PP-DLW

User Guide

ASUS

Motherboard

E1173

First Edition V1

January 2003

Contents

Chapter 4: BIOS setup

Chapter 5: OS 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 adpater or extension cord. These devices could interrupt the grounding circuit.

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

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

Operation safety

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

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

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

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

- Place the product on a stable surface.

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

About this guide

This user guide contains the information you need when installing the ASUS PP-DLW motherboard.

How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the features of the PP-DLW 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 switches, 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 descriptions of the BIOS parameters are also provided.

- **Chapter 5: Driver installation**

  This chapter tells how to install LAN, USB 2.0, and audio drivers under various 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)

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General Tel: +886-2-2894-3447
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Technical Support

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Desktop/Server (Tel): +886-2-2890-7123 (English)
Support Fax: +886-2-2890-7698
Support Email: tsd@asus.com.tw
Web Site: www.asus.com.tw

ASUS COMPUTER INTERNATIONAL (America)

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

Technical Support

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

ASUS COMPUTER GmbH (Germany and Austria)

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

Technical Support

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

PP-DLW specifications summary

CPU	Support for dual Intel® Xeon™ processor with speeds up to 3.06 GHz On-die 256KB/512KB L2 cache
Chipsets	Intel E7505 (Placer) MCH Intel ICH4 I/O Hub P64H2 PCI-X Hub
Front Side Bus (FSB)	533/400 MHz
Memory	4 x 184-pin DDR DIMM sockets Supports PC2100/PC1600 unbuffered/registered ECC/non-ECC DDR DIMMs Supports up to 8GB system memory using 2GB DIMMs
Onboard LAN	Intel® 82540EM Gigabit Ethernet controller
Onboard audio	ADI AD1885 2-channel audio CODEC
Expansion slots	1 x AGP Pro 8x/4x slot (1.5V only) 3 x PCI 64-bit/100MHz 3V (PCI-X1 to PCI-X3) 1 x PCI 64-bit/133MHz 3V (PCI-X4) 1 x PCI 32-bit/33MHz 5V (PCI1)
Rear panel I/O	1 x Parallel port 2 x Serial ports 1 x PS/2 keyboard port 1 x PS/2 mouse port 4 x USB 2.0 ports 1 x RJ-45 port (with LED) Line In/Line Out/Microphone ports
Internal connectors	2 x ATA/100 IDE connectors 1 x Floppy disk connector 1 x USB 2.0 connector for two additional USB ports CD/AUX audio connectors CPU/Power/Chassis fan connectors 24-pin, 8-pin SSI power connectors IDE LED/Power LED connectors 20-pin Front panel connector Chassis intrusion, SMBus, WOL, and WOR connectors
BIOS features	4Mb Flash ROM, AMI BIOS with ACPI, DMI, Green, PnP features, and Enhanced Server BIOS features
Form Factor	Extended ATX form factor: 12 in x 10.5 in (30.5 cm x 26.7 cm)
Support CD contents	Device drivers Utilities Contact information

* Specifications are subject to change without notice.

Chapter 1
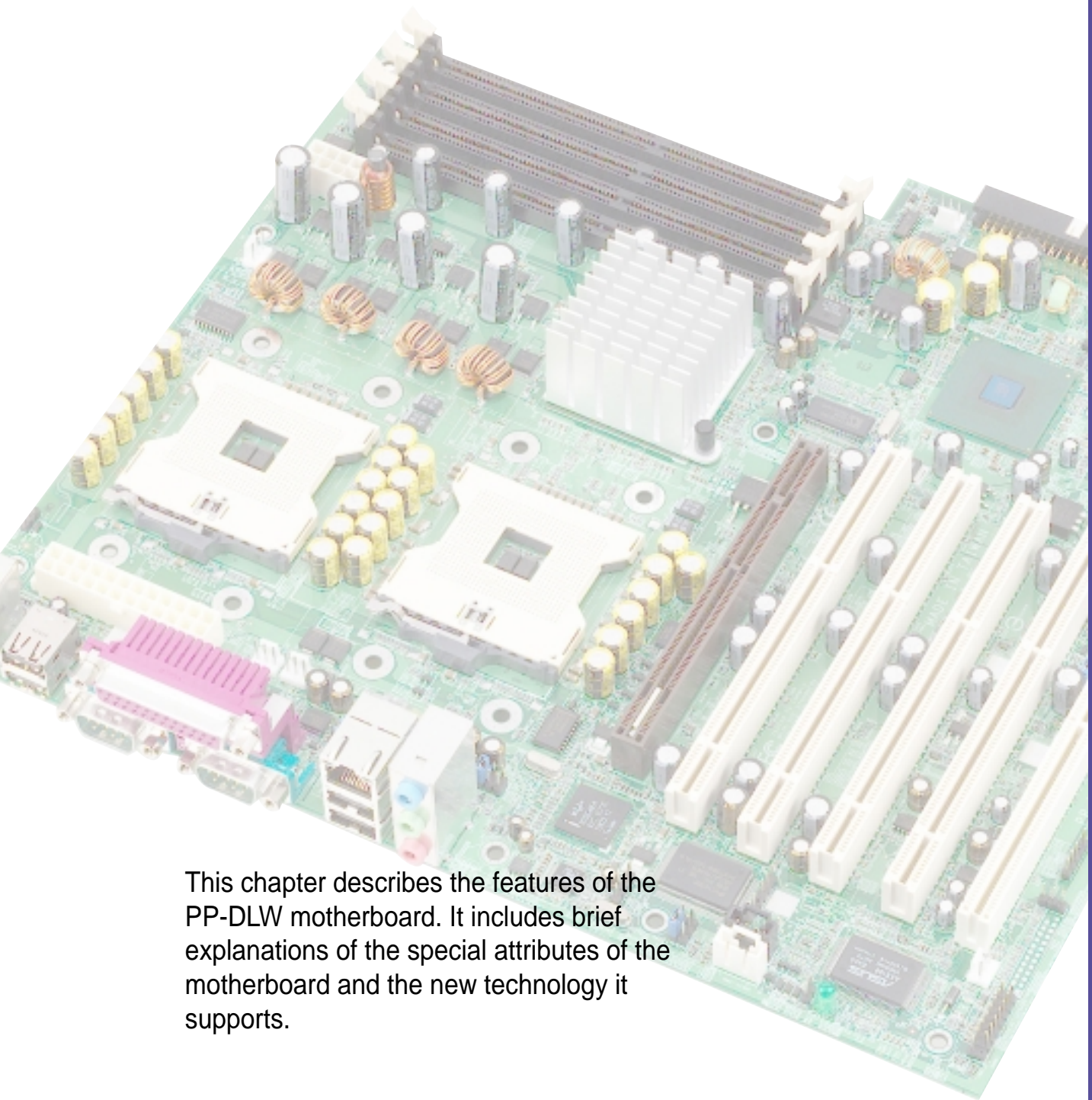
This chapter describes the features of the
PP-DLW motherboard. It includes brief
explanations of the special attributes of the
motherboard and the new technology it
supports.

Product introduction

Chapter summary

1.1   Welcome!

Thank you for buying the ASUS® PP-DLW motherboard!

The ASUS PP-DLW motherboard delivers a host of new features and latest technologies making it another standout in the long line of ASUS quality server/workstation motherboards!

The PP-DLW incorporates dual Intel® Xeon™ processors in 603/604-pin package coupled with the Intel® E7505 chipset to deliver a reliable and high performance dual-processor server platform.

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 PP-DLW package for the following items.

✓ ASUS PP-DLW motherboard
     Extended ATX form factor: 12 in x 10.5 in (30.5 cm x 26.7 cm)

✓ ASUS PP-DLW support CD

✓ I/O shield

✓ 80-conductor ribbon cable for UltraDMA100/66/33 IDE drives

✓ Ribbon cable for a 3.5-inch floppy drive

✓ Bag of extra jumper caps

✓ PP-DLW 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 PP-DLW motherboard supports the Intel® Xeon processor via dual 604-pin surface mount ZIF sockets. The processor features the Intel® NetBurst™ micro-architecture that includes Hyper-Threading technology, a rapid execution engine, a 533/400MHz system bus, and an execution trace cache to offer a significant increase in performance. See page 2-4 for more information.

DDR memory support

Employing the Double Data Rate (DDR) memory technology, the PP-DLW motherboard supports up to 8GB of system memory using PC2100/1600 unbuffered/registered ECC/non-ECC DDR DIMMs. The ultra-fast 266MHz memory bus doubles the speed of the PC133 SDRAM to deliver the required bandwidth for the latest 3D graphics, multimedia, and Internet applications.

Advanced 64-bit PCI-X slots

The 64-bit/133MHz PCI-X slots onboard maximizes I/O bandwidth for the next generation 64-bit PCI-X cards that support 133/100MHz bus. The PCI-X specification 1.0a allows full peer-to-peer transactions between PCI buses and provides options for intelligent I/O and server management cards.

AGP Pro 8x/4X slot

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.

Onboard LAN

The motherboard comes with the Intel® 82540EM Gigabit LAN controller to fully support 10/100/1000BASE-T Gigabit Ethernet Media Access Control (IEEE 802.3 compliant), and provide Physical Layer Transceiver solution for high performance network applications.

Onboard audio

The ADI AD1885 audio CODEC is onboard to provide a 2-channel audio output. This AC'97 audio CODEC provides stereo analog I/O on the motherboard and peripheral devices to deliver high quality audio to PC-connected speakers, headphones, and microphones. The CODEC includes analog-to-digital and digital-to-analog sample rate converters, as power amplifiers and programmable gain blocks.

ATA/100 IDE support

The dual-channel bus master IDE connectors comply with the ATA/100 protocol and supports ATA/100, Multi-Word DMA Mode2, PIO modes 3 & 4 IDE devices such as ATAPI IDE CD-ROM, CD-R/RW, ZIP, and LS-120 drives.

1.3.2   Value-added solutions

Temperature, fan, and voltage monitoring

The CPU temperature is monitored by the ASUS ASIC 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.

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.

Wake-Up support

The motherboard includes Wake-On-LAN, Wake-On-Ring, and BIOS Wake-Up features.

ACPI ready

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

Concurrent PCI

This feature allows multiple PCI transfers from PCI master buses to the memory and processor.

Chassis intrusion detection

With this feature, the chassis intrusion circuitry logs "chassis-open" events into the system BIOS. The onboard battery supports the chassis intrusion detection feature even when the normal power is removed.

Smart BIOS

The 4Mbit firmware gives an easy-to-use interface that provides more control and protection to the motherboard. The BIOS has a boot block write protection and HD/SCSI/MO/ZIP/CD/Floppy boot selection, and is Year 2000 certified.

Compliance

Both the BIOS and the hardware levels of the motherboard meet the stringent requirements for SDG 2.0 certification. The new SDG 2.0 requirements for systems and components are based on the following high-level goals: support for Plug-and-Play compatibility and power management for configuring and managing all system components, 32-bit device drivers, and installation procedures for Windows NT/2000/XP. Color-coded connectors and descriptive icons make identification easy as required by the PC '99 specification.

1.4   Motherboard overview

Before you install the PP-DLW 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 PP-DLW motherboard as pointed out in the picture on page 1-7.

1. ATX power connector
2. 604-pin CPU sockets
3. Intel® E7505 MCH (Placer)
4. 8-pin 12V SSI power connector
5. DDR DIMM sockets
6. AGP Pro 8X slot
7. Intel® P64H2 PCI-X hub
8. IDE connectors
9. Floppy disk connector
10. Intel® ICH4 I/O hub
11. Flash ROM
12. PCI-X slots (PCI-X1 to PCI-X4)
     PCI slot (PCI1)
13. ASUS ASIC
14. Standby power LED
15. LPC Super I/O controller
16. Intel® 82540EM Gigabit LAN
     controller

17. PS/2 mouse port
18. Parallel port
19. RJ-45 port
20. Line In port
21. Line Out port
22. Microphone port
23. USB 2.0 ports 1 and 2
24. Serial ports
25. USB 2.0 ports 3 and 4
26. Keyboard port

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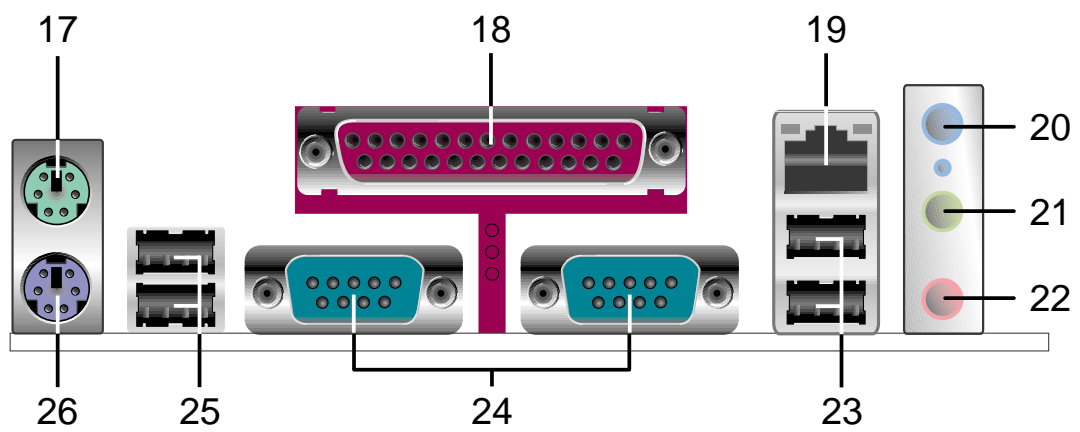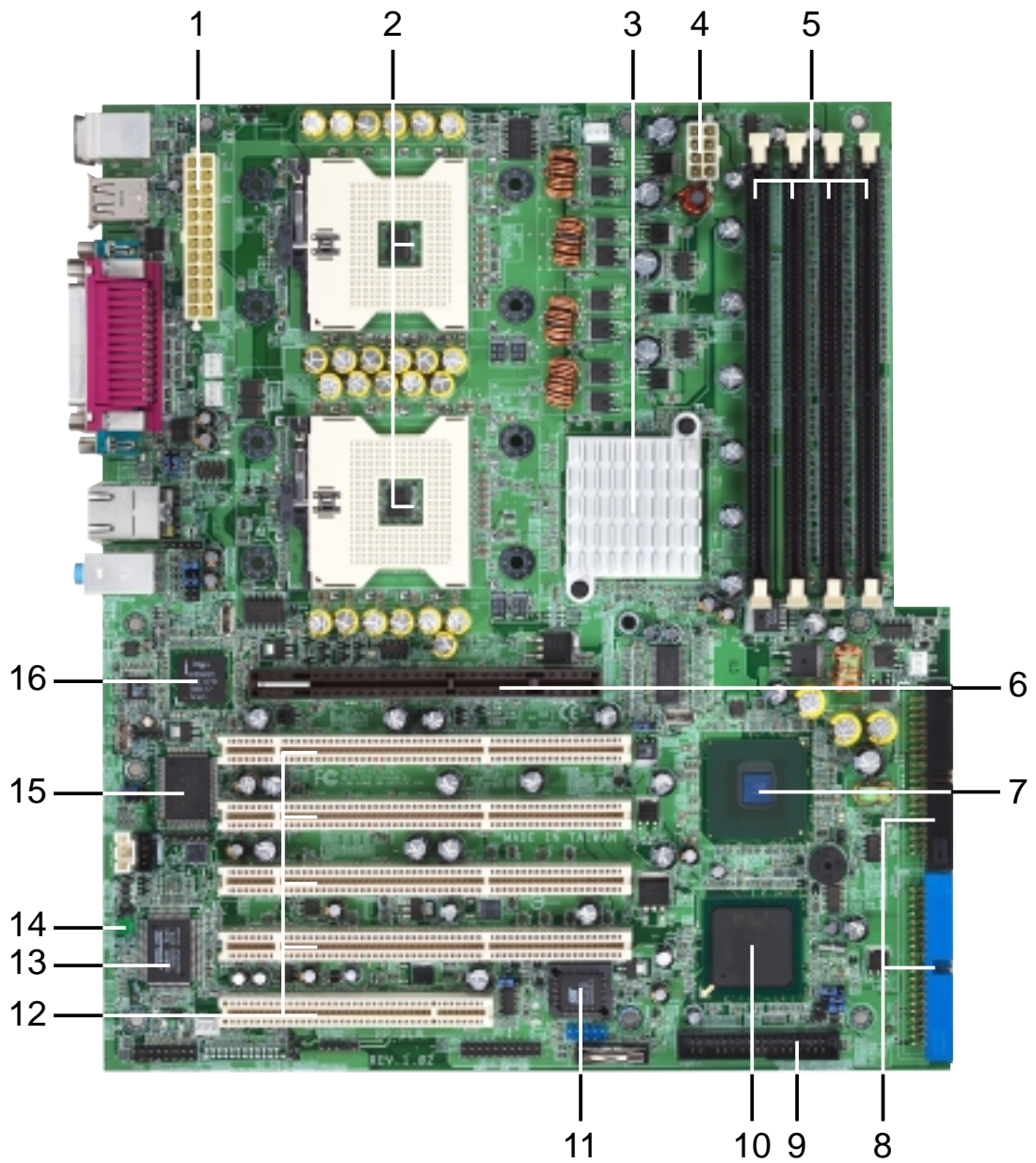
1.4.2 Core specifications

1 **ATX power connector.** This 24/20-pin connector is for an ATX power supply.

2 **604-pin CPU sockets.** A 604-pin surface mount, Zero Insertion Force (ZIF) socket for the Intel® Xeon™ processor with 512KB L2 cache and a 533/400MHz system bus that allows up to 4.2GBps or 3.2GBps data transfer rates. These sockets support Intel Xeon CPUs with Hyper-Threading Technology feature.

3 **Intel E7505 MCH (Placer) .** The E7505 Memory Controller Hub (MCH) is the host bridge of the Placer chipset which is designed for the next generation workstation or high-end desktop platforms. The MCH supports the Intel® Xeon™ processor in dual-processor or uni-processor mode at peak bandwidths of 4.2GBps (533MHz) or 3.2GBps (400MHz). The MCH works with the I/O Controller Hub (ICH4) for the I/O subsystem, provides AGP 8x/4x interface (compliant to AGP 3.0 specification), and supports dual-channel DDR SDRAM interface for up to 8GB system memory.

4 **8-pin 12V SSI power connector.** This 8-pin connector is for an ATX power supply.

5 **DDR DIMM sockets.** These four 184-pin DIMM sockets support up to 8GB system memory using unbuffered/registered ECC/non-ECC PC2100/1600 DDR DIMMs.

6 **AGP Pro 8X slot.** This Accelerated Graphics (AGP) Pro slot supports 1.5V AGP 8X mode graphic cards to deliver up to 2.1GB/s bandwidth.

7 **Intel® P64H2 PCI-X hub.** The P64H2 is PCI/PCI-X 64-bit Hub 2 that provides high-performance I/O capability including 16-bit Hub Interface 2.0 connection to MCH, and two independent 64-bit PCI/PCI-X interfaces.

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

9 **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.

10 **Intel® ICH4 I/O hub.** The I/O Controller Hub 4 (ICH4) component contains the primary PCI interface, LPC interface, USB 2.0, ATA-100, and other legacy functions. The ICH4 communicates with the MCH via the proprietary interconnect Hub Interface (HI1.5).

11 **Flash ROM.** This 4Mb firmware hub contains the programmable BIOS program.

12 **PCI-X/PCI slots.** One 64-bit/133MHz PCI-X slots, three 64-bit/100MHz PCI slot, and a 32-bit/33MHz PCI expansion slot support bus master PCI-X/PCI cards.

13 **ASUS ASIC.** This chip performs multiple system functions that include hardware and system voltage monitoring, IRQ routing, among others.

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

15 **LPC super I/O controller.** This Low Pin Count (LPC) interface provides the commonly used Super I/O functionality. The chipset supports UART compatible serial ports, one parallel port with EPP and ECP capabilities, a floppy drive, and PS/2 keyboard and mouse.

16 **Intel® 82540EM Gigabit LAN controller.** This LAN controller is a single-chip solution for LAN on Motherboard (LOM) and Network Interface Card (NIC) applications. The chipset provides a 32-bit interface and supports 10/100/1000 Mbps data transfer rates.

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

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

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

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

21 **Line Out port.** This Line Out (lime) port connects a headphone or a speaker.

22 **Microphone port.** This Mic (pink) port connects a microphone.

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

24   **Serial ports.** These 9-pin COM1/COM2 ports are for pointing devices or other serial devices.

