───────────────────────────┐
│                                        │
│  Auto configuration                    │
│  Manual configuration                  │
│                                        │
│          ┌─────────────────────────┐   │
│          │ Create with data copy   │   │
│          │ Create without data copy│   │
│          └─────────────────────────┘   │
│                                        │
└────────────────────────────────────────┘
```

> • The **Create with data copy** option allows you to copy the current data from the source drive to the mirror drive.
>
> • Select **Create with data copy** if you have important data in your source drive.
>
> • The **Create without data copy** option disables the disk copy function of the Mirrored set.
>
> • If you selected **Create without data copy**, the RAID 1 set must be repartitioned and reformatted to guarantee the consistency of its contents.

e. If you selected
   **Create with data
   copy**, the following
   pop-up menu
   appears.
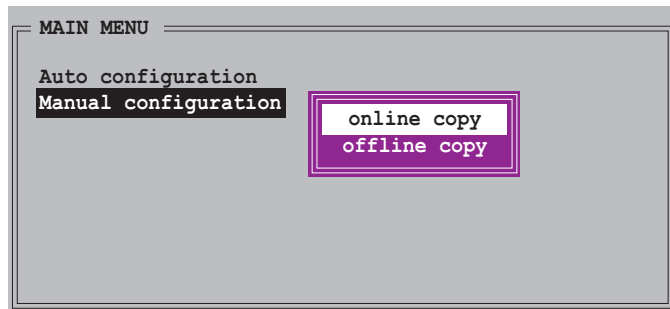
```
┌─ MAIN MENU ──────────────────────────────────┐
│                                               │
│  Auto configuration                           │
│  Manual configuration   ┌──────────────────┐  │
│                         │   online copy    │  │
│                         │   offline copy   │  │
│                         └──────────────────┘  │
│                                               │
│                                               │
└───────────────────────────────────────────────┘
```

The **online copy** option automatically copies the data to the target drives on the background while writing to the source drives. The **offline copy** option allows you to copy the contents of the source drive to the target drives now.

f. Use the up or down arrow keys to select desired copy method, then press <Enter>.

g. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.

h. Press <Y> to confirm or <N> to return to the Main Menu.

A copy progress appears if you previously selected offline copy.

Creating a RAID 5 set (Parity)

To create a RAID 5 set:

1. From the Silicon Image configuration utility main menu, select **Create RAID set** then press <Enter>. The following sub-menu appears.

