PC-DL Deluxe

User Guide

ASUS®

Motherboard

E1356

First edition V1

July 2003

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Chapter 5: Driver installation

Notices

Federal Communications Commission Statement

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

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

Canadian Department of Communications Statement

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

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

Safety information

Electrical safety

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

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

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

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

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

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

Operation safety

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

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

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

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

- Place the product on a stable surface.

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

About this guide

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

How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the features of the PC-DL Deluxe motherboard. It includes brief descriptions of the special attributes 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 jumpers and connectors on the motherboard.

- **Chapter 3: Powering up**

  This chapter describes the power up sequence and gives information on the BIOS beep codes.

- **Chapter 4: BIOS setup**

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

- **Chapter 5: Driver installation**

  This chapter tells how to install various drivers under supported operating systems.

Conventions used in this guide

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

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

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

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

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

Where to find more information

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

1. **ASUS Websites**

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

2. **Optional Documentation**

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

ASUS contact information

ASUSTeK COMPUTER INC. (Asia-Pacific)

Address: 150 Li-Te Road, Peitou, Taipei, Taiwan 112
General Tel: +886-2-2894-3447
General Fax: +886-2-2894-7798
Web Site: www.asus.com.tw

Technical Support

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Notebook (Tel):   +886-2-2890-7122 (English)
Desktop/Server (Tel):   +886-2-2890-7123 (English)
Support Fax: +886-2-2890-7698

ASUS COMPUTER INTERNATIONAL (America)

Address: 44370 Nobel Drive, Fremont, CA 94538, USA
General Fax: +1-502-933-8713
General Email: tmd1@asus.com
Web Site: usa.asus.com

Technical Support

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General Support: +1-502-995-0883
Notebook Support: +1-510-739-3777 x5110
Support Email: tsd@asus.com

ASUS COMPUTER GmbH (Germany and Austria)

Address: Harkort Str. 25, D-40880 Ratingen, BRD, Germany
General Email: sales@asuscom.de (for marketing requests only)
General Fax: +49-2102-9599-31

Technical Support

Support Hotlines: (Components) +49-2102-95990
                    (Notebook PC) +49-2102-959910
Support Fax: +49-2102-959911
Support Email: www.asuscom.de/support (for online support)
Web Site: www.asuscom.de

ASUS COMPUTER (Middle East and North Africa)

Address: P.O. Box 64133, Dubai, U.A.E.
General Tel: +9714-283-1774
General Fax: +9714-283-1775
Web Site: www.ASUSarabia.com

PC-DL Deluxe specifications summary

CPU	Support for Intel® Xeon™ processor up to 3.06+GHz On-die 512KB L2 cache
Chipset	Intel 82875P Memory Controller Hub (MCH) Intel 82801ER I/O Controller Hub (ICH5R)
Front Side Bus (FSB)	533 MHz
Memory	Dual-channel memory architecture 4 x 184-pin DDR DIMM sockets for up to 4GB memory Supports PC2700/2100 unbuffered ECC or non-ECC DDR DIMMs
Expansion slots	1 x AGP Pro/8X 5 x 32-bit/33MHz 5V PCI

Storage	Supported by South Bridge (ICH5R)
	  - 2 x UltraDMA100 connectors
	  - 2 x Serial ATA connectors (supports RAID 0/RAID 1
	      configuration under Windows XP)
	Supported by Promise® PDC20378 controller
	  - 1 x UltraDMA133 connector
	  - 2 x Serial ATA connectors
	  - RAID0, RAID1, RAID0+1, Multi-RAID configurations

IEEE 1394	TI TSB43AB22A IEEE 1394 controller - supports 2 x IEEE 1394 connectors
LAN	Intel 82547EI Gigabit LAN controller
Onboard audio	ADI AD1985 6-channel audio CODEC
Special features	ASUS Q-Fan Technology ASUS POST Reporter™ Power Loss Restart
Rear panel I/O	1 x Parallel port 2 x Serial ports 1 x PS/2 keyboard port 1 x PS/2 mouse port 1 x IEEE 1394 port 4 x USB 2.0 ports 1 x RJ-45 port Line In/Line Out/Microphone ports

(continued on the next page)

PC-DL Deluxe specifications summary

Internal I/O	2 x USB 2.0 connectors for 4 additional USB ports CPU/Power/Chassis fan connectors 24-pin/8-pin SSI 2V power connectors IDE LED/Power LED connectors Chassis intrusion connector 1 x IEEE 1394 connector GAME/MIDI connector S/PDIF Out connector CD/AUX/Modem audio connectors Front panel audio connector
BIOS features	4Mb Flash ROM, AMI BIOS, PnP, DMI2.0, WfM2.0, SM BIOS2.3
Industry standard	PCI 2.3, USB 2.0
Manageability	WfM 2.0. DMI 2.0, WOL/WOR by PME, chassis intrusion
Power requirement	ATX power supply (with 4-pin 12V plug)
Form Factor	ATX form factor: 12 in x 9.6 in (30.5 cm x 24.5 cm)
Support CD contents	Device drivers Management software Utilities ASUS contact information

Specifications are subject to change without notice.
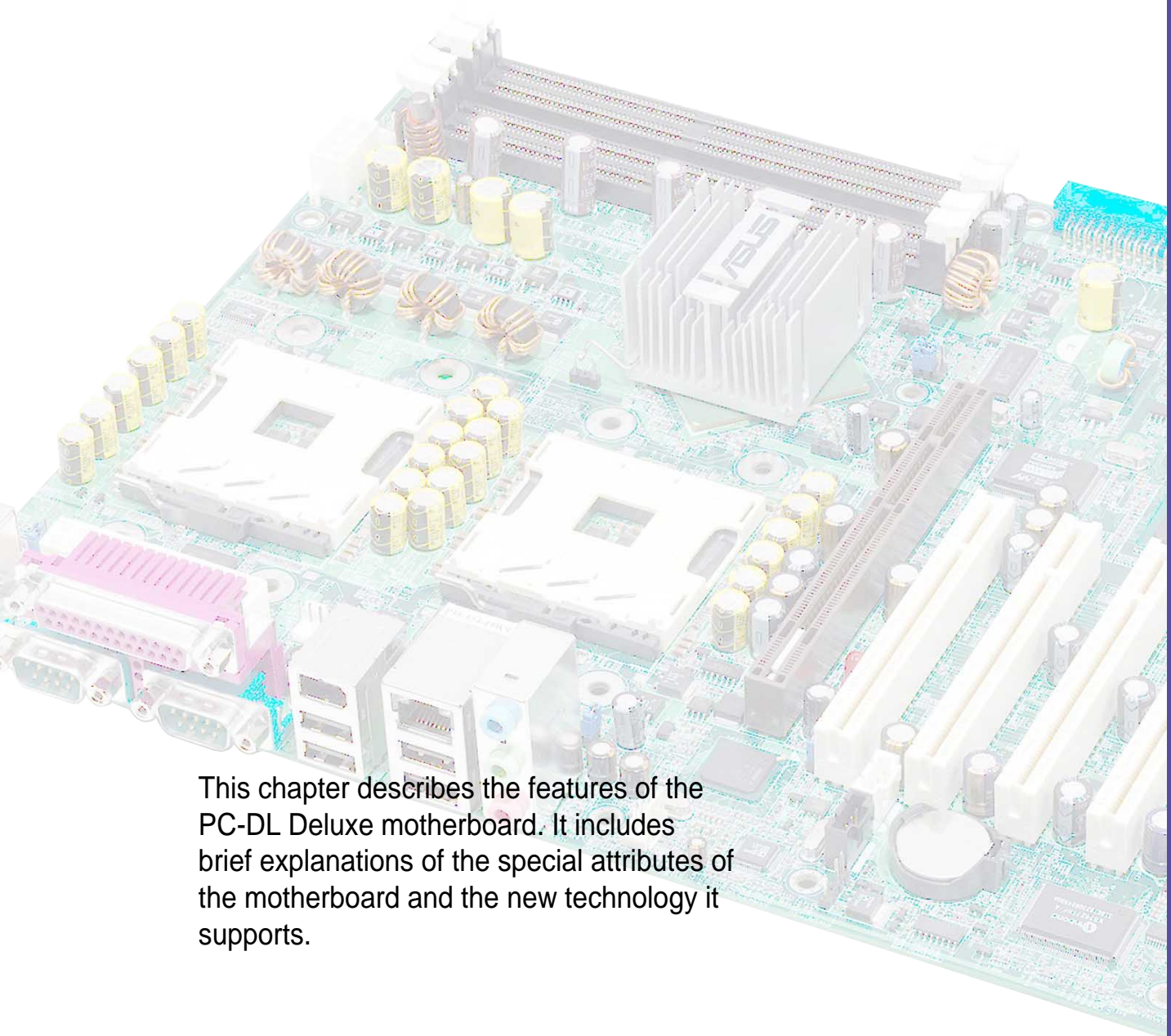
This chapter describes the features of the
PC-DL Deluxe motherboard. It includes
brief explanations of the special attributes of
the motherboard and the new technology it
supports.

Product introduction

Chapter summary

1.1   Welcome!

Thank you for buying the ASUS® PC-DL Deluxe motherboard!

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

The motherboard incorporates the Intel® Xeon™ processor in 604-pin package coupled with the Intel® 82875P chipset to provide a powerful workstation platform solution.

Supporting 533 MHz FSB, up to 4GB of system memory with PC2700/PC2100 DDR SDRAM, high-resolution graphics via an AGP Pro/8X slot, Serial ATA support, IEEE 1394, USB 2.0, and 6-channel audio features, the PC-DL Deluxe is your perfect vehicle to get ahead in the world of power computing!

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

1.2   Package contents

Check your PC-DL Deluxe package for the following items.

- ✓   ASUS PC-DL Deluxe motherboard
- ✓   ASUS support CD
- ✓   4 x SATA cables
- ✓   2 x UltraDMA100/66 IDE and floppy drive cables (4-in-1)
- ✓   1-port IEEE 1394 module
- ✓   2-port USB2.0 module with Game port
- ✓   2-port S/PDIF Out module
- ✓   I/O shield
- ✓   Bag of extra jumper caps
- ✓   User guide

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

1.3   Special features

1.3.1   Product highlights

Latest processor technology

The motherboard supports the latest Intel® Xeon™ processor via dual 604-pin surface mount ZIF sockets. The processor with 512KB L2 cache includes a 533/400 MHz system bus and features the Intel Hyper-Threading Technology and new power design that allow up to 3.06+GHz core frequencies. See page 2-4 for more information.

Dual-channel DDR333 memory support

Employing the dual-channel DDR memory architecture, the motherboard provides a solution that doubles the system memory bandwidth to boost system performance. The motherboard supports up to 4GB of system memory using PC2700/2100 unbuffered ECC or non-ECC DDR DIMMs to deliver up to 5.33GB/s data transfer rate for the latest 3D graphics, multimedia, and Internet applications. See page 2-11.

> When all four sockets are populated with 1GB DIMMs (total 4GB), the system may detect only 3.8GB due to ICH5R resource allocation.

Serial ATA technology

The motherboard supports the new Serial ATA technology through the SATA interfaces, and the Intel ICH5R and Promise® PDC20378 controllers onboard. The SATA specification allows for thinner, more flexible cables with lower pin count, reduced voltage requirement, and up to 150MB/s data transfer rate. See page 2-23.

Multi-RAID solution

The motherboard has the Promise® PDC20378 controller to support multi-RAID solution using Serial ATA/150 and Ultra ATA/133 hard disks. The RAID0 (striping), RAID1 (mirroring), and RAID 0+1 provide a cost-effective high-performance solution for added system performance and reliability.

AGP 8X support

The motherboard supports the latest graphic architecture, the AGP Pro/8X interface (a.k.a. AGP 3.0), offering 2.1GB/s bandwidth which is twice that of its predecessor AGP 4X.

Gigabit LAN solution Intel®PRO
Network Connections
2XGigabit network performance

The Intel® 82547EI Gigabit Ethernet controller allows full-duplex Gigabit performance on LAN on Motherboard (LOM) applications through the Communication Streaming Architecture (CSA). Instead of connecting to the PCI bus, the controller connects to the dedicated CSA bus on the Memory Controller Hub (MCH) thus reducing the PCI bottlenecks by freeing the PCI bus for other I/O operations.

6-channel audio feature

The SoundMAX-class ADI AD1985 AC '97 audio CODEC supports 6-channel 5.1 surround sound output, stereo microphone input, variable Sample Rate Conversion (SRC), professional quality 103-dB out put with 94-dB SNR, and analog enumeration capability. The SoundMAX 4 XL software features the AudioESP™ (Audio Enumeration and Sensing Process) that allows intelligent detection of the peripherals plugged into the audio ports and identifies the incompatible devices, if any.

CPU overclocking

This feature allows convenient overclocking up to 30% (depending on the installed CPU and DRAM) to enhance system performance while still maintaining system stability. See section "4.4.1 Advanced Chipset Features" to set the BIOS items for overclocking.

ASUS Q-Fan technology

The ASUS Q-Fan technology smartly adjusts the fan speeds according to the system loading to ensure quiet, cool, and efficient operation.

ASUS POST Reporter™

The motherboard offers a new exciting feature called the ASUS POST Reporter™ to provide friendly voice messages and alerts during the Power-On Self-Tests (POST) informing you of the system boot status and causes of boot errors, if any. The bundled Winbond Voice Editor software lets you to customize the voice messages in different languages.

IEEE 1394 support

The IEEE 1394 interfaces and the TI TSB43AB22A controller onboard provide high-speed and flexible PC connectivity to a wide range of peripherals and devices compliant to IEEE 1394a standards. The IEEE 1394 allows up to 400Mbps 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 page 2-31.

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 2-30.

1.3.2   Value-added solutions

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 system voltage levels are monitored to ensure stable supply of current for critical components.

ACPI ready

The Advanced Configuration power Interface (ACPI) provides more energy saving features for operating systems that support OS Directed Power Management (OSPM).

Chassis intrusion detection

The motherboard supports chassis intrusion monitoring through the Winbond ASIC. A chassis intrusion event is retained in CMOS for more protection.

ASUS Update

This utility allows you to update the motherboard BIOS through a user-friendly interface. Connect to the Internet then to the ASUS FTP site nearest you to obtain the latest BIOS version for your motherboard.

1.4   Motherboard overview

Before you install the motherboard, familiarize yourself with its physical configuration and available features to facilitate the motherboard installation and future upgrades. A sufficient knowledge of the motherboard specifications will also help you avoid mistakes that may damage the board and its components.

1.4.1   Major components

The following are the major components of the PC-DL Deluxe motherboard as pointed out in the picture on page 1-7.

1.   SSI power connector (24-pin)
2.   CPU sockets
3.   North Bridge controller
4.   SSI 12V power connector (8-pin)
5.   DDR DIMM sockets
6.   AGP Pro/8X slot
7.   RAID Ultra ATA133 connector
8.   SATA connectors (supported by Promise® 20378 controller)
9.   Flash ROM
10. SATA connectors (supported by ICH5R)
11. IDE connectors
12. Floppy disk connector
13. Standby power LED
14. Speech controller
15. IEEE 1394 controller
16. South Bridge controller
17. SATA/RAID controller
18. PCI slots
19. Super I/O controller
20. Audio CODEC
21. AGP warning LED
22. Gigabit LAN controller
23. PS/2 mouse port
24. Parallel port
25. IEEE 1394 port
26. RJ-45 port
27. Line In jack
28. Line Out jack
29. Microphone jack
30. USB 2.0 ports 3 and 4
31. USB 2.0 ports 1 and 2
32. Serial ports
33. PS/2 keyboard port

See page 1-8 for the specifications of each component. Refer to Chapter 2 for detailed information on the components.
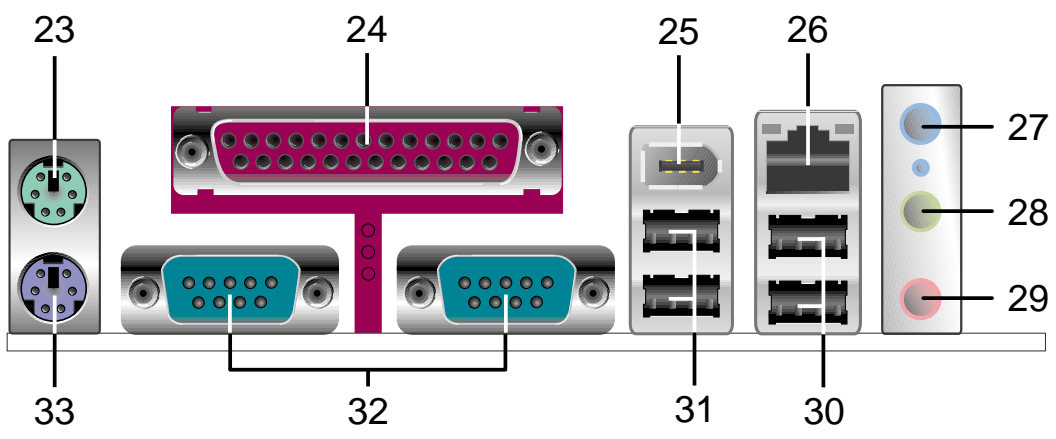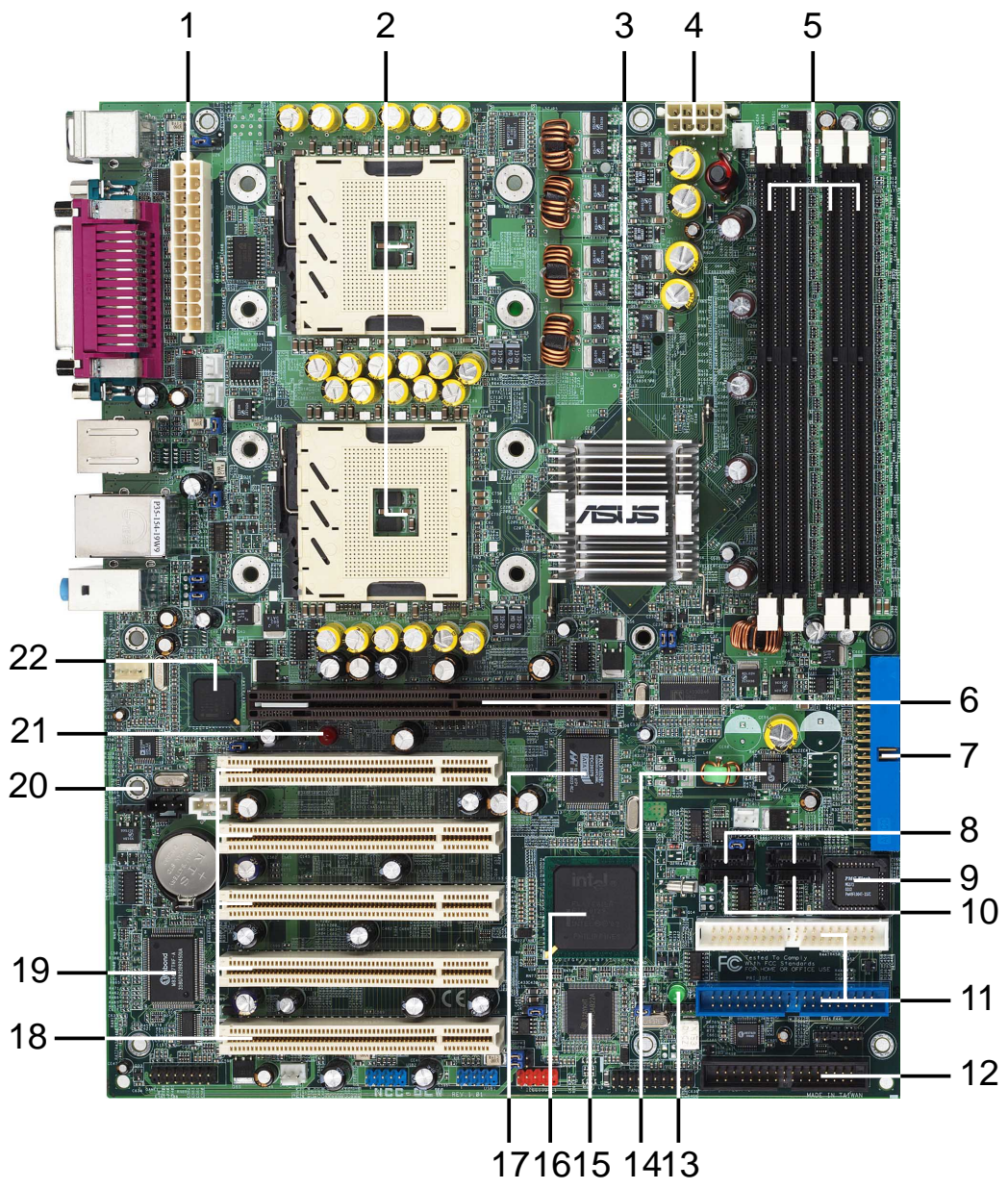
1.4.2 Core specifications

1 **SSI power connector (24-pin).** This 24-pin connector connects to an SSI power supply. The power supply must have at least 1A on the +5V standby lead (+5VSB).

2 **CPU sockets.** Two 604-pin surface mount, Zero Insertion Force (ZIF) sockets for Intel® Xeon™ processors with 512KB L2 cache, and 533MHz system bus that allows up to 4.3GB/s data transfer rates.

3 **North bridge controller.** The Intel® 82875P Memory Controller Hub (MCH) provides the CPU interface, DDR interface, AGP interface, and Hub Interface, and manages the flow of information between these interfaces. The MCH provides the processor interface with 533MHz frequency, system memory interface with up to 5.33GB/s bandwidth in dual-channel mode, and 1.5V AGP Interface Specification 3.0 that supports 8X/4X Fast Write protocol. The MCH interconnects to the south bridge ICH5R via the Intel® proprietary Hub Interface.

4 **SSI 12V connector.** This power connector connects the 8-pin 12V plug from the SSI power supply.

5 **DDR DIMM sockets.** These four 184-pin DIMM sockets support up to 4GB system memory using unbuffered ECC or non-ECC PC2700/PC2100 DDR DIMMs.

6 **AGP Pro/8X slot.** This Accelerated Graphics Port (AGP) Pro slot supports 0.8V/1.5V AGP 8X mode graphics cards for 3D graphical applications and delivers up to 2.1GB/s bandwidth.

7 **RAID Ultra ATA133 connector** *(supported by Promise® PDC20378 controller).* This connector supports two Ultra ATA133 HDDs. On RAID models, the HDDs on this connector may be configured as RAID0, RAID1, or RAID0+1 together with the Serial ATA HDDs on the SATA RAID connectors.

8 **SATA connectors** *(supported by Promise® PDC20378 controller).* These connectors support Serial ATA HDDs and allows for up to 150MB/s data transfer rate using the thin 4-conductor SATA cables. The HDDs may be configured as RAID0, RAID1, RAID0+1. Together with the UltraDMA133 devices, if present, the HDDs may be set up as a multi-RAID configuration.

9 **Flash ROM.** This 4Mb firmware hub (FWH) contains the programmable BIOS program.

10 **SATA connectors** *(supported by ICH5R).* These connectors support Serial ATA HDDs and allows for up to 150MB/s data transfer rate. The HDDs may be configured as RAID 0/RAID 1 level storage.

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

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

13 **Standby power LED.** This LED lights up if there is a standby power on the motherboard. This LED acts as a reminder to turn off the system power before plugging or unplugging devices.

14 **Speech controller.** This Winbond speech controller supports the ASUS POST Reporter™ for configurable vocal POST alerts.

15 **IEEE 1394 controller.** The TI TSB43AB22A chipset supports two low power IEEE 1394 connectors to allow 100Mbps, 200Mbps, and 400Mbps data transfers between the 1394 devices.

16 **South bridge controller.** The fifth-generation Intel I/O Controller Hub (ICH5R) is a subsystem that integrates various I/O functions including 2-channel ATA/100 bus master IDE controller, SATA RAID controller, up to eight USB 2.0/1.1 ports, I/O APIC, LPC interface, AC'97 2.3 interface, and PCI 2.2/2.3 interface. The ICH5 also contains the necessary arbitration and buffering for efficient utilization of these interfaces.

17 **RAID/SATA/IDE controller.** The Promise® PDC20378 RAID controller provides high-performance RAID0/RAID1/RAID0+1 functionality and complies with the Serial ATA and UltraDMA 133 specifications.

18 **PCI slots.** These 32-bit PCI 2.3 expansion slots support bus master PCI cards like SCSI or LAN cards with 133MB/s maximum throughput.

19 **Super I/O controller.** This Winbond Low Pin Count (LPC) interface provides the commonly used Super I/O functionality. The chipset supports a high-performance floppy disk controller for a 360K/720K/1.44M/2.88M floppy disk drive, a multi-mode parallel port, two standard compatible UARTs, and a Flash ROM interface. This controller also integrates the ASIC for PC health monitoring.

20 **Audio CODEC.** The AD1985 AC '97 2.3 stereo audio CODEC provides a 6-channel audio capability. The CODEC supports surround sound output, variable sample rate conversion, analog enumeration capability, and other major audio technologies for a complete integrated audio solution.

21   **AGP warning LED.** Serving as a smart burn-out protection for the motherboard, this red LED lights up if you plug in any 3.3V AGP card into the AGP slot. When this LED is lit, there is no way you can turn on the system power even if you press the power button

22   **Gigabit LAN controller.** The Intel® 82547EI Gigabit Ethernet controller allows full-duplex Gigabit performance on LAN on Motherboard (LOM) applications through the Communication Streaming Architecture (CSA). The controller combines Intel's fifth-generation Gigabit MAC design integrated with physical layer circuitry (PHY) to support 1000BASE-T, 100BASE-TX, and 10BASE-T applications.

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

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

25   **IEEE 1394 port.** This port connects IEEE 1394-compliant devices like camcorders, VCRs, printers, or digital cameras. *(on 1394 models only)*

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

27   **Line In jack.** This Line In (light blue) jack connects a tape player or other audio sources. In 6-channel mode, the function of this jack becomes Rear Speaker Out.