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

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

Chapter 2
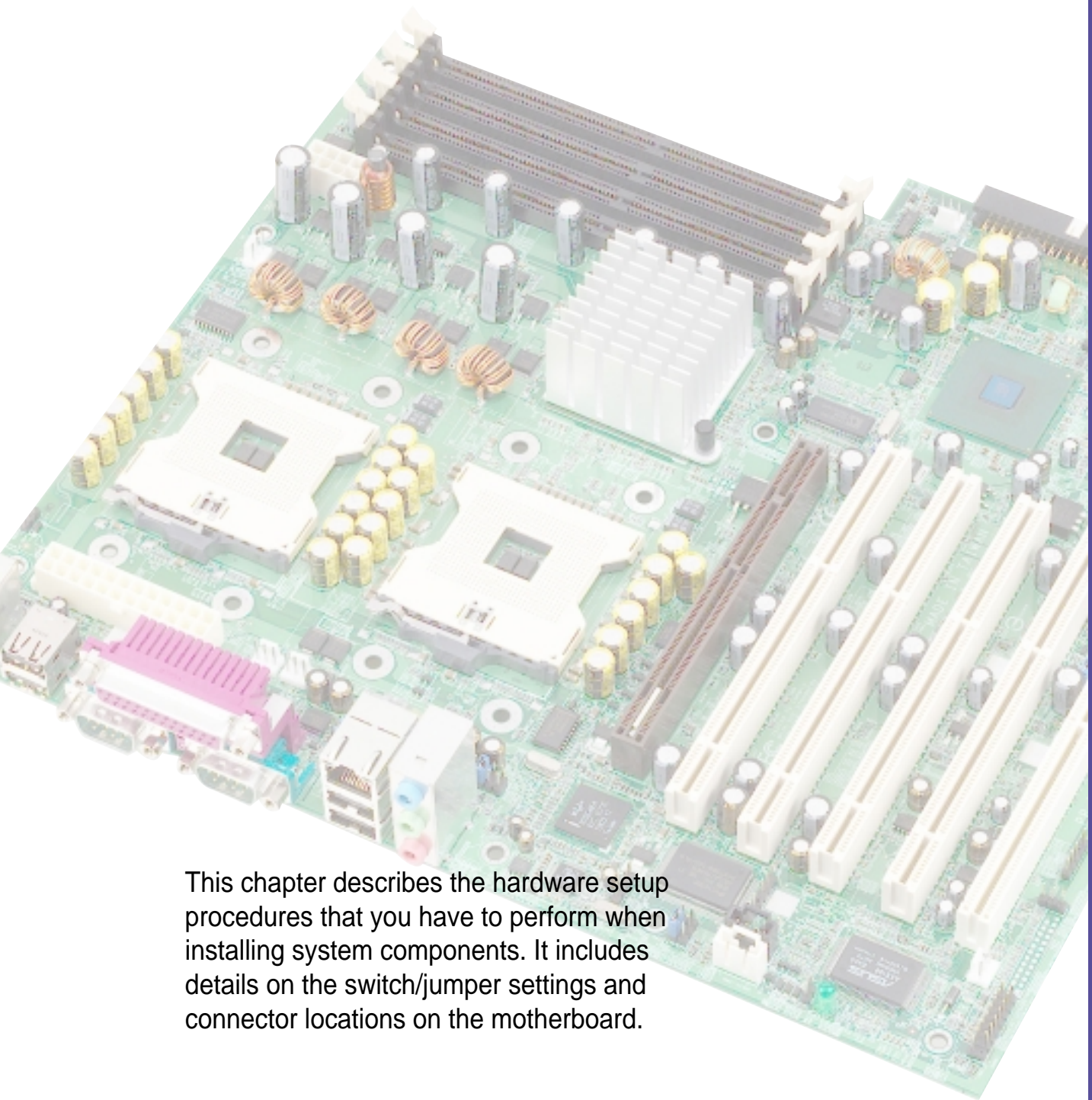
This chapter describes the hardware setup procedures that you have to perform when installing system components. It includes details on the switch/jumper settings and connector locations on the motherboard.

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 PP-DLW uses the extended ATX form factor that measures 12 in x 10.5 in (30.5 cm x 26.7 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 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)

J1

FAN1

CON12V

PS/2KBMS
T: Mouse
B: Keyboard

USB2.0
T: USB3
B: USB4

COM1

ATX_POWER

mPGA 604

PARALLEL PORT

FAN3
FAN2

COM2

J28
J29

Bottom:
USB1
USB2

Top:
RJ-45

mPGA 604

Intel
E7505
MCH
(Placer)

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)

30.5cm (12in)

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

J5

Audio
Codec

Intel
82540EM
Gigabit
Ethernet

Accelerated Graphics Port (AGPPRO)

FAN4

J12

PCI-X1 (64-bit, 100MHz 3V)

P64H2
PCI-X
Bridge
Hub

Secondary IDE

C-Media
CMI8738 6CH
Audio Controller

AUDIO_COM2

J14

PCI-X2 (64-bit, 100MHz 3V)

J16

AUDIO_COM1

PCI-X3 (64-bit, 100MHz 3V)

BUZZ1

J18

LED4

ASUS
ASIC
with Hardware
Monitor

PCI-X4 (64-bit, 133MHz 3V)

Intel I/O
Controller
Hub
(ICH4)

Primary IDE

J20

PCI1 (32-bit, 33MHz 5V)

4Mbit
Flash
BIOS

J21
J22
J23
J24

FAN5

GAME1

J26

J33

J31

J25

BATTERY1

FLOPPY

PP-DLW

26.7cm (10.5in)

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

2-2

Chapter 2: Hardware information

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 standby power LED (LED4) 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.

LED4

PP-DLW Onboard LED

ON
Standby
Power

OFF
Powered
Off
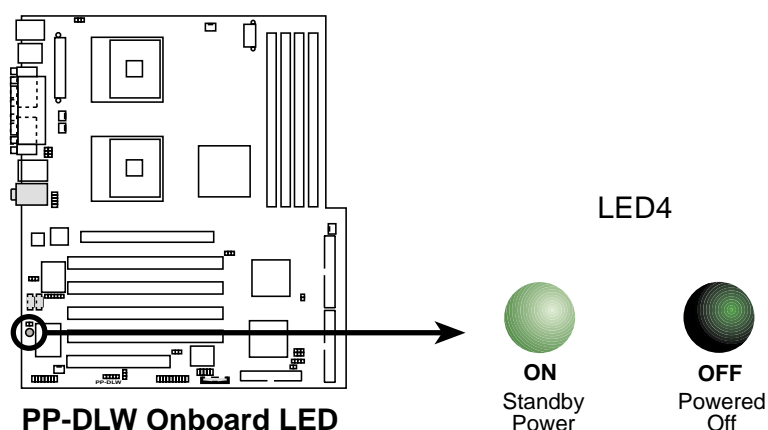
2.4 Central Processing Unit (CPU)

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 603/604-pin package with 512KB L2 cache. The processor includes the Intel® NetBurst™ micro-architecture that features Hyper-Threading Technology, rapid execution engine, 533/400MHz 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 4.2GBps/3.2GBps.

Xeon™ Processor

Gold Mark →

PP-DLW Socket 604
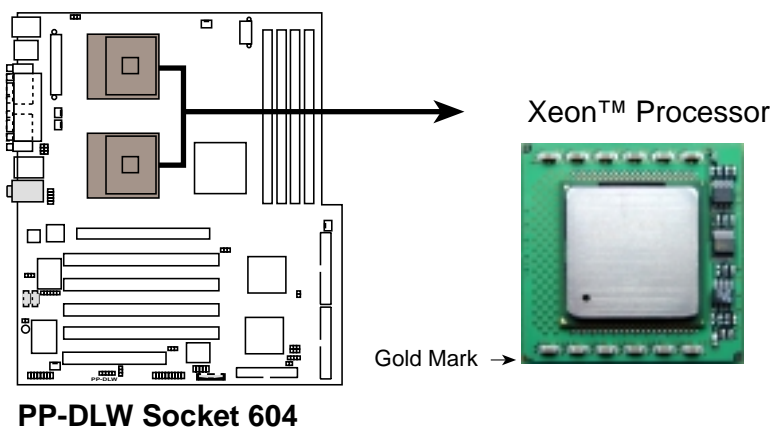
Note in the illustration that the CPU has a gold triangular mark on one corner. This mark indicates the processor Pin 1 that should match a specific corner of the CPU socket.

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

> The motherboard supports either one or two CPUs. If you are installing only one CPU, you MUST install it in CPU socket 1.

CPU Socket 1
(outer socket)

CPU Socket 2
(inner socket)
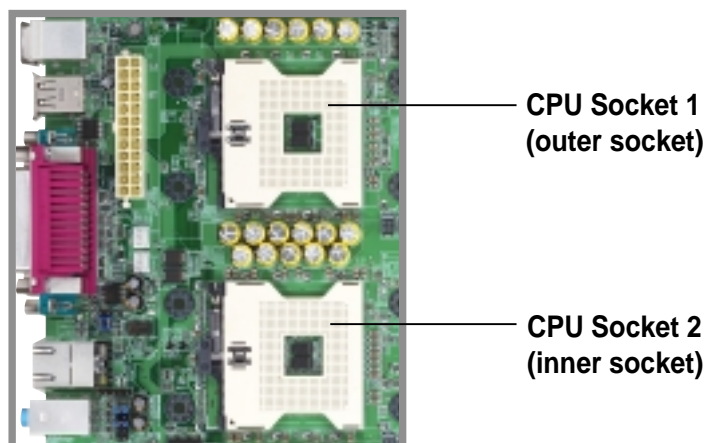
2.4.2 Installing the CPU

If you are installing two CPUs, it is more convenient to install in CPU socket 2 first.

Follow these steps to install a CPU.

1. Locate the 604-pin ZIF sockets on the motherboard. Unlock the socket by pressing the lever sideways, then lift it up to at least 115° angle.

    Make sure that the socket lever is lifted up to at least 115° angle, otherwise the CPU does not fit in completely.
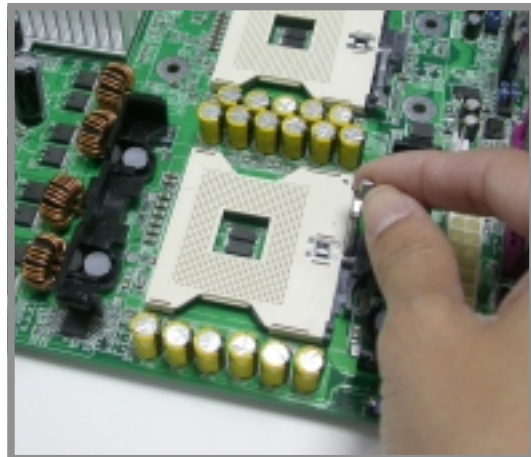
2. Position the CPU above the socket as shown.

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!

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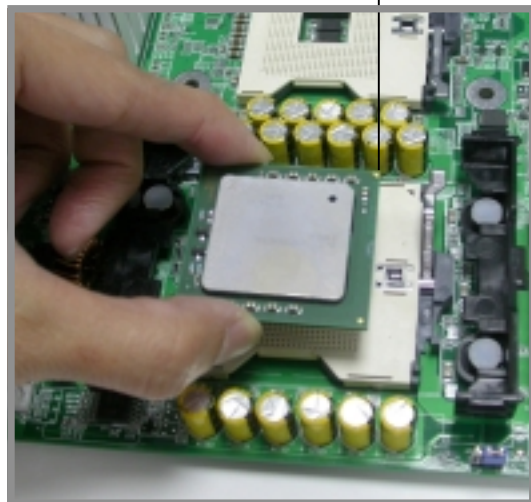
4. When the CPU is in place, push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

2.4.3 Installing the CPU heatsink and fan

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

Follow these steps to install the CPU heatsink and fan.

1. Place the heatsink and fan assembly on top of the installed CPU, making sure that it fits in place.

2. Hook one end of the retention bracket into the protruding tab on the corner of the plastic retention base. (The retention base comes installed with the motherboard.)

3. Use a small flat screw driver to attach the other end of the bracket, while firmly holding down the heatsink and fan assembly. The middle hook of the bracket snaps in place if you properly attached the two ends.
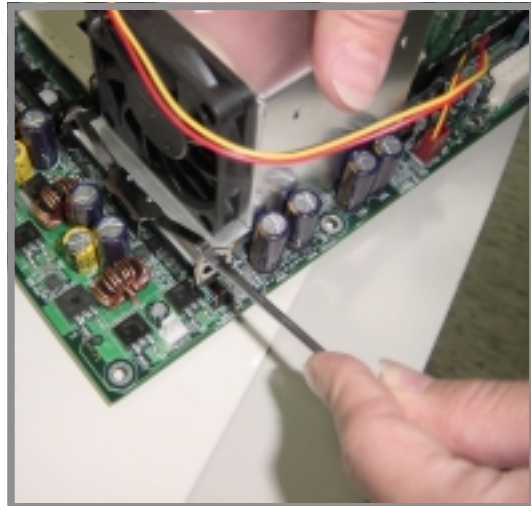
4. As shown, the middle hook of the bracket snaps in place if you properly attached the two ends.

5. Do steps 2 to 4 to install the other bracket.

6. When the heatsink and fan assembly is in place, connect the fan cable to the fan connector on the motherboard labeled FAN2 (for the CPU on socket 1) and FAN3 (for the CPU on socket 2).

Don't forget to connect the CPU fan cable. Hardware monitoring problems may occur if you fail to plug the 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 8GB system memory using 184-pin unbuffered/registered ECC/non-ECC PC2100/1600 DIMMs with Serial Presence Detect (SPD).
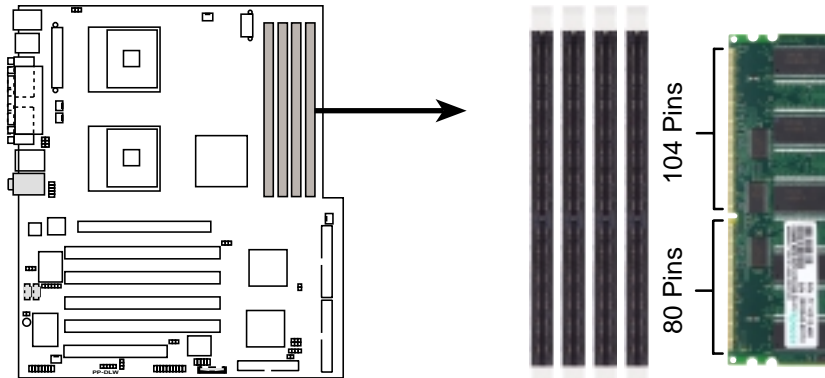
PP-DLW 184-Pin DDR DIMM Sockets

> 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.

The DDR SDRAM technology evolved from the mainstream PC66, PC100, PC133 memory known as Single Data Rate (SDR) SDRAM. DDR memory however, has the ability to perform two data operations in one clock cycle, thus providing twice the throughput of SDR memory. For example, a 200MHz DDR DIMM will support a 100MHz memory bus, and a 266MHz DDR DIMM will support a 133MHz memory bus.

DDR Data Transfer Rate		DDR Base Frequency
266MHz	➡	133MHz
200MHz	➡	100MHz

A DDR DIMM has the same physical dimensions as an SDR DIMM, but it has a 184-pin footprint compared to the 168-pin of the SDR DIMM. Also, a DDR DIMM is single notched while an SDR DIMM is double notched. Therefore, a DDR DIMM is not backward compatible with SDR, and should be installed only in a socket specially designed for DDR DIMMs.

2.5.2 Memory Configurations

You may install 64MB, 128MB, 256MB, 512MB, 1GB, or 2GB Double Data Rate (DDR) DIMMs into the four DIMM sockets using the memory configurations presented in this section.

Important notes on memory configurations

1. Installing DDR DIMMs other than the recommended configurations may cause memory sizing error or system boot failure. See Table 1 for the recommended configurations.

2. Install only **identical** (the same type and size) DDR DIMM pairs using the recommended configurations.

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

4. DO NOT mix unbuffered and registered DIMMs in any configuration.

Table 1   Recommended memory configurations

Mode		Sockets			
		DDR1	DDR2	DDR3	DDR4
Single-channel	(1)	Module A	—	—	—
	(2)	—	—	Module A	—
	(3)	Module A	—	Module A	—
	(4)	Module A	—	Module B	—
Dual-channel	(1)	Module A	Module A	—	—
	(2)	—	—	Module A	Module A
	(3)	Module A	Module A	Module A	Module A
	(4)	Module A	Module A	Module B	Module B

Table 2   Memory frequency/CPU FSB synchronization

CPU FSB	DDR DIMM Type	Memory Frequency
533 MHz	PC2100	266 MHz
400 MHz	PC1600	200 MHz

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.

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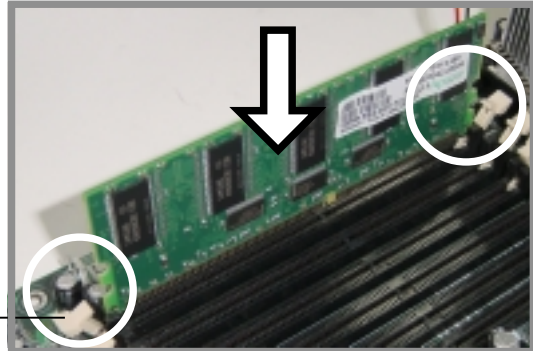
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.

Locked Retaining Clip
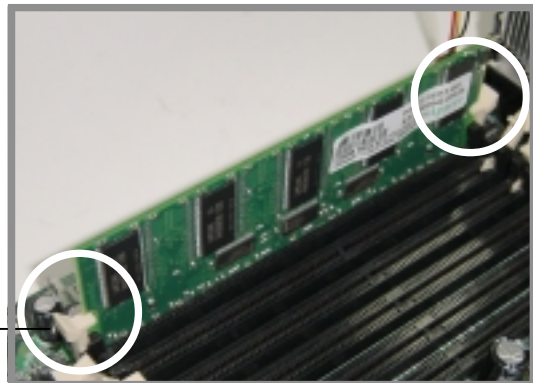
2.5.4 Removing a DIMM

Follow these steps to remove a DIMM.

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

2. Remove the DIMM from the socket.

> ⚠️ Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.
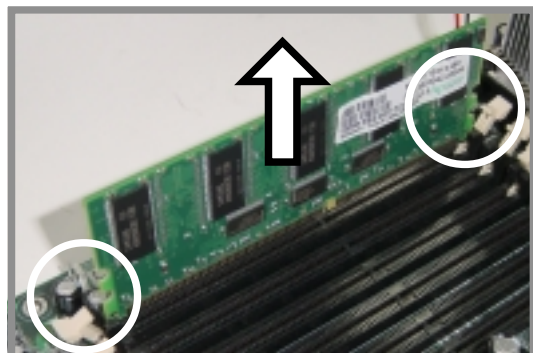
2.6 Expansion slots

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

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

2.6.1 Installing an expansion card

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

	PCI INTA	PCI INTB	PCI INTC	PCI INTD
PCI-X slot 1	PBIRQ0	PBIRQ1	PBIRQ2	PBIRQ3
PCI-X slot 2	PBIRQ4	PBIRQ5	PBIRQ6	PBIRQ7
PCI-X slot 3	PBIRQ8	PBIRQ9	PBIRQ10	PBIRQ11
PCI-X slot 4	PAIRQ0	PAIRQ1	PAIRQ2	PAIRQ3
PCI slot 1	PIRQF	PIRQG	PIRQH	PIRQE
AGP Pro slot	PIRQA	PIRQB	—	—
Onboard 82540EM controller	PIRQD	—	—	—

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

This motherboard implements the PCI-X (Peripheral Component Interconnect Extended) bus technology to support up to 133MHz data transfers, or about 1.06GB/s. This bus technology is primarily designed for servers to increase the performance of high bandwidth devices such as Ultra320 SCSI. PCI-X is backward compatible with the earlier PCI bus technology making it possible to install PCI and PCI-X cards at the same time, but the bus speed will be that of the slowest card.

The following figure shows the four 64-bit PCI-X slots and the 32-bit PCI slot on the motherboard.

PCI-X1 (66/100MHz, 3.3V)

PCI-X2 (66/100MHz, 3.3V)

PCI-X3 (66/100MHz, 3.3V)

PCI-X4 (133MHz, 3.3V)

PCI 1 (33MHz, 5V)
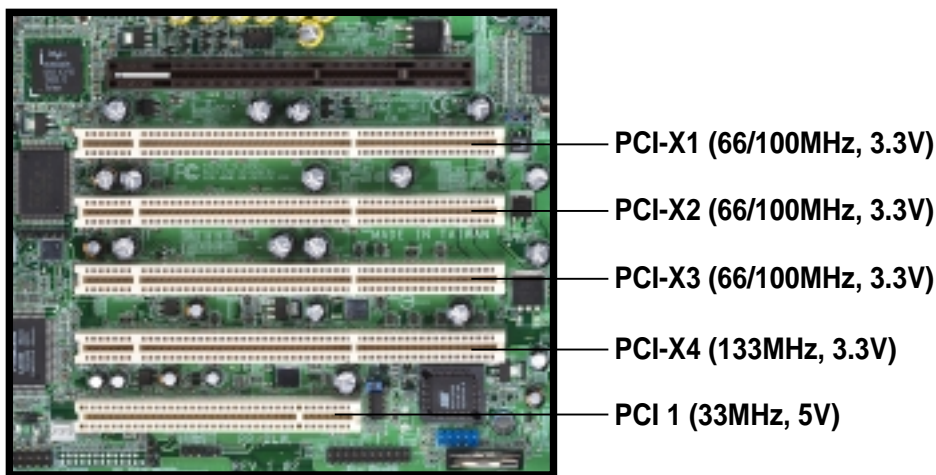
2.6.4 AGP Pro 8x slot

This motherboard has an Accelerated Graphics Port (AGP) Pro slot that supports AGP cards. Note the notches on the card golden fingers to ensure that they fit the AGP slot on your motherboard.

> ⚠ The AGP PRO slot comes with a warning label and a safety tab. Remove the label and tab ONLY if you are installing an AGP PRO card. Use a pointed object, such as a pen tip, to dislodge the tab.

Keyed for 1.5V
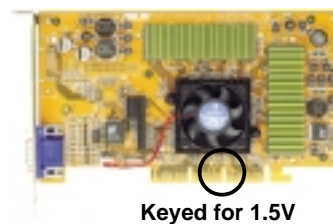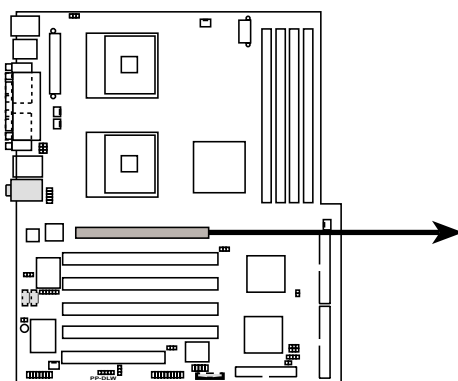
PP-DLW Accelerated Graphics Port (AGP)

2.7   Jumpers

 Keep the default settings for stable system operation.

1.   JumperFree™ setting (J22)

This jumper allows you to enable or disable the JumperFree™ mode.

J22

1 2   2 3

Jumper Mode   Jumper Free
(Default)

PP-DLW JumperFree™ Mode Setting
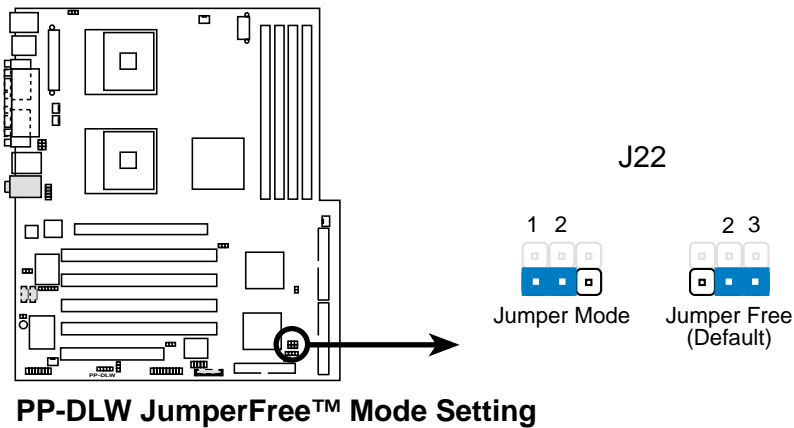
2.   CPU external frequency selection (J12)

This jumper allows you to select your desired CPU external frequency (or bus clock).