```
┌─ MAIN MENU ──────────────────────────────────┐
│                                               │
│  Create RAID set                              │
│  Delete RAID set        ┌──────────────────┐  │
│  Rebuild Raid1 set      │     RAID0        │  │
│  Resolve Conflicts      │     RAID1        │  │
│  Low Level Format       │     RAID5        │  │
│  Logical Drive Info     │     RAID10       │  │
│                         │   SPARE DRIVE    │  │
│                         │   CONCATENATION  │  │
│                         └──────────────────┘  │
└───────────────────────────────────────────────┘
```

2. Select **RAID 5** then press <Enter> to display the following.
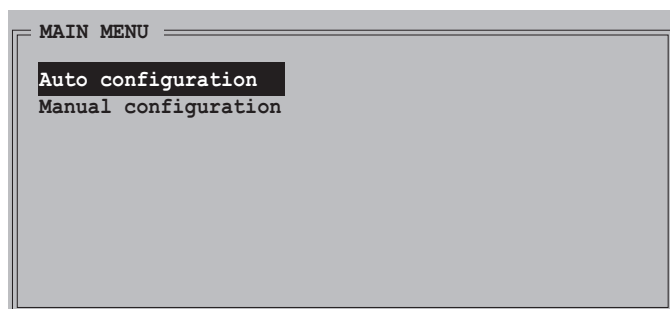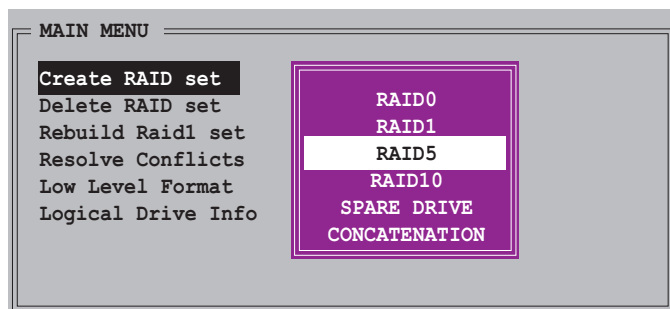
```
┌─ MAIN MENU ──────────────────────────────────┐
│                                               │
│  Auto configuration                           │
│  Manual configuration                         │
│                                               │
│                                               │
│                                               │
│                                               │
│                                               │
└───────────────────────────────────────────────┘
```
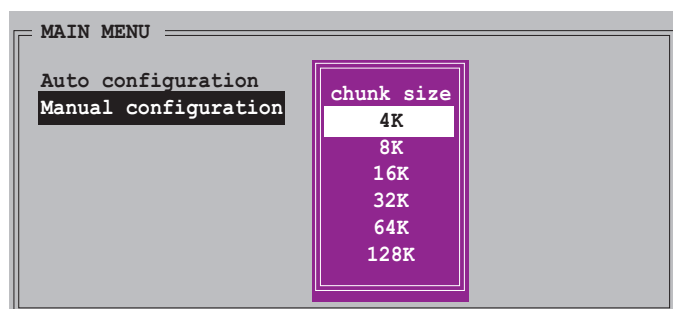
3. Select your desired method of configuration.

Auto configuration

a. Select Auto Configuration then press <Enter>.

b. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.

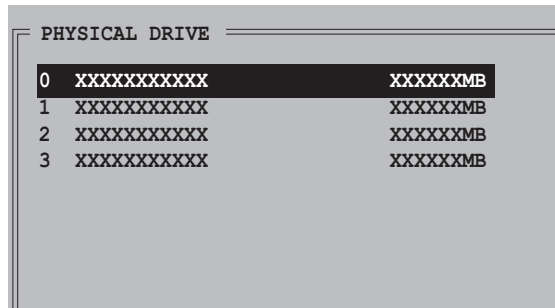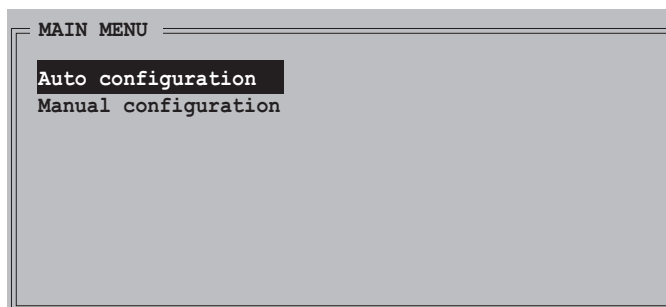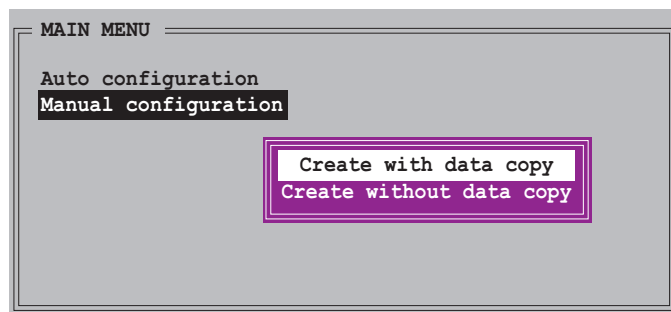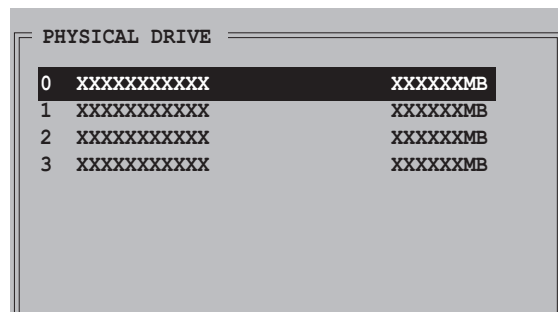c. Press <Y> to confirm or <N> to return to the Main Menu.

Manual configuration

a. Select **Manual configuration** and press <Enter>. The following pop-up menu appears.

b. Use the up or down arrow keys to select a chunk size appropriate to your drive usage then press <Enter>.