28   **Line Out jack.** This Line Out (lime) jack connects a headphone or a speaker. In 6-channel mode, the function of this jack becomes Front Speaker Out.

29   **Microphone jack.** This Mic (pink) jack connects a microphone. In 6-channel mode, the function of this jack becomes Bass/Center.

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

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

32   **Serial ports.** These 9-pin COM1 ports are for pointing devices or other serial devices.

33   **PS/2 keyboard port.** This purple connector is for a PS/2 keyboard.

Chapter 2
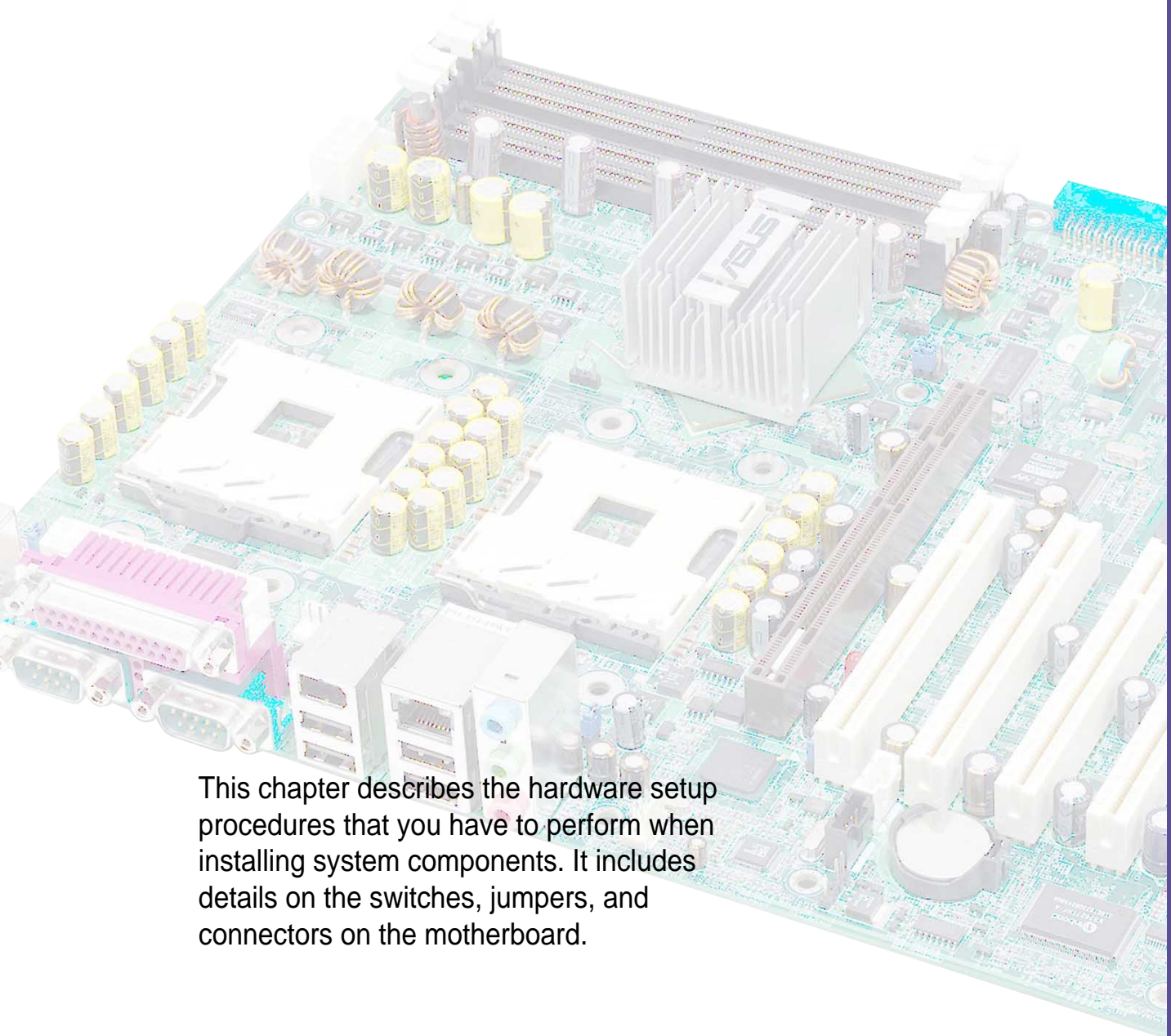
This chapter describes the hardware setup procedures that you have to perform when installing system components. It includes details on the switches, jumpers, and connectors on the motherboard.

Hardware information

Chapter summary

2.1 Motherboard installation

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. The motherboard uses the ATX form factor that measures 12 inches x 9.6 inches (30.5 x 24.5 cm).

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

2.1.1 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.

2.1.2 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 may damage the motherboard.

Place this side towards the rear of the chassis

2.2 Motherboard layout

24.9cm (9.8in)

30.5cm (12in)

- PS/2KBMS
  - T: Mouse
  - B: Keyboard
- KBPWR1
- COM1
- SSI_POWER
- PARALLEL PORT
- mPGA 604 — CPU1
- CON12V
- CHA FAN1
- DDR DIMM1 (72 bit, 184-pin module)
- DDR DIMM2 (72 bit, 184-pin module)
- DDR DIMM3 (72 bit, 184-pin module)
- DDR DIMM4 (72 bit, 184-pin module)
- CPU_FAN1
- CPU_FAN2
- COM2
- USBPW1
- Bottom:
  - T:USB4
  - B:USB3
- Top: 1394
- mPGA 604 — CPU2
- USBPW2
- Intel 82875P (Canterwood)
- USB2.0
  - T: USB1
  - B: USB2
- Top: RJ-45
- Top:Line In
- Center:Line Out
- Below:Mic In
- FP_AUDIO1
- J1
- MODEM1
- Intel 82547EI Gigabit Ethernet
- Accelerated Graphics Port (AGP8X1)
- Audio Codec
- AGP_WARN1
- PCI1
- PROMISE PDC20378 RAID Controller
- Speech Controller
- CD1
- AUX1
- PCI2
- SPDIF_OUT
- CR2032 3V Lithium Cell CMOS Power
- PCI3
- Intel I/O Controller Hub (ICH5R)
- SYS_FAN2
- SATA_RAID2
- SATA_RAID1
- SATA2
- SATA1
- 4Mbit Flash BIOS
- SEC_IDE1
- Super I/O
- PCI4
- SB_PWR1
- J4
- TI TSB43AB22A
- CLRTC1
- CHASSIS1
- PRI_IDE1
- PCI5
- SMB1
- GAME1
- SYS_FAN1
- USB2
- USB1
- USBPW3
- USBPW4
- PC-DL
- IEEE1394_1
- PANEL1
- FLOPPY1

2.3   Before you proceed

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

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

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

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

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

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

When lit, the green LED (SB_PWR1) indicates that the system is ON, in sleep mode, or in soft-off mode, a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component.

The red LED (AGP_WARN1) is a smart protection from motherboard burn out caused by an incorrect AGP card. If you plug in any 3.3V AGP card into the 1.5V AGP slot, this LED lights up thus preventing the system to power up. This LED remains off if you plug in a 1.5V AGP card.

AGP_WARN1

ON
Incorrect
AGP Card

OFF
Correct
AGP Card

SB_PWR1

ON
Standby
Power

OFF
Powered
Off

PC-DL Onboard LED
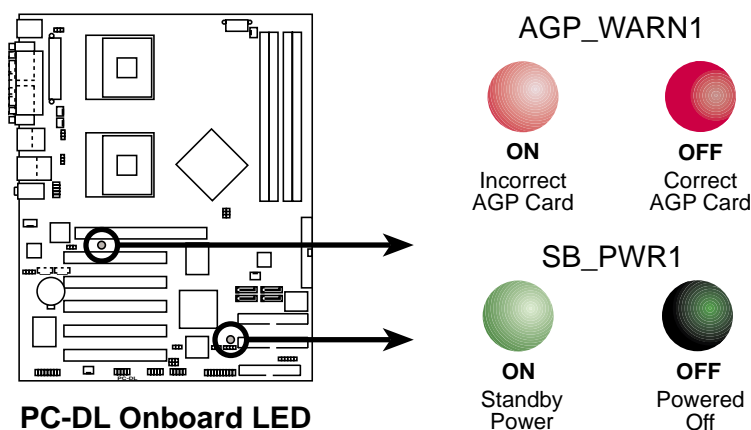
2.4 Central Processing Unit (CPU)

2.4.1 Overview

The motherboard comes with dual surface mount 604-pin Zero Insertion Force (ZIF) sockets. The sockets are designed for the Intel Processor in the 604-pin package with 512KB L2 cache. The processor includes the Intel® NetBurst™ micro-architecture that features the hyper-pipelined technology, rapid execution engine, 533MHz system bus, and execution trace cache. Together, these attributes improve system performance by allowing higher core frequencies, faster execution of integer instructions, and data transfer rate of up to 4.27GB/s.

Prestonia

Gold Arrow →
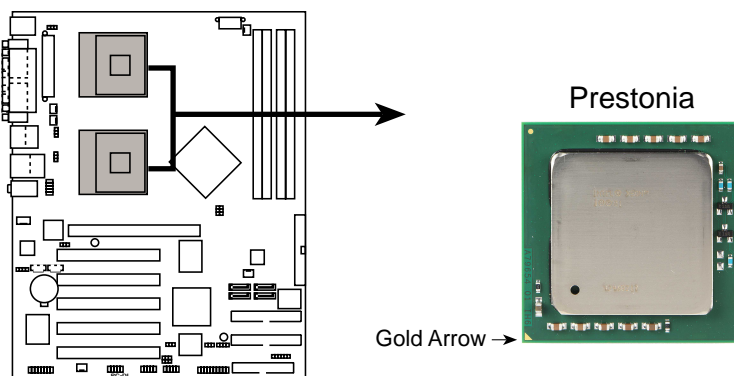
PC-DL Socket 604

2.4.2 Installing the CPU

Note in the above illustration that the CPU has a gold triangular mark on one corner. This mark indicates the processor Pin 1 that should match a specific corner of the CPU socket.

> If installing only one CPU, use CPU socket 1 to ensure system stability..

Socket for CPU1

Socket for CPU2
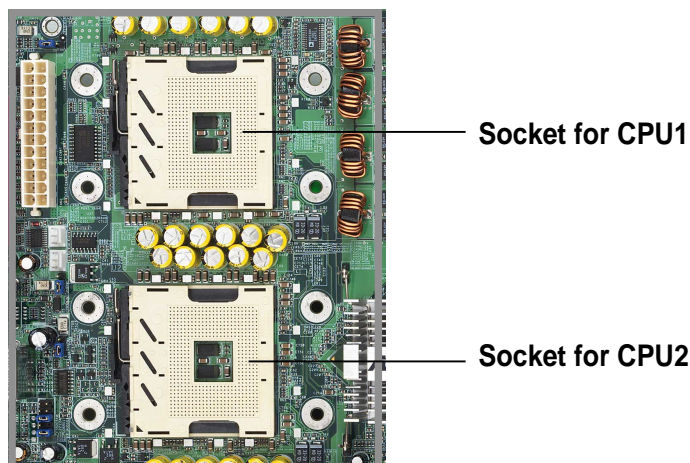
⚠️ Incorrect installation of the CPU into the socket may bend the pins and severely damage the CPU!

Follow these steps to install a CPU.

1. Locate the 604-pin ZIF sockets on the motherboard. Flip up the socket lever and push it all the way to the other side.

   ✍️ Make sure that the socket lever is pushed back all the way, otherwise the CPU does not fit in completely.

Marked Corner
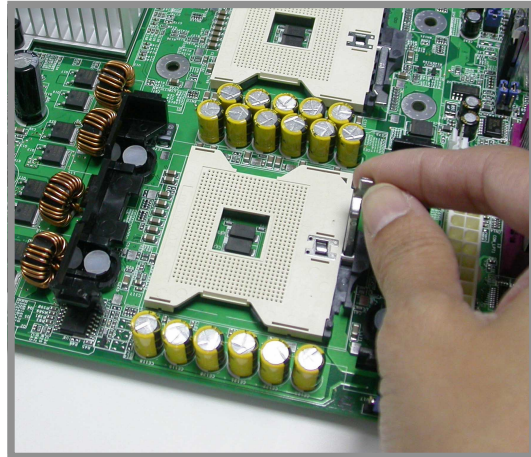
2. Position the CPU above the socket as shown.

3. Carefully insert the CPU into the socket until it fits in place.

   ⚠️ The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!
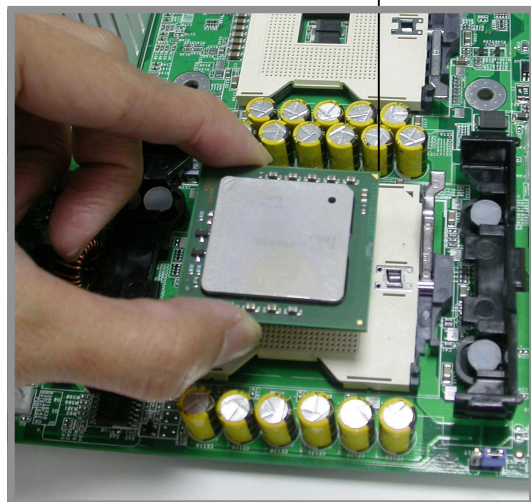
4. Carefully push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

5. Apply the thermal interface material (thermal grease) to the top of the CPU. This thermal grease should come with the CPU package.
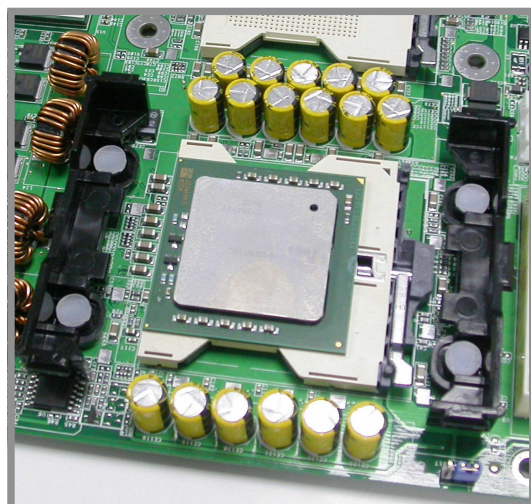
2.4.3   Installing the CPU heatsink and fan

The Intel® Xeon™ processors require an Intel certified heatsink and fan assembly to ensure optimum thermal condition and performance.

When you buy a boxed Intel CPU, the package includes the heatsink, fan, retention brackets, screws, thermal grease, installation manual, and other items that are necessary for CPU installation.

1. **Perform the installation steps 1 to 3 in this section before installing you motherboard into the chassis.**

2. Make sure that you have applied the thermal grease to the top of the CPU before installing the heatsink and fan.

3. Refer to the installation manual that came with the CPU package for details on heatsink/fan assembly and installation.

To install the CPU heatsink and fan:

1. With the on a flat stable surface (such as a table), place the thermal plate underneath a CPU socket, matching the standoffs on the plate with the four holes around the CPU socket.

   The figure below shows the corresponding matches of the motherboard holes and standoffs.

Motherboard hole — Standoff — CPU thermal plate
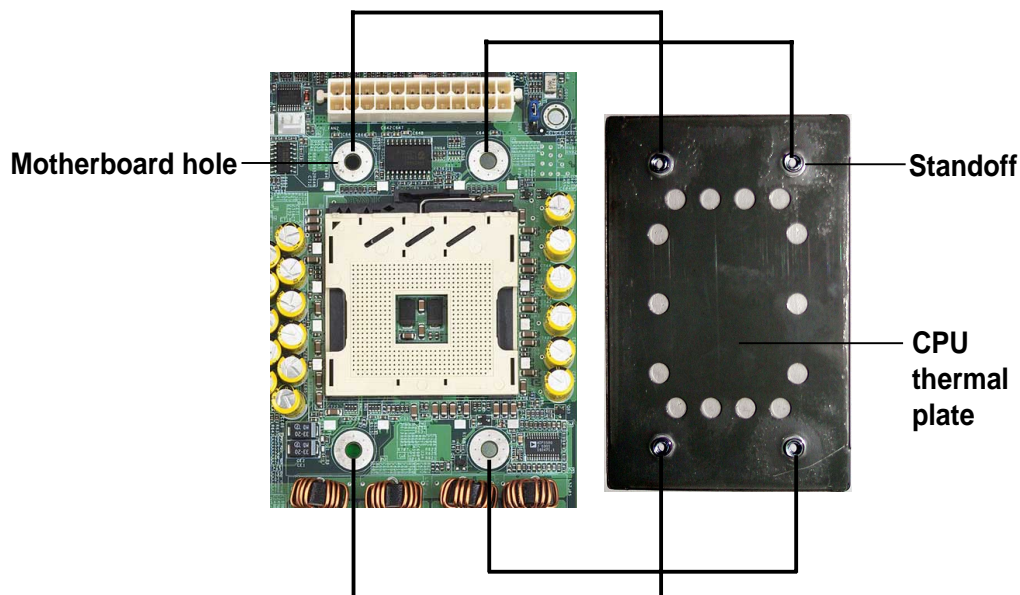
2. Place the heatsink retention mechanism over the CPU socket, matching its holes with the four holes on the motherboard and the standoffs on the thermal plate.

Heatsink retention mechanism —
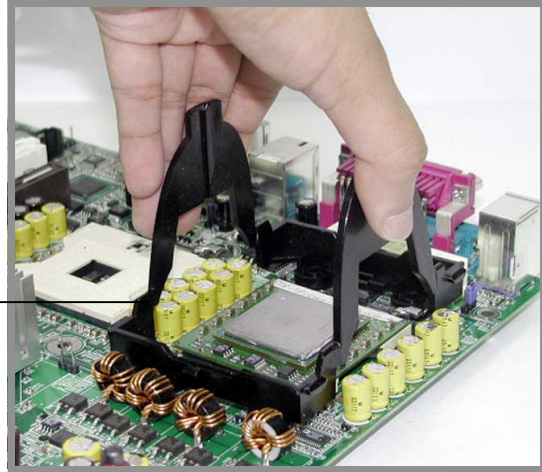
3. Secure the retention mechanism with the thermal plate using four screws.
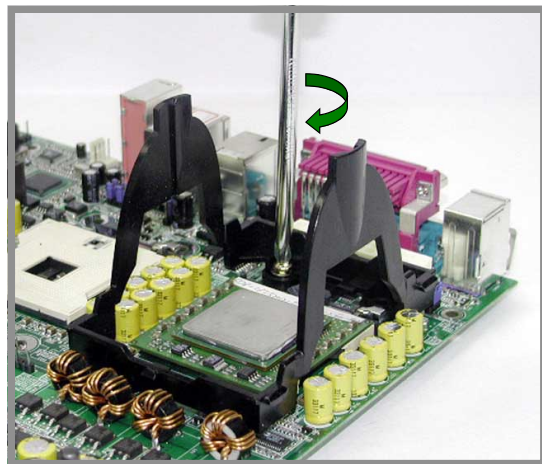
4. Position the heatsink on top of the CPU, having its angled side (with cut corners) facing the memory sockets. Make sure that the heatsink base fits completely on the retention mechanism.
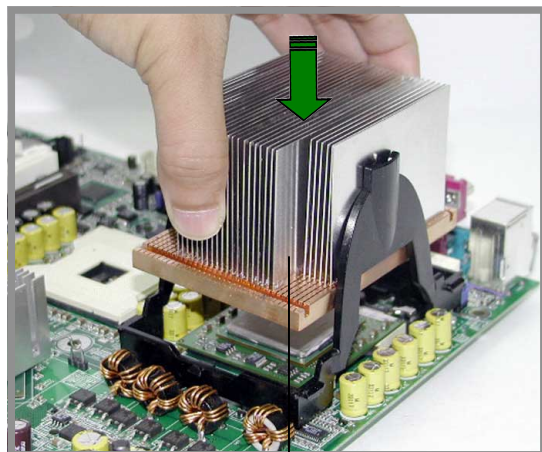
Heatsink angled side

5. Secure the heatsink with the retention clips.

Retention clip
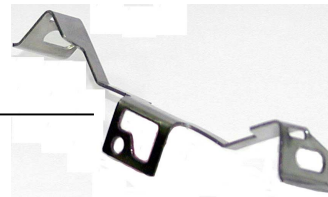
a. Insert the center hole of a retention clip into the center tab on the retention mechanism.

b. Slightly move the clip to the right so that the center tab is positioned on the narrow side of the hole. This ensures that the side holes fit on the side tabs.

c. Press one end of the clip to snap its hole on the right side tab.

5a

5c

5b
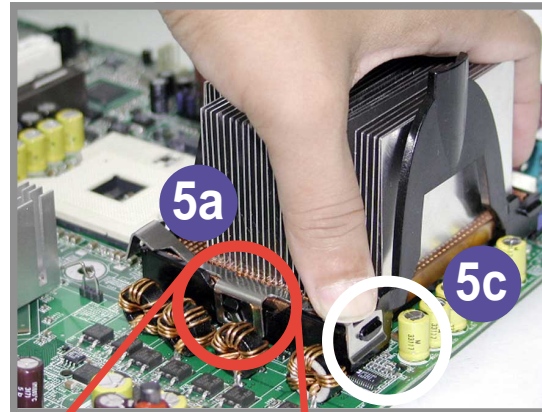
Center tab position when retention clip is in place
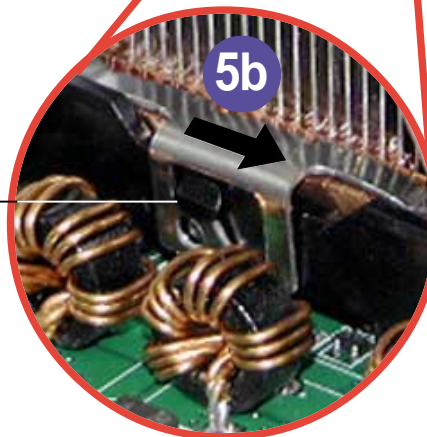
d. Press the other end of the clip to snap its hole on the left side tab. This secures one side of the heatsink.

5d
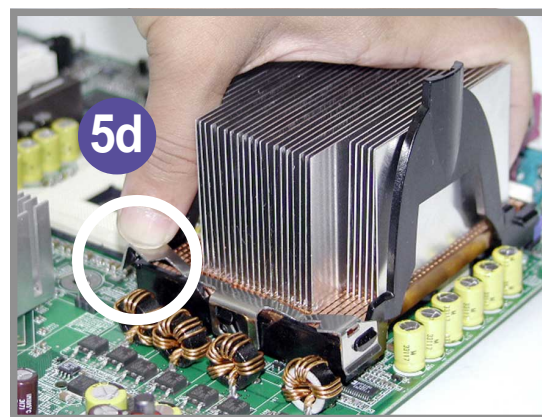
6. Follow step 5 to install the other retention clip, and completely secure the heatsink.

Chapter 2: Hardware information

7. Detach the cover of the air tunnel
    by twisting it back and forth.

Detachable cover
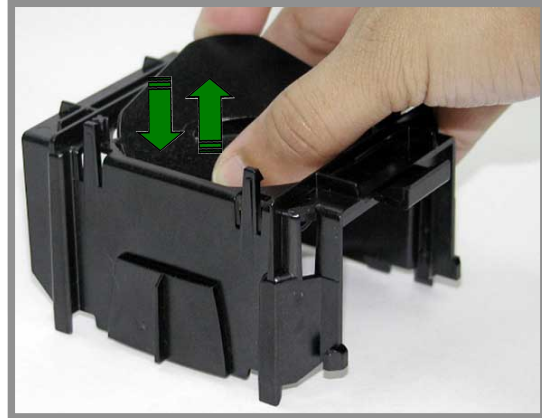
8. Align the two pegs on the air
    tunnel with the corner holes of the
    fan module. Press the module
    down until the four hooks on the
    air tunnel snap on its sides.

Hook
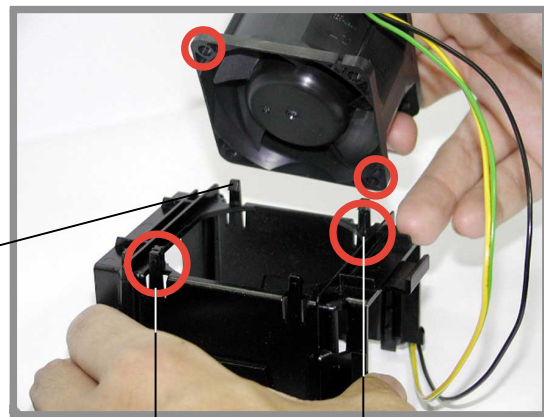
Corners with pegs

9. Position the fan and air tunnel
    assembly over the heatsink such
    that the two curved corners match
    the angled side of the heatsink.

Curved corners

10. Align and insert the side rails of
    the air tunnel into the grooves on
    the retention mechanism.

NOTE You may need to slightly press
    out the side of the retention
    mechanism to properly insert the
    air tunnel.

Side rail

Groove (inner side)

ASUS PC-DL Deluxe motherboard   **2-9**
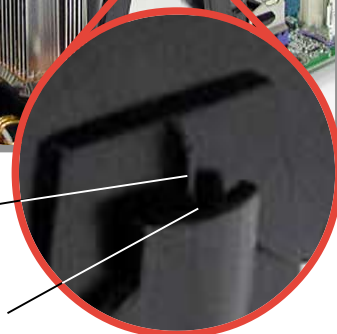
11. Press down the fan and air tunnel assembly until the side rails slide past the grooves and over the rail stoppers. The protruding tab on each corner of the air tunnel should snap over the dents on the retention mechanism.