J12

1 2   2 3   1 2 3

CPU select   100MHz   133MHz
(Default)

PP-DLW CPU External Frequency Selection
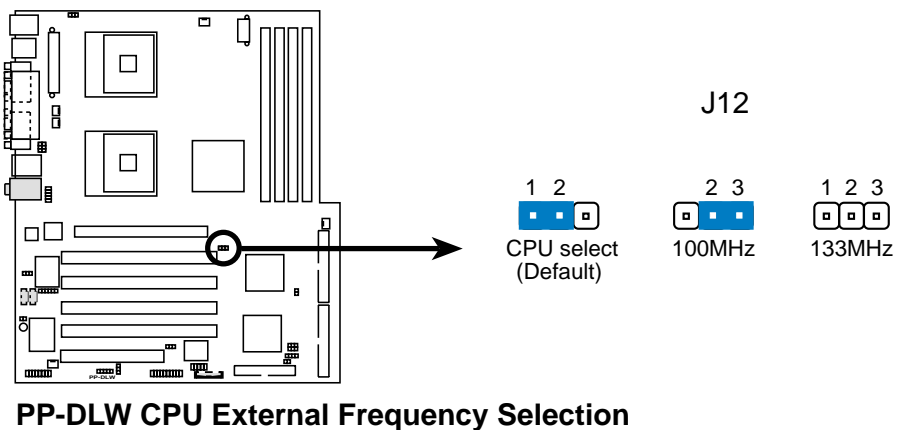
3. Gigabit LAN setting (J14)

Set this jumper to pins 1-2 to enable the onboard Gigabit LAN controller and support 10/100/1000BASE-T networking.

J14

1 2   2 3

Enable   Disable
(Default)

PP-DLW LAN Setting
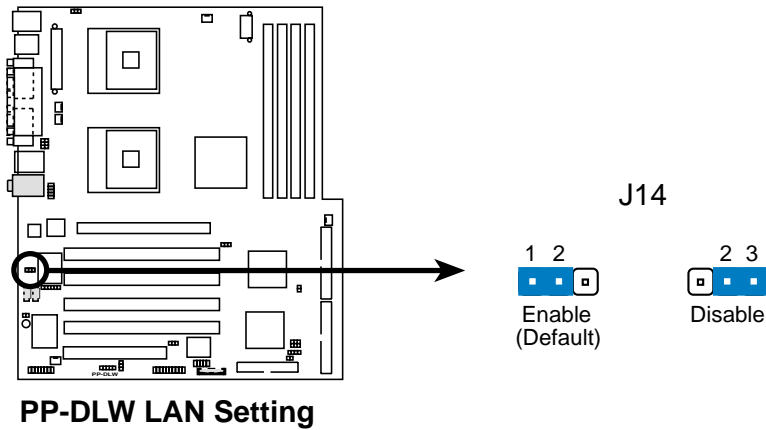
4. PCI-X slot setting (J15)

This jumper allows you to select your desired bus speed for PCI-X1 to PCI-X3 slots.

J33

1   2
2   3

PCI-X   PCI-X
100MHz   66MHz
(Default)

PP-DLW PCI Slot Setting
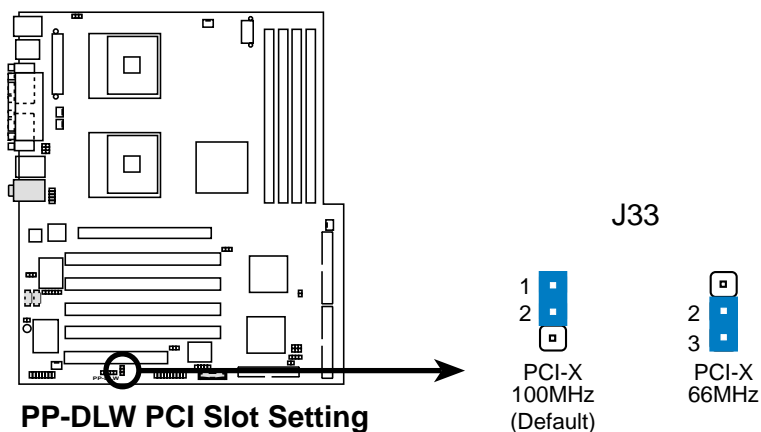
5. Keyboard power (3-pin J1)

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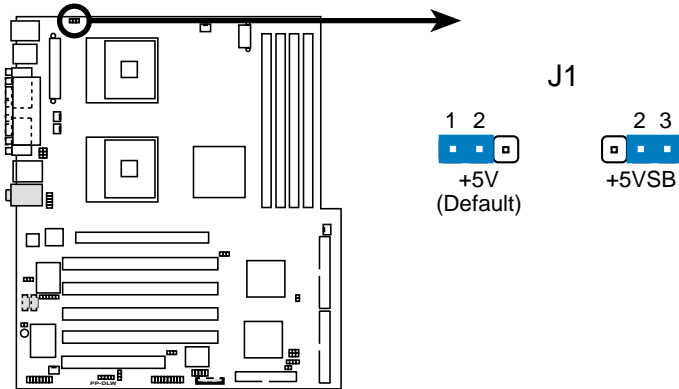
PP-DLW Keyboard Power Setting

6. USB device wake-up (J28, J29, J20)

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

The J28 and the J29 jumpers are for the rear USB ports. The J20 is for the internal USB header that you can connect to the front USB ports.
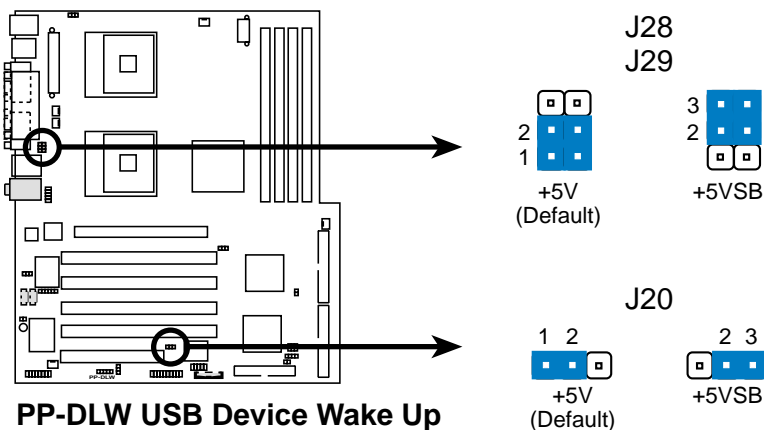
PP-DLW USB Device Wake Up

7. Clear RTC RAM (J21)

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!

J21

1 2   2 3

Normal   Clear CMOS
(Default)

PP-DLW Clear RTC RAM
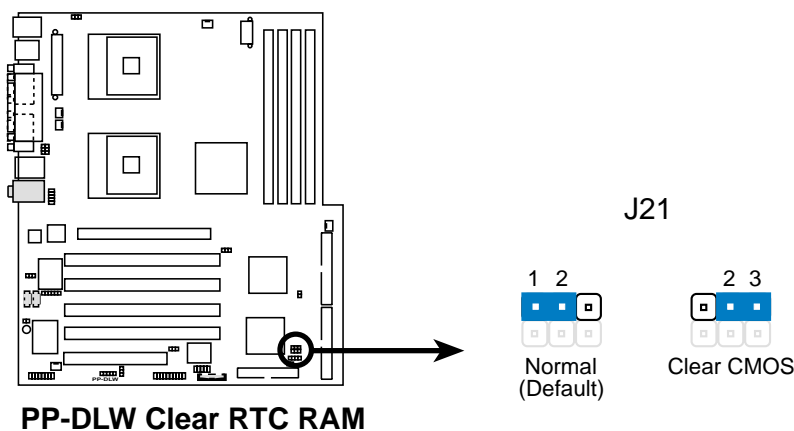
2.8   Connectors

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. Hard disk activity LED (2-pin J24)

This connector supplies power to the hard disk activity LED. The read or write activities of any device connected to the primary or secondary IDE connector cause this LED to light up.
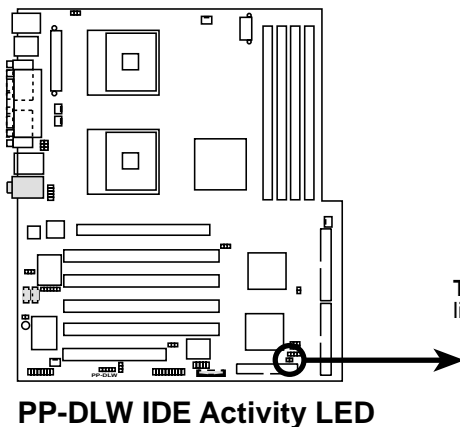
J24

\+ -

TIP: If the case-mounted LED does not light, try reversing the 2-pin plug.

PP-DLW IDE Activity LED

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

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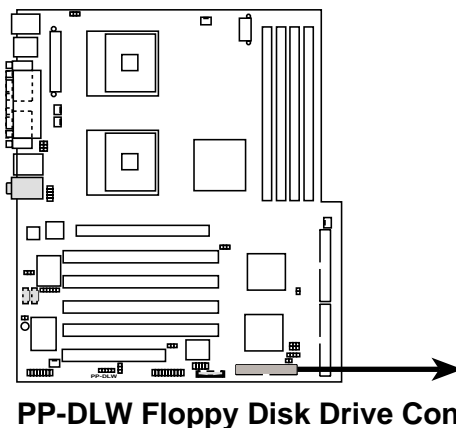
NOTE: Orient the red markings on the floppy ribbon cable to PIN 1.

PIN 1

PP-DLW Floppy Disk Drive Connector
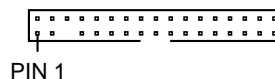
3. IDE connectors (40-1 pin IDE1, IDE2)

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. If you have more than two UltraDMA/100/66 devices, purchase another UltraDMA/100/66 cable. You may configure two hard disks to be both master devices with two ribbon cables – one for the primary IDE connector and another for the secondary IDE connector.

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.

PIN 1

PIN 1

Secondary IDE Connector

Primary IDE Connector

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

PP-DLW IDE Connectors
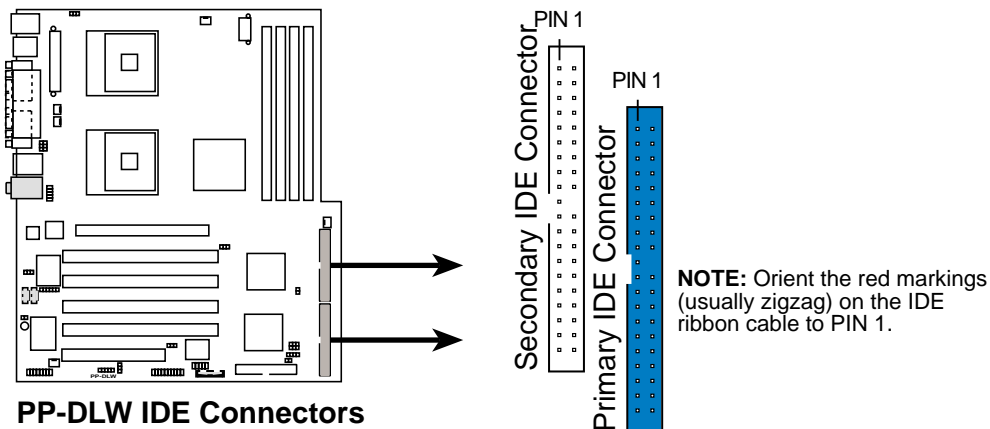
For UltraDMA/100/66 IDE devices, use an 80-conductor IDE cable. The UltraDMA/66 cable included in the motherboard package also supports UltraDMA/100.

4. Chassis alarm lead (4-1 pin J23)

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.
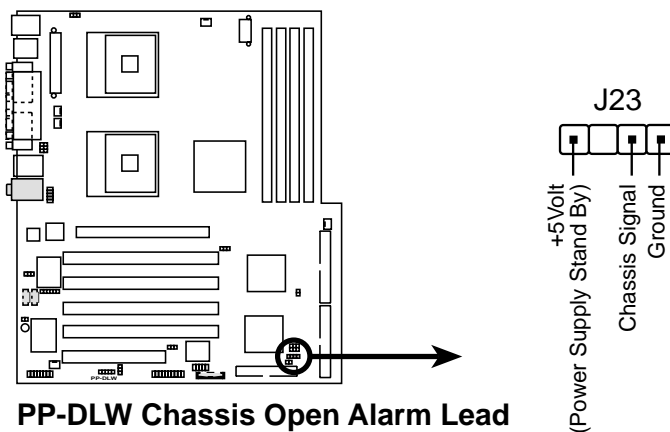
PP-DLW Chassis Open Alarm Lead

J23

(Power Supply Stand By)
+5Volt
Chassis Signal
Ground

5. SMBus connector (6-1 pin J16)

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. SMBus is a specific implementation of an I^2C bus, a multi-device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

PP-DLW SMBus Connector

J16

1

FLOATING
SMBCLK
Ground
SMBDATA
+5V
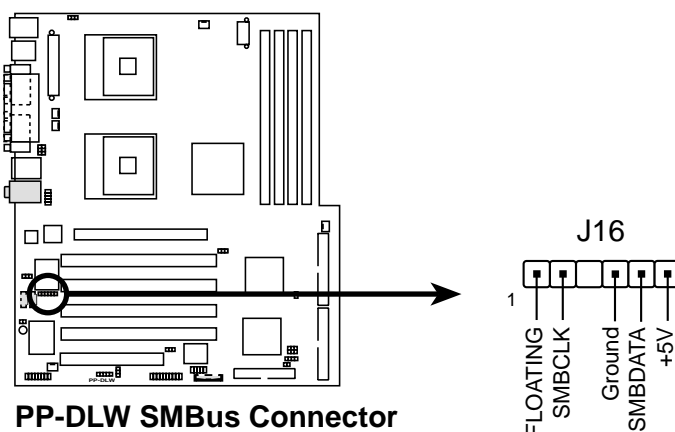
6. ATX power connectors (24/20-pin EATXPWR, 8-pin CON12V)

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 24/20-pin EATXPWR connector, this motherboard requires that you connect the 8-pin +12V power plug to the CON12V connector to provide sufficient power to the CPU.

> Make sure that your ATX 12V power supply can provide 20A on the +12V lead and at least 1A on the +5-volt standby lead (+5VSB). The minimum recommended wattage is 300W for a fully configured system. The system may become unstable and may experience difficulty powering up if the power supply 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

GND	12V
GND	12V
GND	12V
GND	12V

PP-DLW ATX Power Connector
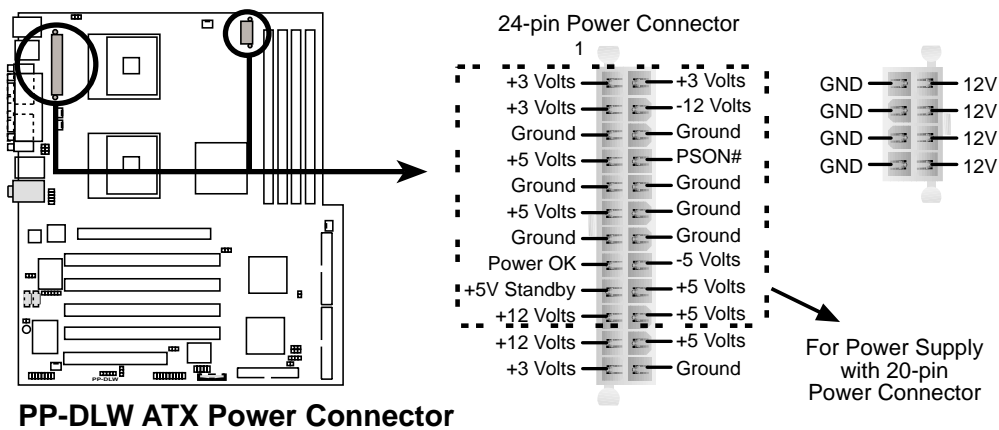
For Power Supply with 20-pin Power Connector

8-pin

7. Front panel audio connector (10-1 pin J5)

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

J5

BOUT_L	LOUT_L
	NC
BOUT_R	LOUT_R
+5VA	MICPWR
AGND_A	MIC2

1
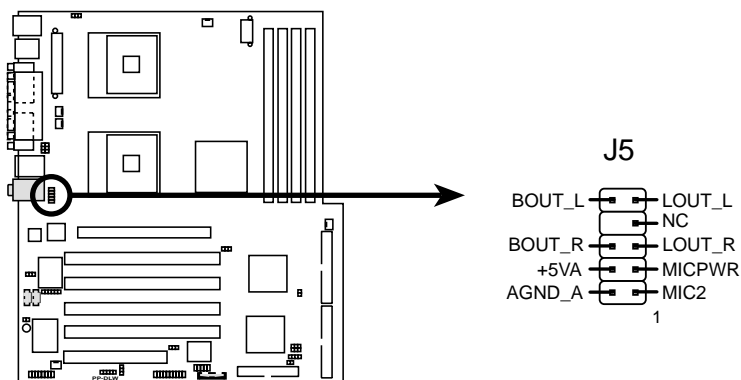
PP-DLW Intel Panel Connector

8. CPU, Chassis, and Power Fan Connectors (3-pin FAN1, FAN2, FAN3, FAN4, FAN5)

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!

FAN1
Rotation
+12V
GND

FAN3
Rotation
+12V
GND

FAN2
Rotation
+12V
GND

FAN4
GND
+12V
Rotation

FAN5
Rotation
+12V
GND

PP-DLW 12-Volt Cooling Fan Power
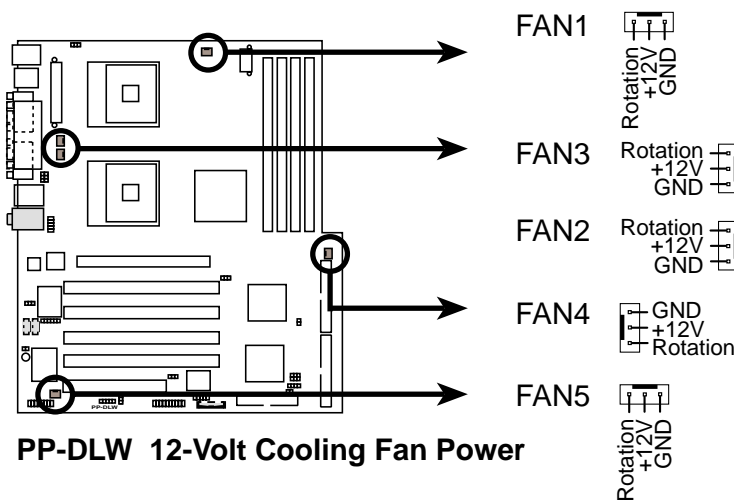
9. GAME/MIDI connector (16-1 pin GAME1)

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

> The GAME/MIDI module is separately purchased.

GAME1

8 +5V
J1B2
J1CY
GND
GND
J1CX
J1B1
+5V 1

16 MIDI_IN
J2B2
J2CY
J2CX
MIDI_OUT
J2B1
+5V 9

PP-DLW Game Connector
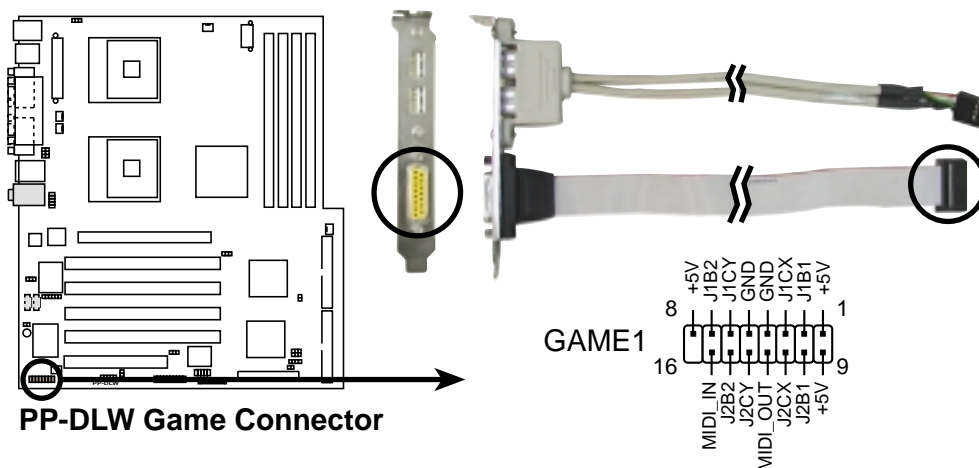
10. USB header (10-1 pin J25)

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

You may purchase a USB module to connect to the USB header.

PP-DLW USB 2.0 Header

J25
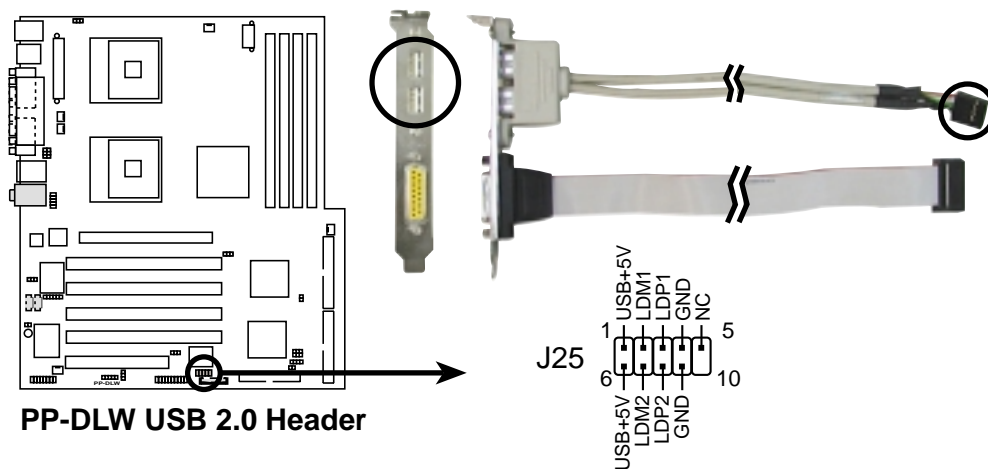
11. Infrared module connector (5-pin J26)

This connector supports an optional wireless transmitting and receiving infrared module. This module mounts to a small opening on system chassis that support this feature. You must also configure the **UART2 Use As** parameter in BIOS to set UART2 for use with IR.