```
┌─ MAIN MENU ──────────────────────────────────┐
│                                              │
│  Auto configuration      ┌─ chunk size ─┐    │
│  Manual configuration    │     4K       │    │
│                          │     8K       │    │
│                          │     16K      │    │
│                          │     32K      │    │
│                          │     64K      │    │
│                          │    128K      │    │
│                          └──────────────┘    │
│                                              │
└──────────────────────────────────────────────┘
```

TIP: We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

c. The selection bar moves to the Physical Drive menu. Using the up or down arrow keys, select a drive then press <Enter> to set the first drive of the RAID set.

```
┌─ PHYSICAL DRIVE ─────────────────────────────┐
│                                              │
│  0  XXXXXXXXXXX            XXXXXXMB           │
│  1  XXXXXXXXXXX            XXXXXXMB           │
│  2  XXXXXXXXXXX            XXXXXXMB           │
│  3  XXXXXXXXXXX            XXXXXXMB           │
│                                              │
│                                              │
│                                              │
└──────────────────────────────────────────────┘
```

d. Repeat step c to set the second, third and fourth drive. The number of available drives depend on the installed and enabled physical drives in the system.

e. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.

f. Press <Y> to confirm or <N> to return to the Main Menu.

Creating a RAID 10 set (Mirrored+Striped)

To create a RAID 10 set:

1. From the Silicon Image
    configuration utility
    main menu, select
    Create RAID set
    then press <Enter>. The
    following sub-menu
    appears.

```
┌─ MAIN MENU ─────────────────────────────────────┐
│                                                   │
│   Create RAID set        ┌───────────────────┐   │
│   Delete RAID set        │      RAID0         │   │
│   Rebuild Raid1 set      │      RAID1         │   │
│   Resolve Conflicts      │      RAID5         │   │
│   Low Level Format       │      RAID10        │   │
│   Logical Drive Info     │   SPARE DRIVE      │   │
│                          │  CONCATENATION     │   │
│                          └───────────────────┘   │
│                                                   │
└───────────────────────────────────────────────────┘
```

2. Select **RAID 10** then
    press <Enter> to
    display the following.
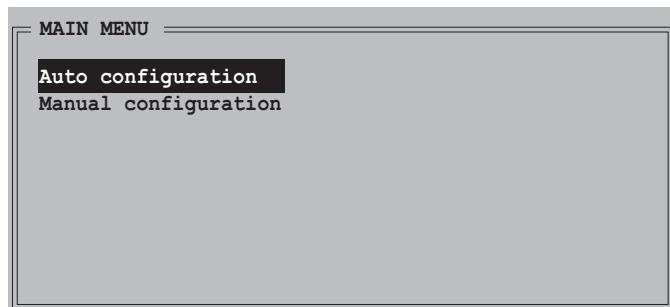
3. Select your desired
    method of
    configuration.

```
┌─ MAIN MENU ─────────────────────────────────────┐
│                                                   │
│   Auto configuration                              │
│   Manual configuration                            │
│                                                   │
│                                                   │
│                                                   │
│                                                   │
└───────────────────────────────────────────────────┘
```

Auto configuration

a. Select Auto Configuration then press <Enter>.

b. The utility prompts a message to input the RAID size, use the up
    or down arrow keys to set the RAID size then press <Enter>.

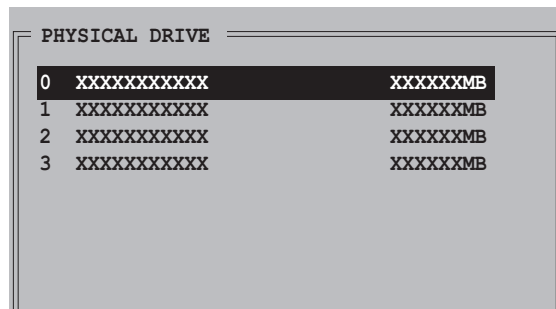c. Press <Y> to confirm or <N> to return to the Main Menu.

> Auto-configuration creates a RAID 10 set without a backup copy of the
> current source disk data.

Manual configuration

a. Select **Manual
    configuration** and
    press <Enter>. The
    following pop-up
    menu appears.

b. Use the up or down
    arrow keys to select
    a chunk size
    appropriate to your
    drive usage then press <Enter>.