Rail stopper

Side rail
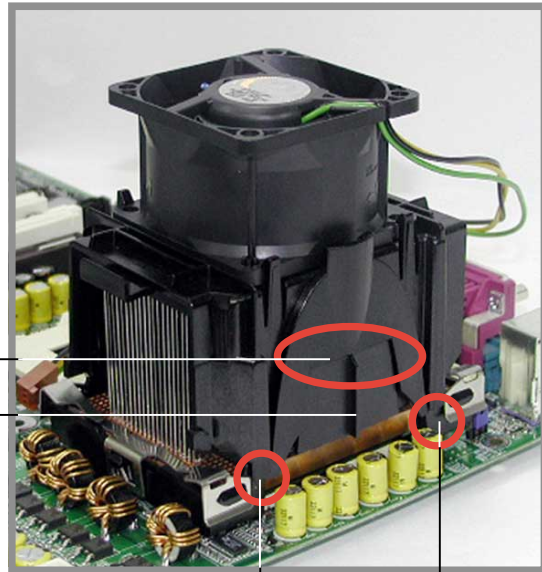
Protruding tabs

12. Connect the fan cable to the fan connector on the motherboard.
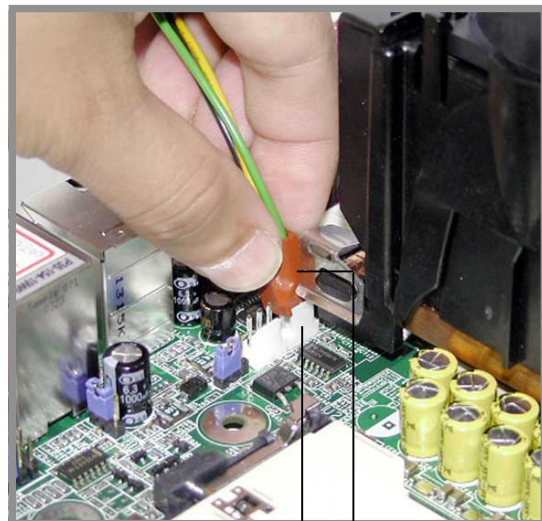
Fan connector

Fan cable

2.5   System memory

2.5.1   Overview

The motherboard comes with four Double Data Rate (DDR) Dual Inline Memory Module (DIMM) sockets. These sockets support up to 4GB system memory using 184-pin unbuffered ECC or non-ECC PC2700/ PC2100 DDR DIMMs, and allow up to 5.33GB/s data transfer rate.

The following figure illustrates the location of the DDR DIMM sockets.

PC-DL 184-Pin DDR DIMM Sockets
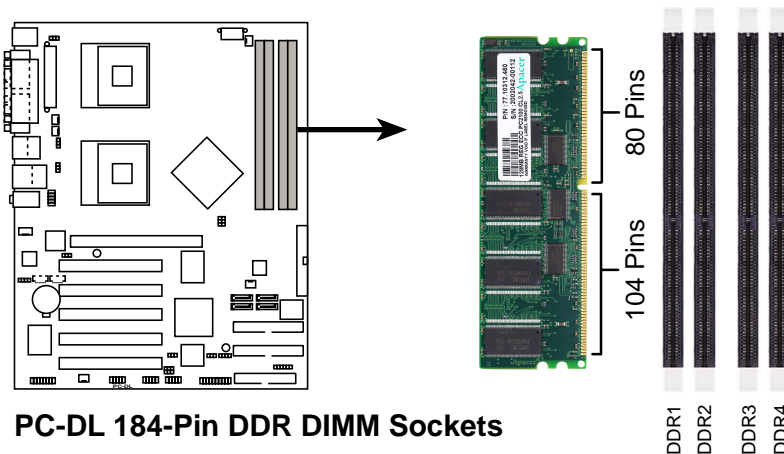
2.5.2   Memory configurations

You may install 64MB, 128MB, 256MB, 512MB, and 1GB DDR DIMMs into the DIMM sockets using the memory configurations in this section.

Important notes

1. Installing DDR DIMMs other than the recommended configurations may cause memory sizing error or system boot failure. Use any of the recommended configurations in Table 1.

2. In dual-channel configurations, install only **identical** (the same type and size) DDR DIMM pairs for each channel.

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

4. Make sure that the memory frequency matches the CPU FSB (Front Side Bus). Refer to Table 2.

5. DIMMs installed into **any three** sockets will function in single-channel mode.

6. When all four sockets are populated with 1GB DIMMs (total 4GB), the system may detect only 3.8GB due to ICH5R resource allocation.

Table 1   Recommended memory configurations

Mode		DIMM_A1 (blue)	DIMM_A2 (black)	DIMM_B1 (blue)	DIMM_B2 (black)
		Sockets			
Single-channel	(1)	Populated	—	—	—
	(2)	—	Populated	—	—
	(3)	—	—	Populated	—
	(4)	—	—	—	Populated
Dual-channel	(1)	Populated	—	Populated	—
	(2)	—	Populated	—	Populated
	(3)*	Populated	Populated	Populated	Populated

*   *For dual-channel configuration (3), you may:*

    • *install identical DIMMs in all four sockets*

      or

    • *install identical DIMM pair in DIMM_A1 and DIMM_B1 (blue sockets)
      and identical DIMM pair in DIMM_A2 and DIMM_B2 (black sockets)*

Table 2   Memory frequency/CPU FSB synchronization

CPU FSB	DDR DIMM Type	Memory Frequency
533 MHz	PC2700/PC2100	333/266 MHz
400 MHz	PC2100	266 MHz

Obtain DDR DIMMs only from ASUS qualified vendors for better system performance. Visit the ASUS website (www.asus.com) for the latest QVL.

2.5.3 Installing a DIMM

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

Follow these steps to install a DIMM.

DDR DIMM notch

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.

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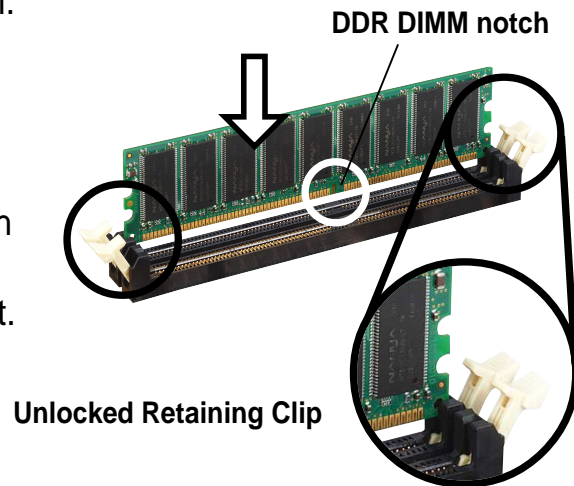
✍️ A DDR DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

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

Locked Retaining Clip
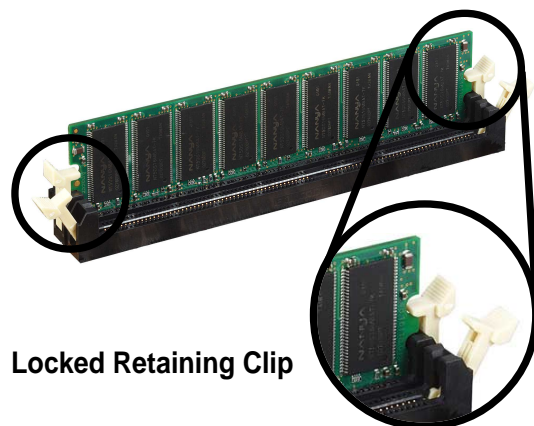
2.5.4 Removing a DIMM

Follow these steps to remove a DIMM.

1. Simultaneously press the retaining clips outward to unlock the DIMM.
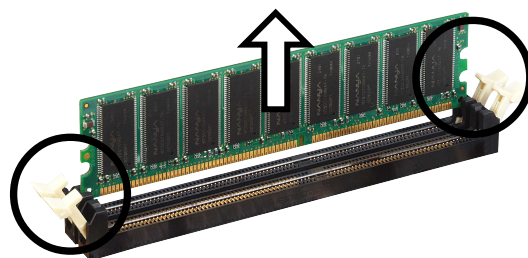
✍️ Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

2.6   Expansion slots

In the future, you may need to install expansion cards. The motherboard has five PCI slots and one Accelerated Graphics Port (AGP) Pro slot. The following sub-sections describe the slots and the expansion cards that they support.

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

2.6.1   Installing an expansion card

Follow these steps to install an expansion card.

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

2.6.2   Configuring an expansion card

After installing the expansion card, configure 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.

Standard Interrupt Assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	N/A	Programmable Interrupt
3*	11	Communications Port (COM2)
4*	12	Communications Port (COM1)
5*	13	Sound Card (sometimes LPT2)
6	14	Floppy Disk Controller
7*	15	Printer Port (LPT1)
8	3	System CMOS/Real Time Clock
9*	4	ACPI Mode when used
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

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

IRQ assignments for this motherboard

	INTA#	INTB#	INTC#	INTD#
PCI slot 1	IRQ_F#	IRQ_G#	IRQ_H#	IRQ_F#
PCI slot 2	IRQ_G#	IRQ_H#	IRQ_E#	IRQ_F#
PCI slot 3	IRQ_G#	IRQ_E#	IRQ_F#	IRQ_F#
PCI slot 4	IRQ_E#	IRQ_F#	IRQ_G#	IRQ_F#
PCI slot 5	IRQ_F#	IRQ_G#	IRQ_H#	IRQ_F#
AGP Pro slot	IRQ_A#	IRQ_B#	—	—
Onboard USB controller #1	IRQ_A#	—	—	—
Onboard USB controller #2	IRQ_D#	—	—	—
Onboard USB controller #3	IRQ_C#	—	—	—
Onboard USB controller #4	IRQ_A#	—	—	—
Onboard USB 2.0 controller	IRQ_H#	—	—	—
Onboard LAN controller (Intel 82547EI)	IRQ_F#	—	—	—
Onboard RAID controller (Promise 20378R)	IRQ_H#	—	—	—
Onboard IDE controller	IRQ_C#			
Onboard SATA controller (ICH5R)	IRQ_C#	—	—	—
Onboard 1394 controller (TSB43AB22A)	IRQ_E#	—	—	—
Onboard audio controller (AD1985)	IRQ_B#			

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

2.6.3   PCI slots

There are five 32-bit PCI slots on this motherboard. The slots support PCI cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications.

When installing long PCI cards, it is recommended that you install them in PCI slots 1, 2, or 5. Long PCI cards installed in PCI slots 3 and 4 may interfere with the SATA and GAME connectors.

2.6.4 AGP Pro slot

This motherboard has an Accelerated Graphics Port (AGP) Pro slot that supports AGP 8X (+0.8V) cards and AGP 4X (+1.5V) cards. When you buy an AGP card, make sure that you ask for one with +0.8V or +1.5V specification.

Note the notches on the card golden fingers to ensure that they fit the AGP slot on your motherboard.

> Install only +0.8V or +1.5V AGP cards. This motherboard does not support 3.3V AGP cards.
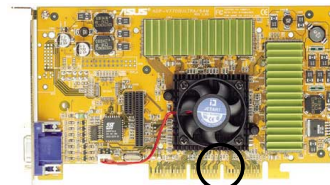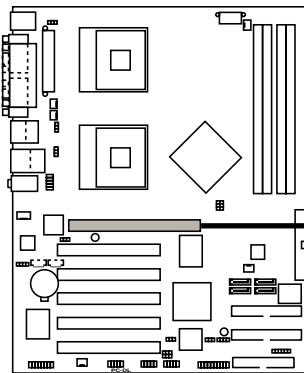
Keyed for 1.5V

PC-DL Accelerated Graphics Port (AGP)

> If installing the ATi 9500 or 9700 Pro Series VGA cards, use only the card version **PN xxx-xxxxx-30** or later, for optimum performance and overclocking stability.

PN 109-94200-30

2.7 Jumpers

1. Keyboard power (3-pin KBPWR1)

This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) if you wish to wake up the computer when you press a key on the keyboard (the default is the Space Bar).

✎ This feature requires a power supply that can provide 500mA on the +5VSB lead. Otherwise the system does not power up.

KBPWR1

1 2   2 3
+5V   +5VSB
(Default)
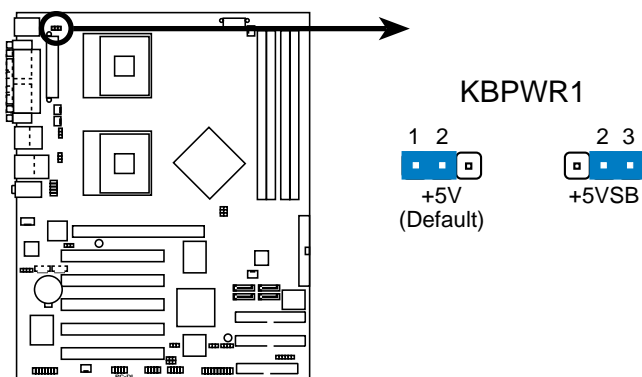
PC-DL Keyboard Power Setting

2. CPU external frequency selection (3-pin J1)

These jumpers allow you to select your desired CPU external frequency (or bus clock).

J1

2   1
4   3   4   3
             6   5
CPU select   100MHz
frequency
(Default)
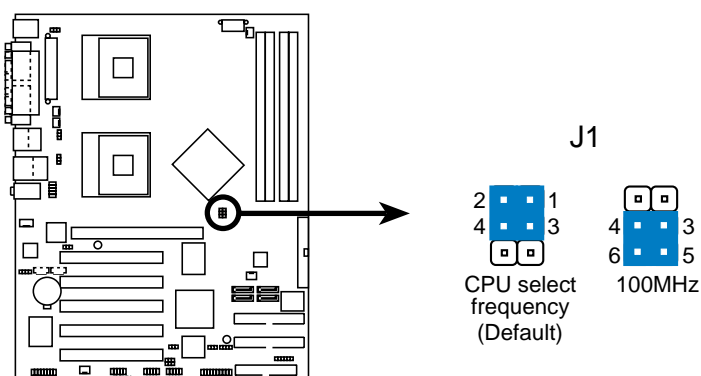
PC-DL CPU External Frequency Selection

3. IEEE 1394 setting (3-pin J4)

This jumper allows you to enable or disable the onboard IEEE 1394 controller. Set to pins 1-2 to activate the 1394 feature.

PC-DL 1394 Setting

J4

1 2
Enable
(Default)

2 3
Disable
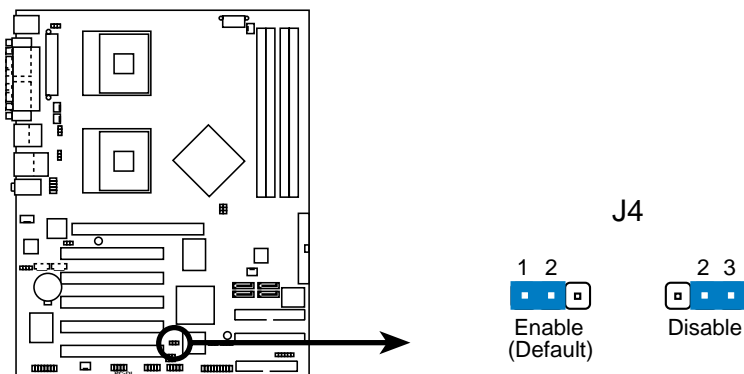
4. USB device wake-up (3-pin USBPW1, USBPW2, USBPW3, USBPW4)

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

The USBPWR1 and USBPWR2 jumpers are for the rear USB ports. The USBPWR3 and USBPWR4 jumpers are for the internal USB headers that you can connect to the front USB ports.

PC-DL USB Device Wake Up

USBPW1

+5V
(Default)

+5VSB

USBPW2

+5V
(Default)

+5VSB

USBPW3
USBPW4

1 2
+5V
(Default)

2 3
+5VSB
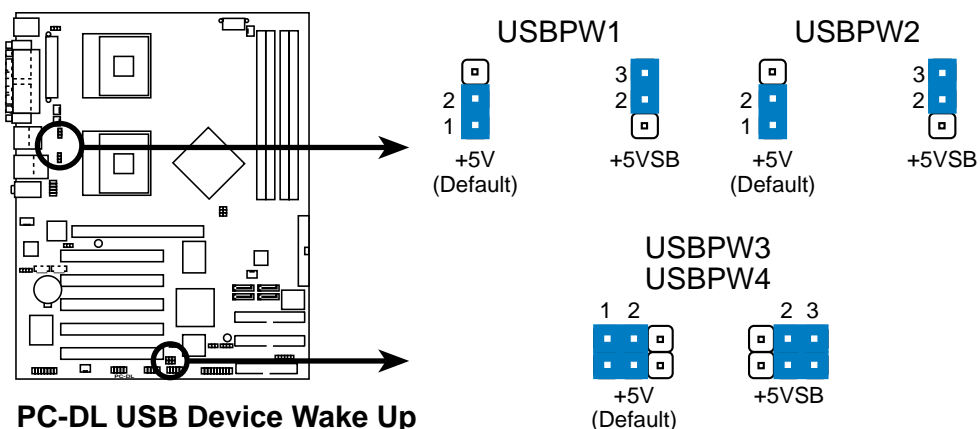
1. The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port. Otherwise, the system would not power up.

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

5. Clear RTC RAM (CLRTC1)

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

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
3. Plug the power cord and turn ON the computer.
4. Hold down the <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!

CLRTC1

PC-DL Clear RTC RAM

1 2
Normal
(Default)

2 3
Clear CMOS
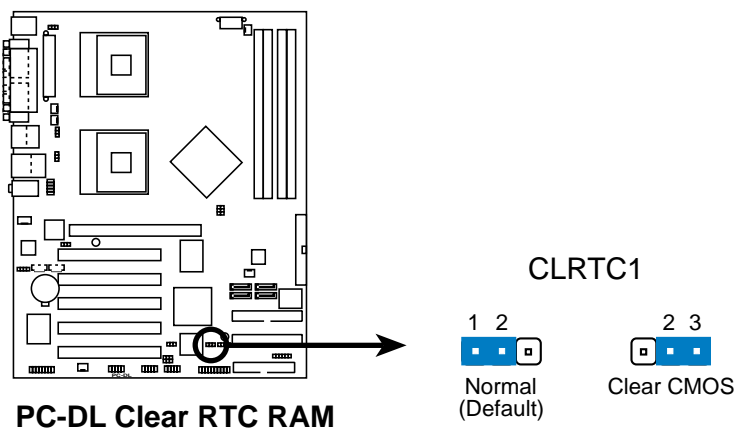
> You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so BIOS can automatically reset parameter settings to default values.

2.8   Connectors

This section describes and illustrates the internal connectors on the motherboard.

> Always connect ribbon cables with the red stripe to Pin 1 on the connectors. Pin 1 is usually on the side closest to the power connector on hard drives and CD-ROM drives, but may be on the opposite side on floppy disk drives.

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

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

FLOPPY1

PIN 1

NOTE: Orient the red markings on the floppy ribbon cable to PIN 1.
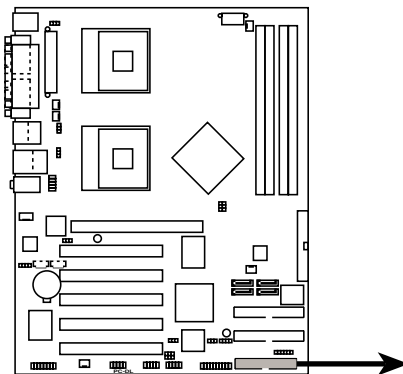
PC-DL Floppy Disk Drive Connector

2. SMBus connector (6-1 pin SMB1)

This connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.

SMB1

1

FLOATING
SMBCLK
Ground
SMBDATA
+3V
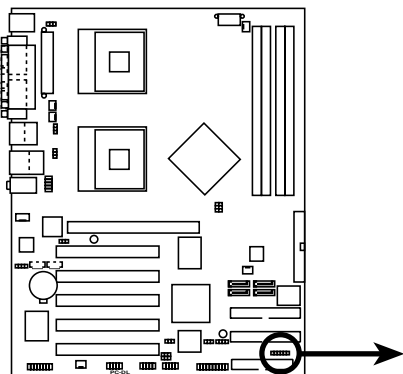
PC-DL SMBus Connector
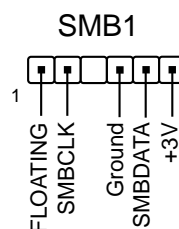
3. IDE connectors (40-1 pin PRI_IDE[blue], SEC_IDE [black)

This connector supports the provided UltraDMA/100/66 IDE hard disk ribbon cable. Connect the cable's blue connector to the primary (recommended) or secondary IDE connector, then connect the gray connector to the UltraDMA/100/66 slave device (hard disk drive) and the black connector to the UltraDMA/100/66 master device. It is recommended that you connect non-UltraDMA/100/66 devices to the secondary IDE connector. If you install two hard disks, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings. BIOS supports specific device bootup. You may configure two hard disks to be both master devices with two ribbon cables – one for the primary IDE connector and another for the secondary IDE connector.

1. Pin 20 on each IDE connector is removed to match the covered hole on the UltraDMA cable connector. This prevents incorrect orientation when you connect the cables.

2. The hole near the blue connector on the UltraDMA/100/66 cable is intentional.

3. For UltraDMA/100/66 IDE devices, use the 80-conductor IDE cable.
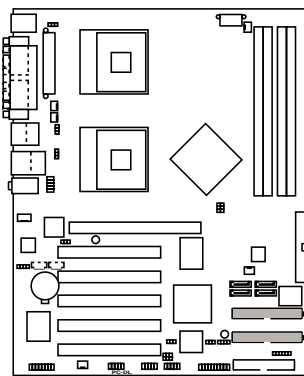
PC-DL IDE Connectors

SEC_IDE1

PIN 1

PRI_IDE1
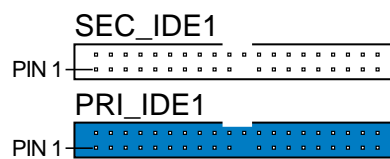
PIN 1

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

Important note when using legacy OS

Refer to page 2-21 on how to configure P-ATA and S-ATA devices if you installed a legacy operating system (e.g. MS-DOS, Windows 98/ Me/NT4.0).

4. Serial ATA connectors (7-pin SATA1, SATA2)

These next generation connectors support the thin Serial ATA cables for Serial ATA hard disks. The current Serial ATA interface allows up to 150 MB/s data transfer rate, faster than the standard parallel ATA with 133 MB/s (Ultra ATA/133).

If you installed Serial ATA hard disks, you may create a RAID 0/RAID 1 configuration using the RAID feature of the Intel ICH5R chipset. See section "5.5 Intel RAID for Serial ATA" for information on creating a RAID.

PC-DL SATA Connectors
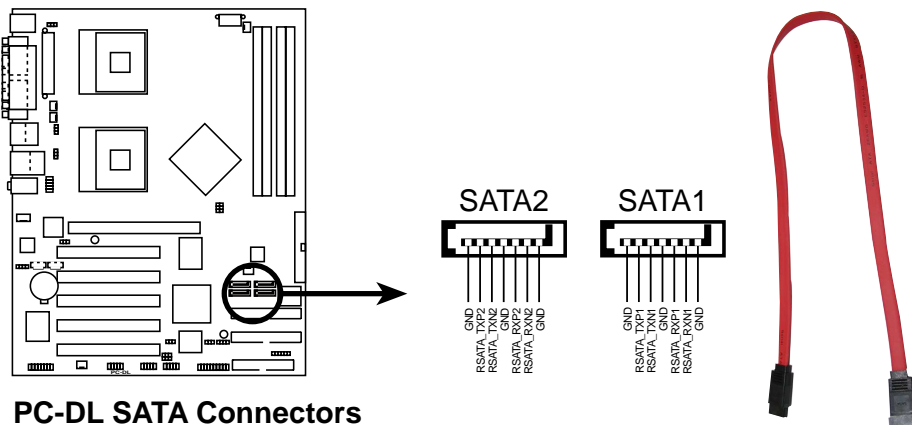
Important notes on Serial ATA

1. In a legacy operating system (DOS, Windows 98, Windows Me, Windows NT) environment, using the Serial ATA connectors will disable the ICHR chipset support to one of the IDE channels (either primary or secondary channel).

2. The Serial ATA RAID feature (RAID 0) is available only if you are using Windows XP.

Parallel ATA and Serial ATA device configurations

Following are the Parallel ATA and Serial ATA device configurations supported by Intel ICH5 specifications.

Native operating systems (OS) are Windows 2000/XP. ICH5 supports a maximum of six (6) devices using these OS.

Legacy OS are MS-DOS, Windows 98/Me/NT4.0. ICH5 supports a maximum of four (4) devices using these OS.

Operating System	P-ATA		S-ATA	
	Primary (2 devices)	**Secondary** (2 devices)	**Port 0** (1 device)	**Port 1** (1 device)
1. Windows 2000/XP	✓	✓	✓	✓
2. Windows 98/Me/NT4.0				
Configuration A	✓	—	✓	✓
Configuration B	—	✓	✓	✓
Configuration C	✓	✓	—	—

Legend:

✓   Supported

—   Disabled

Required Serial ATA settings in BIOS

Refer to the following table for the appropriate BIOS settings of the above Parallel ATA and Serial ATA device configurations.

BIOS item	Windows 2000/XP	Windows 98/Me/NT4.0 A	B	Any OS
On-Chip Serial ATA	Enhanced Mode	Combined Mode	SATA Only	Auto
Serial ATA Port0 Mode	SATA0 or SATA1 Master	Primary Master or Slave	Primary or Sec. Master	—
Serial ATA Port1 Mode	SATA0 or SATA1 Master	Primary Master or Slave	Primary or Sec. Master	—

See section "4.4.2 Integrated Peripherals" for details on the related BIOS items.