Use the five pins as shown in Back View and connect a ribbon cable from the module to the motherboard SIR connector according to the pin definitions.
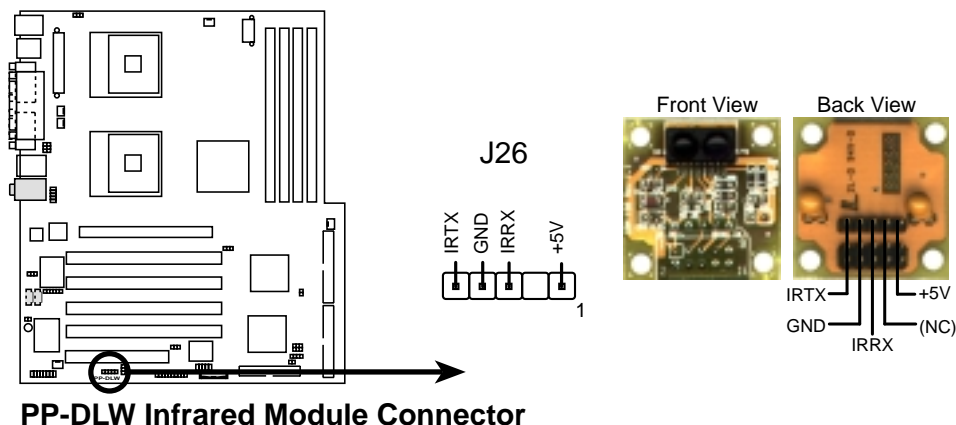
J26

Front View   Back View

IRTX ———— +5V
GND ———— (NC)
IRRX

PP-DLW Infrared Module Connector

12. SMBus connector (6-1 pin J16)

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. SMBus is a specific implementation of an I^2C bus, a multi-device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

PP-DLW SMBus Connector

J16

FLOATING SMBCLK Ground SMBDATA +5V
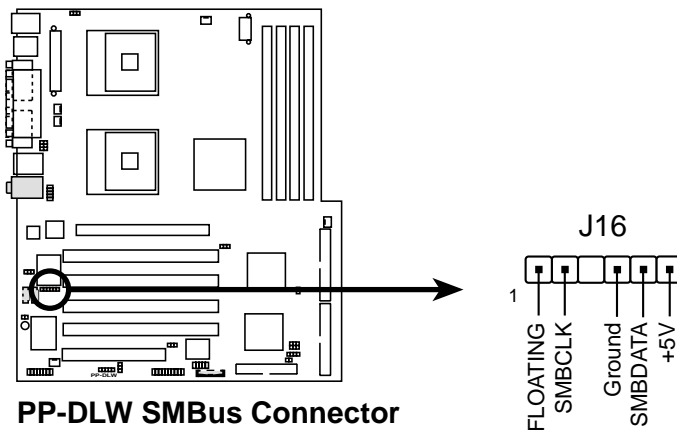
13. Internal audio connectors (4-pin AUDIO_COM1, AUDIO_COM2)

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.

AUDIO_COM2 (White)   AUDIO_COM1 (Black)

Left Audio Channel
Ground
Ground
Right Audio Channel

PP-DLW Internal Audio Connectors
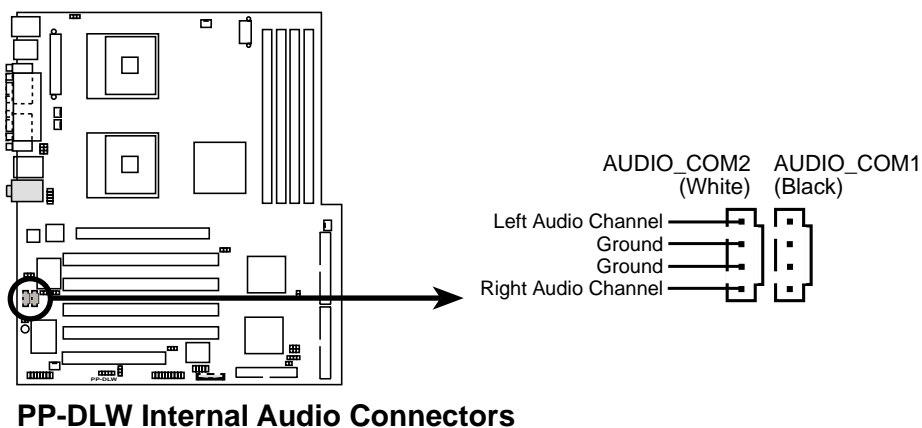
14. Wake-On-Ring Connector (2-pin J18)

This connector connects to internal modem cards with a Wake-On-Ring output. The connector wakes up the system when a ringup packet or signal is received through the internal modem card.

For external modems, Wake-On-Ring is detected through the COM port.

J18

Ground   Ring#

1   2

PP-DLW Wake-On-Ring Connector
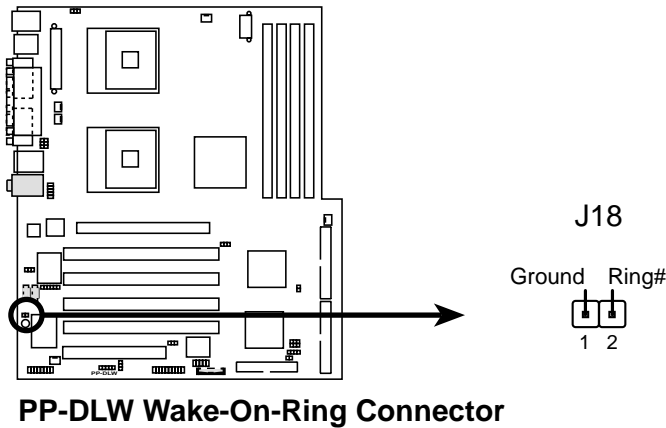
15. System panel connector (20-pin PANEL)

This connector accommodates several system front panel functions.

Keylock

Power LED

Speaker Connector

+5VSB
PLED
Keylock
Ground

+5V
Ground
Ground
Speaker

+5 V
MLED
ExtSMI#
Ground

PWR
Ground
Reset
Ground

Message LED

SMI Lead

Reset SW

ATX Power Switch*

* Requires an ATX power supply.

PP-DLW System Panel Connectors
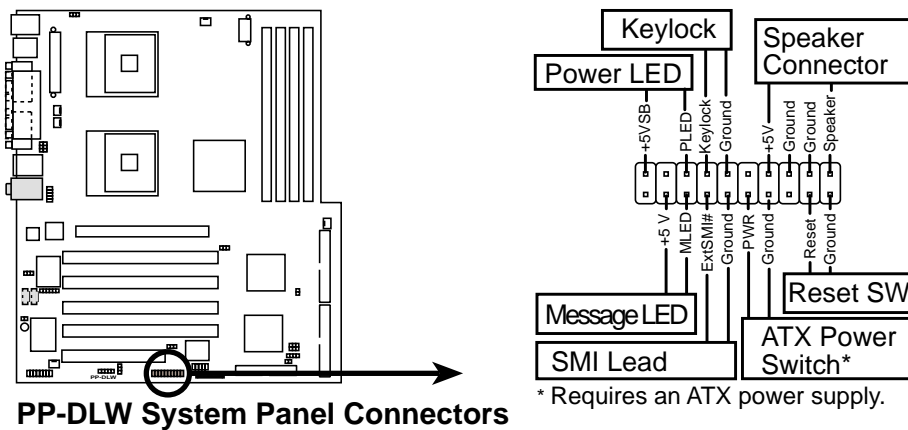
- **System Power LED Lead (3-1 pin PLED)**

  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.

- **System Message LED Lead (2-pin MLED)**

  This 2-pin connector is for the system message LED that indicates receipt of messages from a fax/modem. The normal status for this LED is OFF, when there is no incoming data signal. The LED blinks when data is received. The system message LED feature requires an ACPI OS and driver support.

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

  This 4-pin connector is for a chassis-mounted speaker.

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

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

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

  This lead connects to the case-mounted suspend switch, and allows you to manually place the system into "Suspend Mode" or "Green Mode" where system activity is decreased to save electricity and expand the life of system components.

- **Keylock Lead (2-pin KEYLOCK)**

  This lead connects to a chassis-mounted switch to allow use of the keyboard lock feature.
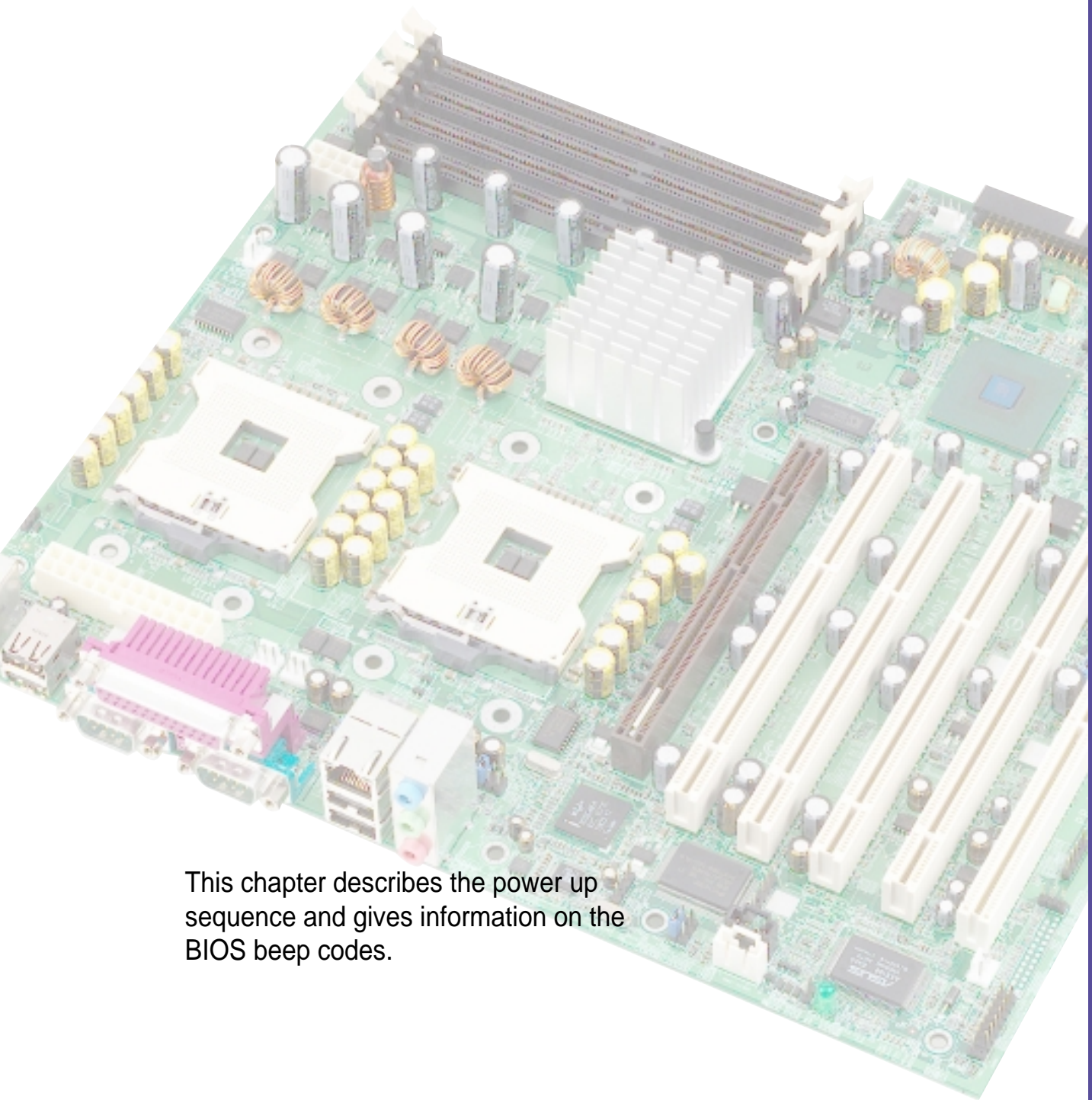
This chapter describes the power up
sequence and gives information on the
BIOS beep codes.

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 (if you are using an ATX power supply, you need to switch on the power supply as well as press the ATX power switch on the front of the chassis).

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 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.

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

3.2   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. If you use Windows 2000/XP, click the Start button, click Shut Down, then click the OK button to shut down the computer. The power supply should turn off after Windows shuts down.

> The message "You can now safely turn off your computer" does not appear when shutting down with ATX power supplies.
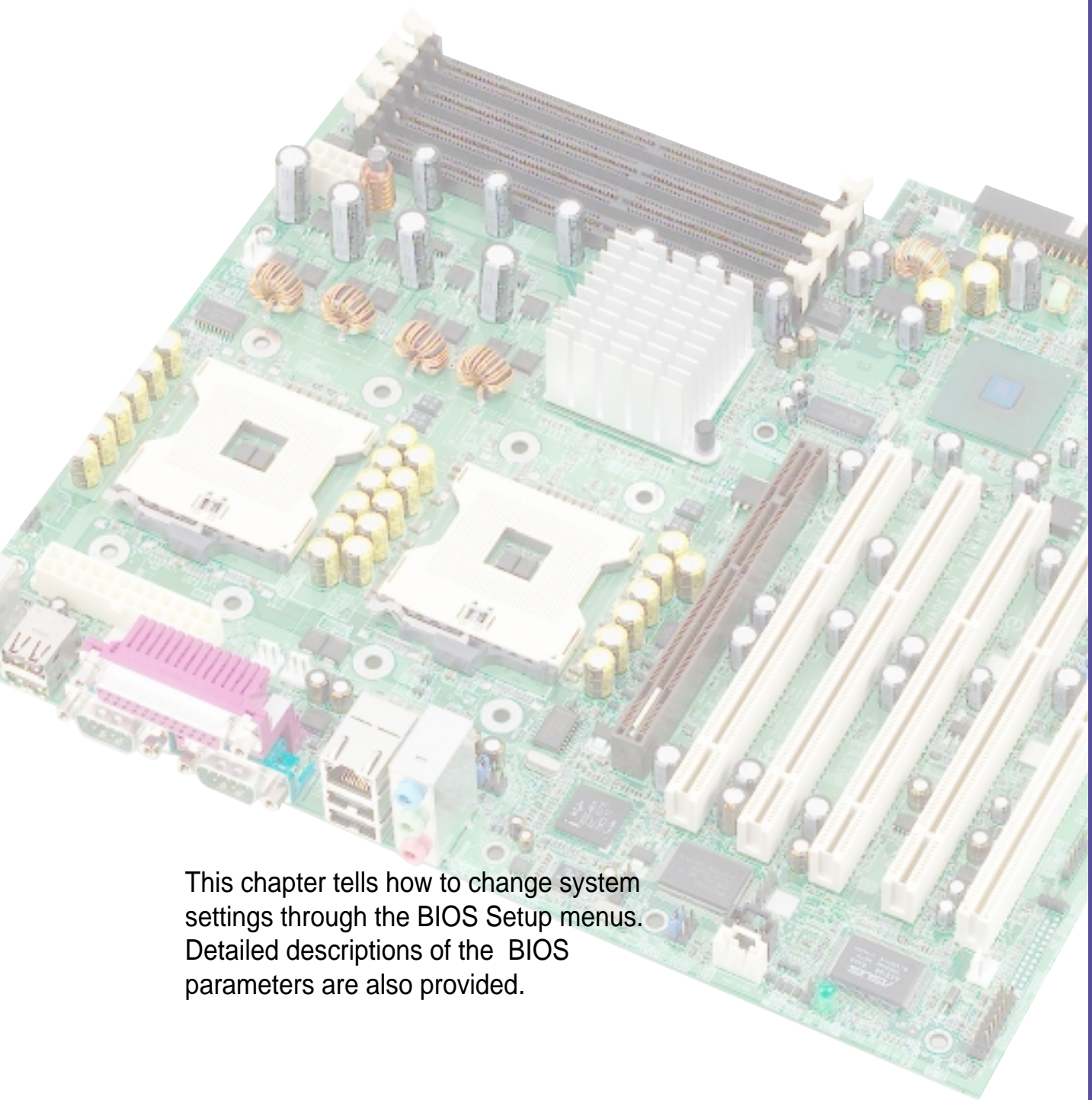
This chapter tells how to change system
settings through the BIOS Setup menus.
Detailed descriptions of the BIOS
parameters are also provided.

BIOS setup

Chapter summary

4.1   Managing and updating your BIOS

To update the BIOS, use the AFUDOS.EXE utility in DOS mode.

1. Copy the AFUDOS.EXE utility and the latest BIOS file into a floppy disk.

2. Insert the floppy disk into the drive, and type **afudos** at the prompt. The screen displays the command usage of the utility.

```
A:\>afudos
AMI Firmware Update Utility - Version 1.03
Copyright (C)2002 American Megatrends, Inc.  All rights reserved.

 Usage: afudos /i<ROM filename> [/o<save ROM filename>] [/nr] [/p[b][n][c]]

        /nr   - don't check ROM ID
        /pbnc -
              b - Program Boot Block
              n - Program NVRAM
              c - Destroy System CMOS


A:\>
```

3. Type the command line **afudos /*filename.rom*,** where "filename.rom" means the original or latest BIOS file with which you wish to update current BIOS on the motherboard.

> Visit the ASUS website (www.asus.com) to obtain BIOS updates for this motherboard.

4. Press Enter. The screen displays the status of the update and goes back to the DOS prompt when done.

```
A:\>afudos /i1abdx01f.rom
AMI Firmware Update Utility - Version 1.03
Copyright (C)2002 American Megatrends, Inc.  All rights reserved.

 Reading file ...... done
 Erasing flash ..... done
 Writing flash ..... done
 Verifying flash ... done

A:\>
```

5. Boot the system with the new BIOS.

4.2 BIOS Setup program

This motherboard supports a programmable firmware hub (FWH) 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 firmware hub.

The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <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

General help

```
                    BIOS SETUP UTILITY
 Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit

 System Overview                                    Use [ENTER], [TAB]
                                                    or [SHIFT-TAB] to
 AMIBIOS                                            select a field.
 Version   : 08.00.08
 Build Date: 01/16/03                               Use [+] or [-] to
 ID        : 1MBDX01F                               configure system Time.

 Processor
 Type      : Intel(R) Xeon(TM) CPU 3.06GHz
 Speed     : 3066MHz
 Count     : 1
                                                    ←→      Select Screen
 System Memory                                      ↑↓      Select Item
 Size      : 512MB                                  +-      Change Field
                                                    Tab     Select Field
 System Time                  [10:11:21]            F1      General Help
 System Date                  [Fri 12/19/2002]      F10     Save and Exit
                                                    ESC     Exit

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```

Menu items   **Field setting**   **Navigation keys**

4.2.2 Menu bar

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

Main   For changing the basic system configuration

Advanced   For changing the advanced system settings

PCIPnP   For changing the PCI/PnP settings

Boot   For changing the system boot configuration

Security   For changing the system security settings

Chipset   For changing the advanced chipset settings

Power   For changing the APM configuration

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

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

4.2.4   General help

At the top right corner 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.
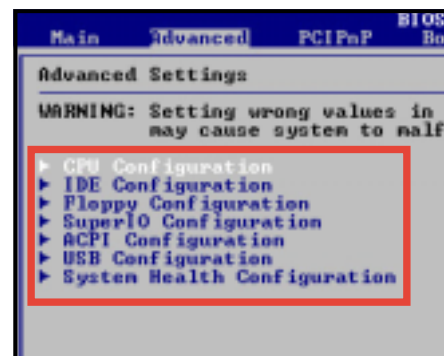
4.2.6   Scroll bar

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.

Scroll bar
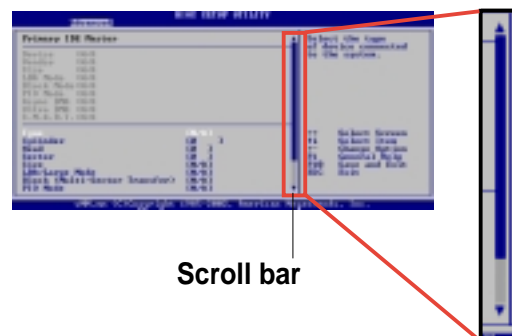
4.2.7   Pop-up window

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

Pop-up window
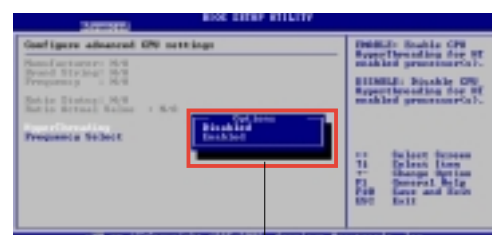
4.3 Main menu

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

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

```
                        BIOS SETUP UTILITY
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit

  System Overview                                Use [ENTER], [TAB]
                                                 or [SHIFT-TAB] to
  AMIBIOS                                        select a field.
  Version   : 08.00.08
  Build Date: 01/16/03                           Use [+] or [-] to
  ID        : 1ABDX01F                           configure system Time.

  Processor
  Type      : Intel(R) Xeon(TM) CPU 3.06GHz
  Speed     : 3066MHz
  Count     : 1
                                                 ←→   Select Screen
  System Memory                                  ↑↓   Select Item
  Size      : 512MB                              +-   Change Field
                                                 Tab  Select Field
  System Time                 [10:11:21]         F1   General Help
  System Date             [Fri 12/19/2002]       F10  Save and Exit
                                                 ESC  Exit

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```

4.3.1 AMI BIOS

This item displays the auto-detected BIOS information.

4.3.2 Processor

This item displays the auto-detected CPU specification.

4.3.3 System Memory

This item displays the auto-detected system memory installed.