```
┌─ MAIN MENU ─────────────────────────────────────┐
│                                                   │
│   Auto configuration     ┌───────────────┐       │
│   Manual configuration   │  chunk size   │       │
│                          │      4K       │       │
│                          │      8K       │       │
│                          │      16K      │       │
│                          │      32K      │       │
│                          │      64K      │       │
│                          │      128K     │       │
│                          └───────────────┘       │
└───────────────────────────────────────────────────┘
```

> **TIP:** We recommend a lower stripe size for server systems, and a higher
> stripe size for multimedia computer systems used mainly for audio and
> video editing.

c. The selection bar moves to the Physical Drive menu. Using the up or down arrow keys, select a drive then press <Enter> to set the first drive of the RAID set.
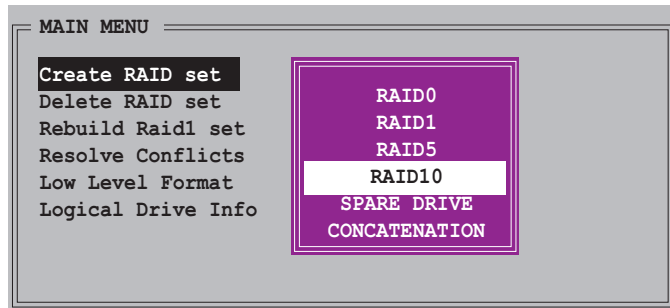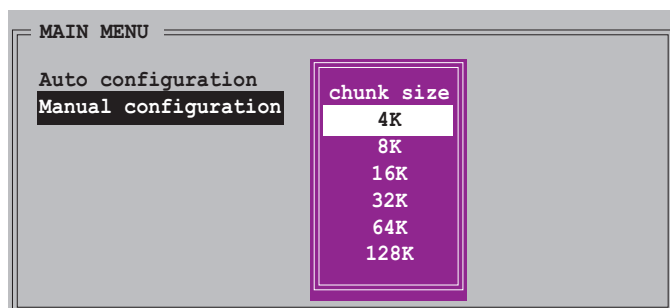
```
┌─ PHYSICAL DRIVE ──────────────────────────────┐
│                                               │
│ 0  XXXXXXXXXXX              XXXXXXMB           │
│ 1  XXXXXXXXXXX              XXXXXXMB           │
│ 2  XXXXXXXXXXX              XXXXXXMB           │
│ 3  XXXXXXXXXXX              XXXXXXMB           │
│                                               │
│                                               │
│                                               │
└───────────────────────────────────────────────┘
```

d. Repeat step c to set the second, third, and fourth drive. The number of available drives depend on the installed and enabled physical drives in the system.

e. After setting the RAID drives, the following pop-up menu appears.

```
┌─ MAIN MENU ───────────────────────────────────┐
│                                               │
│  Auto configuration                           │
│  Manual configuration                         │
│                                               │
│            ┌──────────────────────────┐       │
│            │    Create with data copy │       │
│            │ Create without data copy │       │
│            └──────────────────────────┘       │
│                                               │
│                                               │
└───────────────────────────────────────────────┘
```
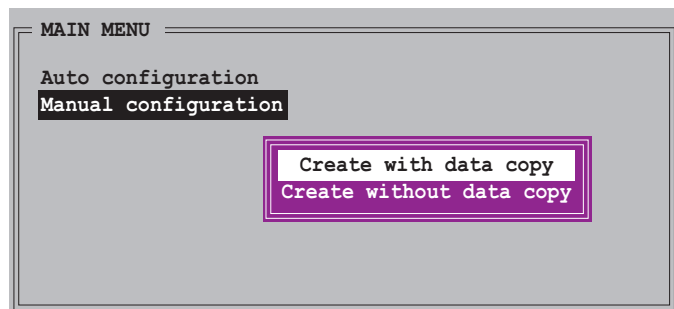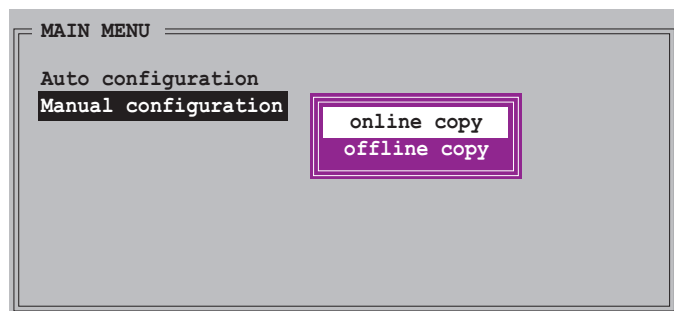
- The **Create with data copy** option allows you to copy the current data from the source drive to the mirror drive. The **Create without data copy** option disables the disk copy function of the Mirrored set.

- If you selected **Create without data copy**, the RAID 1 set must be repartitioned and reformatted to guarantee the consistency of its contents.

- Select **Create with data copy** if you have important data in your source drive.

f. If you selected **Create with data copy**, the following pop-up menu appears.