5. Serial ATA RAID connectors (7-pin SATA_RAID1, SATA_RAID2)

These Serial ATA connectors support SATA hard disks that you may configure as a RAID set. Through the onboard Promise® PDC20378 RAID controller, you may create a RAID0, RAID1, RAID0+1, or multi-RAID configuration together with the RAID ATA133 connector. See Chapter 5 for details on RAID configuration.
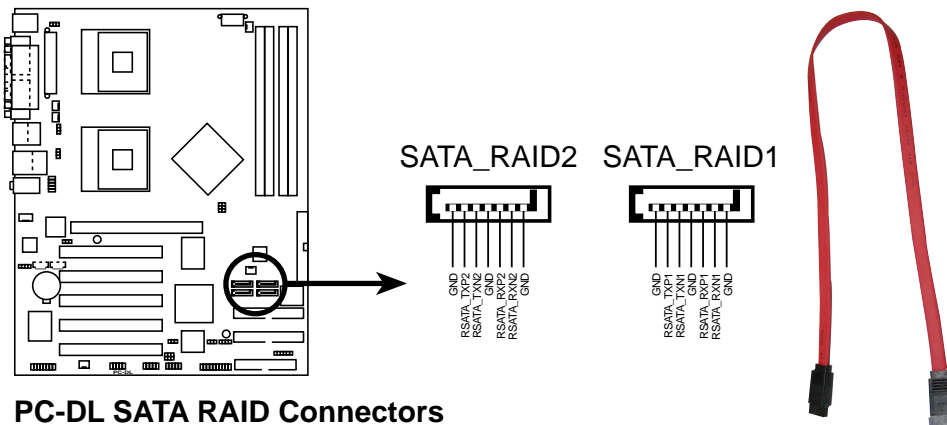
PC-DL SATA RAID Connectors

1. If you wish to create a RAID set, make sure that you have connected the SATA cable and installed Serial ATA devices. You cannot enter the SATARaid™ utility and SATA BIOS setup during POST if there are no connected Serial ATA devices.

2. The Promise PDC20378 RAID controller does not support ATAPI devices such as CD-ROMs, DVD-ROMs, etc.

6. RAID ATA/133/100/66/33 connector (40-1 pin PRI_RAID1)

This connector supports either RAID 0 or RAID 1 configuration through the onboard Promise® PDC20378 controller. You can connect two UltraATA133 hard disks to this connector and set up a disk array configuration. You may also set up the UltraATA133 hard disks with the Serial ATA hard disks on the Serial ATA RAID connectors to create a multi-RAID configuration. See Chapter 5 for details on RAID configuration.

PRI_RAID1

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

PIN 1

PC-DL RAID Connector
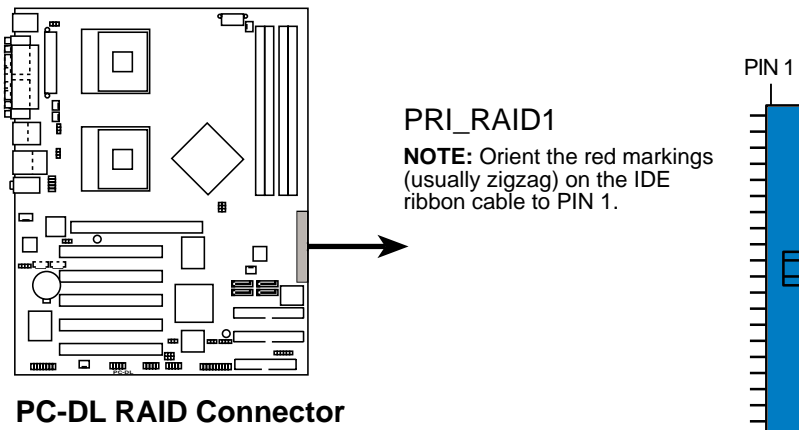
1. If you wish to create a RAID set using UltraATA hard disks, make sure that you have connected the UltraATA cable and installed UltraATA 133 hard disks.

2. The Promise PDC20376 RAID controller does not support ATAPI devices such as CD-ROMs, DVD-ROMs, etc.

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

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

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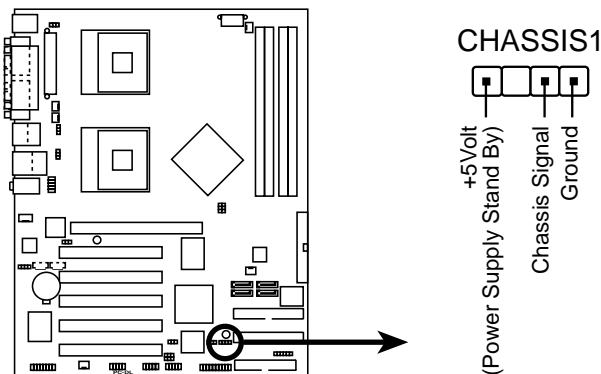
PC-DL Chassis Open Alarm Lead

8. CPU, Chassis, and Power Fan Connectors (3-pin CHA_FAN1, CPU_FAN1, CPU_FAN2, SYS_FAN1, SYS_FAN2)

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

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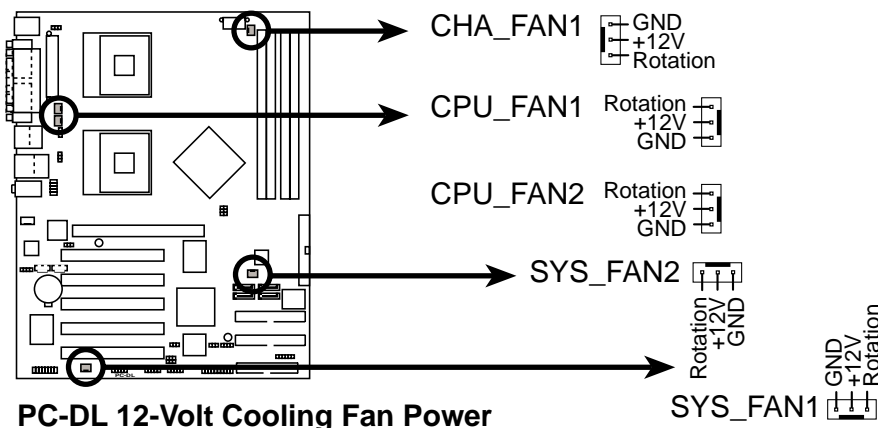
PC-DL 12-Volt Cooling Fan Power

9. SSI power connectors (24-pin ATXPWR, 8-pin ATX12V)

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

In addition to the 24-pin ATXPWR connector, this motherboard requires that you connect the 8-pin ATX +12V power plug to provide sufficient power to the CPU.

1. Do not forget to connect the 4-pin ATX +12V power plug. Otherwise, the system does not boot up.

2. Make sure that your ATX 12V power supply can provide 8A on the +12V lead and at least 1A on the +5-volt standby lead (+5VSB). The minimum recommended wattage is 230W, or 300W for a fully configured system. The system may become unstable or may not boot up if the power is inadequate.

24-pin Power Connector

1

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

8-pin

12V 12V 12V 12V

GND GND GND GND

For Power Supply with 20-pin Power Connector
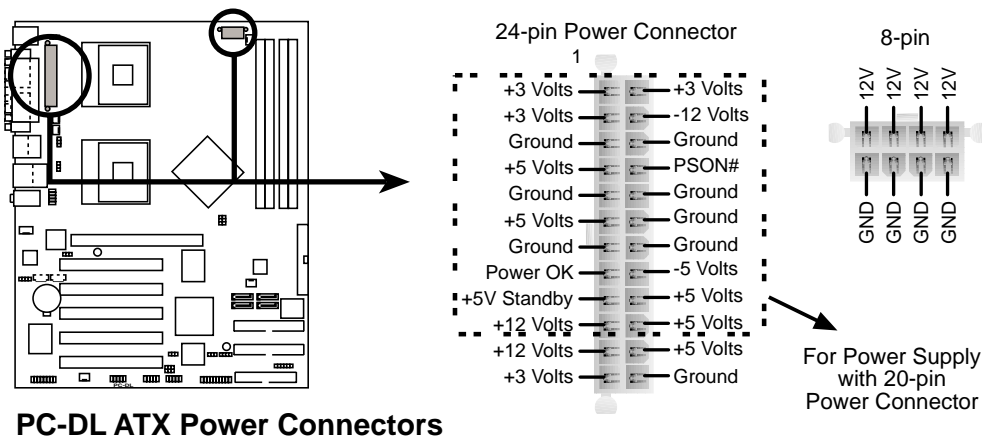
PC-DL ATX Power Connectors

10. Digital audio connector (4-1 pin SPDIF_OUT1)

In addition to the S/PDIF Out port on the rear panel, an S/PDIF Out connector is available for an S/PDIF audio module. Connect one end of the S/PDIF audio cable this connector and the other end to the S/PDIF module.

SPDIF_OUT1
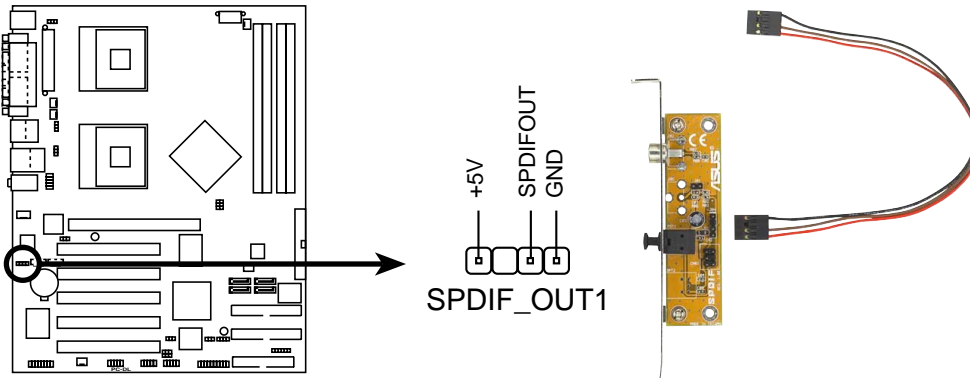
PC-DL Digital Audio Connector

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

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

GAME1
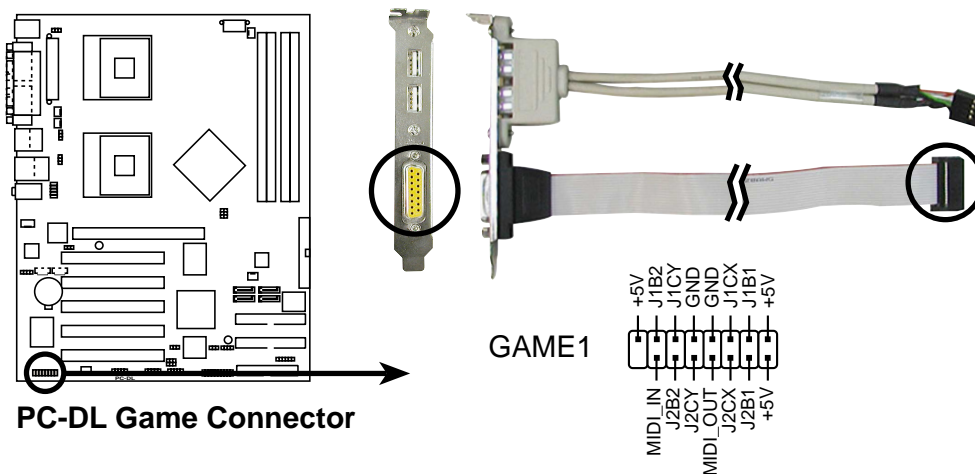
PC-DL Game Connector

12. USB headers (10-1 pin USB1, USB2)

If the USB ports on the rear panel are inadequate, two USB headers are available for additional USB ports. The USB header complies with USB 2.0 specification that supports up to 480 Mbps connection speed. This speed advantage over the conventional 12 Mbps on USB 1.1 allows faster Internet connection, interactive gaming, and simultaneous running of high-speed peripherals.

Connect an optional USB 2.0/GAME module to this header. The module has two USB 2.0 ports that support the next generation USB peripherals such as high resolution cameras, scanners, and printers.

PC-DL USB 2.0 Headers
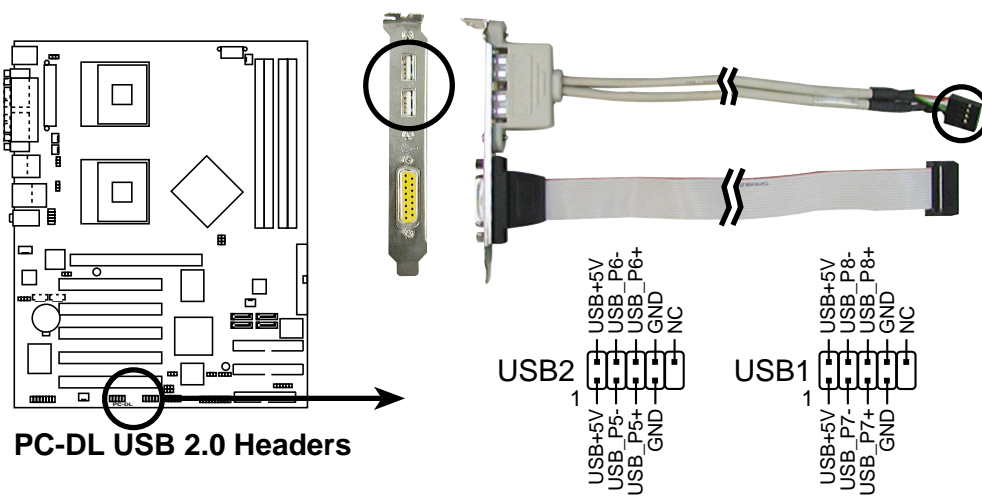
NEVER connect a **1394 cable** to the either USB1 or USB2 connector. Doing so will damage the motherboard!

13. Internal audio connectors (4-pin CD1, AUX1, MODEM1)

These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card. The MODEM connector allows the onboard audio to interface with a voice modem card with a similar connector. It also allows the sharing of mono_in (such as a phone) and a mono_out (such as a speaker) between the audio and a voice modem card.
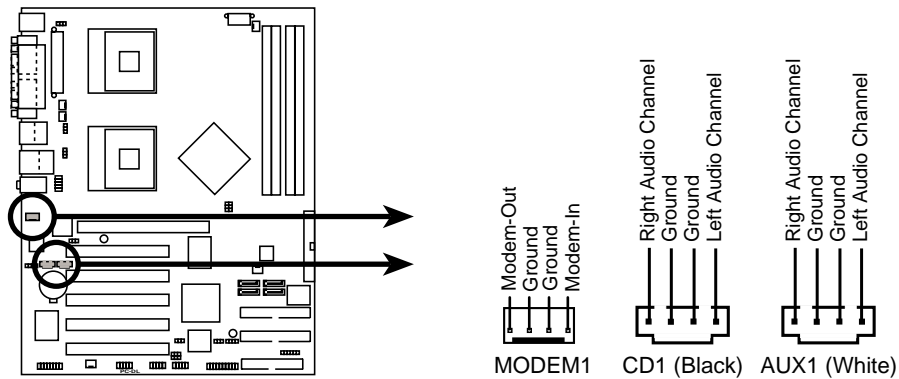
PC-DL Internal Audio Connectors

14. IEEE 1394 connector (10-1 pin IEEE1394_1)

This connector is for a 1394 module. Attach the 10-1 pin 1394 cable plug from the module to this connector. You may also connect a 1394-compliant internal hard disk to this connector.
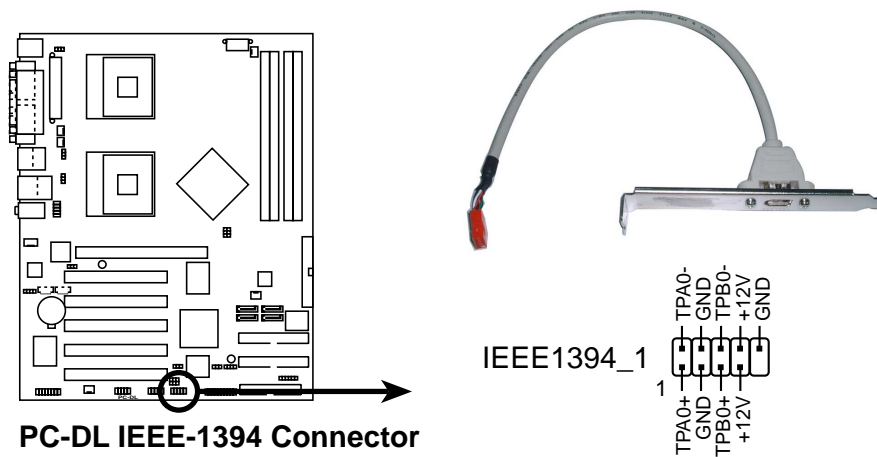
PC-DL IEEE-1394 Connector

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

15. Front panel audio connector (10-1 pin FP_AUDIO1)

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

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

FP_AUDIO1

MIC2 — AGND
MICPWR — +5VA
Line out_R — BLINE_OUT_R
NC
Line out_L — BLINE_OUT_L
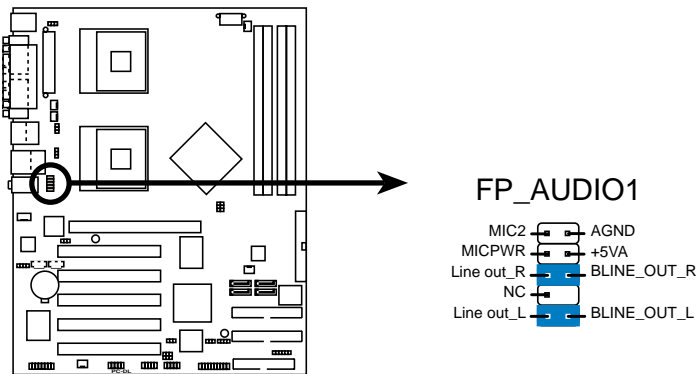
PC-DL Intel Panel Connector

16. System panel connector (20-pin PANEL1)

This connector accommodates several system front panel functions.

Power LED

Speaker Connector

+5VSB
LAN_LINK
PLED

+5V
HD_LED+
HD_LED-
Speaker

LAN_ACT
+5V
MLED
ExtSMI#
Ground
PWR
Ground
Reset
Ground

Message LED

Reset SW

SMI Lead

ATX Power Switch*
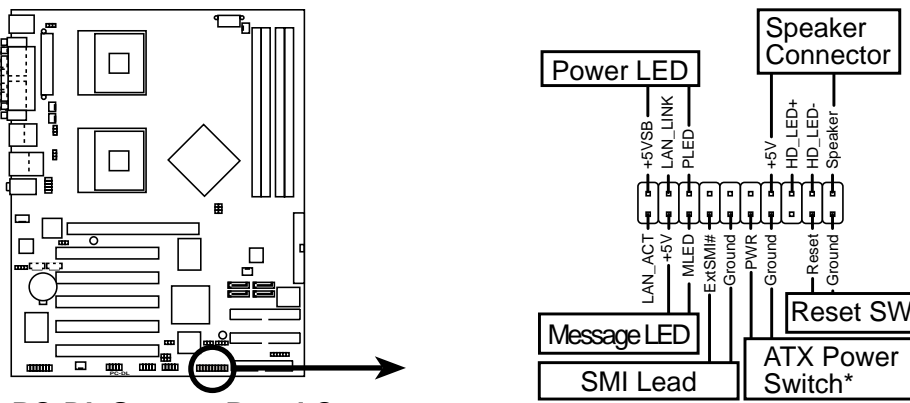
PC-DL System Panel Connector

* Requires an ATX power supply.

- **System Power LED Lead (3-1 pin PLED)**

  This 3-1 pin connector connects to the system power LED. The LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard Disk Activity Lead (2-pin IDELED)**

  This 2-pin connector is for the HDD LED cable. The read or write activities of the device connected to the any of IDE connectors cause the IDE LED to light up.

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

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

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

  This 2-pin connector allows you to manually place the system into a suspend mode, or "green" mode, where system activity is instantly decreased to save power and to expand the life of certain system components. Attach the case-mounted suspend switch to this 2-pin connector.

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

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

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

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

Chapter 3
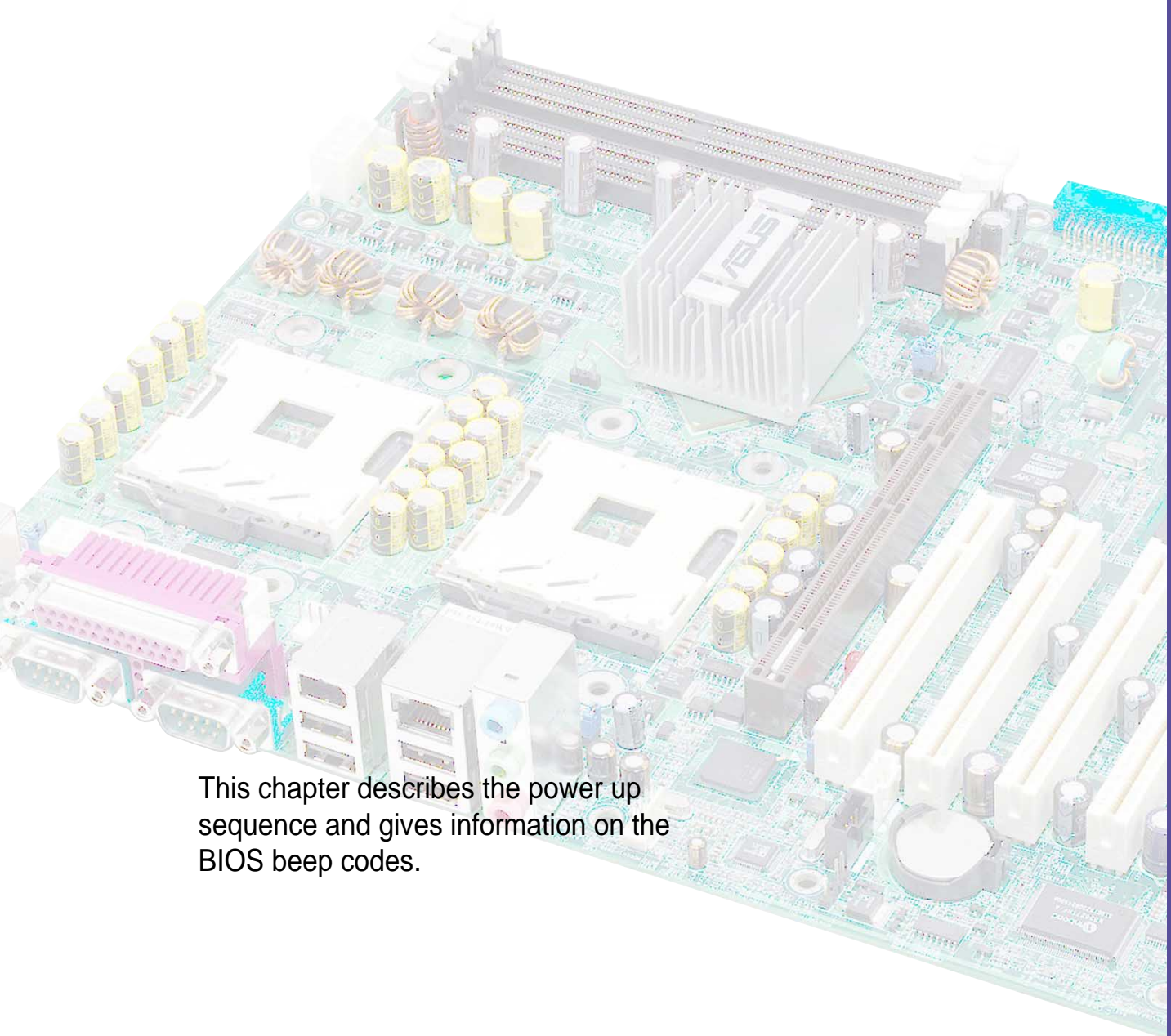
This chapter describes the power up sequence and gives information on the BIOS beep codes.

Powering up

Chapter summary

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 power LED on the system front panel case lights up. For ATX power supplies, the system LED lights up when you press the ATX power switch. 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 tests. 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.

Award/Phoenix BIOS beep codes

No. of Beeps	Description
2	Parity error
3	Main memory read/write test error
4	Motherboard timer not operational
6	Keyboard controller BAT test error
7	General exception error
8	Display memory error
10	CMOS shutdown register read/write error

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

3.2   Vocal POST Messages

This motherboard includes the Winbond speech controller to support a special feature called the ASUS POST Reporter™. This feature gives you vocal POST messages and alerts to inform you of system events and boot status. In case of a boot failure, you will hear the specific cause of the problem.

These POST messages are customizable using the Winbond Voice Editor software that came with your package. You can record your own messages to replace the default messages.

Following is a list of the default POST messages and their corresponding actions, if any.

POST Message	Action
No CPU installed	• Install an Intel Pentium 4 Processor into the CPU socket.
System failed CPU test	• Check the CPU if properly installed. • Call ASUS technical support for assistance. See the "ASUS contact information" on page x.
System failed memory test	• Install 184-pin unbuffered PC3200/2700/2100 DIMMs into the DIMM sockets. • Check if the DIMMs on the DIMM sockets are properly installed. • Make sure that your DIMMs are not defective. • Refer to section "2.5 System memory" for instruction on installing a DIMM.
System failed VGA test	• Install a PCI VGA card into one of the PCI slots, or a +0.8V/1.5V AGP card into the AGP slot. • Make sure that your VGA/AGP card is not defective.
System failed due to CPU over-clocking	• Check your CPU settings in BIOS and make sure you only set to the recommended settings.

POST Message	Action
No keyboard detected	• Check your keyboard if properly connected to the purple PS/2 connector on the rear panel. • See section "1.4.1 Major components" for the location of the connector.
No floppy disk detected	• Make sure you have connected a floppy disk to the floppy disk connector on the motherboard. • See section "2.8 Connectors."
No IDE hard disk detected	• Make sure you have connected an IDE hard disk drive to the one of the IDE connectors on the motherboard. • See section "2.8 Connectors."
CPU temperature too high	• Check CPU fan if working properly.
CPU fan failed	• Check the CPU fan and make sure it turns on after you applied power to the system. • Make sure that your CPU fan supports the fan speed detection function.
CPU voltage out of range	• Check your power supply and make sure it is not defective. • Call ASUS technical support for assistance. See the "ASUS contact information" on page x.
System completed Power-On Self Test	• No action required
Computer now booting from operating system	• No action required

3.3 Powering off the computer

You must first exit the operating system and shut down the system before switching off the power. For ATX power supplies, you can press the ATX power switch after exiting or shutting down the operating system.