4.3.4 System Time [xx:xx:xxxx]

This item allows you to set the system time.

4.3.5 System Date [Day xx/xx/xxxx]

This item allows you to set the system date.

4.4 Advanced menu

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

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

```
                         BIOS SETUP UTILITY
  Main   Advanced   PCIPnP   Boot   Security   Chipset   Power   Exit
 ┌─────────────────────────────────────────────────┬─────────────────────┐
 │ Advanced Settings                                │ Configure CPU.      │
 │                                                  │                     │
 │ WARNING: Setting wrong values in below sections  │                     │
 │          may cause system to malfunction.        │                     │
 │                                                  │                     │
 │ ▶ CPU Configuration                              │                     │
 │ ▶ IDE Configuration                              │                     │
 │ ▶ Floppy Configuration                           │                     │
 │ ▶ SuperIO Configuration                          │                     │
 │ ▶ ACPI Configuration                             │                     │
 │ ▶ USB Configuration                              │                     │
 │ ▶ System Health Configuration                    │                     │
 │                                                  │ ↔    Select Screen  │
 │                                                  │ ↑↓   Select Item    │
 │                                                  │ Enter Go to Sub Screen│
 │                                                  │ F1    General Help  │
 │                                                  │ F10   Save and Exit │
 │                                                  │ ESC   Exit          │
 │                                                  │                     │
 └─────────────────────────────────────────────────┴─────────────────────┘
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```

4.4.1 CPU Configuration

The items in this menu allow you to change CPU-related settings. Select the item then press Enter to display the sub-menu.

```
                         BIOS SETUP UTILITY
       Advanced
 ┌─────────────────────────────────────────────────┬─────────────────────┐
 │ Configure advanced CPU settings                  │ ENABLE: Enable CPU  │
 │                                                  │ HyperThreading for HT│
 │ Manufacturer:  Intel                             │ enabled processor(s).│
 │ Brand String:  Intel(R) Xeon(TM) CPU 3.06GHz     │                     │
 │ Frequency   :  3066MHz                           │ DISABLE: Disable CPU│
 │                                                  │ Hyperthreading for HT│
 │ Ratio Status:  Unlocked                          │ enabled processor(s).│
 │ Ratio Actual Value  : 23                         │                     │
 │   Ratio CMOS Setting [23]                        │                     │
 │                                                  │                     │
 │ HyperThreading             [Disabled]            │                     │
 │                                                  │                     │
 │                                                  │ ↔    Select Screen  │
 │                                                  │ ↑↓   Select Item    │
 │                                                  │ +-   Change Option  │
 │                                                  │ F1    General Help  │
 │                                                  │ F10   Save and Exit │
 │                                                  │ ESC   Exit          │
 │                                                  │                     │
 └─────────────────────────────────────────────────┴─────────────────────┘
           vMM.nn (C)Copyright 1985-2002, American Megatrends, Inc.
```

The values opposite the dimmed items Manufacturer, Brand String, Frequency, Ratio Status, and Ratio Actual Value are auto-detected by BIOS and are not user-configurable.

Ratio CMOS Setting [8]

Sets the ratio between the CPU core clock and the FSB frequency. If an invalid ratio is set in CMOS, the actual and set point values may differ. This item is auto-detected.

Hyper-Threading [Disabled]

This item allows you to enable or disable the CPU Hyper-Threading Technology feature. Configuration options: [Disabled] [Enabled]

4.4.2   IDE Configuration

The items in this menu allow you to change the settings for the IDE drives installed in the system. Select an item then press Enter to display the configuration options. For other items, a sub-menu appears when you press Enter.

> The IDE master/slave items show Not Detected if no IDE device is installed in the system.

```
                        BIOS SETUP UTILITY
      Advanced

 IDE Configuration                                   DISABLED: disables the
                                                     integrated IDE
 OnBoard PCI IDE Controller      [Both]              Controller.
                                                     PRIMARY: enables only
 ▶ Primary IDE Master        [Not Detected]          the Primary IDE
 ▶ Primary IDE Slave         [Not Detected]          Controller.
 ▶ Secondary IDE Master      [Not Detected]          SECONDARY: enables
 ▶ Secondary IDE Slave       [Not Detected]          only the Secondary IDE
                                                     Controller.
 Hard Disk Write Protect        [Disabled]           BOTH: enables both IDE
 IDE Detect Time Out (Sec)      [35]                  Controllers.
 ATA(PI) 80Pin Cable Detection  [Host & Device]
                                                     ←→    Select Screen
                                                     ↑↓    Select Item
                                                     +-    Change Option
                                                     F1    General Help
                                                     F10   Save and Exit
                                                     ESC   Exit

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```

Onboard PCI IDE Controller [Both]

This item allows you to enable or disable the IDE controller. Configuration options: [Disabled] [Primary] [Secondary] [Both]

Primary IDE Master
Primary IDE Slave
Secondary IDE Master
Secondary IDE Slave

While entering Setup, BIOS auto-detects the presence of IDE devices. These fields display the information of the detected IDE devices.

These items have sub-menus. Select an item then press Enter to display the specific sub-menu.
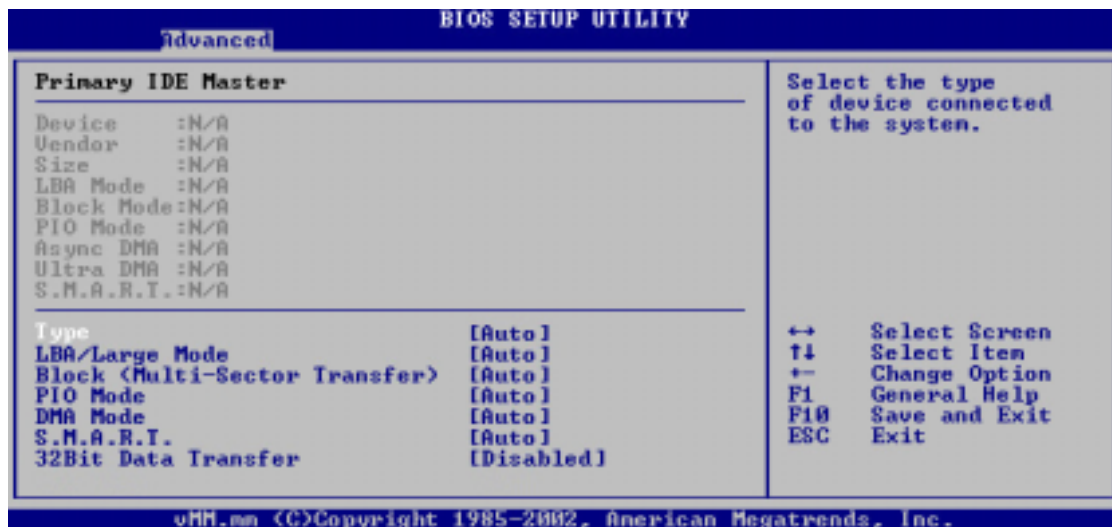
The values opposite the dimmed items Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and S.M.A.R.T. are auto-detected by BIOS and are not user-configurable.These items show N/A if no IDE device is installed in the system.

Type [Auto]

Selects the type of IDE drive. Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

LBA/Large Mode [Auto]

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

Block (Multi-sector Transfer) [Auto]

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

PIO Mode [Auto]

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

DMA Mode [Auto]

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

S.M.A.R.T. [Auto]

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

32Bit Data Transfer [Disabled]

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

Hard Disk Write Protect [Disabled]

Enables or disables device write protection. This will be effective only if the device is accessed through BIOS. Configuration options: [Disabled] [Enabled]

IDE Detect Time Out (Sec) [35]

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

ATA(PI) 80Pin Cable Detection [Host & Device]

Selects the mechanism for detecting 80-pin ATA/ATAPI cable. Configuration options: [Host & Device] [Host] [Device]

4.4.3 Floppy Configuration

The items in this menu allow you to change the settings for the floppy drives installed in the system. Select an item then press Enter to display the configuration options.

```
                              BIOS SETUP UTILITY
         Advanced

   Floppy Configuration                          Select the type of
                                                 floppy drive
   Floppy A                     [Disabled]       connected to the
   Floppy B                     [Disabled]       system.





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


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```

Floppy A [Disabled]
Floppy B [Disabled]

Selects the type of floppy drive installed in the system. Configuration options: [Disabled] [360 KB 5 1/4] [1.2 MB 5 1/4] [720 KB 3 1/2] [1.44 MB 3 1/2] [2.88 MB 3 1/2]

4.4.4 Super IO Configuration

The items in this menu allow you to configure the Super I/O chipset. Select an item then press Enter to display the configuration options.

```
                              BIOS SETUP UTILITY
         Advanced

   Configure Nat366 Super IO Chipset            Allows BIOS to Enable
                                                 or Disable Floppy
   OnBoard Floppy Controller    [Enabled]        Controller.
   Serial Port1 Address         [3F8/IRQ4]
   Serial Port2 Address         [2F8/IRQ3]
     Serial Port2 Mode          [Normal]
       IR Duplex Mode           [N/A]
       IR Receiver Pin          [N/A]
   Parallel Port Address        [378]
     Parallel Port Mode         [Normal]
       EPP Version              [1.9]
       ECP Mode DMA Channel     [DMA3]
     Parallel Port IRQ          [IRQ7]           ↔    Select Screen
   Onboard Game Port            [Disabled]       ↑↓   Select Item
   Onboard MIDI Port            [Disabled]       +-   Change Option
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit


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```

OnBoard Floppy Controller [Enabled]

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

Serial Port1 Address [3F8/IRQ4]

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

Serial Port2 Address [2F8/IRQ3]

Allows you to select the Serial Port2 base address. Configuration options: [Disabled] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Serial Port2 Mode [Normal]

Allows you to select the mode for Serial Port2. When the item **Serial Port 2 Address** is set to **Disabled**, this item does not appear. Configuration options: [Normal] [Sharp-IR] [SIR] [Consumer]

IR Duplex Mode

Allows selection of either Full Duplex or Half Duplex for Serial Port2 in IR mode. This item appears only when Serial Port2 Mode is set to either Sharp-IR, SIR, or Consumer.

IR Receiver Pin

Allows selection of either Receiver pin or Transmit pin for Serial Port2 in IR mode. This item appears only when Serial Port2 Mode is set to either Sharp-IR, SIR, or Consumer.

Parallel Port Address [378]

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

Parallel Port Mode [Normal]

Allows you to select the Parallel Port mode. When the item **Parallel Port Address** is set to **278**, the Parallel Port Mode options are only Normal and EPP. Configuration options: [Normal] [Bi-directional] [EPP] [ECP]

EPP Version [1.9]

Allows selection of the Parallel Port EPP version. This item appears only when the **Parallel Port Mode** is set to **EPP**. Configuration options: [1.9] [1.7]

ECP Mode DMA Channel [DMA3]

Allows selection of the Parallel Port ECP DMA. This item appears only when the **Parallel Port Mode** is set to **ECP**. Configuration options: [DMA0] [DMA1] [DMA3]

Parallel Port IRQ [IRQ7]

Allows you to select the Parallel Port IRQ. Configuration options: [IRQ5] [IRQ7]

Onboard Game Port [Disabled]

Allows you to select the Game Port address or to disable the port. Configuration options: [Disabled] [220h-22Fh] [210h-21Fh]

Onboard MIDI Port [Disabled]

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

4.4.5 ACPI Configuration

The items in this menu allow you to change the ACPI (Advanced Configuration and Power Interface) settings. Select an item then press Enter to display the configuration options. For other items, a sub-menu appears when you press Enter.

ACPI Aware O/S [Yes]

Allows you to enable or disable ACPI support for your operating system. Select No if your operating system does not support ACPI. Select Yes if your operating system supports ACPI. Configuration options: [No] [Yes]

General ACPI Configuration

Allows you change the general ACPI settings.
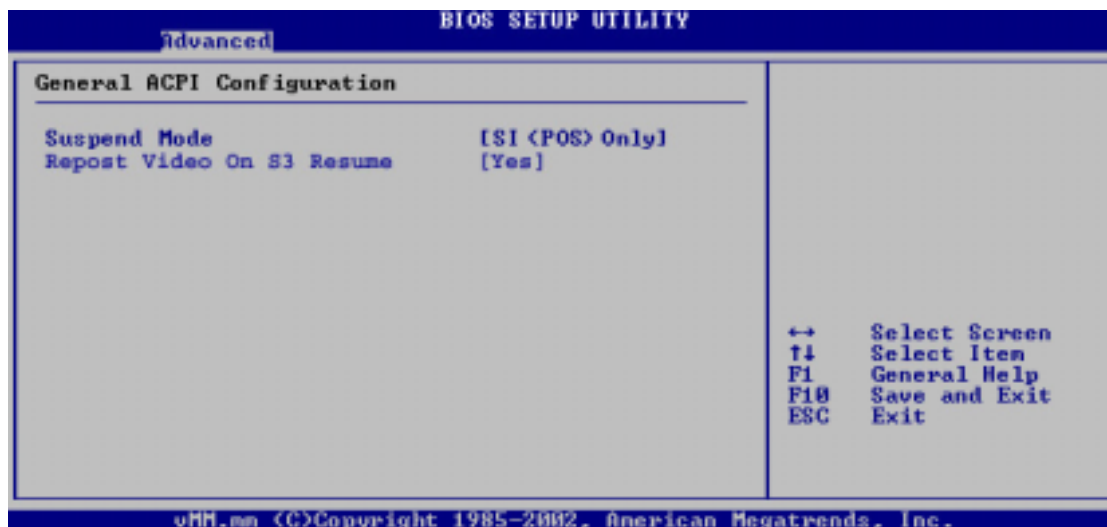
Suspend Mode [S1 (POS) Only]

Allows you to select the ACPI state to be used for system suspend.
Configuration options: [S1 (POS) Only] [S1 & S3 (STR)]

Repost Video On S3 Resume [Yes]

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

Advanced ACPI Configuration

Allows you to change the advanced ACPI settings.
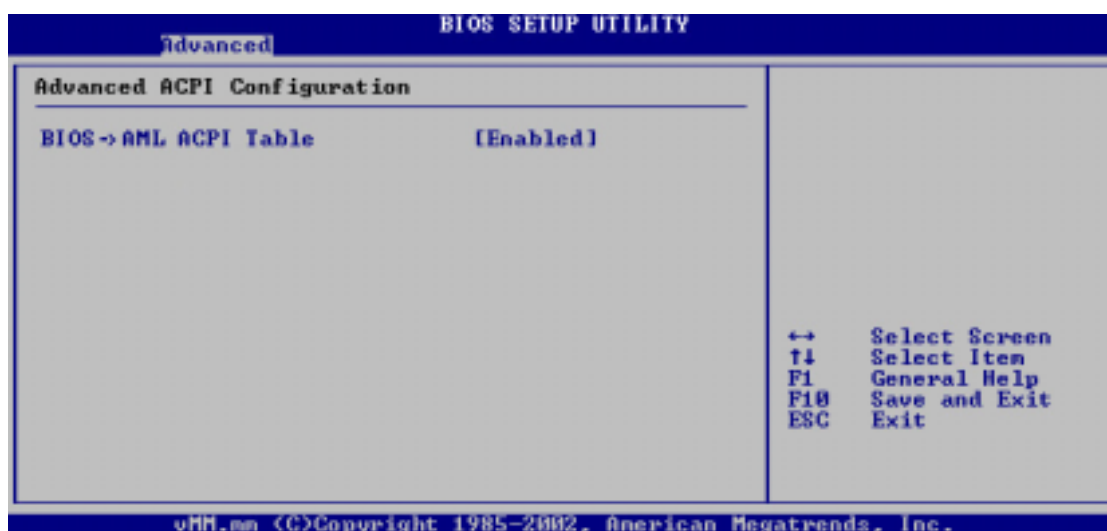
BIOS -> AML ACPI Table [Enabled]

Allows you to enable or disable the inclusion of the BIOS -> AML
exchange pointer to (X)RSDT pointer list. Configuration options:
[Disabled] [Enabled]

4.4.6 USB Configuration

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

```
                          BIOS SETUP UTILITY
      Advanced

  USB Configuration                                  Enables support for
                                                     legacy USB. AUTO
  Module Version - 2.22.3-5.3                        option disables
                                                     legacy support if
  USB Devices Enabled :  None                        no USB devices are
                                                     connected.
  Legacy USB Support               [Enabled]
  USB 2.0 Controller Mode          [HiSpeed]

  ▶ USB Mass Storage Device Configuration

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


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```

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

Legacy USB Support [Enabled]

Allows you to enable or disable support for legacy USB devices. Setting to Auto disables the legacy support if no USB devices are connected. Configuration options: [Disabled] [Enabled] [Auto]

USB 2.0 Controller Mode [HiSpeed]

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

USB Mass Storage Device Configuration

```
                          BIOS SETUP UTILITY
    Advanced

   USB Mass Storage Device Configuration            Number of seconds
                                                     POST waits for the
   USB Mass Storage Reset Delay    [20 Sec]          USB mass storage
                                                     device after start
                                                     unit command.




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


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```

USB Mass Storage Reset Delay [20 Sec]

Allows you to select the number of seconds POST waits for the USB
mass storage device after the start unit command. The message "No
USB mass storage device detected" appears if none is installed in the
system. Configuration options: [10 Sec] [20 Sec] [30 Sec] [40 Sec]

4.4.7 System Health Configuration

```
                      System Health Configuration
    Advanced

   System Health Configuration   [Enabled]           HHM Function help
   Fan1 Speed                    0 RPM
   Fan2 Speed                    0 RPM
   Fan3 Speed                    0 RPM
   Fan4 Speed                    0 RPM
   Fan5 Speed                    0 RPM
   CPU Thermal Sensor 1          37°C/98°F
   CPU Thermal Sensor 2          36°C/96°F
   Motherboard Thermal Sensor 1  40°C/104°F
   Motherboard Thermal Sensor 2  39°C/102°F
   +3V                           3.338V
   +5V                           4.984V
   +12V                          11.400V
                                                     ←→    Select Screen
                                                     ↑↓    Select Item
                                                     +−    Change Option
                                                     F1    General Help
                                                     F10   Save and Exit
                                                     ESC   Exit


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```

System Health Configuration [Enabled]

Allows you to enable or disable the System Health Configuration feature.
When this feature is enabled, the items in the menu displays the auto-
detected fan speeds, system temperatures, and output voltages. When
disabled, the items show [N/A]. Configuration options: [Disabled] [Enabled]

4.5   PCI PnP menu

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel resources for either PCI/PnP or legacy ISA devices, and enabling or disabling the PCI device option ROM for shadow memory.

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

```
                           BIOS SETUP UTILITY
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit
 ┌─────────────────────────────────────────────┬──────────────────────────┐
 │ Advanced PCI/PnP Settings                     │ NO: lets the BIOS        │
 │                                               │ configure all the        │
 │ WARNING: Setting wrong values in below sections │ devices in the system. │
 │          may cause system to malfunction.     │ YES: lets the            │
 │                                               │ operating system         │
 │ Plug & Play O/S            [No]               │ configure Plug and       │
 │ PCI Latency Timer         [64]               │ Play (PnP) devices not   │
 │ Palette Snooping          [Enabled]          │ required for boot if     │
 │                                               │ your system has a Plug   │
 │ Slot1 Option Rom Keep     [Enabled]          │ and Play operating       │
 │ Slot2 Option Rom Keep     [Enabled]          │ system.                  │
 │ Slot3 Option Rom Keep     [Enabled]          │                          │
 │ Slot4 Option Rom Keep     [Enabled]          │ ↔      Select Screen     │
 │ Slot5 Option Rom Keep     [Enabled]          │ ↑↓     Select Item       │
 │ Onboard Lan Option Rom Keep  [Enabled]       │ +-     Change Option     │
 │                                               │ F1     General Help      │
 │                                               │ F10    Save and Exit     │
 │                                               │ ESC    Exit              │
 └─────────────────────────────────────────────┴──────────────────────────┘
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```

4.5.1   Plug & Play O/S [No]

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

4.5.2   PCI Latency Timer [64]

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

4.5.3   Pallete Snooping [Enabled]

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

4.5.4 Slot 1, Slot 2, Slot 3, Slot 4, Slot 5 Option ROM Keep [Enabled]

These items allow you to enable or disable copying the PCI device option ROM to shadow memory. Configuration options: [Disabled] [Enabled]

4.5.5 Onboard LAN Option ROM Keep [Enabled]

This item allows you to enable or disable copying the onboard LAN option ROM to shadow memory. Configuration options: [Disabled] [Enabled]

4.6   Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press Enter to display the sub-menu.
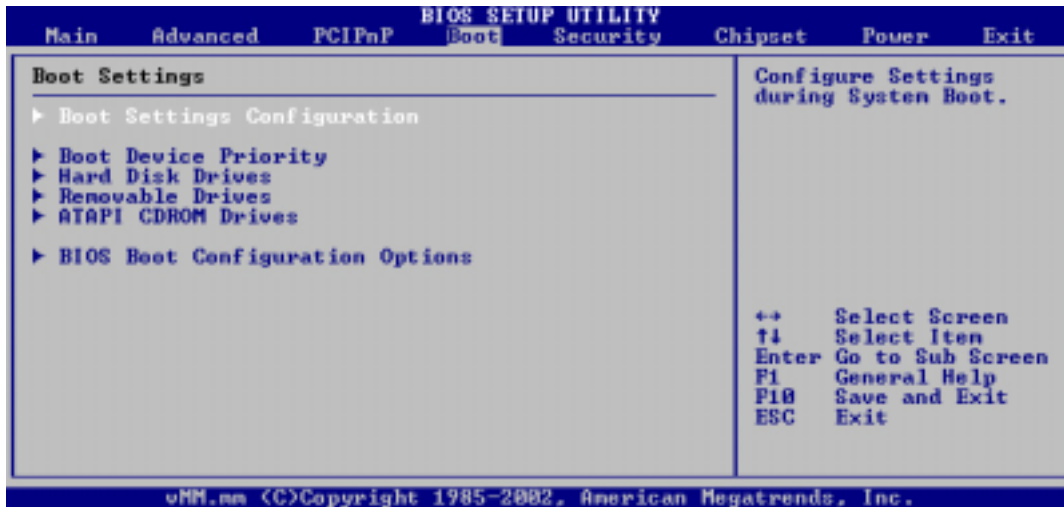
4.6.1   Boot Settings Configuration