```
┌─ MAIN MENU ───────────────────────────────────┐
│                                               │
│  Auto configuration                           │
│  Manual configuration  ┌──────────────┐       │
│                        │  online copy │       │
│                        │ offline copy │       │
│                        └──────────────┘       │
│                                               │
│                                               │
└───────────────────────────────────────────────┘
```

The **online copy** option automatically copies the data to the target drives on the background while writing to the source drives. The **offline copy** option allows you to copy the contents of the source drive to the target drives now.

g. Use the up or down arrow keys to select desired copy method, then press <Enter>.

h. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.

i. Press <Y> to confirm or <N> to return to the Main Menu. A copy progress appears if you previously selected offline copy.
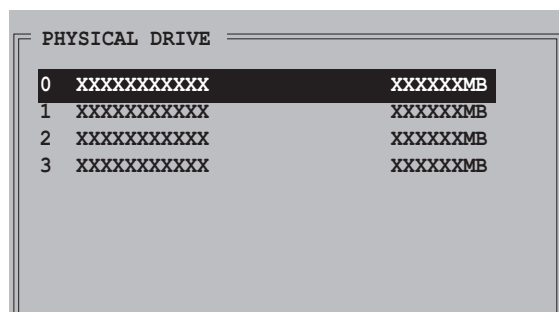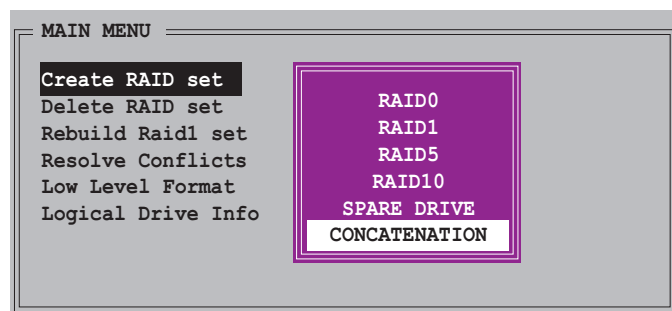
- • You can also create a RAID set using the SATARAID5 GUI utility under a Windows® environment.

- • For details on the Silicon Image SATARaid™ RAID 5 configuration, refer to the "Sil3132 User's Manual" found in your motherboard support CD.

Creating a CONCATENATION set

To create a CONCATENATION set:

1. From the Silicon Image configuration utility main menu, select **Create RAID set** then press <Enter>.

2. From the sub-menu Select **CONCATENATION** then press <Enter>.

```
┌ MAIN MENU ═══════════════════════════════
│
│  Create RAID set          ┌──────────────┐
│  Delete RAID set          │   RAID0      │
│  Rebuild Raid1 set        │   RAID1      │
│  Resolve Conflicts        │   RAID5      │
│  Low Level Format         │   RAID10     │
│  Logical Drive Info       │  SPARE DRIVE │
│                           │ CONCATENATION│
│                           └──────────────┘
```

3. The selection bar moves to the Physical Drive menu. Using the up or down arrow keys, select a drive then press <Enter> to set a drive for the RAID set.

4. The utility prompts a message to input the RAID size, use the up or down arrow keys to set the RAID size then press <Enter>.

```
┌ PHYSICAL DRIVE ══════════════════════════
│
│  0  XXXXXXXXXXX          XXXXXXMB
│  1  XXXXXXXXXXX          XXXXXXMB
│  2  XXXXXXXXXXX          XXXXXXMB
│  3  XXXXXXXXXXX          XXXXXXMB
│
```

5. Press <Y> to confirm or <N> to return to the Main Menu.

Configure a CONCATENATION set when using a single Serial ATA drive; otherwise, the system will not recognize the drive.

5.6 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing Windows® 2000/XP operating system on a hard disk drive that is included in a RAID set. You can create a RAID driver disk in DOS (using the Makedisk application in the support CD) or in Windows® environment.

To create a RAID driver disk in DOS environment:

1. Place the motherboard support CD in the optical drive.
2. Restart your computer, then enter the BIOS Setup.
3. Select the optical drive as the first boot priority to boot from the support CD. Save your changes, then exit the BIOS Setup.
4. Restart your computer.
5. Press any key when prompted to boot from CD.