> The message "You can now safely turn off your computer" does not appear when shutting down with an ATX power supply.

Using the dual function power switch

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

Using the OS shut down function

If you use Windows 98SE/ME/2000/XP, click the **Start** button, click **Shut Down**, then the **OK** button to shut down the computer. The power supply should turn off after Windows shuts down.
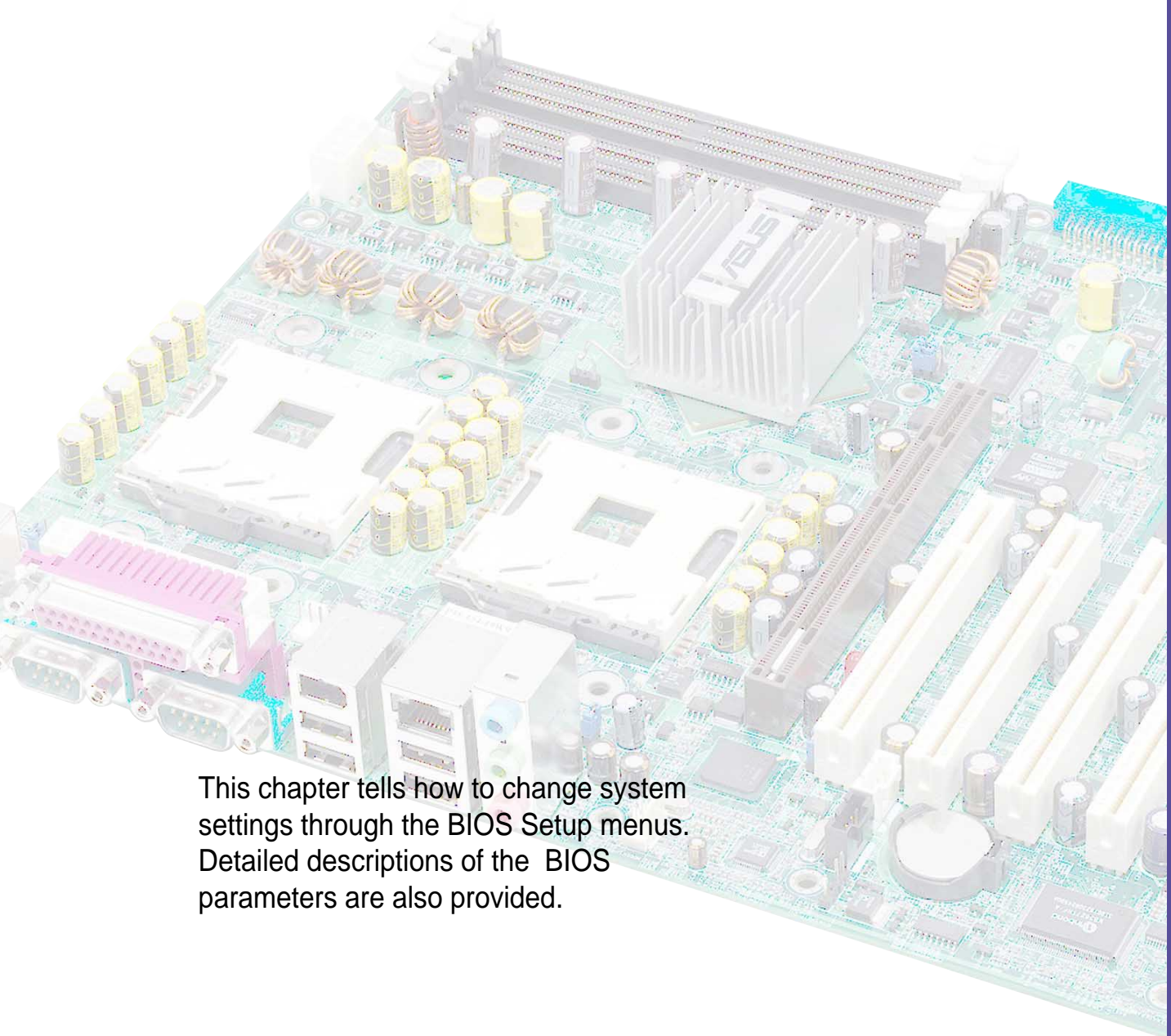
This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

BIOS setup

Chapter summary

4.1   Managing and updating your BIOS

- The **original BIOS file** for this motherboard is in the support CD.
- Copy the original BIOS to a **bootable floppy disk** in case you need to restore the BIOS in the future.

4.1.1   Creating a bootable floppy disk

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

    DOS environment

    Insert a 1.44 MB floppy disk into the drive. At the DOS prompt, type:

    > **format a: /s**, then press the <Enter> key

    Windows® 98SE environment

    a. From your Windows desktop, click **Start**, point to **Settings**, then click **Control Panel**.

    b. Double-click **Add/Remove Programs** icon from the Control Panel window.

    c. Click on the **Startup Disk** tab, then on **Create Disk...** button.

    d. Insert a 1.44 MB floppy disk when prompted. Follow the succeeding screen instructions to complete the process.

    Windows® XP environment

    a. Insert a new 1.44 MB floppy disk in the floppy disk drive.

    b. From the Windows desktop, click **Start** > **My Computer**.

    c. In the **My Computer** window, click the **3 1/2 Floppy** icon.

    d. From the Menu bar, click **File** > **Format.**

    e. Select "**Create an MS-DOS Startup Disk**" in the **Format Options** field, then click **Start**.

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

4.1.2 Updating the BIOS

The Basic Input/Output System (BIOS) can be updated using the AwardBIOS Flash Utility (AWDFLASH.EXE). Follow these instructions to update the BIOS using this utility.

1. Download the latest BIOS file from the ASUS website (see ASUS contact info on page x of this user guide). Rename the file to ***.BIN** and save it to a floppy disk.

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

> Save only the updated BIOS file in the floppy disk to avoid loading the wrong BIOS file.

3. Reboot the computer.

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

```
        AwardBIOS Flash Utility V8.24B
  (C)Phoenix Technologies Ltd. All Rights Reserved

For KM400-8235-6A6LYA0AC-00    DATE: 05/19/2003
Flash Type - SST-39SF020 /5V

File Name to Program :  1001-015.BIN




Message: Please Wait!
```

5. AWDFLASH checks the new BIOS file from the floppy disk.

6. After verification, AWDFLASH flashes the new BIOS file. Do not shut down the computer during the flash process.

```
        AwardBIOS Flash Utility V8.24B
  (C)Phoenix Technologies Ltd. All Rights Reserved

For KM400-8235-6A6LYA0AC-00    DATE: 05/19/2003
Flash Type - SST-39SF020 /5V

File Name to Program :  1001-015.BIN

Program Flashing Memory



    Write OK    No Update    Write Fail

  Warning: Don't Turn Off Power Or Reset System!
```

7. After the new BIOS file is copied, the computer returns to POST.

4.2   BIOS Setup program

This motherboard includes a Flash ROM 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 may want to change the configuration of your computer in the future. For example, you may want to enable the security password feature or make changes to the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the Flash ROM.

The Flash ROM on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Delete> during the Power-On Self Test (POST) to enter the Setup utility, otherwise, POST continues with its test routines.

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. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.

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

4.2.1 BIOS menu screen

Menu bar   **Menu items**   **General help**

```
           Phoenix - AwardBIOS CMOS Setup Utility
 Main  Advanced  Power  Boot  Exit
┌─────────────────────────┬───────────────────────┬──────────────────────┐
│ Date (mm:dd:yy)         │ Wed, July 16 2003     │      Item Help       │
│ Time (hh:mm:ss)         │ 15 : 30 : 30          │                      │
│                         │                       │ Menu Level    ▶      │
│ Legacy Diskette A       │ [1.44M, 3.5 in.]      │                      │
│ Floppy 3 Mode Support   │ [Disabled]            │ Change the day, month,│
│                         │                       │ year and century.    │
│ ▶ Primary Master        │ [ST321122A]           │                      │
│ ▶ Primary Slave         │ [ASUS CDS520/]        │                      │
│ ▶ Secondary Master      │ [None]                │                      │
│ ▶ Secondary Slave       │ [None]                │                      │
│                         │                       │                      │
│ Supervisor Password     │ Clear                 │                      │
│ User Password           │ Clear                 │                      │
│ Security Option         │ [Setup]               │                      │
│ Halt On                 │ [All Errors]          │                      │
│                         │                       │                      │
│ Base Memory             │ 640K                  │                      │
│ Extended Memory         │ 261120K               │                      │
│ Total Memory            │ 26114K                │                      │
├─────────────────────────┴───────────────────────┴──────────────────────┤
│ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help│
│      F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults   │
└─────────────────────────────────────────────────────────────────────────┘
```

Navigation keys   **Field setting**

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 settings

Advanced   For changing the advanced system settings

Power   For changing the power configuration settings

Boot   For changing the system boot configuration settings

Exit   For selecting the exit options and loading default settings

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

4.2.3 Navigation keys

At the **bottom** 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.

> The navigation keys differ from one screen to another.

4.2.4 General help

On the right side of the menu screen is a brief description of the selected item.

4.2.5 Sub-menu

An item with a sub-menu on any menu screen is distinguished by a solid triangle before the item. To display the sub-menu, select the item and press Enter.

4.2.6 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 **Up/Down arrow keys** or **PageUp/PageDown keys** to display the other items on the screen.

4.2.7 Pop-up window

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

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.

```
              Phoenix - AwardBIOS CMOS Setup Utility
   Main   Advanced   Power   Boot   Exit
  ┌─────────────────────────────────────────────┬──────────────────────┐
  │  Date (mm:dd:yy)          Wed, July 16 2003  │      Item Help       │
  │  Time (hh:mm:ss)          15 : 30 : 30       ├──────────────────────┤
  │                                              │ Menu Level    ▶      │
  │  Legacy Diskette A        [1.44M, 3.5 in.]   │                      │
  │  Floppy 3 Mode Support    [Disabled]         │ Change the day, month,│
  │                                              │ year and century.    │
  │ ▶ Primary Master          [ST321122A]        │                      │
  │ ▶ Primary Slave           [ASUS CDS520/A]    │                      │
  │ ▶ Secondary Master        [None]             │                      │
  │ ▶ Secondary Slave         [None]             │                      │
  │                                              │                      │
  │  Supervisor Password      [Enter]            │                      │
  │  User Password            [Enter]            │                      │
  │  Security Option          [Setup]            │                      │
  │  Halt On                  [All Errors]       │                      │
  │                                              │                      │
  │  Base Memory              640K               │                      │
  │  Extended Memory          261120K            │                      │
  │  Total Memory             26114K             │                      │
  └─────────────────────────────────────────────┴──────────────────────┘
  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help
         F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults
```

Date [mm/dd/yy]

Sets the system to the date that you specify (usually the current date). The format is month, day, year. Valid values for month, day, and year are Month: (1 to 12), Day: (1 to 31), Year: (1999 to 2099). Use the <Tab> key to move between the month, day, and year fields.

Time [hh:mm:ss]

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

Legacy Diskette A [1.44M, 3.5 in.]

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

Floppy 3 Mode Support [Disabled]

This is required to support older Japanese floppy drives. The Floppy 3 Mode feature allows reading and writing of 1.2MB (as opposed to 1.44MB) ona 3.5-inch floppy disk. Configuration options: [Disabled] [Enabled]

Set Supervisor Password [Enter] / Set User Password [Enter]

These fields allow you to set passwords. To set a password, highlight the appropriate field and press <Enter>. Type in a password then press <Enter>. You can type up to eight alphanumeric characters. Symbols and other characters are ignored. To confirm the password, type the password again and press <Enter>. The password field setting is changed to [Set].

To clear the password, highlight this field, and press <Enter>.

A note about passwords

The Supervisor password is required to enter the BIOS Setup program preventing unauthorized access. The User password is required to boot the system preventing unauthorized use.

Forgot the password?

If you forget your password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. The RAM data containing the password information is powered by the onboard button cell battery. If you need to erase the CMOS RAM, unplug the all the power cables and remove the button cell battery. Re-install the battery after about 2 seconds, then power up the system. Refer to section "2.7 Jumpers" on how to erase the CMOS RTC RAM.

Security Option [Setup]

This field requires users to enter the password before entering the BIOS setup or the system. Select [Setup] to require the password before entering the BIOS Setup. Select [System] to require the password before entering the system. Configuration options: [Setup] [System]

Halt On [All Errors]

This field sets the system to halt on errors according to the system functions specified in each option. Configuration options: [All Errors] [No Errors] [All, But Keyboard] [All , But Diskette] [All, But Disk/Key]

Base/Extended/Total Memory [xxxK]

The base memory, extended memory, and total memory values are auto-detected. These fields are not user-configurable.

4.3.1 Primary and Secondary Master/Slave

```
              Phoenix - AwardBIOS CMOS Setup Utility
  Main  Advanced  Power  Boot  Exit
 ┌──────────────────────────────────────────┬─────────────────────┐
 │              Primary Master               │     Item Help       │
 ├──────────────────────────────────────────┼─────────────────────┤
 │                                           │ Menu Level    ▶     │
 │   Auto-Detection          [Press Enter]   │                     │
 │                                           │ To auto-detect the  │
 │   IDE Channel 0 Master     [Auto]         │ HDD's size, head...on│
 │   Access Mode              [Auto]         │ this channel.       │
 │                                           │                     │
 │   Capacity                 40020 MB       │                     │
 │                                           │                     │
 │   Cylinder                 19158          │                     │
 │   Head                     16             │                     │
 │   Precomp                  0              │                     │
 │   Landing Zone             19157          │                     │
 │   Sector                   255            │                     │
 │                                           │                     │
 │                                           │                     │
 │                                           │                     │
 ├──────────────────────────────────────────┴─────────────────────┤
 │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help│
 │     F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults          │
 └─────────────────────────────────────────────────────────────────┘
```

Auto-Detection [Press Enter]

Press enter to automatically detect an IDE hard disk drive, if the hard drive
is not already detected. In cases of undetected HDDs, pressing enter
detects the HDD and allows you access to the IDE Primary Master and
Access Mode fields.

IDE Channel 0/1 Master/Slave [Auto]
IDE Channel 0/1 Master/Slave [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic
detection is successful, the setup BIOS automatically fills in the correct
values for the remaining fields on this sub-menu. If automatic detection
fails, this may be because the hard disk drive is too old or too new. If the
hard disk was already formatted on a previous system, the setup BIOS
may detect incorrect parameters. In these cases, select [Manual] to
manually enter the IDE hard disk drive parameters. If no drive is installed
or if you are removing a drive and not replacing it, select [None].
Configuration options: [None] [Auto] [Manual]

Access Mode [Auto]

The default [Auto] allows automatic detection of an IDE hard disk drive.
Select [CHS] for this item if you set the IDE Channel 0/1 Master/Slave to
[Manual] to enter the Hard Disk Drive values manually. Configuration
options: [CHS] [LBA] [Large] [Auto]

Manual HDD type selection

If you wish to manually enter the hard disk information, set the IDE Primary Master item to [Manual], and the Access Mode item to [CHS]. To manually enter the number of cylinder, head, precomp, landing zone, and sector per track for the drive, highlight an item, key-in the value that you obtained from the drive documentation then press Enter. Refer to the drive documentation or the drive label for this information.

To enter a value, you may also highlight the item, then press Enter to display a pop-up menu. Type in the value from the drive documentation, then press Enter.

> ⚠️ Before attempting to configure a hard disk drive, make sure you have the correct configuration information supplied by the drive manufacturer. Incorrect settings may cause the system to fail to recognize the installed hard disk.

```
               Phoenix - AwardBIOS CMOS Setup Utility
  Main   Advanced  Power  Boot  Exit

                   Primary Master                        Item Help

     Auto-Detection          [Press Enter]        Menu Level    ▶

     IDE Primary Master      [Manual]             To auto-detect the
     Access Mode             [CHS]                HDD's size, head...on
                                                  this channel.
     Capacity                40020 MB

     Cylinder                [19158]
     Head                    [   16]
     Precomp                 [    0]
     Landing Zone            [19157]
     Sector                  [  255]



  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help
         F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults
```

Capacity [xxxxx MB]

This item displays the auto-detected hard disk capacity. The value is not user-configurable.

Cylinder

This item shows the number of the hard disk cylinders.

Head

This item shows the number of the hard disk read/write heads.

Precomp

This field displays the precompressed volumes on the hard disk, if any, on the motherboard.

Landing Zone

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

Sector

This item shows the number of sectors per track.

After entering the IDE hard disk drive information into BIOS, use a disk utility, such as FDISK, to partition and format new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

4.4 Advanced menu

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

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

```
                   Phoenix - AwardBIOS CMOS Setup Utility
    Main   Advanced  Power  Boot  Exit
   ┌─────────────────────────────────────────────────┬──────────────────┐
   │                                                 │    Item Help     │
   │  ▶ Advanced Chipset Features                    │                  │
   │  ▶ Integrated Peripherals                       │                  │
   │  ▶ PnP/PCI Configuration                        │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   │                                                 │                  │
   └─────────────────────────────────────────────────┴──────────────────┘
   ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help
          F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults
```
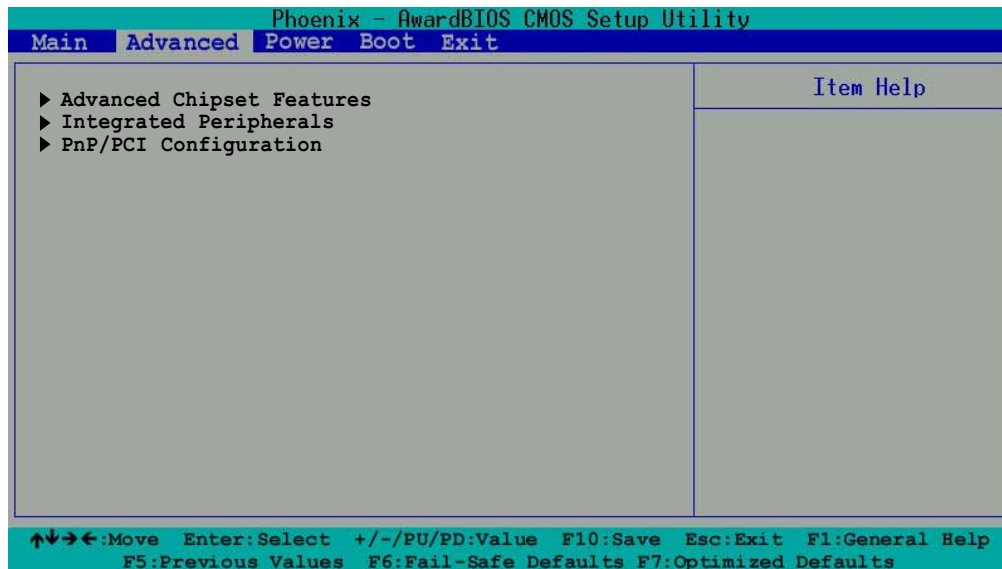
4.4.1 Advanced Chipset Features

This menu displays the CPU type, speed, cache RAM, front side bus frequency, and DRAM information.

```
                   Phoenix - AwardBIOS CMOS Setup Utility
    Main   Advanced  Power  Boot  Exit
   ┌─────────────────────────────────────────────────┬──────────────────┐
   │           Advanced Chipset Features             │    Item Help     │
   │                                                 │                  │
   │  CPU Clock                    [100MHz]          │                  │
   │  CPU Clock Ratio              [16 X]            │                  │
   │  DRAM Frequency               [Auto]            │                  │
   │  Memory Timing Selectable     [By SPD]          │                  │
   │  CAS Latency Time             2                 │                  │
   │  Active to Precharge Delay    6                 │                  │
   │  DRAM RAS# to CAS# Delay      3                 │                  │
   │  DRAM RAS# Precharge          3                 │                  │
   │  DRAM Data Integrity Mode     [ECC]             │                  │
   │  System BIOS Cacheable        [Enabled]         │                  │
   │  Memory Hole at 15M-16M       [Disabled]        │                  │
   │  AGP Aperture Size (MB)       [128]             │                  │
   │                                                 │                  │
   │  Auto Detect PCI Clock        [Enabled]         │                  │
   │  Spread Spectrum              [Disabled]        │                  │
   │  Video BIOS Cacheable         [Disabled]        │                  │
   └─────────────────────────────────────────────────┴──────────────────┘
   ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help
          F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults
```

CPU Clock [100MHz]

This item allows you to set the CPU frequency. To do so, highlight the item then press Enter to display a pop-up menu. Key-in a value from the specified range, then press Enter. Configuration options: [Min=100] [Max=165]

CPU Clock Ratio

This item sets the ratio between the CPU core clock and the FSB frequency. Configuration options: [Min=16] [Max=26]

DRAM Frequency [Auto]

This item sets the DRAM operating frequency. Configuration options: [DDR266] [DDR333] [Auto]

Memory Timing Selectable [By SPD]

The DRAM clock are set according to the DRAM SPD (Serial Presence Detect). Select [By SPD] for automatic DRAM clock detection. Select [Manual] to allow setting the succeeding memory items to optimal timings. Configuration options: [By SPD] [Manual]

> The items CAS Latency Time, Active to Precharge Delay, DRAM RAS# to CAS# Delay, and DRAM RAS# Precharge are configurable only when the Memory Timing Selectable item is set to [Manual].

CAS Latency Time [2]

This item sets the latency (in clocks) between the DRAM read command and the time the data actually becomes available. Configuration options: [2] [2.5] [3]

Active to Precharge Delay [6]

This item controls the number of DRAM clocks used for DRAM parameters. Configuration options: [8] [7] [6] [5]

DRAM RAS# to CAS# Delay [3]

This item controls the latency between the DRAM active command and the read/write command. Configuration options: [4] [3] [2]

DRAM RAS# Precharge [3]

This item controls the idle clocks after issuing a precharge command to the DDR SDRAM. Configuration options: [4] [3] [2]

DRAM Data Integrity Mode [ECC]

Configuration options: [ECC] [Non-ECC]

System BIOS Cacheable [Enabled]

This item allows you to enable or disable the BIOS cacheable function. Configuration options: [Disabled] [Enabled]

Memory Hole at 15M-16M [Disabled]

This field allows you to reserve an address space for ISA expansion cards. Setting the address space to a particular setting makes that memory space unavailable to other system components. Expansion cards can only access memory up to 16MB. Configuration options: [Disabled] [Enabled]

AGP Aperture Size [128]

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

Auto Detect PCI Clock [Enabled]

This item allows you to select the maximum PCI bus speed to be porgrammed. Configuration options: [Enabled] [Disabled]

Spread Spectrum [Disabled]

This item allows you to select the clock generator spread spectrum. Configuration options: [Disabled] [0.40%] [0.50%] [0.60%] [1.00%]

Video BIOS Cacheable [Disabled]

This item allows you to enable or disable the video BIOS cacheable function. Setting to [Enabled] imploves the display speed by caching the display data. Configuration options: [Disabled] [Enabled]

4.4.2 Integrated Peripherals
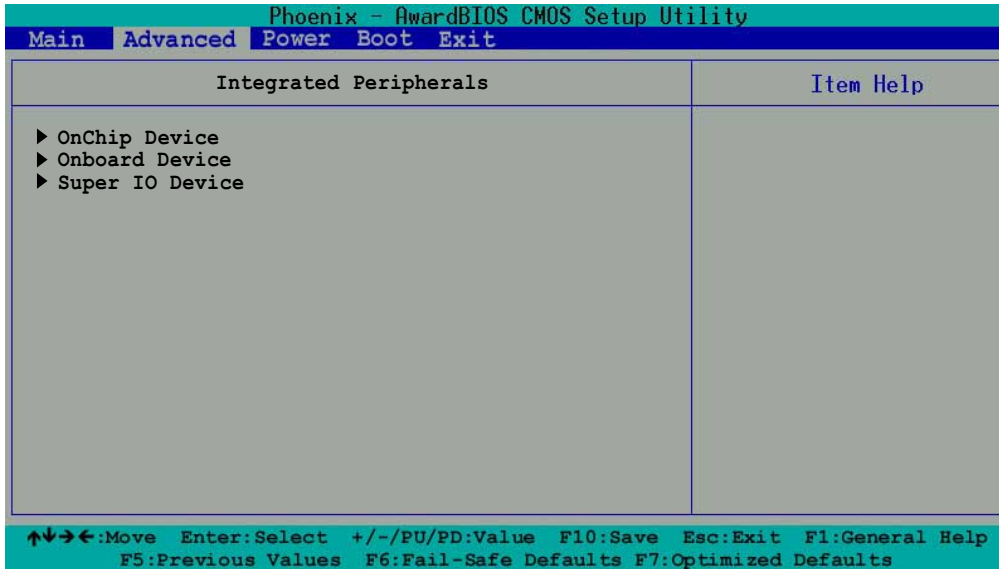
OnChip IDE Device
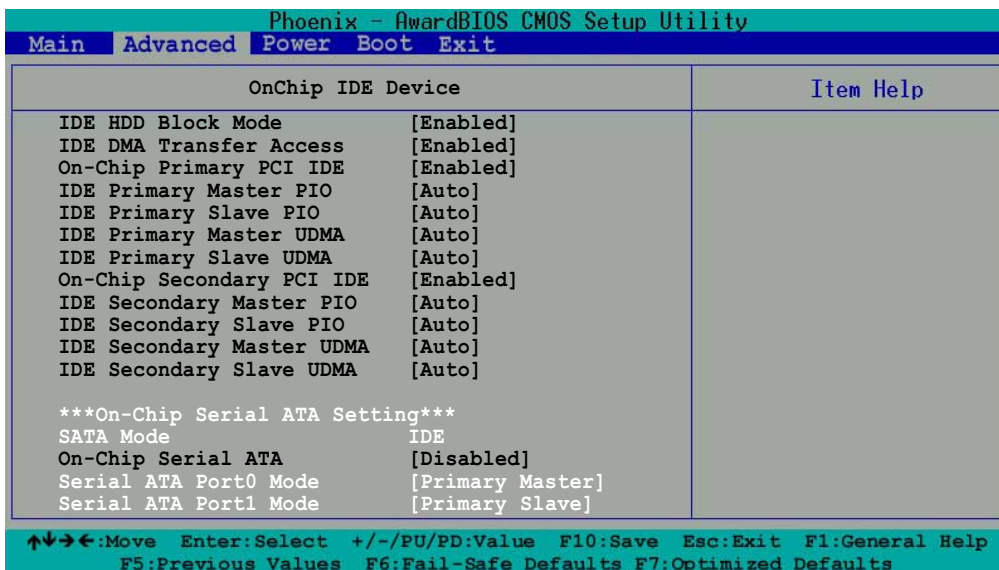
IDE HDD Block Mode [Enabled]

If your IDE hard disk supports the block mode feature, set this item to [Enabled] to allows automatic detection of the optimal number of block read/writes per sector the drive can support. Configuration options: [Disabled] [Enabled]

IDE DMA Transfer Access [Enabled]

Configuration options: [Disabled] [Enabled]

On-Chip Primary PCI IDE [Enabled]

Configuration options: [Disabled] [Enabled]

IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]

These items allow you to set a PIO (Programmable Input/Output) mode for primary IDE devices. Configuration options: [Auto] [Mode 0] [Mode 1] [Mode 2] [Mode 3] [Mode 4]

IDE Primary Master UDMA [Auto]|
IDE Primary Slave UDMA [Auto]

These items allow you to automatically set or disable the primary IDE UDMA capability, which improves transfer speeds and data integrity for compatible IDE devices. Configuration options: [Auto] [Disabled]

On-Chip Secondary PCI IDE [Enabled]

Configuration options: [Disabled] [Enabled]

IDE Secondary Master PIO [Auto]
IDE Secondary Slave PIO [Auto]

These items allow you to set a PIO (Programmable Input/Output) mode for secondary IDE devices. Configuration options: [Auto] [Mode 0] [Mode 1] [Mode 2] [Mode 3] [Mode 4]

IDE Secondary Master UDMA [Auto]
IDE Secondary Slave UDMA [Auto]

These items allow you to automatically set or disable the secondary IDE UDMA capability, which improves transfer speeds and data integrity for compatible IDE devices. Configuration options: [Auto] [Disabled]

**On-Chip Serial ATA Setting

1. The items SATA Mode, Serial ATA Port0 Mode, and Serial ATA Port1 Mode are configurable only when the On-Chip Serial ATA item is not set to [Disabled].