Quick Boot [Enabled]

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

Quiet Boot [Disabled]

Setting to [Disabled] displays the normal POST messages. Setting to [Enabled] displays the OEM logo instead of the POSt messages. Configuration options: [Disabled] [Enabled]

Bootup Num-Lock [On]

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

PS/2 Mouse Support [Enabled]

Allows you to enable or disable support fr PS/2 mouse. Configuration options: [Disabled] [enabled]

Typematic Rate [Fast]

Allows you to select the keyboard typematic rate. Configuration options: [Slow] [Fast]

System Keyboard [Present]

Allows you to enable or disable the keyboard/s connected to the system [Absent] [Present]

Boot to OS/2 [No]

Allows you to specify the OS/2 compatibility mode. Configuration options: [No] [Yes]

Wait for 'F1' If Error [Enabled]

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

Hit 'DEL' Message Display [Enabled]

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

Interrupt 19 Capture [Disabled]

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

4.6.2 Boot Device Priority

1st ~ 12th Boot Device [1st Floppy Drive]

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

4.6.3 Hard Disk Drives
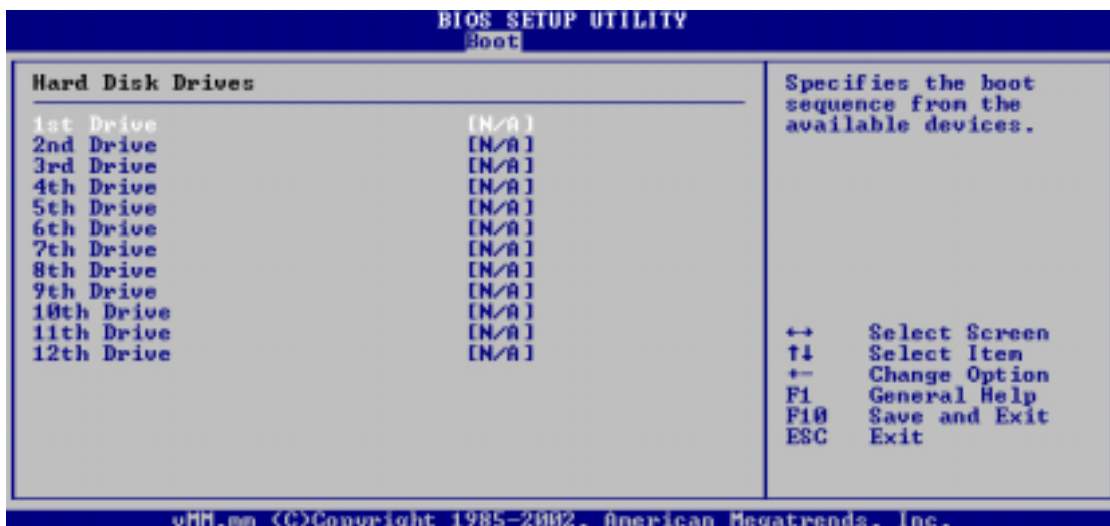
1st ~ 12th Drive

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

4.6.4   Removable Drives

1st ~ 4th Drive

These items specify the boot priority sequence from the available
removable drives. The number of device items that appear on the screen
depends on the the number of devices installed in the system.
Configuration options: [xxxxx Drive] [Disabled]
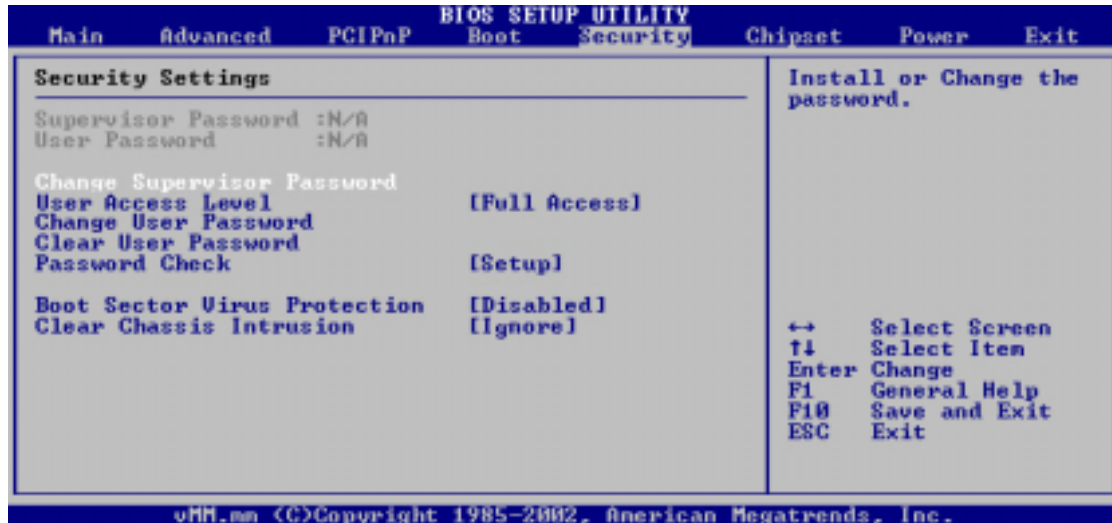
4.6.5   ATAPI CDROM Drives

1st ~ 4th Drive

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

4.7   Security menu

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

```
                          BIOS SETUP UTILITY
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit

 Security Settings                                   Install or Change the
                                                     password.
 Supervisor Password :N/A
 User Password       :N/A

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

 Boot Sector Virus Protection      [Disabled]
 Clear Chassis Intrusion           [Ignore]        ←→      Select Screen
                                                   ↑↓      Select Item
                                                   Enter   Change
                                                   F1      General Help
                                                   F10     Save and Exit
                                                   ESC     Exit

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```

4.7.1   Change Supervisor Password

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

To set a Supervisor Password:

1. Select the Change Supervisor Password item and press Enter.

2. On the password box that appears, type a password composed of
    letters and/or numbers, then press Enter. Your password should have
    at least six characters.

3. Confirm the password when prompted.
    The message "Password Installed" appears after you have
    successfully set your password.

    The Supervisor Password item now shows **Installed**.

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

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

4.7.2 User Access Level (Full Access]

After you have set a supervisor password, the item User Access Level appears. This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

No Access prevents user access to the Setup utility.

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

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

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

4.7.3 Change User Password

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

To set a User Password:

1. Select the Change User Password item and press Enter.
2. On the password box that appears, type a password composed of letters and/or numbers, then press Enter. Your password should have at least six characters.
3. Confirm the password when prompted.
   The message "Password Installed" appears after you have successfully set your password.

   The User Password item now shows **Installed**.

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

4.7.4 Clear User Password

Select this item if you wish to clear the user password.

4.7.5 Password Check [Setup]

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

4.7.6 Boot Sector Virus Protection [Disabled]

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

4.7.7 Clear Chassis Intrusion [Ignore]

If the intrusion feature is set and the chassis is opened, use this item to clear the intrusion flag by selecting the option Clear. When the the flag is cleared, the value of this item returns to Ignore. Configuration options: [Ignore] [Clear]

4.8 Chipset menu

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

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

```
                    BIOS SETUP UTILITY
 Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit
┌──────────────────────────────────────────────┬────────────────────────┐
│ Advanced Chipset Settings                      │ Intel E7505/E7502      │
│                                                │ NorthBridge            │
│ WARNING: Setting wrong values in below sections│ Configuration          │
│          may cause system to malfunction.      │                        │
│ ▶ Configure advanced settings for NorthBridge  │                        │
│ ▶ Intel ICH4 SouthBridge Configuration         │                        │
│ ▶ Intel PCI-64 Hub 2 Configuration             │                        │
│                                                │                        │
│                                                │                        │
│                                                │ ←→    Select Screen    │
│                                                │ ↑↓    Select Item      │
│                                                │ Enter Go to Sub Screen │
│                                                │ F1    General Help     │
│                                                │ F10   Save and Exit    │
│                                                │ ESC   Exit             │
│                                                │                        │
└──────────────────────────────────────────────┴────────────────────────┘
         vMM.mm (C)Copyright 1985-2002, American Megatrends, Inc.
```

4.8.1 Configure Advanced Settings for NorthBridge

```
                    BIOS SETUP UTILITY
                                              Chipset
┌──────────────────────────────────────────────┬────────────────────────┐
│ Configure advanced settings for NorthBridge   │ Size of the AGP        │
│                                                │ Aperture.              │
│ Graphics Aperture Size        [ 64MB]          │                        │
│                                                │                        │
│                                                │                        │
│                                                │                        │
│                                                │                        │
│                                                │                        │
│                                                │                        │
│                                                │ ←→    Select Screen    │
│                                                │ ↑↓    Select Item       │
│                                                │ +-    Change Option    │
│                                                │ F1    General Help     │
│                                                │ F10   Save and Exit    │
│                                                │ ESC   Exit             │
│                                                │                        │
└──────────────────────────────────────────────┴────────────────────────┘
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```

Graphics Aperture Size [64MB]

Allows you to select the size of the AGP aperture. Configuration options:
[4MB] [8MB] [16MB] [32MB] [64MB] [128MB] [256MB]

4.8.2 Intel ICH4 SouthBridge Configuration

```
                          BIOS SETUP UTILITY
                                                  Chipset

Configure advanced settings for SouthBridge    Enable / Disable ICH4
                                                IDE Controller
 ICH4 Dev31 Func1, IDE       [Enabled]          function.
 ICH4 Dev31 Func3, SMBUS     [Enabled]
 ICH4 Dev31 Func5, AC'97     [Enabled]
 ICH4 Dev31 Func6, AC'97     [Enabled]
 ICH4 Dev29 Func0, USB#1     [Enabled]
 ICH4 Dev29 Func1, USB#2     [Enabled]
 ICH4 Dev29 Func2, USB#3     [Enabled]
 ICH4 Dev29 Func7, EHCI      [Enabled]

 Onboard LAN                 [Enabled]
 USB Device Wakeup From S4   [Disabled]     ←→    Select Screen
                                            ↑↓    Select Item
                                            +-    Change Option
                                            F1    General Help
                                            F10   Save and Exit
                                            ESC   Exit


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```

ICH4 Dev31 Func1, IDE [Enabled]

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

ICH4 Dev31 Func3, SMBUS [Enabled]

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

ICH4 Dev31 Func5, AC'97 [Enabled]

Allows you to enable or disable the AC'97 audio controller. Configuration options: [Disabled] [Enabled]

ICH4 Dev31 Func6, AC'97 [Enabled]

Allows you to enable or disable the AC'97 modem controller. Configuration options: [Disabled] [Enabled]

ICH4 Dev29 Func0, USB#1 [Enabled]

Allows you to enable or disable the USB controller 1. Configuration options: [Disabled] [Enabled]

ICH4 Dev29 Func1, USB#2 [Enabled]

Allows you to enable or disable the USB controller 2. Configuration options: [Disabled] [Enabled]

ICH4 Dev29 Func2, USB#3 [Enabled]

Allows you to enable or disable the USB controller 3. Configuration options: [Disabled] [Enabled]

ICH4 Dev29 Func7, EHCI [Enabled]

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

Onboard LAN [Enabled]

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

USB Device Wakeup from S4 [Disabled]

Allows you to enable or disable the USB device wake up feature from S4 sleep mode. Configuration options: [Disabled] [Enabled]

4.8.3   Intel PCI-64 Hub 2 Configuration

HotPlug Inhibit Bus Connect [Enabled]

Allows you to enable or disable the inhibit bus connect status in the HotPlug controller. Configuration options: [Disabled] [Enabled]

PCI Bus Frequency [Auto]

Allows selection of maximum PCI bus speed to be programmed. The default setting is Auto so that the bus speed is decided based on the capabilities of te device on that bus. Configuration options: [33 Mhz] [66 MHz] [100 MHz] [133 MHz] [Auto]

4.9   Power menu

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

```
                           BIOS SETUP UTILITY
   Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit
 ┌──────────────────────────────────────────────────┬─────────────────────────┐
 │ APM Configuration                                  │ Enable or disable       │
 │ ───────────────────────────────────────────       │ APM.                    │
 │ Power Management/APM            [Enabled]          │                         │
 │ Video Power Down Mode           [Suspend]          │                         │
 │ Hard Disk Power Down Mode       [Suspend]          │                         │
 │ Standby Time Out                [Disabled]         │                         │
 │ Suspend Time Out                [Disabled]         │                         │
 │                                                    │                         │
 │                                                    │                         │
 │ Power Button Mode               [Suspend]          │                         │
 │ Restore on AC Power Loss        [Last State]       │                         │
 │                                                    │                         │
 │ Resume On Ring                  [Disabled]         │  ←→    Select Screen    │
 │ Resume On LAN                   [Enabled]          │  ↑↓    Select Item      │
 │ Resume On PME#                  [Disabled]         │  +-    Change Option    │
 │ Resume On RTC Alarm             [Disabled]         │  F1    General Help     │
 │   RTC Alarm Date                [N/A]              │  F10   Save and Exit    │
 │   RTC Alarm Hour                [N/A]              │  ESC   Exit             │
 │   RTC Alarm Minute              [N/A]              │                         │
 │   RTC Alarm Second              [N/A]              │                         │
 └──────────────────────────────────────────────────┴─────────────────────────┘
            vMM.nm (C)Copyright 1985-2002, American Megatrends, Inc.
```

4.9.1   Power Management/APM [Enabled]

Allows you to enable or disable the Advanced Power Management (APM) feature. Configuration options: [Disbaled] [Enabled]

4.9.2   Video Power Down Mode [Suspend]

Powers down video in suspend mode or standby mode. This item appears only when the Power Management/APM item is set to Enabled. Configuration options: [Disabled] [Standby] [Suspend]

4.9.3   Hard Disk Power Down Mode [Suspend]

Powers down hard disk in suspend mode or standby mode. This item appears only when the Power Management/APM item is set to Enabled. Configuration options: [Disabled] [Standby] [Suspend]

4.9.4   Standby Time Out [Disabled]

When set to any one of the time options, the system goes into standby at the specified time. When set to Disabled, the system does not go into standby. This item appears only when the Power Management/APM item is set to Enabled. Configuration options: [Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

4.9.5 Suspend Time Out [Disabled]

When set to any one of the time options, the system goes into standby at the specified time. When set to Disabled, the system does not go into standby. This item appears only when the Power Management/APM item is set to Enabled. Configuration options: [Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

4.9.6 Power Button Mode [Suspend]

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

4.9.7 Restore on AC Power Loss [Last State]

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

4.9.8 Resume On Ring [Disabled]

Allows you to enable or disable RI to generate a wake event. Configuration options: [Disabled] [Enabled]

4.9.9 Resume On LAN [Enabled]

Allows you to enable or disable LAN GPI to generate a wake event. Configuration options: [Disabled] [Enabled]

4.9.10 Resume On PME# [Disabled]

Allows you to enable or disable PME to generate a wake event. Configuration options: [Disabled] [Enabled]

4.9.11 Resume On RTC Alarm [Disabled]

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

4.10   Exit menu

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

```
                          BIOS SETUP UTILITY
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit

  Exit Options                                       Exit system setup
  ─────────────────────────────────────────         after saving the
  Save Changes and Exit                              changes.
  Discard Changes and Exit
  Discard Changes                                    F10 key can be used
                                                     for this operation.
  Load Optimal Defaults
  Load Failsafe Defaults




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

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```

4.10.1 Save Changes and Exit

Saves the changes that you made before exiting Setup.

4.10.2 Discard Changes and Exit

Exits setup without saving your changes.

4.10.3 Discard Changes

Discards the changes that you made and restores the previously saved values.

4.10.4 Load Optimal Defaults

Loads the optimal values for the best system performance. You may also use the F9 key to load the optimal defaults.

4.10.5 Load Failsafe Defaults

Loads the values that ensures that you can boot the system, though not with the best system performance. You may also use the F8 key to load the failsafe defaults.
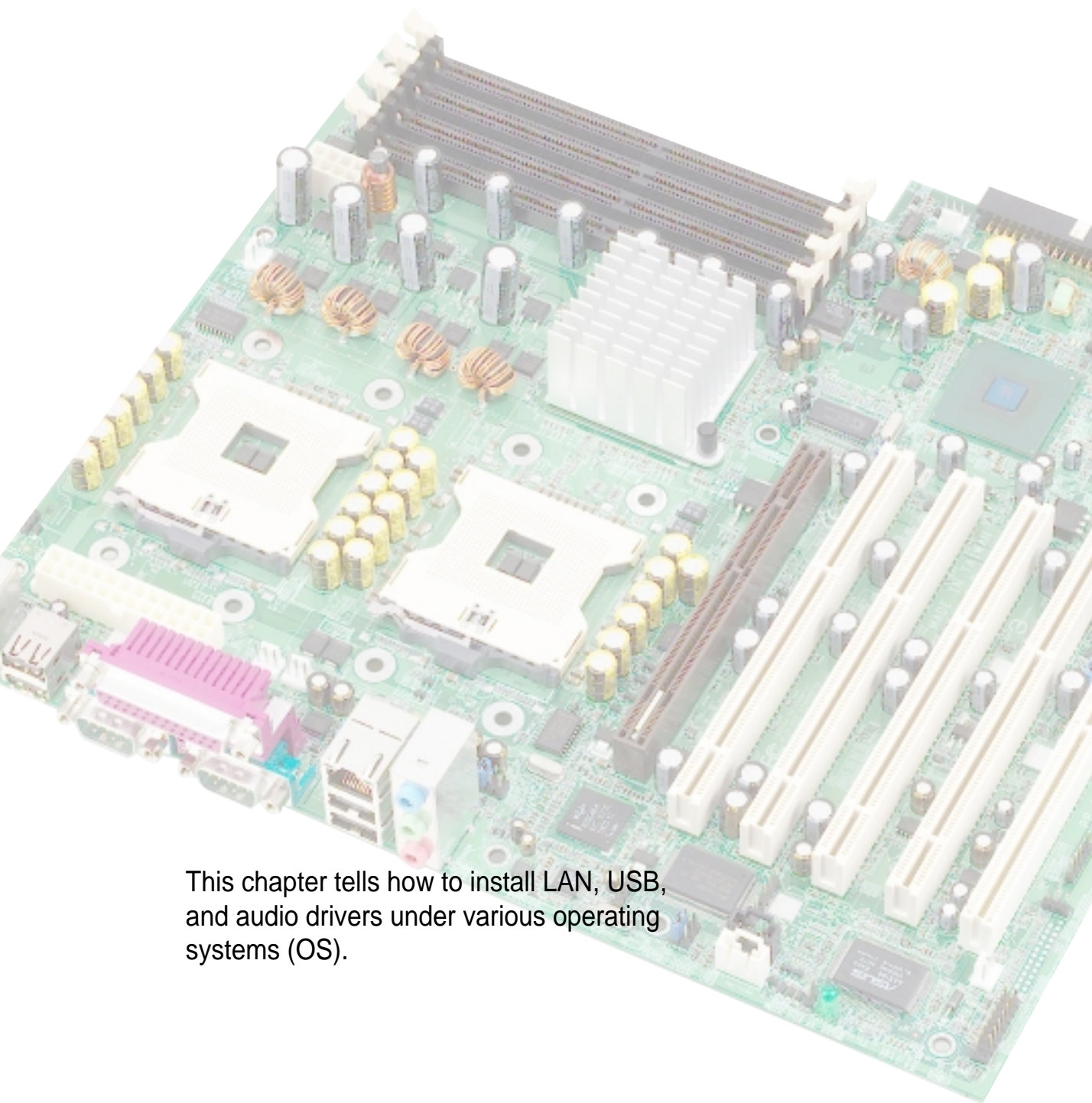
This chapter tells how to install LAN, USB, and audio drivers under various operating systems (OS).

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.
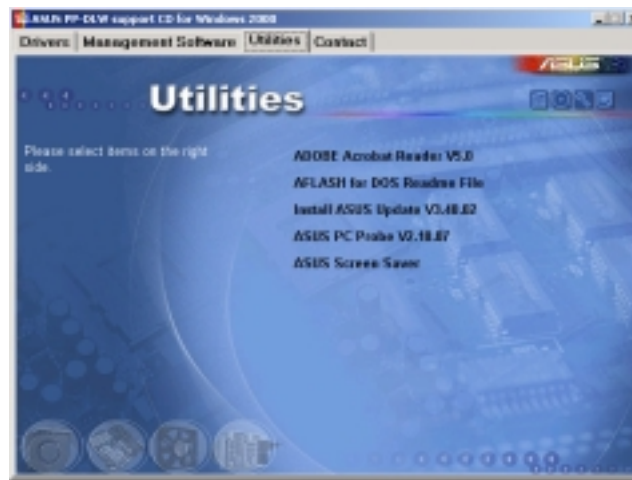
5.1.4 Contact

This screen displays the ASUS worldwide contact information.

5.2 Microsoft® Windows® NT Server 4.0

5.2.1 Intel® 82540EM LAN driver installation

A. Preparing the Intel 82540EM LAN Driver Disk

Windows NT 4.0 does not have the drivers for the Intel 82540EM LAN controller. Before installing Windows NT 4.0, copy the LAN drivers from the support CD into a floppy disk.

> Prepare one blank formatted high density floppy disk before proceeding.

1. Insert the support CD into the CD-ROM drive.
2. Run the **dcreat.exe** utility from the following path:

    \Drivers\LAN\MAKEDISK

3. Insert the floppy disk into the floppy disk drive when prompted.
4. Proceed to the next section to install the LAN drivers from the driver disk that you created.