```
Loading FreeDOS FAT KERNEL GO!
Press any key to boot from CDROM...
```

The Makedisk menu appears.

```
1) Make ICH7 RAID/AHCI 32bits Driver Disk
2) Make ICH7 RAID/AHCI 64bits Driver Disk
3) Make ITE8211 32bits Driver Disk
4) Make ITE8211 64bits Driver Disk
5) Make Sil3132 RAID 32bits Driver Disk
6) Make Sil3132 SATA 32bits Driver Disk
7) Format floppy disk
8) FreeDOS command prompt
Please choose 1 ~ 8
```

6. Place a blank, high-density floppy disk to the floppy disk drive, then press <7>. The following message displays on screen.

```
Insert new diskette for drive B:\
and press ENTER when ready...
```

7. Press <Enter> to format the floppy disk.
8. When finished, select the type of RAID driver disk you want to create by typing the number preceding the option, then press <Enter>. For example, if you want to create an ICH7R SATA RAID driver disk, press <1>. The following message appears on screen.

```
Please insert your formatted floppy to drive B:\
Press a key to continue.
```

9. The RAID drivers are copied to the floppy disk. After creating a RAID driver disk, eject the floppy disk, then write-protect it to prevent computer virus infection.

10. Press any key to return to the Makedisk menu.

To create a RAID driver disk:

1. Place the motherboard support CD into the CD-ROM drive.

2. When the **Drivers** menu appears, select the RAID driver disk you want to create:
   - Click **Make ITE8211 32/64 bit IDE Driver Disk** to create a 32-bit or 64-bit ITE® 8211F driver disk.
   - Click **Make ICH7 32 bit RAID Driver Disk** or **Make ICH7 64 bit RAID Driver Disk** to create a 32-bit or 64-bit Silicon Image RAID driver disk.
   - Click **Make Silicon Image 32bit RAID Driver Disk** or **Make Silicon Image 32bit SATA Driver Disk** to create a Silicon Image RAID driver disk.

   Or

   Browse the contents of the support CD to locate the driver disk utility.
   - Go to **\Drivers\ITE8211\Makedisk** for the Silicon Image RAID driver disk utility.
   - Go to **\Drivers\Chipset\Intel\Makedisk** for the Intel® ICH7R RAID driver disk utility.
   - Go to **\Drivers\Sil3132** for the Silicon Image RAID driver disk utility.

Refer to section "5.2.2 Drivers menu" for details.

3. Insert floppy disk to floppy disk drive.

4. Follow succeeding screen information to complete process.

5. Write-protect the floppy disk to avoid computer virus infection.

To install the RAID driver:

1. During the OS installation, the system prompts you to press the F6 key to install third-party SCSI or RAID driver.

2. Press <F6> then insert the floppy disk with RAID driver into the floppy disk drive.

3. Follow the succeeding screen instructions to complete the installation.

The Appendix describes the CPU features that the motherboard supports.

CPU features A

Chapter summary

A.1 Intel® EM64T

- The motherboard is fully compatible with Intel® Pentium® D or Intel® Pentium® 4 LGA775 processors running on 32-bit operating systems.

- The motherboard comes with a BIOS file that supports EM64T. You can download the latest BIOS file from the ASUS website (www.asus.com/support/download/) if you need to update the BIOS file. See Chapter 4 for details.

- Visit www.intel.com for more information on the EM64T feature.

- Visit www.microsoft.com for more information on Windows® 64-bit OS.

Using the Intel® EM64T feature

To use the Intel® EM64T feature:

1. Install an Intel® Pentium® 4 CPU that supports the Intel® EM64T.