2. Refer to the Parallel ATA and Serial ATA device configurations on page 2-24 for more information when installing IDE devices.

SATA Mode [IDE]

When set to [RAID], this item allows configuration of the installed IDE devices into a disk array. See Chapter 5 for information on RAID configuration. Configuration options: [IDE] [RAID]

On-chip Serial ATA [Disabled]

This item allows you to configure your serial ATA devices if present. Configuration options: [Disabled] [Auto] [Combined Mode] [Enhanced Mode] [SATA Only]

a. Setting to [**Auto**] allows BIOS to automatically configure the SATA devices.

b. Setting to [**Combined Mode**] allows you to install parallel ATA and serial ATA devices at the same time. You may install **two IDE devices on any of the parallel ATA channels**, and **one IDE device on each serial ATA channel** for a maximum of **four** devices. Use ths option when you installed a legacy operating system like MS-DOS, Windows ME/98/NT4.0.

c. Setting to [**Enhanced Mode**] allows you to install parallel ATA and serial ATA devices at the same time, with a maximum of **six** IDE devices on each channel. Use ths option when you installed a native operating system like Windows 2000/XP.

d. Setting to [**SATA Only**] allows you to install IDE devices on the Serial ATA channels only.

e. Setting to [**Disabled**] disables the onboard SATA controller. The RAID feature is also disabled.

Serial ATA Port0 Mode [Primary Master]
Serial ATA Port1 Mode [Primary Slave]

Allow you to set the SATA Port0 and Serial ATA Port1 modes. The options for these items vary depending on the setting of the **On-Chip Serial ATA** item. Configuration options: [Primary Master] [Primary Slave] [Secondary Master] [Secondary Slave]

Onboard Device

```
            Phoenix - AwardBIOS CMOS Setup Utility
  Main   Advanced  Power  Boot  Exit
╔═══════════════════════════════════════════════╦═══════════════════╗
║              Onboard Device                   ║    Item Help      ║
╠═══════════════════════════════════════════════╬═══════════════════╣
║  Init Display First        [AGP]              ║                   ║
║  USB Controller            [Enabled]          ║                   ║
║  USB 2.0 Support           [Enabled]          ║                   ║
║  USB Keyboard Support      [Enabled]          ║                   ║
║  USB Mouse Support         [Enabled]          ║                   ║
║  Onboard AC97 Audio        [Auto]             ║                   ║
║  CSA LAN (Giga-LAN)        [Enabled]          ║                   ║
║  Onboard TI1394            [Enabled]          ║                   ║
║  Onboard Promise Controller [Enabled]         ║                   ║
║  Operating Mode            [IDE]              ║                   ║
║                                               ║                   ║
║                                               ║                   ║
║                                               ║                   ║
║                                               ║                   ║
║                                               ║                   ║
╠═══════════════════════════════════════════════╩═══════════════════╣
║ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help ║
║       F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults         ║
╚═══════════════════════════════════════════════════════════════════╝
```

Init Display First [AGP]

Allows you to select the graphics controller to use as primary boot device.
Configuration options: [PCI slot] [AGP]

USB Controller [Enabled]

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

USB 2.0 Support [Enabled]

Allows you to enable or disable the EHCI controller. Setting this item to
[Enabled] allows the built-in high speed USB support in the BIOS to turn
on automatically when you install high speed USB devices. Configuration
options: [Disabled] [Enabled]

USB Keyboard Support [Enabled]

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

USB Mouse Support [Enabled]

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

Onboard AC97 Audio [Auto]

Allows you to enable or disable the onboard AC97 audio controller.
Configuration options: [Auto] [Disabled]

CSA LAN (Giga-LAN) [Enabled]

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

Onboard TI1394 [Enabled]

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

Onboard Promise Controller [Enabled]

Allows you enable or disable the onboard Promise® RAID controller.
Configuration options: [Disabled] [Enabled]

Operating Mode [IDE]

Allows you to set the Promise RAID controller operating mode. This item is
configurable only when the Onboard Promise Controller item is set to
[Enabled]. Configuration options: [IDE] [RAID]

Super IO Device

```
              Phoenix - AwardBIOS CMOS Setup Utility
    Main   Advanced  Power  Boot  Exit
  ┌─────────────────────────────────────────────┬──────────────────┐
  │               Super IO Device                │    Item Help     │
  │                                              │                  │
  │   Onboard FDC Controller      [Enabled]      │                  │
  │   Onboard Serial Port 1       [3F8/IRQ4]     │                  │
  │   Onboard Serial Port 2       [2F8/IRQ3]     │                  │
  │   Onboard Parallel Port       [378/IRQ7]     │                  │
  │   Parallel Port Mode          [SPP]          │                  │
  │   EPP Mode Select             [EPP1.7]       │                  │
  │   ECP Mode Use DMA            [3]            │                  │
  │   PWRON After PWR-Fail        [Off]          │                  │
  │   Game Port Address           [201]          │                  │
  │   Midi Port Address           [330]          │                  │
  │   Midi Port IRQ               [10]           │                  │
  │                                              │                  │
  │                                              │                  │
  │                                              │                  │
  ├──────────────────────────────────────────────┴──────────────────┤
  │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help │
  │      F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults │
  └──────────────────────────────────────────────────────────────────┘
```

Onboard FDC Controller [Enabled]

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

Onboard Serial Port 1 [3F8/IRQ4]
Onboard Serial Port 2 [2F8/IRQ3]

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

Onboard Parallel Port [378/IRQ7]

Allows you to select the parellel port base address. Configuration options: [Disabled] [378/IRQ7] [278/IRG5] [3BC/IRQ7]

Parallel Port Mode [SPP]

Allows you to select the parallel port mode. Configuration options: [SPP] [EPP] [ECP] [ECP+EPP] [Normal]

EPP Mode Select [EPP1.7]

Allows you to select the EPP mode. This item becomes configurable only if the **Parallel Port Mode** is set to [EPP] or [ECP+EPP]. Configuration options: [EPP 1.7] [EPP 1.9]

ECP Mode Use DMA [3]

Allows you to select the ECP mode. This item becomes configurable only if the **Parallel Port Mode** is set to [ECP] or [ECP+EPP]. Configuration options: [1] [3]

PWRON After PWR-Fail [Off]

Configuration options: [Off] [On] [Former-Sts]

Game Port Address [201]

Allows you to select the game port address. Configuration options: [Disabled] [201] [209]

Midi Port Address [330]

Allows you to select the MIDI port address. Configuration options: [Disabled] [330] [300] [290]

Midi Port IRQ [10]

Allows you to select the MIDI port IRQ. Configuration options: [5] [10]

4.4.3 PnP/PCI Configuration

```
                Phoenix - AwardBIOS CMOS Setup Utility
     Main   Advanced  Power   Boot   Exit
    ┌─────────────────────────────────────────────┬──────────────────┐
    │              PnP/PCI Configuration          │    Item Help     │
    ├─────────────────────────────────────────────┼──────────────────┤
    │  Reset Configuration Data    [Disabled]     │                  │
    │                                             │                  │
    │  Resources Controlled By     [Auto(ESCD)]   │                  │
    │  IRQ Resources                              │                  │
    │                                             │                  │
    │  PCI/VGA Pallete Snoop       [Disabled]     │                  │
    │  INT Pin 1 Assignment        [Auto]         │                  │
    │  INT Pin 2 Assignment        [Auto]         │                  │
    │  INT Pin 3 Assignment        [Auto]         │                  │
    │  INT Pin 4 Assignment        [Auto]         │                  │
    │  INT Pin 5 Assignment        [Auto]         │                  │
    │  INT Pin 6 Assignment        [Auto]         │                  │
    │  INT Pin 7 Assignment        [Auto]         │                  │
    │  INT Pin 8 Assignment        [Auto]         │                  │
    │                                             │                  │
    │                                             │                  │
    │                                             │                  │
    ├─────────────────────────────────────────────┴──────────────────┤
    │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help │
    │      F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults │
    └─────────────────────────────────────────────────────────────────┘
```

Reset Configuration Data [Disabled]

This item allows you to enable or disabled resetting of the Extended System Configuration Data (ESCD) when you exit the Setup. The ESCD includes information on non-PnP devices. Set this item to [Enabled] if you installed an expansion card that conflicts with other devices and cause system boot failure. Configuration options: [Disabled] [Enabled]

Resources Controlled By [Auto(ESCD)]

Configuration options: [Auto(ESCD)] [Manual]

PCI/VGA Pallete Snoop [Disabled]

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

INT Pin 1~8 Assignment [Auto]

Allows you to select the appropriate interrupt to the specific devices to avoid conflict. Configuration options: [Auto] [3] [4] [5] [7] [9] [10] [11] [12] [14] [15]

IRQ Resources

```
         Phoenix - AwardBIOS CMOS Setup Utility
  Main  Advanced  Power  Boot  Exit
┌─────────────────────────────────────────────┬──────────────────┐
│              IRQ Resources                   │     Item Help    │
│                                              │                  │
│   IRQ-3 assigned to        [PCI Device]      │  Menu Level      │
│   IRQ-4 assigned to        [PCI Device]      │                  │
│   IRQ-5 assigned to        [PCI Device]      │  Legacy ISA for devices │
│   IRQ-7 assigned to        [PCI Device]      │  compliant with the │
│   IRQ-9 assigned to        [PCI Device]      │  original PC AT bus │
│   IRQ-10 assigned to       [PCI Device]      │  specification, PCI/ISA │
│   IRQ-11 assigned to       [PCI Device]      │  PnP for devices │
│   IRQ-12 assigned to       [PCI Device]      │  compliant with the │
│   IRQ-14 assigned to       [PCI Device]      │  Plug and Play standard │
│   IRQ-15 assigned to       [PCI Device]      │  whether designed for │
│                                              │  PCI or ISa bus │
│                                              │  architecture. │
│                                              │                  │
│                                              │                  │
│                                              │                  │
├─────────────────────────────────────────────┴──────────────────┤
│ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help │
│      F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults │
└─────────────────────────────────────────────────────────────────┘
```

IRQ-xx assigned to [PCI device]

The IRQ Resources sub-menu is activated when the Resources Controlled by parameter is set to [Manual]. Select [PCI Device] to assign an IRQ address to a Plug and Play device. Setting to [Reserved] reserves the IRQ address.Configuration options: [PCI Device] [Reserved]

4.5   Power menu

```
            Phoenix - AwardBIOS CMOS Setup Utility
   Main   Advanced   Power   Boot   Exit
 ┌──────────────────────────────────────────┬─────────────────────────┐
 │ ▶ Hardware Monitor                     ▲  │      Item Help          │
 │   PS2 Keyboard Power On     [Disabled]    │                         │
 │   ACPI Function             [Enabled]     │  Menu Level    ▶        │
 │   ACPI Suspend Type         [S1&S3]       │                         │
 │   Run VGA BIOS if S3 Resume [Auto]        │                         │
 │   Power Management          [User Define] │                         │
 │   Video Off Method          [DPMS]        │                         │
 │   Video Off In Suspend      [Yes]         │                         │
 │   Suspend Type              [Stop Grant]  │                         │
 │   MODEM Use IRQ             [3]           │                         │
 │   Suspend Mode              [Disabled]    │                         │
 │   HDD Power Down            [Disabled]    │                         │
 │   Soft-Off by PWR-BTTN      [Instant-Off] │                         │
 │   Wake-Up by PCI Card       [Enabled]     │                         │
 │   Power On by Ring          [Enabled]     │                         │
 │   USB Wake-Up from S3       [Enabled]     │                         │
 │   Resume by Alarm           [Disabled]    │                         │
 │   Date (of Month) Alarm      0            │                         │
 │   Time (hh:mm:ss) Alarm      0 : 0 : 0  ▼ │                         │
 ├──────────────────────────────────────────┴─────────────────────────┤
 │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help │
 │      F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults │
 └─────────────────────────────────────────────────────────────────────┘
```

Press the down arrow key or PgDn key to view the other items

```
 ┌──────────────────────────────────────────┬─────────────────────────┐
 │   ** Reload Global Timer Events **        │                         │
 │   Primary IDE 0             [Disabled]    │                         │
 │   Primary IDE 1             [Disabled]    │                         │
 │   Secondary IDE 0           [Disabled]    │                         │
 │   Secondary IDE 1           [Disabled]    │                         │
 │   FDD, COM, LPT Port        [Disabled]    │                         │
 │   PCI PIRQ[A-D]#            [Disabled]  ▼ │                         │
 ├──────────────────────────────────────────┴─────────────────────────┤
 │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help │
 │      F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults │
 └─────────────────────────────────────────────────────────────────────┘
```
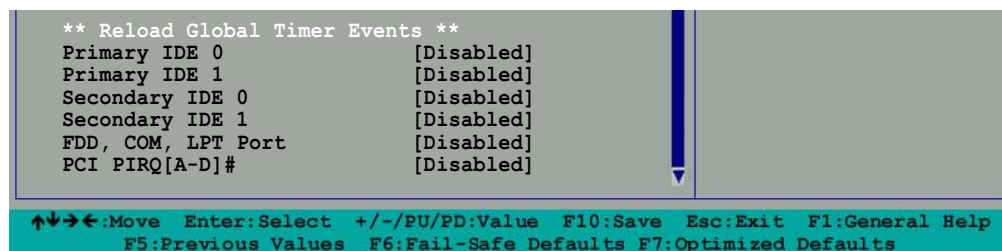
PS2 Keyboard Power On [Disabled]

Allows you to enable or disable PS/2 keyboard wake-up feature.
Configuration options: [Disabled] [Enabled]

ACPI Function [Enabled]

Allows you to enable or disable the ACPI feature on the operating system.
Configuration options: [Disabled] [Enabled]

ACPI Suspend Type [S1&S3]

Allows you to select the ACPI state that you wish to use for system
suspend. Configuration options: [S1(POS)] [S3(STR)] [S1&S3]

Run VGA BIOS if S3 Resume [Auto]

Allow you to determine whether to invoke VGA BIOS POST on S3/STR
resume. Configuration options: [Auto] [Yes] [No]

Power Management [User Define]

Allows you to set the automatic power saving features. Configuration options: [User Define] [Min. Saving] [Max. Saving]

Video Off Method [DPMS]

This item determines the video off features. The Display Power Management System (DPMS) feature allows the BIOS to control the video display card if it supports the DPMS feature. [Blank Screen] only blanks the screen. Use this for monitors without power management or "green" features. Configuration options: [DPMS] [Blank Screen] [V/H SYNC+Blank]

Video Off In Suspend [Yes]

This item determines when to activate the video off feature for monitor power management. Configuration options: [Yes] [No]

Suspend Type [Stop Grant]

Allows you to select the suspend type. Configuration options: [Stop Grant] [PWR On Suspend]

MODEM Use IRQ [3]

Allows you to select the IRQ assignment for the modem. Configuration options: [NA] [3] [4] [5] [7] [9] [10] [11]

Suspend Mode [Disabled]

Configuration options: [Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [12 Min] [20 Min] [30 Min] [40 Min] [1 Hr]

HDD Power Down [Disabled]

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

Soft-Off by PWR-BTTN [Instant-Off]

When set to [Instant-Off], the system goes to soft off when you press the power button for **less** than 4 seconds. When set to [Delay 4 Sec], press the power button for **more** than 4 seconds to power off the system. Configuration options: [Instant-Off] [Delay 4 Sec.]

Wake-Up by PCI Card [Enabled]

When set to [Enabled], this item allows system wake-up through a PCI card event. Configuration options: [Disabled] [Enabled]

Power On by Ring [Enabled]

Allows you to enable or disable system wake-up on ring. Configuration options: [Disabled] [Enabled]

USB Wake-Up from S3 [Enabled]

Allows you to enable or disable system wake-up from S3 through a USB keyboard or mouse event. Configuration options: [Disabled] [Enabled]

Resume by Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is enabled, you can set the date and time of alarm using the two following items. Configuration options: [Disabled] [Enabled]

Date (of Month) Alarm   [0]

To set the date of alarm, highlight this item and press Enter to display a pop-up menu. Key-in a value within the specified range then press Enter. Configuration options: [Min=0] [Max=31]

Time (hh:mm:ss) Alarm [0 : 0 : 0]

To set the time of alarm:

1. Highlight this item and press Enter to display a pop-up menu for the hour field.
2. Key-in a value (Min=0, Max=23), then press Enter.
3. Press tab to move to the minutes field, then press Enter.
4. Key-in a minute value (Min=0, Max=59), then press Enter.
5. Press tab to move to the seconds field, then press Enter.
6. Key-in a value (Min=0, Max=59), then press Enter.

** Reload Global Timer Events **

Primary IDE 0 [Disabled]
Primary IDE 1 [Disabled]

Allow you to set the time period before the primary IDE 0/1 goes into suspend mode. Configuration options: [Disabled] [Enabled]

Secondary IDE 0 [Disabled]
Secondary IDE 1 [Disabled]

Allow you to set the time period before the secondary IDE 0/1 goes into suspend mode. Configuration options: [Disabled] [Enabled]

FDD, COM, LPT Port [Disabled]

Allow you to set the time period before the FDD, COM, LPT ports go into suspend mode. Configuration options: [Disabled] [Enabled]

PCI PIRQ[A-D]# [Disabled]

Allow you to set the time period before PIRQ[A-D]# goes into suspend mode. Configuration options: [Disabled] [Enabled]

4.5.1   Hardware Monitor

```
                   Phoenix - AwardBIOS CMOS Setup Utility
     Main   Advanced  Power  Boot  Exit
  ┌─────────────────────────────────────────────────┬──────────────────┐
  │            Hardware Monitor                      │    Item Help     │
  ├─────────────────────────────────────────────────┼──────────────────┤
  │  Clear CASE Opened Status    [Enabled]           │                  │
  │  M/B Temperature             38°C/100°F          │ Menu Level    ►  │
  │  CPU1 Teperature             127°C/  4°F         │                  │
  │  CPU2 Temperature            N/A                 │                  │
  │  M/B Temperature 2           36°C/96°F           │                  │
  │  M/B Temperature 3           33°C/91°F           │                  │
  │  Chassis Fan Speed              0 RPM            │                  │
  │  CPU Fan1 Speed              4245 RPM            │                  │
  │  CPU Fan2 Speed                 0 RPM            │                  │
  │  System Fan1 Speed              0 RPM            │                  │
  │  System Fan2 Speed              0 RPM            │                  │
  │  CPU VCORE (V)                1.44V             │                  │
  │  +12VIN (V)                  12.01V             │                  │
  │  +3VIN (V)                    3.36V             │                  │
  │  5VCC (V)                     5.04V             │                  │
  │  VBAT (V)                     3.10V             │                  │
  │  5VSB (V)                     4.83V             │                  │
  │  CPU Smart Fan Temperature   [40°C/102°F]       │                  │
  ├─────────────────────────────────────────────────┴──────────────────┤
  │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help │
  │       F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults │
  └─────────────────────────────────────────────────────────────────────┘
```

> The grayed items in this menu are auto-detected by BIOS, and not user- configurable.

Clear CASE Opened Status [Enabled]

Allows you to enable or disable the case open status feature. Setting to [Enabled] clears the case open status. Configuration options: [Disabled] [Enabled]

CPU Smart Fan Temperature [xx°C/xxx°F]

Allows you to automatically adjust the CPU fan speeds to maintain the specified temperature according to the system temperature. [Disabled] [30°C/86°F] [35°C/95°F] [40°C/104°C]

4.6   Boot menu

```
         Phoenix - AwardBIOS CMOS Setup Utility
  Main   Advanced  Power  Boot  Exit
┌──────────────────────────────────────┬─────────────────────┐
│ ▶ Hard Disk Boot Priority            │    Item Help         │
│ ▶ Removable Device Priority          │                      │
│ ▶ CD-ROM Boot Priority               │  Menu Level    ▶     │
│   First Boot Device      [Removable] │                      │
│   Second Boot Device     [CDROM]     │                      │
│   Third Boot Device      [Hard Disk] │                      │
│   Boot Other Device      [Enabled]   │                      │
│   CPU L1 & L2 Cache      [Enabled]   │                      │
│   Hyper-Threading Technology [Enabled]│                     │
│   Quick Power On Self Test [Enabled] │                      │
│                                      │                      │
│   Boot Up Floppy Seek    [Enabled]   │                      │
│   Boot Up NumLock Status [On]        │                      │
│   Gate A20 Option        [Fast]      │                      │
│   Typematic Rate         [Disabled]  │                      │
│   Type Rate              6           │                      │
│   Type Delay             250         │                      │
│   OS Select for DRAM > 64MB [Non-OS2]│                      │
└──────────────────────────────────────┴─────────────────────┘
 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help
        F5:Previous Values  F6:Fail-Safe Defaults F7:Optimized Defaults
```

4.6.1   Hard Disk Boot Priority

```
         Phoenix - AwardBIOS CMOS Setup Utility
  Main   Advanced  Power  Boot  Exit
┌──────────────────────────────────────┬─────────────────────┐
│        Hard Disk Priority            │    Item Help         │
│                                      │                      │
│   1. Ch0 M.              [ST321122A] │  Menu Level    ▶     │
│   2. Bootable Add-In Cards           │                      │
│                                      │                      │
│                                      │                      │
│                                      │                      │
│                                      │                      │
│                                      │                      │
│                                      │                      │
│                                      │                      │
│                                      │                      │
│                                      │                      │
│                                      │                      │
│                                      │                      │
└──────────────────────────────────────┴─────────────────────┘
 ↑↓:Move      PU/PD/+/-: Change Priority      F10:Save      Esc:Exit
```

4.6.2 Removable Device Priority

```
            Phoenix - AwardBIOS CMOS Setup Utility
    Main   Advanced  Power  Boot  Exit
  ┌──────────────────────────────────────────┬────────────────┐
  │      Removable Device Priority           │    Item Help   │
  ├──────────────────────────────────────────┼────────────────┤
  │                                          │ Menu Level   ► │
  │   1. Floppy Disk                         │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  └──────────────────────────────────────────┴────────────────┘
   ↑↓:Move      PU/PD/+/-: Change Priority   F10:Save    Esc:Exit
```

4.6.3 CD-ROM Boot Priority

```
            Phoenix - AwardBIOS CMOS Setup Utility
    Main   Advanced  Power  Boot  Exit
  ┌──────────────────────────────────────────┬────────────────┐
  │         CD-ROM Priority                  │    Item Help   │
  ├──────────────────────────────────────────┼────────────────┤
  │                                          │ Menu Level   ► │
  │   1. Ch0 S.            [ASUS CDS520/A]    │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  │                                          │                │
  └──────────────────────────────────────────┴────────────────┘
   ↑↓:Move      PU/PD/+/-: Change Priority   F10:Save    Esc:Exit
```

First Boot Device [Removable]
Second Boot Device [CDROM]
Third Boot Device [Hard Disk]

These items allow you to select your boot device priority. Configuration options: [Removable] [Hard Disk] [CDROM] [Legacy LAN] [IBA GE Slot 020] [Disabled]

Boot Other Device [Enabled]

Allows you to enable or disable selection of other boot device. Configuration options: [Disabled] [Enabled]