B. New System Installation

1. When the **Installing Windows NT Networking** screen appears, press **Next** to display the following screen.
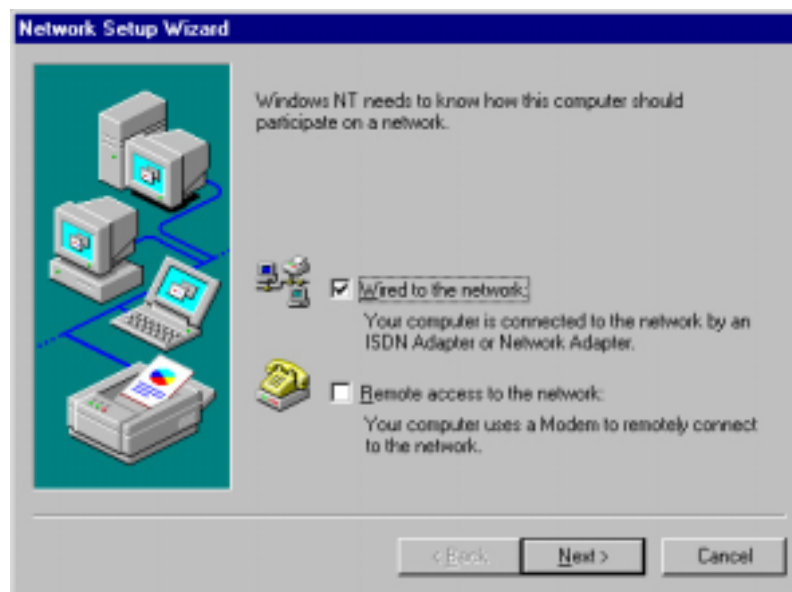
2.   Check the **Wired to the Network** box, then click **Next**.

3.   On the screen that appears, click the button **Select from list...** to dispaly the following.
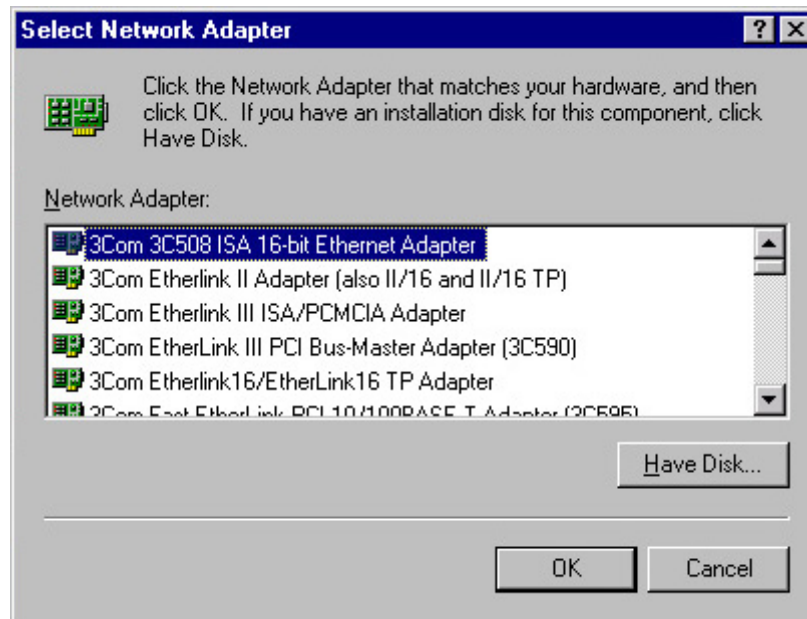
4.   Insert the LAN driver disk that you created, then click **Have Disk...**

5.   Type **A:** in the dialog box that appears, then click OK. The following screen lists the Intel LAN adapters that you can install.
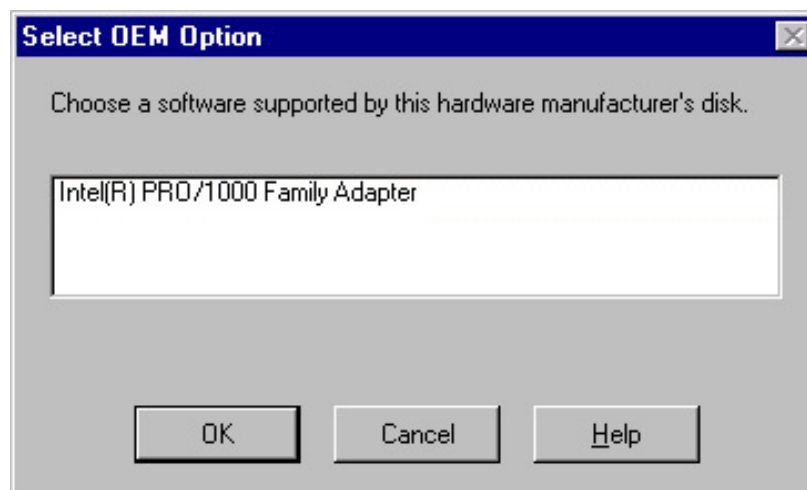
6.   Select **Intel(R) PRO/1000 Family Adapter**, then click OK. Follow the succeeding screen instructions.

7. When done, the following screen appears showing the **Intel(R) PRO/1000 Family Adapter** in the list.
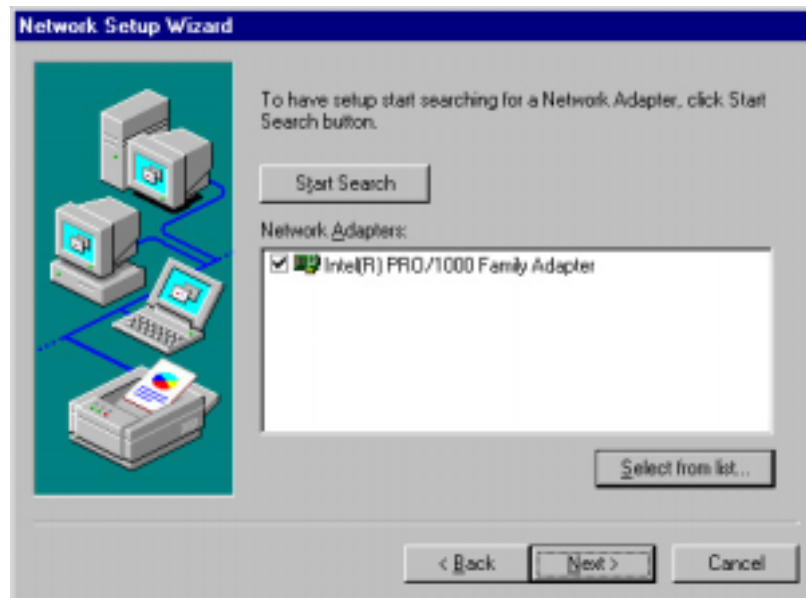
8. Click **Next** and follow any other screen instructions to complete the installation.

C. Existing System Installation

1. Double-click the **Network** icon in the Control Panel.

2. Select the **Adapter** tab, then click **Add**. A list of adapters appears.

4. Do not select an adapter from the list. Instead, insert the LAN driver disk that you created from the support CD.

   Refer to section *"A. Preparing the Intel 82540EM LAN Driver Disk"* if you have not yet created the LAN driver disk.

5. Follow steps 4 to 8 in section *"B. New System Installation"* to install the required LAN drivers.

5.3   Microsoft® Windows® 2000 Server

5.3.1   Intel® 82540EM LAN driver installation

You may install the Intel 82540EM LAN drivers directly from the support CD. Proceed to section *"B. Update LAN Driver on an Existing System Installation."*

If you wish to create a LAN driver disk, proceed to section *"A. Preparing the Intel 82540EM LAN Driver Disk."*

A.   Preparing the Intel 82540EM LAN driver disk

> Prepare one blank formatted high density floppy disk before proceeding.

1.   Insert the support CD into the CD-ROM drive.

2.   Run the **MAKEDISK.BAT** utility from the following path:

   \Drivers\LAN\MAKEDISK

3.   Insert the floppy disk into the floppy disk drive when prompted.

4.   Follow the screen instructions to complete the process.

B.   Update driver on an existing system installation

You may update the LAN driver directly from the support CD.

1.   Insert the support CD into the CD-ROM drive. On the screen that appears, click on **Intel PRO/1000 LAN Driver**, then on the item **Install Base Driver Only**.

2.   Follow the screen instructions to complete the driver update.

When done, your Computer Management window shows the installed LAN adapter.
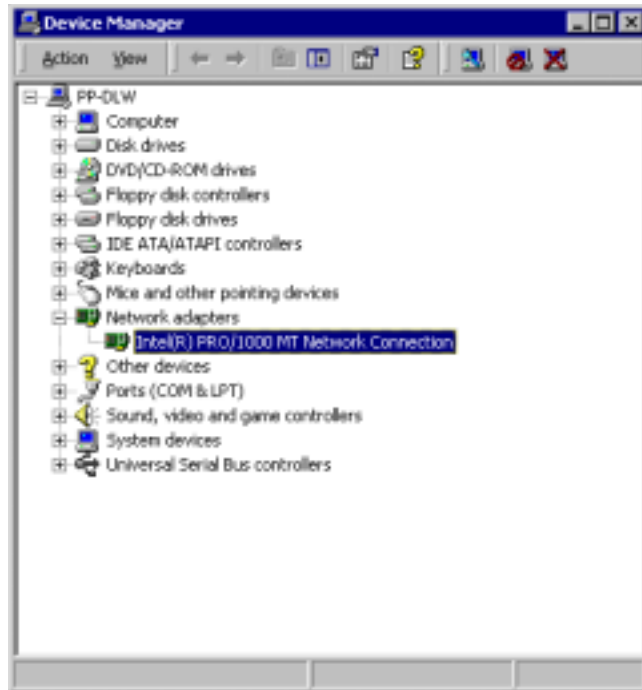
4. Highlight the **Intel(R) PRO-1000 LAN Driver**, click the right mouse button, and select **Properties** to display the following.

C. Updating the LAN driver using the LAN driver disk

You may also update the LAN drivers from the LAN Driver Disk if you created one in section *"A. Preparing the Intel 82540EM LAN Driver Disk."*

Follow these steps to update from the LAN driver disk.

1. Boot Windows 2000 system and log on as Administrator.
2. Click on the **Start** button. Select **Settings**, then **Control Panel**.
3. Double-click the **System** icon in the Control Panel. Select the **Hardware** tab to display the following screen.
4. Click on **Device Manager**, then on **Other Devices**.
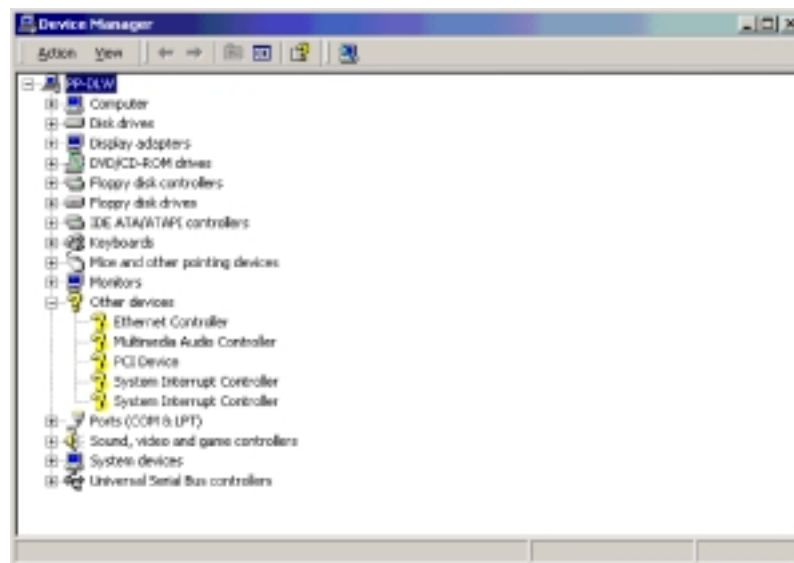
5. Highlight **Ethernet Controller**, then click the right mouse button and select **Properties**.
6. Select the **Driver** tab and click on **Update Drivers**.
7. Click **Next**. Select **Display a list of the known drivers for this device ...**
8. Select **Network adapters** under Hardware Type, and click **Next**.
9. Click **Have Disk…**, then insert the LAN driver disk.
10. Follow the succeeding instructions to complete the installation.

5.3.2 SoundMAX audio driver and application installation

To install the device drivers for the audio controller under Windows 2000:

1. Insert the support CD into your CD-ROM drive. When Autorun in enabled in your computer, the Drivers menu automatically appears.

2. Click on the **SoundMAX Audio Driver and Application** item to start the audio installation.

    If Autorun is not enabled, locate the drivers and applications in the following path:

    \Drivers\SoundMAX\Win_2K

3. Follow the screen instructions to install the SoundMAX wizard.
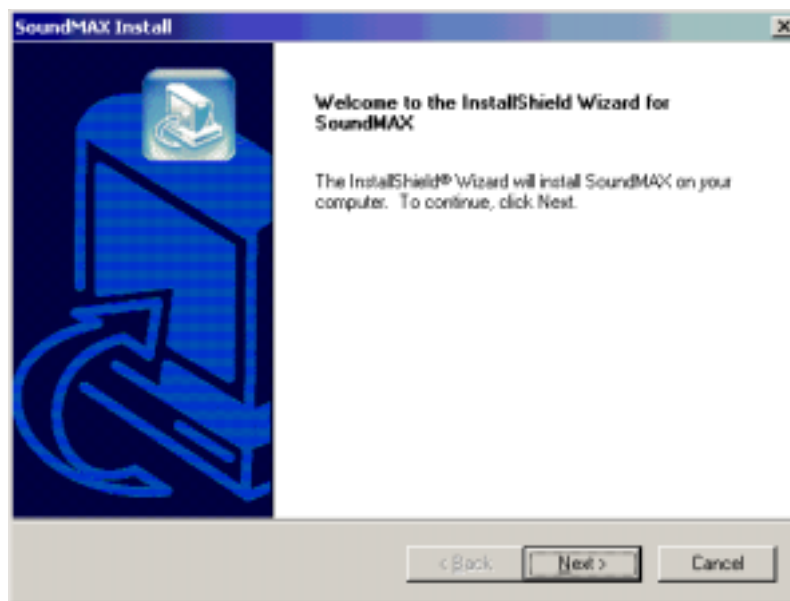
4. When prompted, select the option **Yes, I want to restart my computer now**, then click Finish to complete the installation.

5.3.3 USB 2.0 driver installation

To install the USB 2.0 driver under Windows 2000:

1. Insert the support CD into your CD-ROM drive. When Autorun in enabled in your computer, the Drivers menu automatically appears.
2. Click on the **USB 2.0 Driver** item to start the installation.
3. Follow the screen instructions in the device driver installation wizard.
4. When prompted to select a device driver, select Intel PCI to USB Enhanced Host Controller, then click Next.
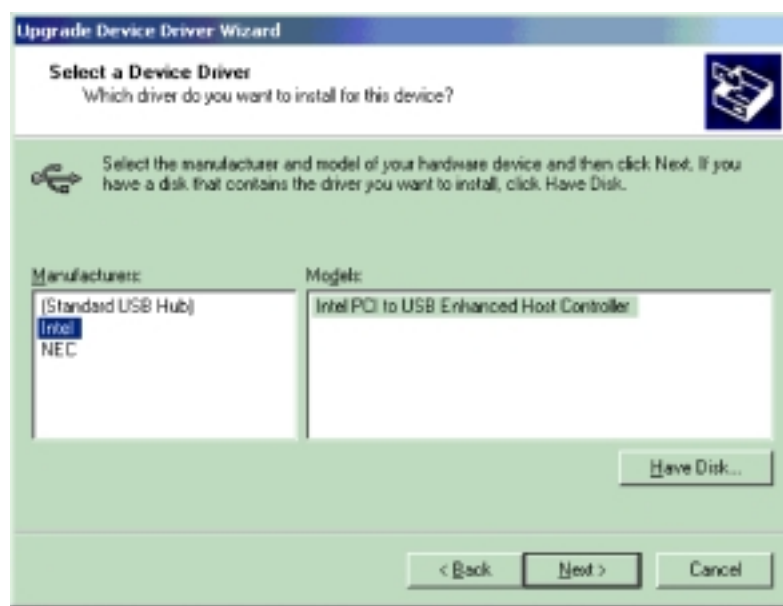
5. Follow the succeeding instructions to complete the installation.

5.3.4 Enabling ATA100 Feature in Windows® 2000

To enable the ATA100 feature under Windows 2000, you need to upgrade to Windows 2000 Service Pack 2 or 3.

5.4 Microsoft®Windows® XP Professional

5.4.1 Intel 82540EM LAN driver installation

Windows XP contains default drivers to support the Intel 82540EM chipset controller.

> For Windows XP Professional users, we recommended that you use the Intel 82540EM driver from the support CD.

A. Preparing the Intel 82540EM LAN driver disk

> Prepare one blank formatted high density floppy disk before proceeding.

1.   Insert the support CD into the CD-ROM drive.
2.   On the screen that appears, select **Create Install Disk**.

The following information window appears.
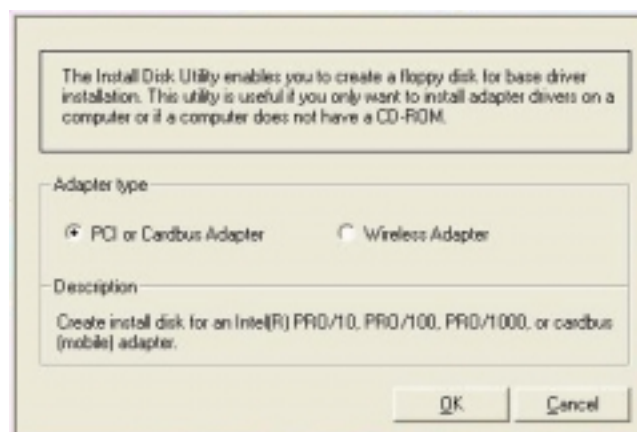
3. The next screen allows you to select an operating system to install the driver. Select Windows XP/64.

4. Select A:/ for the destination drive, then click on **Create Disk**.

5. Follow the succeeding installation instructions.

6. When prompted, click **Finish** to complete the process.

B. Update driver on an existing system installation

1. Insert the support CD into the CD-ROM drive. On the screen that appears, click on **Intel PRO/1000 LAN Driver**, then on the item **Install Drivers and Utilities**.

2. The following screen appears allowing you to install the Intel(R) PRO Intelligent Installer. Click Next.
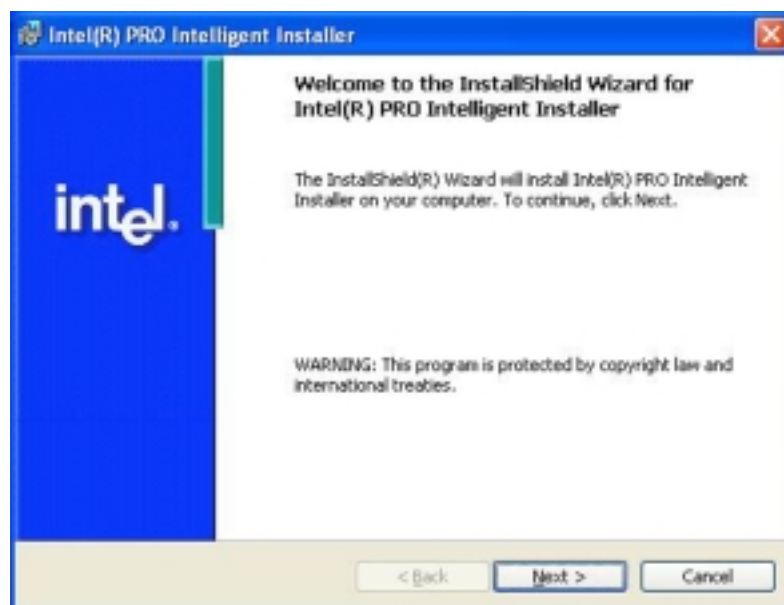
3.	The following screen prompts you to select the Setup type. Select **Custom**, then click Next.
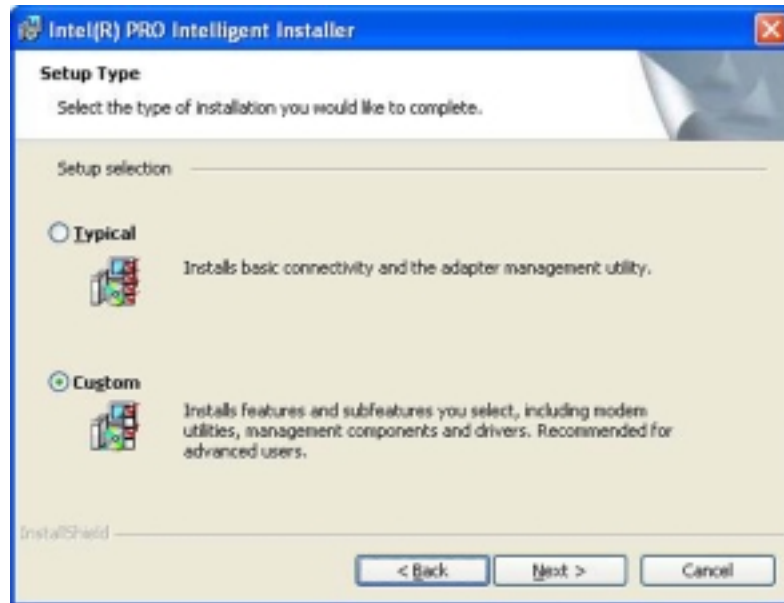
4.	On the next screen, select **Drivers for wired Ethernet adapters**, then click Next.
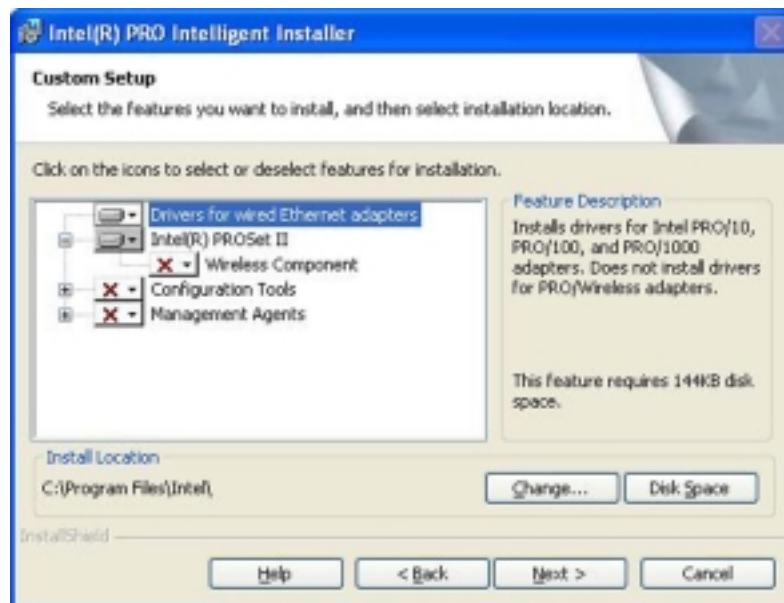
5.	Click **Finish** when done installing the wizard.