2. Install a 64-bit operating system (Windows® XP Professional x64 Edition or Windows® Server 2003 x64 Edition).
3. Install the 64-bit drivers for the motherboard components and devices from the support CD.
4. Install the 64-bit drivers for expansion cards or add-on devices, if any.

Refer to the expansion card or add-on device(s) documentation, or visit the related website, to verify if the card/device supports a 64-bit system.

A.2 Enhanced Intel SpeedStep® Technology (EIST)

- The motherboard comes with a BIOS file that supports EIST. You can download the latest BIOS file from the ASUS website (www.asus.com/support/download/) if you need to update the BIOS. See Chapter 4 for details.

- Visit www.intel.com for more information on the EIST feature.

A.2.1 System requirements

Before using EIST, check your system if it meets the following requirements:

- Intel® Pentium® 4 processor with EIST support
- BIOS file with EIST support
- Operating system with EIST support (Windows® XP SP2/Windows® Server 2003 SP1/Linux 2.6 kernel or later versions)

A.2.2 Using the EIST

To use the EIST feature:

1. Turn on the computer, then enter the BIOS Setup.

2. Go to the **Advanced Menu**, highlight **CPU Configuration**, then press <Enter>.

3. Set the **Intel(R) SpeedStep Technology** item to [Automatic], then press <Enter>. See page 4-26 for details.

4. Press <F10> to save your changes and exit the BIOS setup.

5. After the computer restarts, right click on a blank space on the desktop, then select **Properties** from the pop-up menu.

6. When the **Display Properties** window appears, click the **Screen Saver** tab.

7. Click the **Power** button on the Monitor power section to open the **Power Options Properties** window.
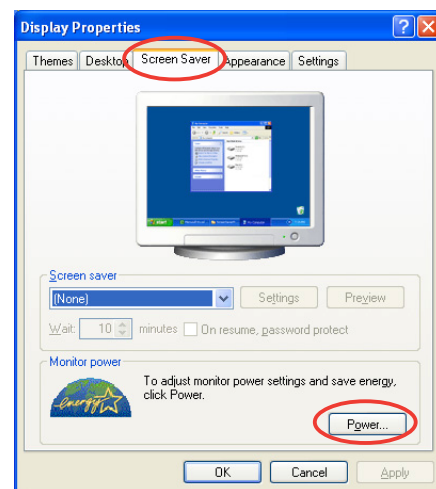
8. On the **Power schemes** section, click ⌄, then select any option except Home/Office Desktop or **Always On**.

9. Click **Apply**, then click **OK**.

10. Close the **Display Properties** window.

    After you adjust the power scheme, the CPU internal frequency slightly decreases when the CPU loading is low.
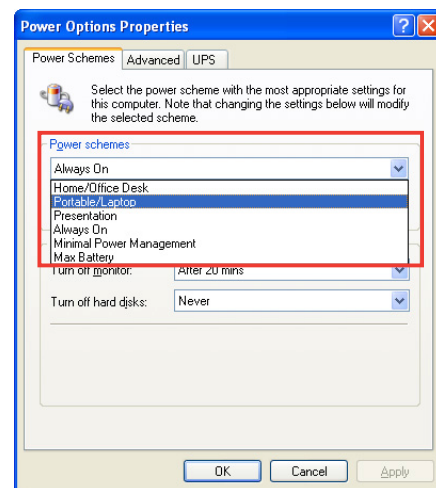
The screen displays and procedures may vary depending on the operating system.

A.3 Intel® Hyper-Threading Technology

- The motherboard supports Intel® Pentium® 4 LGA775 processors with Hyper-Threading Technology.

- Hyper-Threading Technology is supported under Windows® XP/2003 Server and Linux 2.4.x (kernel) and later versions only. Under Linux, use the Hyper-Threading compiler to compile the code. If you are using any other operating systems, disable the Hyper-Threading Techonology item in the BIOS to ensure system stability and performance.

- Installing Windows® XP Service Pack 1 or later version is recommended.

- Make sure to enable the Hyper-Threading Technology item in BIOS before installing a supported operating system.

- For more information on Hyper-Threading Technology, visit www.intel.com/info/hyperthreading.

Using the Hyper-Threading Technology

To use the Hyper-Threading Technology:

1. Install an Intel® Pentium® 4 CPU that supports Hyper-Threading Technology.

2. Power up the system and enter the BIOS Setup. Under the **Advanced Menu**, make sure that the item **Hyper-Threading Technology** is set to **Enabled**. See page 4-26 for details.

   The BIOS item appears only if you installed a CPU that supports Hyper-Threading Technology.

3. Restart the computer.