CPU L1 & L2 Cache [Enabled]

Allows you enable or disable CPU L1/L2 cache. Configuration options: [Disabled] [Enabled]

Hyper-Threading Technology [Enabled]

Set this item to [Enabled] when using Windows XP and Linux 2.4.x operating systems that are optimized for Hyper-Threading Technology. Set to [Disabled] when using other operating systems. Configuration options: [Disabled] [Enabled]

Quick Power On Self Test [Enabled]

This field speeds up the Power-On-Self Test (POST) routine by skipping retesting a second, third, and fourth time. Configuration options: [Disabled] [Enabled]

Boot Up Floppy Seek [Enabled]

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

Boot Up NumLock Status [On]

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

Gate A20 Option [Fast]

When set to [Fast], the chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Configuration options: [Normal] [Fast]

Typematic Rate Setting [Disabled]

Allows you to enable or disable the keyboard typematic rate setting. When set to [Enabled], you can set the Type Rate and Type Delay items. Configuration options: [Disabled] [Enabled]

Type Rate [6]

Allows you to select the rate at which character repeats when you hold a key. Configuration options: [6] [8] [10] [12] [15] [20] [24] [30]
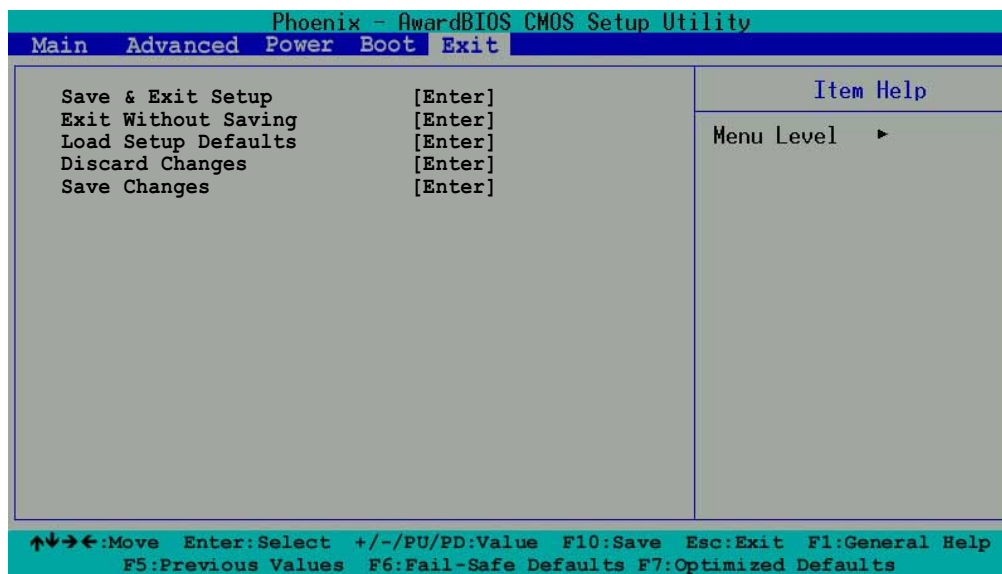
Type Delay [250]

Allows you to set the delay before key strokes begin to repeat. Configuration options: [250] [500] [750] [1000]

OS Select for DRAM > 64MB [Non-OS2]

Select [OS2] only when you are using an OS2 operating system with greater than 64MB RAM. Otherwise, set to [Non-OS2]. Configuration options: [Non-OS2] [OS2]

4.7   Exit menu

```
           Phoenix - AwardBIOS CMOS Setup Utility
 Main   Advanced  Power  Boot  Exit
┌─────────────────────────────────────────┬──────────────────────┐
│  Save & Exit Setup        [Enter]        │     Item Help        │
│  Exit Without Saving       [Enter]       │                      │
│  Load Setup Defaults       [Enter]       │  Menu Level    ▶     │
│  Discard Changes           [Enter]       │                      │
│  Save Changes              [Enter]       │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
├──────────────────────────────────────────────────────────────┤
│ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  Esc:Exit  F1:General Help │
│       F5:Previous Values  F6:Fail-Safe Defaults  F7:Optimized Defaults       │
└──────────────────────────────────────────────────────────────┘
```

Save & Exit Setup

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

Exit Without Saving

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

Load Setup Defaults

This option allows you to load the optimized values for each of the parameters on the Setup menus. When you select this option or if you press <F7>, a confirmation window appears. Select [Yes] to load optimized values. Select Save & Exit or make other changes before saving the values to the non-volatile RAM.

Discard Changes

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

Save Changes

This option saves your selections without exiting the Setup program. You can then return to other menus and make further changes. After you select this option, a confirmation window appears. Select [Yes] to save changes to the non-volatile RAM.
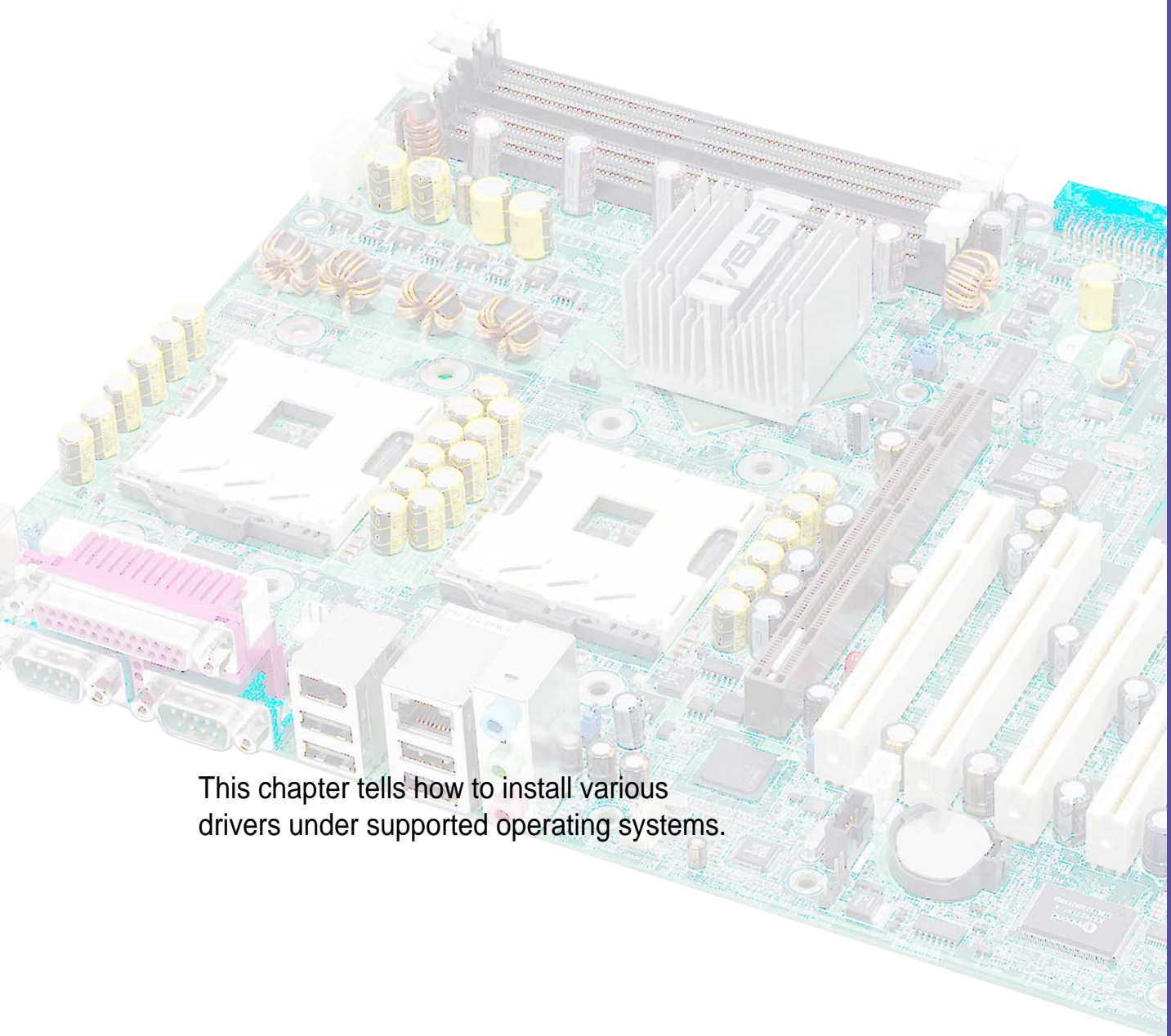
This chapter tells how to install various
drivers under supported operating systems.

Driver installation

Chapter summary

5.1   Support CD contents

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

To begin using the support CD, simply insert the CD into your CD-ROM drive. The CD automatically displays the welcome screen and the installation menus if Autorun is enabled in your computer.

> 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.
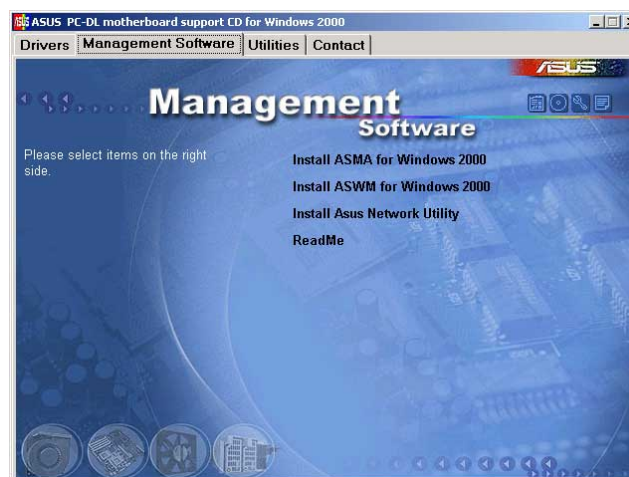
5.1.1   Drivers

This screen displays the drivers available for the onboard devices. Follow the installation wizards or find additional instructions as text files in each of the driver folders.
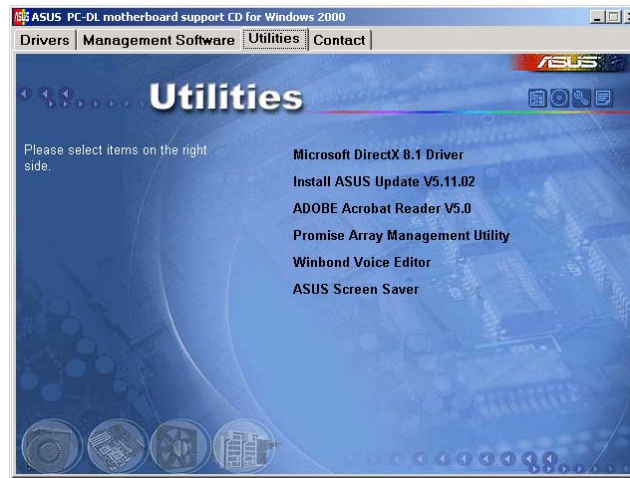

5.1.2   Management Sofware

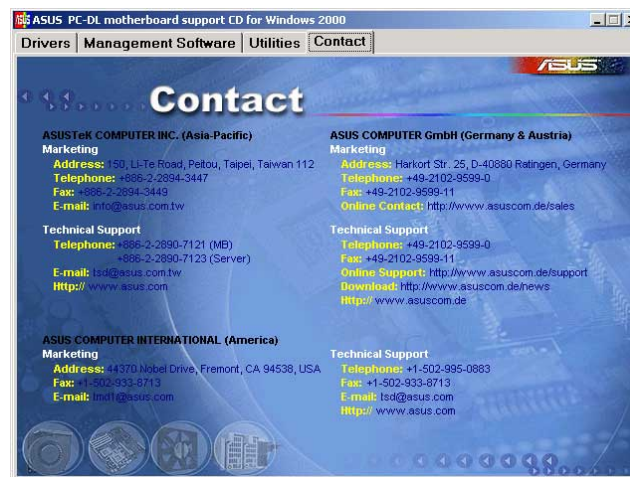This screen displays the ASUS proprietary server management software.

5.1.3   Utilities

This screen displays the available system utilities that you can install.

5.1.4   Contact

This screen displays the ASUS worldwide contact information.

5.2   Winbond Voice Editor

The Winbond Voice Editor software allows you to customize the vocal POST messages. Install the software from the Utilities menu in the support CD.

> To avoid conflicts, do not run the Winbond Voice Editor while running the ASUS PC Probe.

Follow these steps to use the Winbond Voice Editor.

Launching the program

Launch the program either from the Winbond Voice Editor icon on your desktop, or from the Windows Start menu, **Programs/Winbond Voice Editor/ Voice Editor**.

The Winbond Voice Editor screen appears.
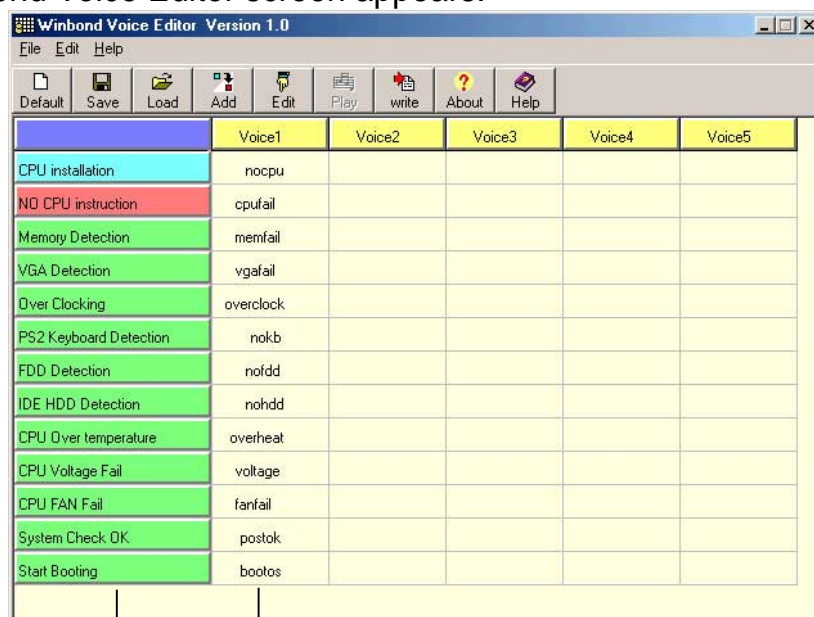
Default Messages

POST Events

Playing the default wave files

To play the default wave files, simply click on a POST event on the left side of the screen, then click the Play button.

> The default language setting is English.

Changing the default language

1. Click on the Load button. a window showing the available languages appears.

2. Select your desired language then click Open. The event messages for the language you selected appear on the Voice Editor screen.

> For some languages, not all events have a corresponding message due to file size constraints.

3. Click on the Write button to update the EEPROM.

4. Click Yes on the confirmation window that appears.

The next time you boot your computer, the POST messages are announced in the language that you selected .

Customizing your POST messages

If your language is not in the selection or if you wish to record your own POST messages to replace the pre-installed wave files, you may easily do so.

Follow these steps to customize your POST messages.

1. Launch the Voice Editor and take note of the list of POST events on the leftmost column of the screen.

2. Prepare your message for each event.

    🖉   The total compressed size for all the wave files must not exceed 1Mbit, so make your messages as short as possible.

3. Use a recording software, such as Windows Recorder, to record your messages.

4. Save the messages as wave files (.WAV). It is recommended that you save your files in low quality to keep them small. For example, use 8-bit, mono quality at 22Khz sampling rate.

    🖉   You may want to create a separate folder for your wave files so you can locate them easily in one place.

5. From the Voice Editor screen, click on the Add button to display the Add Wave File window.

6. Copy the wave files that you recorded to the database. Close the window when done.
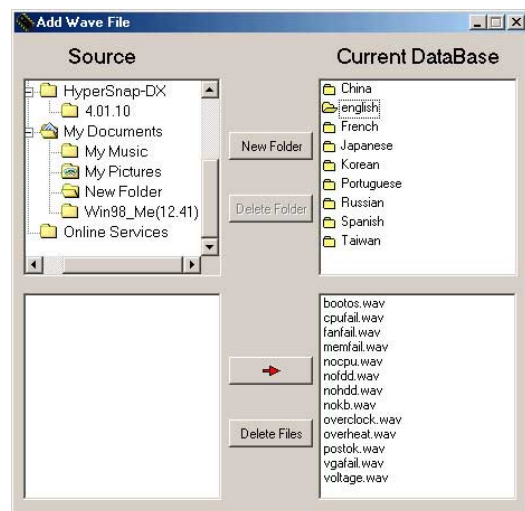
7. Click a POST event on the Voice Editor screen, then on the Edit button. The Event Sound Editor window appears.

8. Locate and select your wave file for the event then click on the arrow opposite Voice1. The file you selected appears on the space next to it.

9. Click OK to return to the Voice Editor screen.

10. Do steps 7 to 9 for the other events.

11. When done, click the Save button. A window appears prompting you to save your configuration.

12. Type a file name with a **.flh** extension, then click Save.

13. Click on the Write button to compress the file and copy into the EEPROM.

14. Click Yes on the confirmation window that appears.
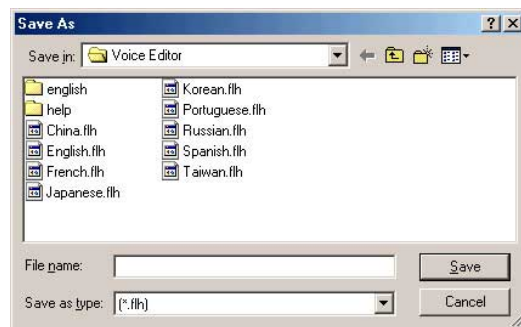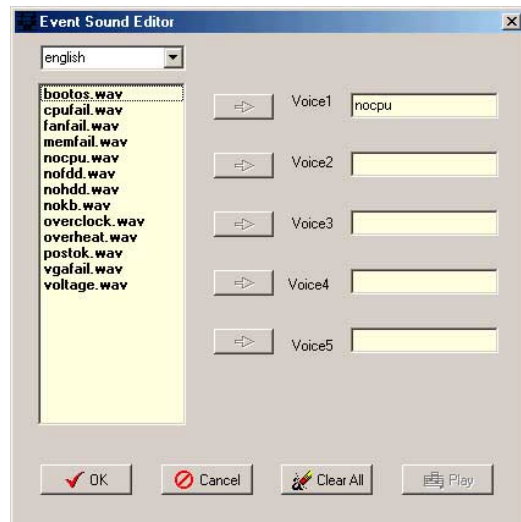
If you receive an error message telling you that the files exceed the total allowable size, do one or all of the following.

• Try to modify your messages to make them shorter

• Save the wave files at a lower quality

• Skip lesser used events like FDD Detection, IDE HDD Detection, etc.

5.3   SoundMAX® 4 XL software

The ADI AD1985 AC '97 audio CODEC provides 6-channel audio capability through the SoundMAX4 XL with AudioESP™ software to deliver the ultimate audio experience on your PC. The software implements high quality audio synthesis/rendering, 3D sound positioning, and advanced voice-input technologies.

Follow the installation wizard install the **AD1985 Audio Driver and Application** from the support CD that came with the motherboard package to activate the 6-channel audio feature.

> You must use 4-channel or 6-channel speakers for this setup.
>
> SoundMAX 4 XL requires Microsoft Winodws 98SE/ME/2000/XP. Make sure that one of these operating systems is installed before installing SoundMAX.

If the SoundMAX4 XL software is correctly installed, you will find the SoundMAX4 XL icon on the taskbar.

SoundMAX4 XL icon

From the taskbar, double-click on the **SoundMAX4 XL** icon to display the **SoundMAX Control Panel**.

Setup wizards

Use the speaker and microphone setup wizards to fine tune the gain/ attenuation of the inputs/outputs for optimal audio performance. You may launch the setup wizards by clicking the Configuration button when AudioESP detects and verifies a newly connected peripheral, or by clicking on the [icon] icon from the SoundMAX control panel.

Speaker wizard

Follow the screen instructions to configure the speakers to your desired settings.
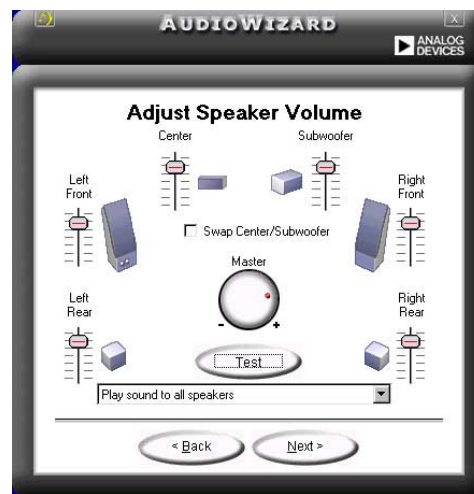
Microphone wizard

Follow the screen instructions to configure the microphone to your desired settings.
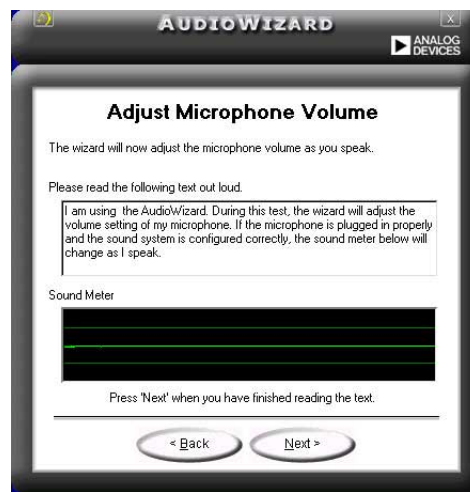
Audio preferences

The Preferences page of the SoundMAX4 XL allows you to change various audio settings.
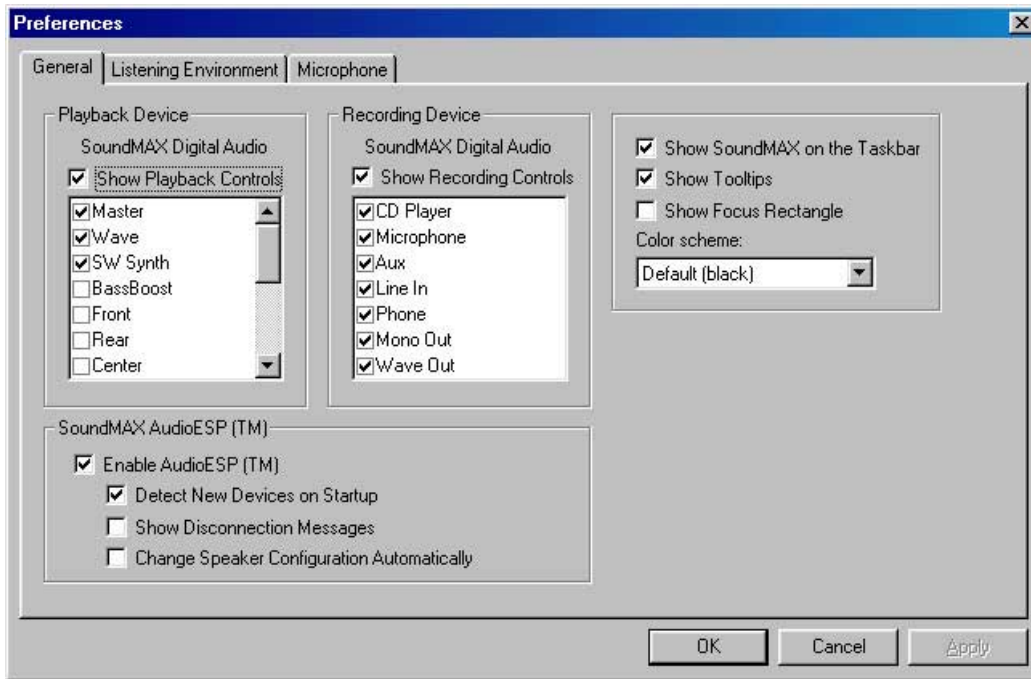
Listening environment options

The SoundMAX4 XL support several audio technologies including SoundMAX SPX™ Animated Audio, 3DPA™, MultiDrive™ 5.1, EnvironmentFC™, MacroFX/ZoomFX™, and Virtual Theater Surround.
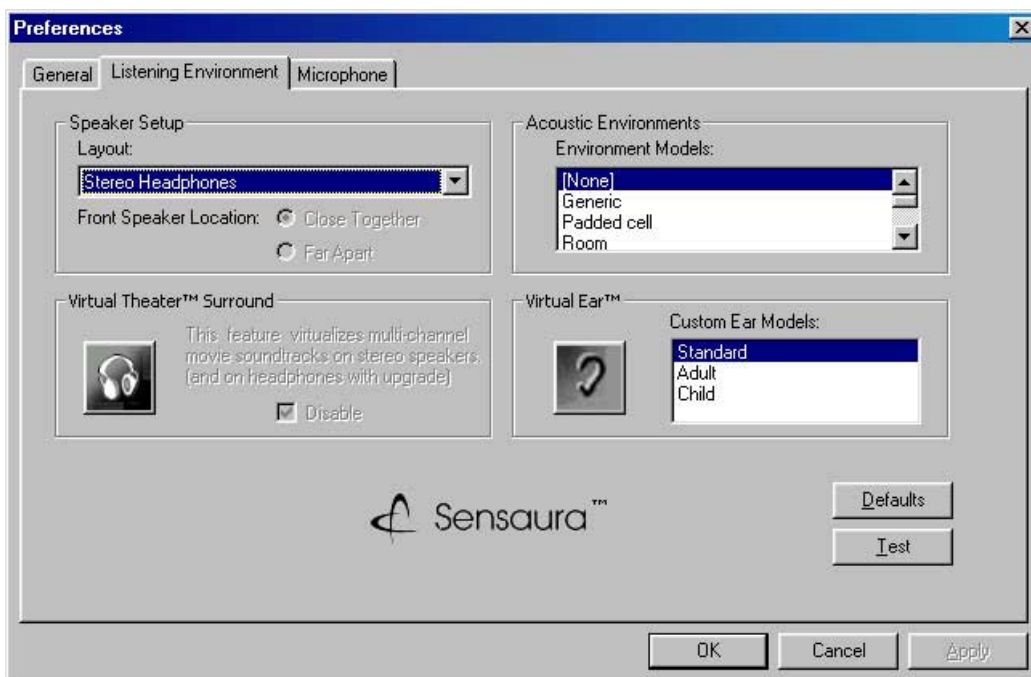
5.4   Promise® RAID configurations

The motherboard includes the Promise® PDC20378 controller chipset to support Redundant Array of Independent Disks (RAID) configurations. Using two Serial ATA hard disks on SATA_RAID1/SATA_RAID2 interfaces, and two ATA133 hard disks on the PRI_RAID interface, you may set up RAID0, RAID1, RAID0+1, and Multi-RAID configurations. Use the MBFastTrak378™ BIOS and the FastBuild™ utility to configure a disk array.