6. The following screen displays the network components that you cna
    install. Select **Intel(R) PRO/1000 MT Network Connection**, then
    click OK.
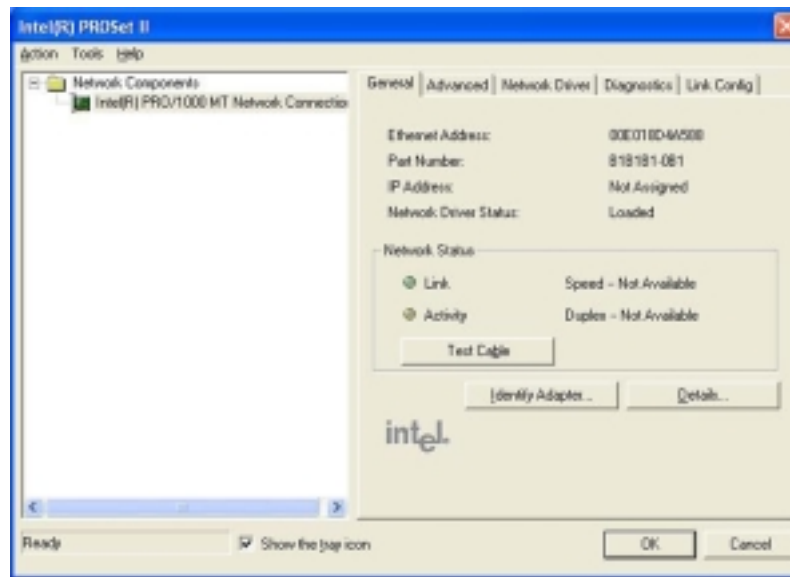
7. Follow the succeeding screen instructions to complete the
    installation.

5.4.2 SoundMAX audio driver and application installation

To install the device drivers for the audio controller under Windows XP:

1. Insert the support CD into your CD-ROM drive. When Autorun in enabled in your computer, the Drivers menu automatically appears.

2. Click on the **SoundMAX Audio Driver and Application** item to start the audio installation.

3. Follow the screen instructions to install the SoundMAX wizard.
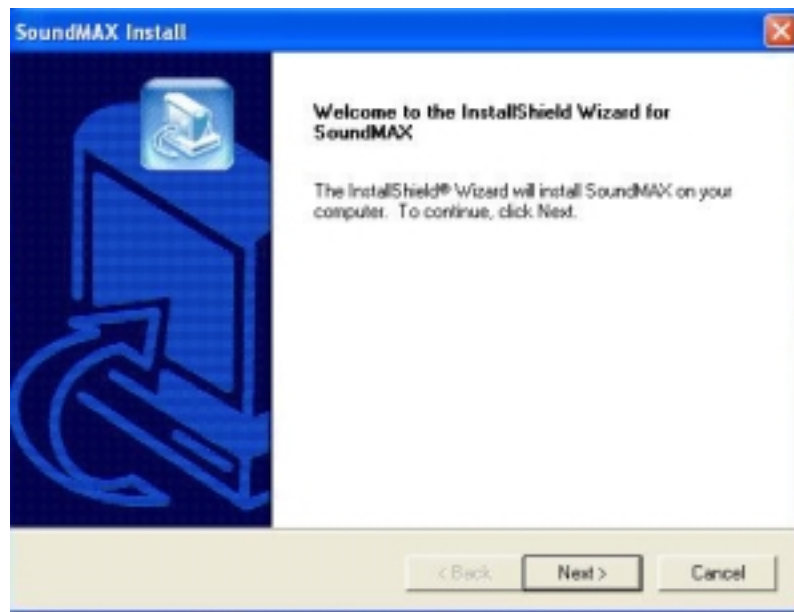
4. When prompted, select the option **Yes, I want to restart my computer now**, then click Finish to complete the installation.

5. After restarting the computer, double-click the SoundMAX Digital Integrated Audio icon from the taskbar to display the SoundMAX Control Panel.

The Listening Environment screen allows you to change the speaker setup, enable or disable the Virtual Theater Surround, and select Acoustic Environments and Virtual Ear.
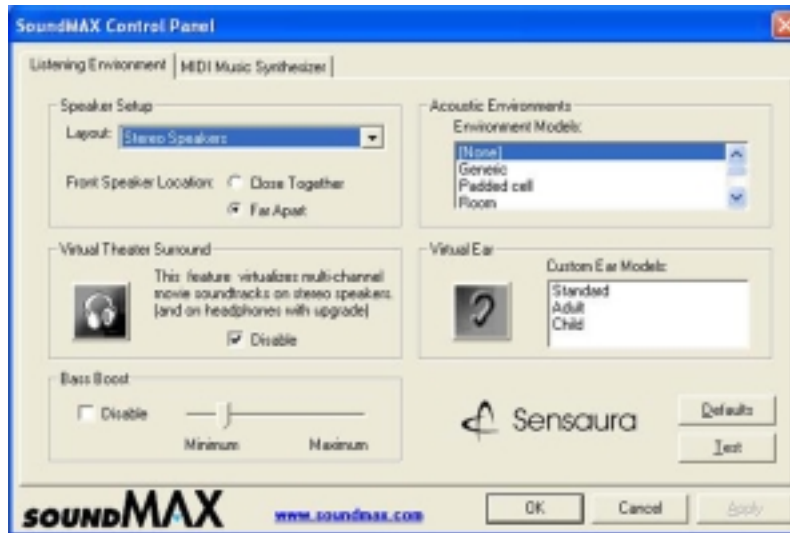
The MIDI Music Synthesizer screen allows you to select a setting for the MIDI. Click the arrow under the Synthesizer Default Set to display a list of options, and choose your desired setting.
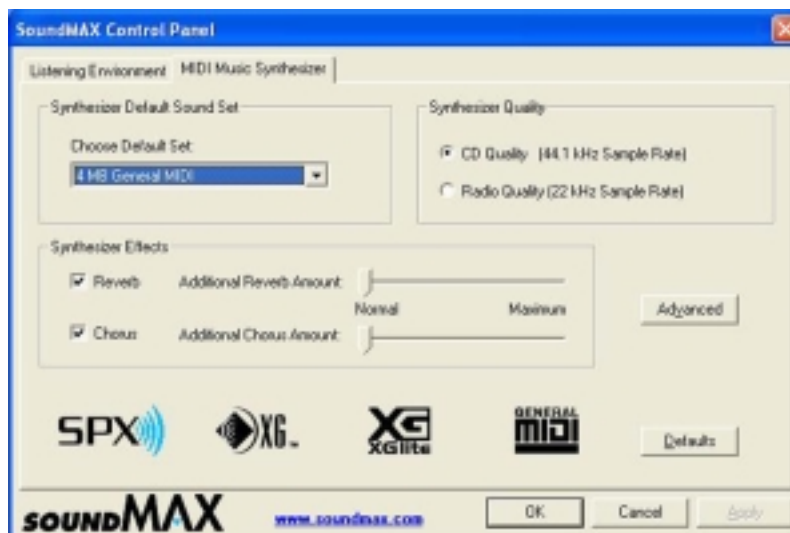
6. Click OK when done.

5.4.3 USB 2.0 driver installation

To update the USB 2.0 driver under Windows XP:

1. Open the Device Manager,
    select Universal Serial Bus
    controllers.
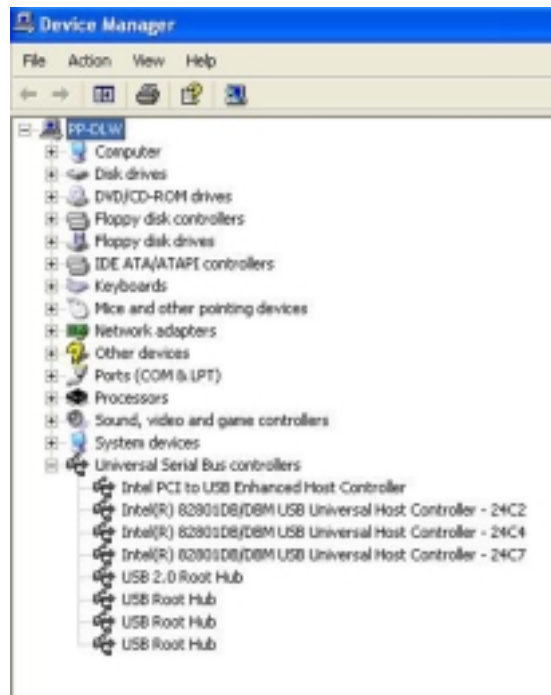
2. Right-click on the item to display
    the Universal Serial Bus (USB)
    Controller Properties window.

3. In the following screen, select Install from a list or specific location (Advanced), then click Next.

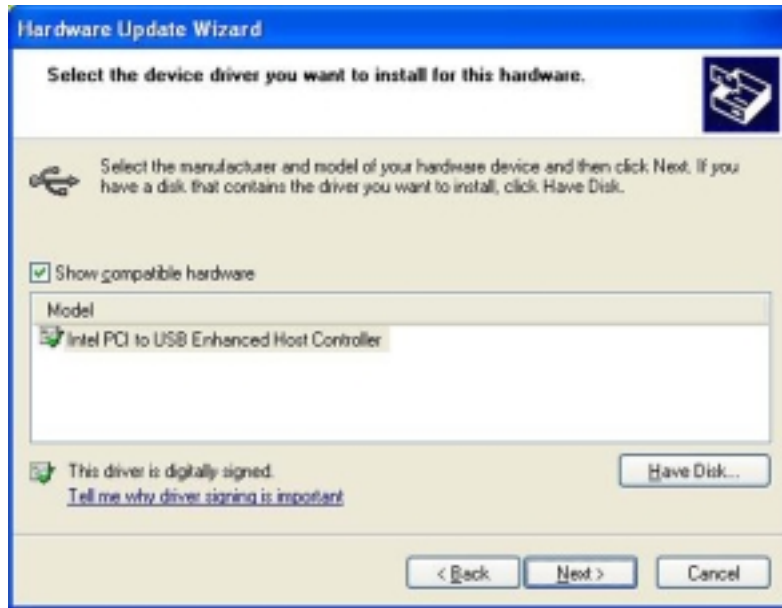4. For Hardware Type, choose Universal Serial Bus Controllers. Click Next.
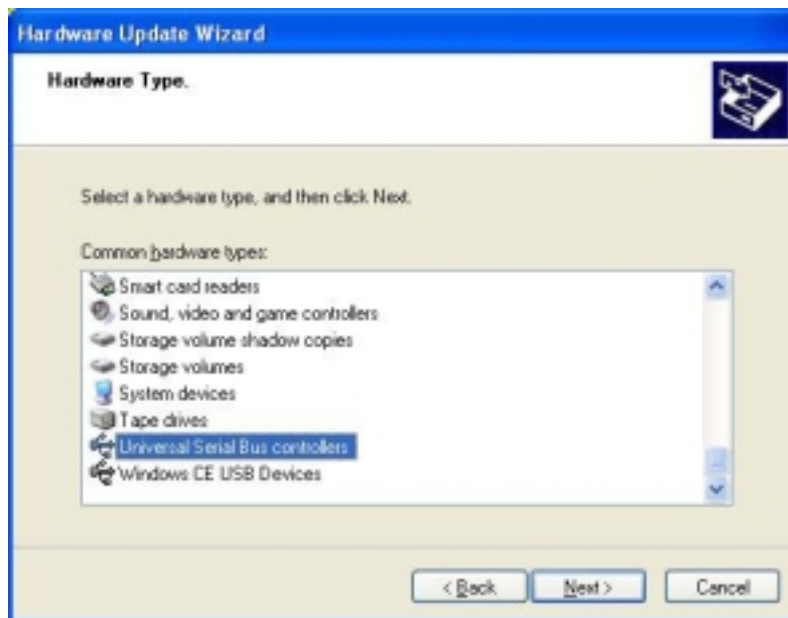
5. When prompted to select the device driver to install, select Standard Universal PCI to USB Host Controller, then click Next.
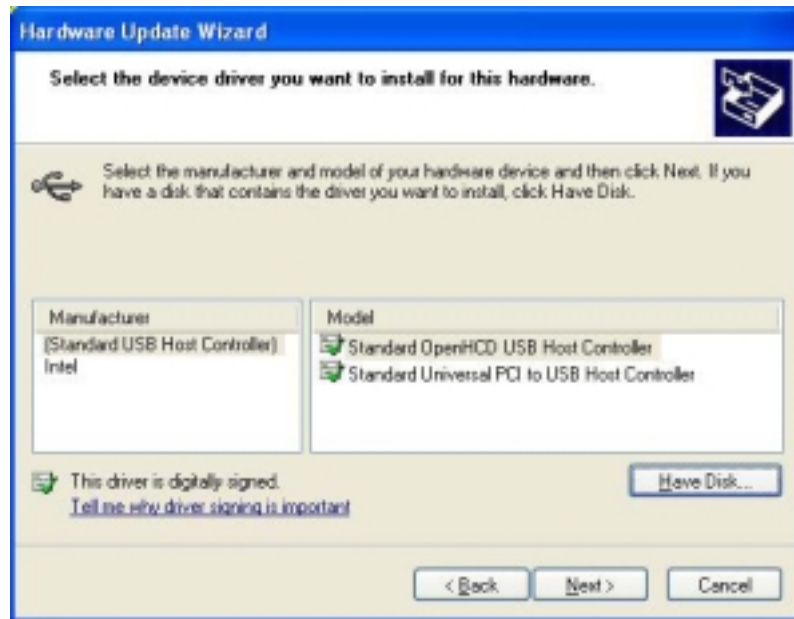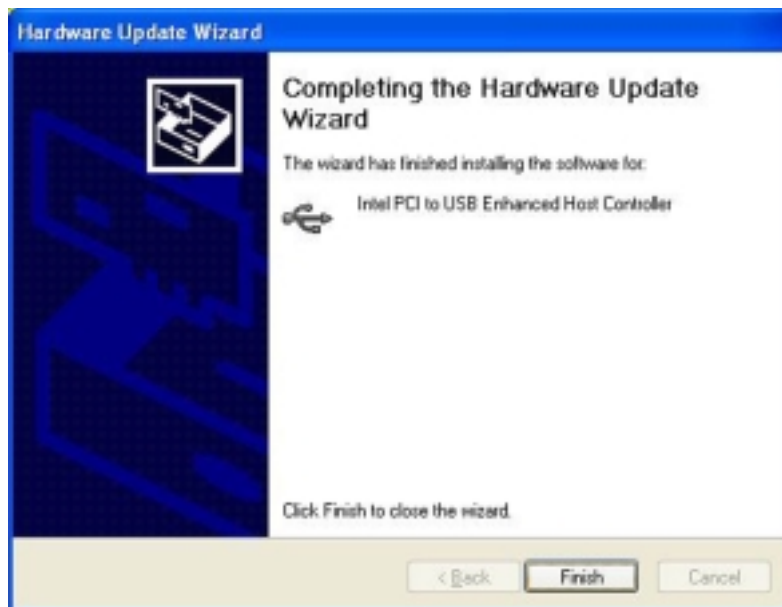

6. Locate the file **usb2x** from the from your specified location. Click Open.
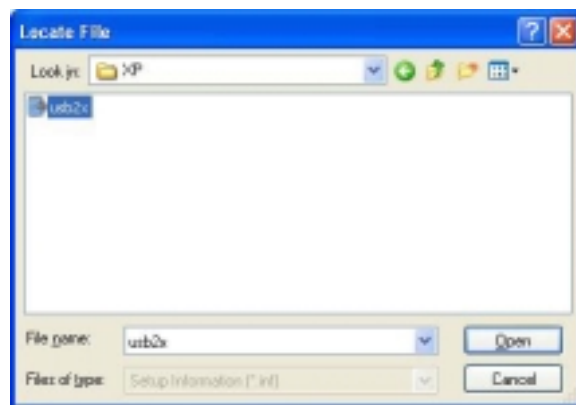
7. Select the model of the device that you wish to install, then click Have Disk.

8. Follow the succeeding screen instructions
9. When prompted, click Finish to complete the installation.

5.5   Novell® NetWare® Server

5.5.1   Intel® 82540EM LAN Driver Installation

A.   Preparing Intel 82540EM LAN Driver Disk

1.   Use the self-extracting image files.

   For the Intel(R) PRO/1000 Server Adapter driver, the executable file is located here:

   \Drivers\Lan\makedisk\makenw.bat

2.   Use the manual to create driver disk.

   If you need to use a floppy disk to install the onboard Intel 82540EM network adapter drivers, use the **MAKEDISK.BAT** utility located at **\Drivers\LAN\MAKEDISK** in the support CD.

   MAKEDISK [operating system] [destination]

where **[operating system]** is the OS for which you are creating the diskette, and **[destination]** is the drive letter and path (such as A:). If no destination is specified, the A: drive will be used. The possible **[operating system]** options are:

   NT = Microsoft Windows NT

   W2K = Microsoft Windows* 2000

   NW = Novell NetWare servers and clients

Make sure you have a 1.44MB formatted, non-bootable diskette in the floppy drive when using this utility.

B. NetWare 4.XX, 5.X, and 6.X Installations

1. Prepare the Intel(R) PRO/1000 Server Adapter driver from the previous section.

2. Install NetWare 4.xx or 5.x according to the NetWare instructions.

3. When the NetWare installation procedure prompts you for a Network Driver, insert the Intel PRO/100+ driver disk into drive **A:** Then use the **INS** key to select an unlisted driver. A dialog box appears. The "**CE100B.LAN** — **Intel 8255X PCI Adapter (CHSM spec 1.11)** " driver appear as a selection.

> If the "Loader could not find public symbol: <symbol name>" error message prompted when system is loading Intel Pro/1000 PCI network driver, it is because the related network driver modules are too old. Download the latest Netware Support Pack from Novell web site at: http://support.novell.com/products/nw411/patches.htm

4. Installation of the Intel 82540EM Network Adapter for NetWare 5.x or 4.xx is complete.

   Add or check the load and bind statements you need to the server's AUTOEXEC.NCF file so the PRO/1000 adapter driver loads automatically load and bind the server driver as follows:

   LOAD CE100B SLOT=x   FRAME=ETHERNET_802.2

   BIND IPX TO CE100B NET=xxxxxxxx

   where: SLOT=x Specifies the NBI (NetWare Bus Interface) slot number. Substitute x with the valid value for the adapter. You will be prompted with the slot number(s) of installed PRO/1000 adapters. The NBI numbers are different from the slot number indicated in the SETUP.EXE utility.

   NET=xxxxxxxx is the unique network address for that LAN segment. The default frame type is 802.2. If your workstation needs to use the 802.3 frame type, see the section later in this document about using multiple frame types on one adapter.

5.6   SUN Solaris 7 Server

5.6.1   Intel® 82540EM LAN Driver Installation

Solaris7 system can correctly recognize Intel 82540EM controller by itself at installation step. You didn't need to load the network driver for the onboard LAN device.

5.7   SCO Open Server 5.0.x

5.7.1   Intel® 82540EM LAN Driver Installation

SCO OpenServer 5.0.6 system can correctly recognize Intel 82540EM network controller during installation. User doesn't need to load or modify the network driver for the onboard LAN device.

You can find the Intel 82540EM Network driver from support CD at:

> **\Drivers\Lan\UNIX\SCO5**

Instructions for Installing the eeE Driver for SCO OpenServer

1. Copy the eee.vol file to any directory, say /tmp, on the SCO system, renaming the file as **VOL.000.000.** Also, make the file read-only by using '**chmod**'.

    For example,

    > **# cp eeE.vol /tmp/VOL.000.000**
    > **# chmod 444 /tmp/VOL.000.000**

2. If there is an older version of the eeE driver on the system, you must first remove it. To do this, run 'netconfig'. Remove all instances of the "Intel ..." adapters. Exit netconfig without opting to relink the kernel.

3. Install the new driver using **'custom'**. When asked for the installation media, choose **'media images'**, and type the directory path to the VOL.000.000 file. (In step 1, if you copied it to /tmp, type '/tmp'). After the installation of the driver is complete, exit 'custom'.

4. Run **'netconfig'** and add the adapters. For each adapter that is present in the system, enter the appropriate TCP/IP parameters. By default, the driver automatically detects the line speed and duplex mode. If you want to force any of these settings, choose 'Advanced Options' and set the speed and duplex modes. Exit 'netconfig' and choose to relink the kernel.

5. Reboot the system. At the command prompt, type:

    > **# reboot (or init 6)**

5.8   SCO UnixWare Server

5.8.1   Intel® 82540EM LAN Driver Installation

SCO UnixWare 7.1.1 system can correctly recognize Intel 82540EM network controller during installation. User doesn't need to load or modify the network driver for the onboard LAN device.

You can find the Intel 82540EM Network driver from support CD at:

\Drivers\Lan\UNIX\UW7DDI8

It is not necessary, nor recommended, to remove previous versions of this package from the system before installing this updated version. To install this package, you may use the **scoadmin** Application Installer from the desktop, or as a root login with **pkgadd** command.

1.   Copy the **eeE8.pkg** file into any directory on the UnixWare system, such as in the **/tmp** directory.

2.   Make sure no other users are logged on and all user applications are closed.

3.   If there is an older version of the **eeE** driver on the system, first run '**netcfg**' and remove any configured NICs. Exit '**netcfg**'. Remove the old driver by typing 'pkgrm eeE'. (You can find the driver version by typing '**pkginfo -l eeE**').

4.   Install the new driver using 'pkgadd'. For example:

   # pkgadd -d /tmp/eeE8.pkg

5.   Run '**netcfg**' to add and configure the NICs.

6.   Reboot the system.

> If you require Hot Plug PCI capabilities, the DDI 8 eeE8 driver must be used. The DDI 8 driver is supported on UnixWare 7.1.0 and later versions. For more information about Hot Plug PCI capabilities please refer to SCO UnixWare 7 documentation.

5.9   Linux RedHat 7.x

5.9.1   Intel 82540EM LAN Driver Installation

Linux RedHat 7.x system can automatically recognize Intel 82540EM network controller during installation. You don't need to load or modify the network driver for the onboard LAN device.