RAID 0 (called *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.

RAID 1 (called *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.

RAID 0+1 is *data striping* and *data mirroring* combined without parity (redundancy data) having to be calculated and written. The advantage of RAID 0 + 1 is fast data access (like RAID 0), but with the ability to loose one drive and have a complete duplicate surviving drive or set of drives (like RAID 1).

1. If you use either Windows XP or Windows 2000 operating system (OS), copy first the **Promise FastTrak 378 Driver** from the support CD to a floppy disk before creating RAID configurations.

2. Refer to the **FastTrak 378 Quick Start Guide** and **SATA Quick Start Guide** in the support CD for detailed information on RAID configurations under different operating systems.

5.4.1   Install the hard disks

The PDC20378 chipset supports Ultra ATA/133/100/66 hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

- If you are creating a **RAID 0 (striping)** array for perfomance, use two new drives.

- If you are creating a **RAID 1 (mirroring)** array for protection, you can use two new drives or use an existing drive and a new drive (the new drive must be of the same size or larger than the existing drive).

Follow these steps to install the hard disks for RAID configuration.

1.   Set the jumpers of each hard disk as Master/Slave.
2.   Install the hard disks into the drive bays.
3.   Connect the HDD cables. These connection options are available for creating a RAID 0 or RAID 1 array:

   a)   Connect two Parallel ATA HDDs to PRI_RAID connector and one Serial ATA HDD to either one of the two Serial ATA connectors, using separate parallel ATA or serial ATA cables.

   b)   Connect one Serial ATA HDD to each Serial ATA connector, using separate serial ATA cables.

4.   Connect the power cable to the power connector on each drive.
5.   Boot the system and enter the BIOS Setup Utility.
6.   Go to the **Advanced** menu in BIOS and set the appropriate IDE configuration settings.
7.   Save your changes and Exit Setup.
8.   Proceed to section 5.4.2 for the next procedure.

5.4.2   Enter the MBFastBuild™ utility

1. Boot the system.

   If this is the first time you boot the system with the new hard disks installed and connected to the ATAIDE connectors on the motherboard, the MBFastTrak378™ BIOS displays the following:

```
MBFastTrak378 (tm) BIOS version 1.00
(c)2000-2005 Promise Technology, Inc. All Rights Reserved.

   No Array defined...


Press <Ctrl-F> to enter FastBuild (tm) Utility
Or press <ESC> key to continue booting.
```

2. Press <Ctrl-F> simultaneously to display the FastBuild™ utility main menu.

```
FastBuild (tm) Utility 2.00 (c) 2002-2005 Promise Technology, Inc.
══════════════════════════[ Main Menu ]═══════════════════════════




              Auto Setup . . . . . . . . . . [ 1 ]

              View Drive Assignments . . . . [ 2 ]

              Define Array . . . . . . . . . [ 3 ]

              Delete Array . . . . . . . . . [ 4 ]

              Rebuild Array. . . . . . . . . [ 5 ]




══════════════════════════[ Keys Available ]══════════════════════

 Press 1..5 to select Option                      [ESC] Exit
```

5.4.3 Creating a RAID 0 array (Performance)

1. In the FastBuild™ utility main menu, press "1" to select Auto Setup. The following screen appears.

```
FastBuild (tm) Utility 2.00 (c) 2002-2005 Promise Technology, Inc.
══════════════════════[ Auto Setup Options Menu ]══════════════════════

   Optimize Array for:                        Performance


══════════════════════[ Array Setup Configuration ]══════════════════════

   Mode ..................................... Stripe

   Spare Drive............................... 0

   Drive(s) Used in Array.................... 2

   Array Disk Capacity (size in MB)........... 8650



══════════════════════════[ Keys Available ]══════════════════════════


[ ↑ ] Up  [ ↓ ] Down  [ ←,→,Space] Change Option  [ ESC] Exit [CTRL-Y] Save
```

2. Use the arrow keys to go to the field **Optimize Array for** and select "*Performance*" with the space bar. The **Mode** field displays **"*Stripe*"**.

3. After making a selection, press <**Ctrl-Y**> to save and create a RAID 0 array.

4. Press any key to reboot the system. During the boot process, the MBFastTrak378 BIOS checks and displays the disk array information.

```
MBFastTrak376 (tm) BIOS Version 1.00
(c) 2000-2005 Promise Technology, Inc.  All Rights Reserved.

ID      MODE        SIZE      TRACK-MAPPING      STATUS

1*      2+0 Stripe  3257M     723/192/48         Functional


Press <Ctrl-F> to enter FastBuild (tm) Utility
```

5. Once the array is created, use the FDISK utility to format the array as a single hard drive.

6. After you have formatted the arrayed drives, install an operating system (OS). The OS will treat the RAID 0 array as a single drive unit.

7. Install the RAID driver from the support CD that came with the motherboard package.

Depending on the operating system you are installing, you may need to install the RAID driver during or after the OS installation.

5.4.4 Creating a RAID 1 array (Security)

Creating a Security Array with New Drives

1. In the FastBuild™ utility main menu, press "1" to select Auto Setup.

```
FastBuild (tm) Utility 2.00 (c) 2002-2005 Promise Technology, Inc.
══════════════════[ Auto Setup Options Menu ]══════════════════

    Optimize Array for:                      Security

═════════════════[ Array Setup Configuration ]═════════════════

    Mode ......................................... Mirror

    Spare Drive................................ 0

    Drive(s) Used in Array..................... 2

    Array Disk Capacity (size in MB)........... 4000



═════════════════════[ Keys Available ]════════════════════════


[ ↑]  Up  [ ↓]  Down  [ ←,→,Space]  Change Option  [ ESC] Exit [ CTRL-Y]  Save
```

2. Use the arrow keys to go to the field **Optimize Array for** and select "*Security*" with the space bar. The **Mode** field displays "*Mirror*".

3. Press <**Ctrl-Y**> to save your selection.

4. The following message appears:

```
Do you want the disk image to be duplicated to another? (Yes/No)


Y - Create and Duplicate
N - Create Only
```
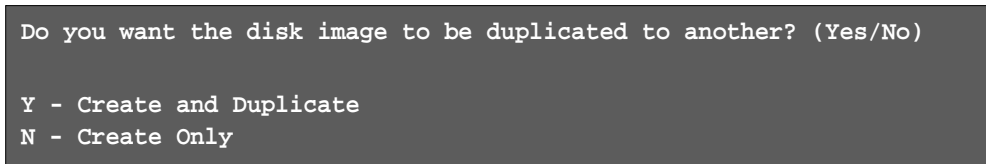
5. Press **N** for the *Create Only* option. A message appears confirming that your Security array has been created.

```
Array has been created.

<Press any key to reboot>
```
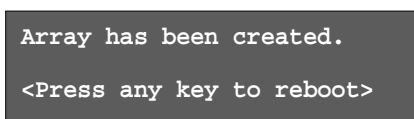
6. Press any key to reboot the system. During the boot process, the MBFastTrak376 BIOS checks and displays the disk array information.

```
MBFastTrak376 (tm) BIOS Version 1.00
(c) 2000-2005 Promise Technology, Inc.  All Rights Reserved.

ID      MODE          SIZE      TRACK-MAPPING     STATUS
─────────────────────────────────────────────────────────────
1*      1x2 Mirror    1628M     827/64/63         Functional


Press <Ctrl-F> to enter FastBuild (tm) Utility
```
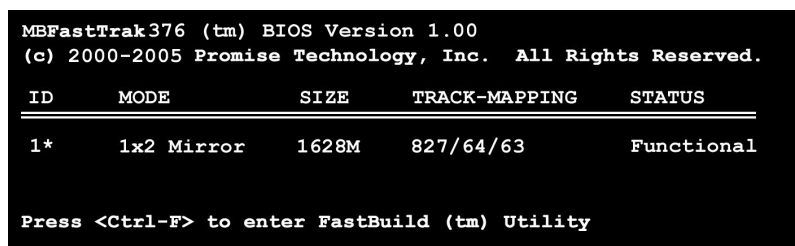
7. Use the FDISK utility and follow the format procedure for installing a new hard drive. After you have formatted the arrayed drives, install an operating system (OS).

8. Install the RAID driver from the support CD that came with the motherboard package.
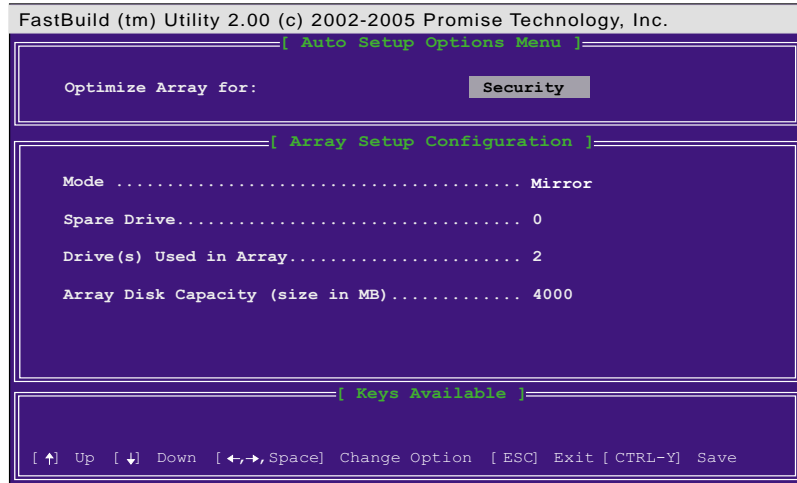
Depending on the operating system you are installing, you may need to install the RAID driver during or after the OS installation.

Creating a Security Array with Existing Data Drive

If you would like to use an existing drive that already contains data and/or is the bootable drive in your system, make sure that the new hard drive you will use in the array has the same or larger capacity as the existing drive.

Backup all important data before creating an array. Failure to do so may cause data loss.

1. In the FastBuild™ utility main menu, press "**1**" to select Auto Setup.

2. Use the arrow keys to go to the field **Optimize Array for** and select "*Security*" with the space bar. The **Mode** field displays "*Mirror*".

3. Press <**Ctrl-Y**> to save your selection. The following message appears:

```
Do you want the disk image to be duplicated to another? (Yes/No)


Y - Create and Duplicate
N - Create Only
```

5. Press **Y** for the *Create and Duplicate* option. The next window prompts you to select the source drive to use.

6. Use the arrow keys to select the source drive. The FastBuild utility will copy all the data from the source drive to the target drive.

7. Press <**Ctrl-Y**> to save the selection and start the duplication. The following message appears:

```
Start to duplicate the image...
Do you want to continue? (Yes/No)

Y - Continue    N - Abort
```

8. Select **Y** to continue. Select **N** to return to the main menu.

9. When the duplication process is completed, a message appears confirming that your Security array has been created.

10. Press any key to reboot the system.

11. Install the RAID driver from the support CD that came with the motherboard package.

> Depending on the operating system you are installing (or that is already installed), the RAID driver installation sequence may vary.

5.4.5   Other FastBuild Utility Commands

Command options 3-6 on the FastBuild™ Utility main menu are not required for setting up an array, but they are useful for reconfiguring an array.

View Array (3): This command allows you to view the drive assignments of hard disks in an array.

Delete Array (4): This command deletes an array to reconfigure the system. Deleting an array does not remove information on the hard disks. If an array is deleted by mistake, recover it immediately by redefining it as the deleted array.

Rebuild Array (5): This command restores the array and system data after faults on RAID 1 arrays.

Follow these steps to rebuild and restore data in the array:

1. On boot-up, an error message notifies of a system failure.

2. Press <**Ctrl-F**> to enter the FastBuild™Main Menu.

3. Select <3> for View Array to verify the ID of the defunct hard disk.

4. Power off the system and replace the hard disk with an identical model.

5. Reboot and enter the FastBuild™ Main Menu again.

6. Select <5> for Rebuild Array. The malfunctioning array is highlighted. Press **Enter** to select.

```
FastBuild (tm) Utility 2.00 (c) 2002-2005 Promise Technology, Inc.
═══════════════════[ Rebuild Array Menu ]═══════════════════

    Array No    RAID Mode    Total Drv    Capacity    Status

    Array  1    Mirror/Stripe    4           7999      Critical
    Array  2    -----            -----       -----     -----
    Array  3    -----            -----       -----     -----
    Array  4    -----            -----       -----     -----




                         ══[ Keys Available ]══


   [↑] Up  [↓] Down  [ESC] Exit  [Enter] Select
```
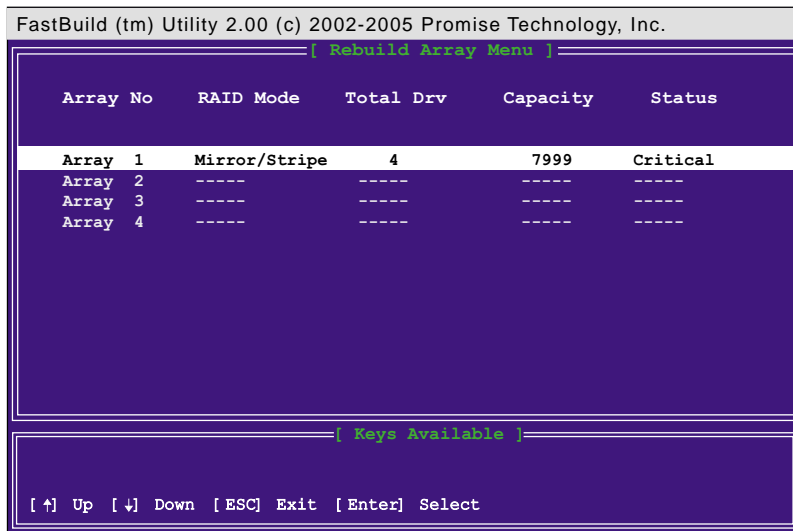
7. Select the replacement drive. Press <Enter>.

```
FastBuild (tm) Utility 2.00 (c) 2002-2005 Promise Technology, Inc.
════════════════[ View Array Definition Menu ]════════════════

    Array No    RAID Mode    Total Drv              Status

    Array  1   Mirror/Stripe      4                 Critical


    Stripe Block: Not Available        Gigabyte Boundary: ON
              ════════[ Select Drive for Rebuild ]════════

    Channel: ID      Drive Model         Capacity (MB)
       3:Mas FUJITSU MPD3043AT              4325



                     ══[ Keys Available ]══


   [↑] Up  [↓] Down  [ESC] Exit  [Enter] Select
```
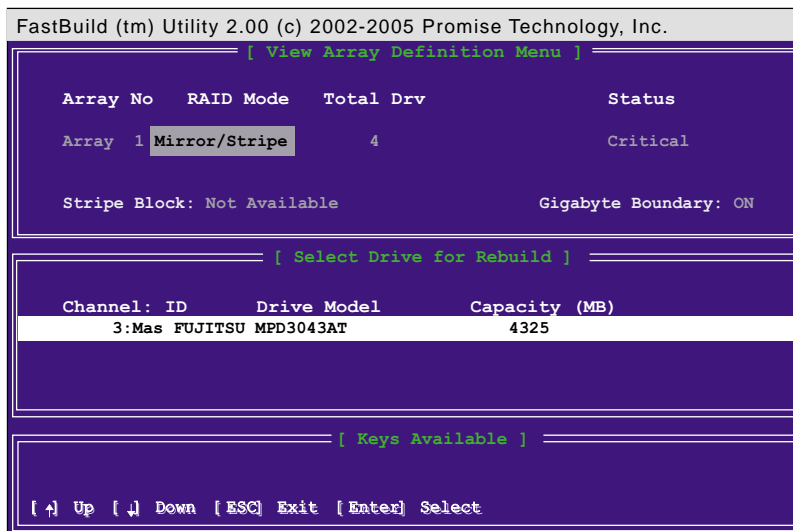
8. Confirm the command to copy data from the intact source hard disk
    onto a new replacement hard disk. A progress gauge displays the
    copy progress for the duration of the task.

9. After the rebuild processis complete, the user is prompted to reboot
    the system.

Controller Configuration (6): This command shows the default for
Controller Configuration. The default value is [Enabled].

5.5   Intel® RAID for Serial ATA

The Intel® ICH5R chipset supports Redundant Array of Independent Disks (RAID) configuration. Using two Serial ATA hard disks on SATA1 and SATA2 connectors onboard, you may set up a RAID 0 level storage configuration.

RAID 0 (called *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.

5.5.1   BIOS configuration

Follow these steps to set the BIOS items related to the RAID function.

1.   Enter the BIOS Setup utility by pressing <Delete> during the Power-On Self Test (POST). See section "4.2 BIOS Setup program" for more information on entering the Setup utility.

2.   Select **Advanced** > **Integrated Peripherals** > **OnChip IDE Device**

3.   Set the SATA items to either one of the following options:

BIOS item	A	B	C
SATA Mode	[RAID]	[RAID]	[RAID]
On-Chip Serial ATA	[Combined Mode]	[Enhanced Mode]	[SATA Only]
Serial ATA Port0 Mode	[Primary Master]	[SATA0 Master]	[Primary Master]
Serial ATA Port1 Mode	[Primary Slave]	[SATA1 Master]	[Secondary Master]

> When creating a RAID, make sure that the item **SATA Mode** is set to **RAID** to load the Intel RAID Option ROM upon boot up. The Intel RAID Option ROM provides the pre-operating system user interface for the Intel RAID implementation.

4.   Press <F10> to save your changes, then press <Esc> to exit the Setup utility.

> For more information on the Intel RAID for Serial ATA , refer to the Intel Application Accelerator (RAID Edition) User's Manual in the motherboard support CD.

5.5.2 Installing Serial ATA hard disks

1. A Serial ATA hard disk requires SATA data (4-conductor) and power cables. Make sure that you have the appropriate SATA cables before your proceed with the installation.

2. Carefully follow other hard disk installation instructions that came with the Serial ATA hard disks.

Follow these steps to install a Serial ATA hard disk.

1. Install the hard disk into the drive bay.

2. Connect one end of the SATA data cable to an SATA connector on the motherboard, then connect the other end to the hard disk.

3. Connect a 4-pin power cable to the power connector on the hard disk.

5.5.3 Creating, Deleting, and Resetting RAID Sets

Use the Intel® Integrated RAID for Serial ATA - RAID Configuration Utility to configure your Serial ATA hard disks as RAID. Launch the utility by pressing <Ctrl-I> when the message "**Press <Ctrl-I> to enter RAID Configuration Utility**" appears during the Power-On Self Test (POST).

Pressing <Ctrl-I> displays the Main Menu of the RAID Configuration utility.

```
        Intel(R) Integrated RAID for Serial ATA - RAID Configuration Utility
        Copyright(C) 2003 Intel Corporation. All Rights Reserved. v3.x.x.xxxx
    ═════════════════════════[ 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.                                                │
    │                                                               │
    │  Non-RAID Disks:                                              │
    │  Port Drive Model      Serial #      Size     Status    Bootable │
    │    0 ST320413A         xxxxxxxx      18.6GB   Normal      Yes  │
    │    1 ST320413A         xxxxxxxx      18.6GB   Normal      Yes  │
    │                                                               │
    │      [↓↑]-Select        [ ESC] Exit        [Enter]-Select Menu │
    ═══════════════════════════════════════════════════════════════
```
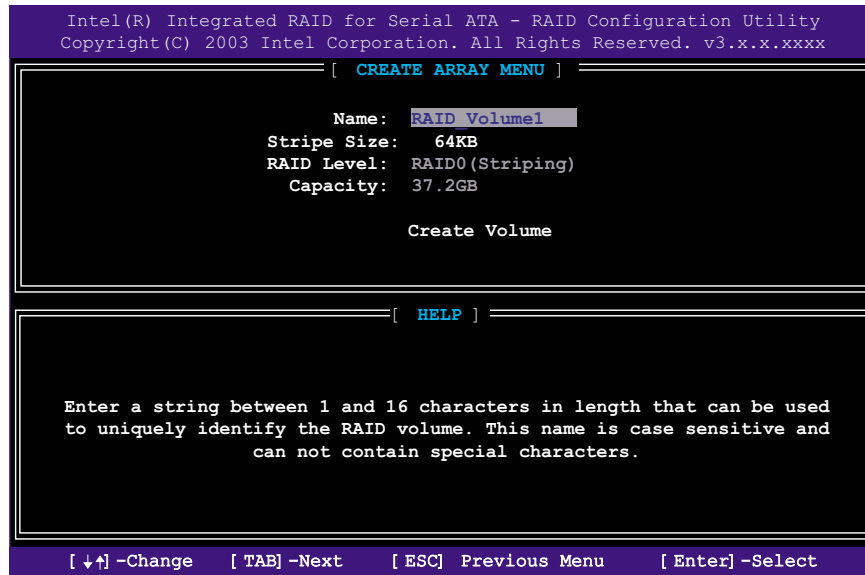
5.5.4 Creating a RAID Volume

To create a RAID 0 volume:

1.   Select the option **1. Create RAID Volume** from the Main menu, then press <Enter>. The Create Array menu appears.

```
Intel(R) Integrated RAID for Serial ATA - RAID Configuration Utility
Copyright(C) 2003 Intel Corporation. All Rights Reserved. v3.x.x.xxxx
========================[ CREATE ARRAY MENU ]========================

                        Name:     RAID_Volume1
                  Stripe Size:    64KB
                   RAID Level:    RAID0(Striping)
                     Capacity:    37.2GB

                                Create Volume


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




          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
                            can not contain special characters.




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

2.   Type a name for your RAID volume using 1 to 16 characters (letters and/or numbers, no special characters). Press <Enter>.

3.   Use the Up and Down arrow keys to select the stripe size for the RAID 0 array. Press <Enter> to make the selection.

      The available values range from 8 KB to 128 KB. The default is 64 KB. Select a stripe value from the following suggestions depending on your planned drive usage.

      • 16 KB - low disk usage

      • 64 KB - typical disk usage

      • 128 KB - performance disk usage

4.   Highlight **Create Volume** then press <Enter> to create the array. Press **Y** when a confirmation message appears.

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

5.   Scroll down to option **4. Exit** and press <Enter> to exit the RAID configuration utility. Press **Y** when a confirmation message appears.

5.5.5 Deleting a RAID Volume

⚠ Take caution when deleting a RAID volume. Deleting a RAID volume erases all data on the RAID drives!

```
      Intel(R) Integrated RAID for Serial ATA - RAID Configuration Utility
      Copyright(C) 2003 Intel Corporation. All Rights Reserved. v3.x.x.xxxx
   ┌──────────────────────── [ DELETE ARRAY MENU ] ────────────────────────┐
   │                                                                        │
   │  Name          Level         Drives     Capacity  Status     Bootable │
   │  RAID_Volume1   RAID0(Stripe) 2          37.2GB    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 WITHING THIS VOLUME WILL BE LOST AND NON-RECOVERABLE │
   │                                                                        │
   │                                                                        │
   └────────────────────────────────────────────────────────────────────────┘
   [ ↓↑ ]-Change     [ TAB]-Next     [ <ESC> ]-Previous Menu   [ <DEL> ]-Delete Volume
```

To delete a RAID volume:

1. Select the option **2. Delete RAID Volume** and press <Enter> to delete the RAID volume.

2. When a confirmation message appears, press **Y** to permanently delete the RAID volume.

```
   ┌──────────── [ VOLUME DELETE VERIFICATION ] ────────────┐
   │                                                        │
   │       Are you sure you want to delete this volume?     │
   │          ALL DATA IN THE VOLUME WILL BE LOST!!         │
   │                                                        │
   │  Are you sure you want to delete volume "RAID_Volume1"? (Y/N) │
   │                                                        │
   └────────────────────────────────────────────────────────┘
```

5.5.6 Resetting a RAID to non-RAID

⚠ Take caution when resetting a RAID to non-RAID. Resetting all RAID data will remove any internal RAID structures from all RAID disks!

```
     Intel(R) Integrated RAID for Serial ATA - RAID Configuration Utility
     Copyright(C) 2003 Intel Corporation. All Rights Reserved. v3.x.x.xxxx
   ═══════════════════════════[ 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.

    Non-RAID Disks:
    Port Drive Model        Serial #       Size     Status       Bootable
      0 ST320413A           xxxxxxxx       18.6GB   Normal         Yes
      1 ST320413A           xxxxxxxx       18.6GB   Normal         Yes


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

To reset a RAID to non-RAID structure:

1.   Select the option **3. Reset Disks to Non-RAID** and press <Enter>.

2.   When a confirmation message appears, press **Y** to revert to non-RAID hard disk structure.

```
                 ═══════[ RESET ALL DATA RAID DATA ]═══════

        Resetting all RAID data will remove any internal RAID structures
        from all RAID disks, including disks with working volumes. These
        structures are used to maintain the RAID volumes. By removing
        these structures, the drive will revert back to a Non-RAID disk
        that can then be used or reallocated to a new RAID volume.

        WARNING: Selecting "Yes" will cause all data on any RAID disk
                 (RAID Volume or Other RAID Disk) to be lost.

           Are you sure you want to destroy all RAID data (Y/N):
```