G4E620-N
G4E620-B

System Board
User's Manual

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Caution

To avoid damage to the system:
• Use the correct AC input voltage range.

To reduce the risk of electric shock:
• Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

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

Joystick or MIDI port:
- Do not use any joystick or MIDI device that requires more than 10A current at 5V DC. There is a risk of fire for devices that exceed this limit.

FCC and DOC Statement on Class B

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 when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, 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 the receiver.
- Connect the equipment into 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.

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. Shielded interface cables must be used in order to comply with the emission limits.

Notice

An electronic file of this manual is included in the CD. To view the user's manual, insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. Click "User's Manual" on the main menu.

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Chapter 1 - Introduction

Specifications

Processor

The system board is equipped with Socket 478 for installing one of the following supported processors.

- Intel® Pentium® 4 (Prescott and Northwood) processor
  - Intel Hyper-Threading Technology
  - FSB: 400MHz and 533MHz
- Intel® Celeron® / Celeron® D processor
  - 400MHz system data bus
- Processor socket: Socket 478

Chipset

- Intel® 845E chipset
  - Intel® 82845E Memory Controller Hub (MCH)
  - Intel® 82801DB I/O Controller Hub (ICH4)

System Memory

- Two 184-pin DDR SDRAM DIMM sockets
- 2.5V unbuffered PC1600 (DDR200) or PC2100 (DDR266) DDR SDRAM DIMM
- Supports maximum of 2.1GB system memory using 64Mbit, 128Mbit, 256Mbit or 512Mbit technology
  - Double-sided x16 DDR SDRAM DIMM is not supported
- Supports ECC function

Density	64 Mbit		128 Mbit		256 Mbit		512 Mbit	
Density Width	X8	X16	X8	X16	X8	X16	X8	X16
Single/Double	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS	SS/DS
184-pin DDR	64/128MB	32MB/NA	128/256MB	64MB/NA	256/512MB	128MB/NA	512/1024MB	256MB/NA

BIOS

- Award BIOS
- 4Mbit flash memory

Energy Efficient Design

- Supports ACPI specification and OS Directed Power Management
- Supports ACPI STR (Suspend to RAM) function
- Wake-On-Events include:
  - Wake-On-PS/2 Keyboard/Mouse
  - Wake-On-USB Keyboard
  - Wake-On-Ring (through internal or external modem)
  - Wake-On-LAN
  - RTC timer to power-on the system
- System power management supported
- CPU stopped clock control
- Hardware supports SMI green mode
- Microsoft®/Intel® APM 1.2 compliant
- Soft Power supported - ACPI v1.0b specification
- AC power failure recovery

Hardware Monitor

- Monitors CPU/system temperature and overheat alarm
- Monitors 5VSB/VBAT/1.5V/3.3V/±5V/±12V/Vcore voltages and failure alarm
- Monitors CPU/chassis/2nd fan speed and failure alarm
- Read back capability that displays temperature, voltage and fan speed
- Opened chassis alarm
- Watchdog timer function

Onboard Audio Features

- 18-bit stereo full-duplex codec with independent variable sampling rate
- High quality differential CD input
- True stereo line level outputs
- S/PDIF-out interface
- 2-channel audio output

PCI IDE Interface

- Supports ATA/33, ATA/66 and ATA/100 hard drives
- PIO Mode 4 Enhanced IDE (data transfer rate up to 14MB/sec.)

Onboard LAN Features

- Uses 82551 fast ethernet controller (G4E620-N only)
  - Integrated IEEE 802.3, 10BASE-T and 100BASE-TX compatible PHY
  - Glueless 32-bit PCI master interface
  - Glueless CardBus master interface
  - Integrated power management functions
  - 128 Kbyte Flash interface
  - Thin BGA 15 mm^2 package
- Uses 82562 fast ethernet controller
  - Basic 10/100 Client Connection. Supports 559 level cable and PHY Stats. Support for Server OS included as check item, but no Server function included
  - Same Quality Driver suits as 82559
  - Supports DMI/SNMP/WMI
  - 10/100 Auto Sensing
  - IEEE 802.3, 10BASE-T/100BASE-TX compliant physical layer interface
  - IEEE 802.3u Auto-Negotiation
  - 48-pin SSOP, 3.3V device

Accelerated Graphics Port (A.G.P.)

- Supports 1.5V AGP with up to 1066MB/sec. bandwidth for 3D graphics applications

Rear Panel I/O Ports

- 1 mini-DIN-6 PS/2 mouse port
- 1 mini-DIN-6 PS/2 keyboard port
- 1 DB-25 parallel port
- 2 DB-9 serial ports
- 2 RJ45 LAN ports (G4E620-N only)
  1 RJ45 LAN port (G4E620-B only)
- 4 USB 2.0/1.1 ports
- Mic-in, line-in and line-out

I/O Connectors

- 1 CompactFlash™ socket
- 1 connector for 2 additional external USB 2.0/1.1 ports
- 1 connector for an external game/MIDI port
- 1 front audio connector for external line-out and mic-in jacks
- 2 internal audio connectors (CD-in and AUX-in)
- 1 S/PDIF-out connector
- 1 connector for IrDA interface
- 2 IDE connectors
- 1 floppy connector
- 1 20-pin ATX power connector
- 1 4-pin ATX 12V power connector
- 1 Wake-On-LAN connector
- 1 Wake-On-Ring connector
- 1 chassis open connector
- 1 keylock connector
- 1 front panel connector
- 3 fan connectors

Expansion Slots

- 1 AGP slot that supports 1.5V AGP
- 4 PCI slots (1 shared with ISA slot)
- 3 ISA slots

Compatibility

- PCI 2.2 and AC '97 compliant

PCB

- 4 layers, ATX form factor
- 30.5cm (12") x 24.4cm (9.6")

Special Features of the System Board

Watchdog Timer

The Watchdog Timer function allows your application to regularly "clear" the system at the set time interval. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

Hyper-Threading Technology Functionality Requirements

The system board supports Intel processors with Hyper-Threading Technology. Enabling the functionality of Hyper-Threading Technology for your computer system requires **ALL** of the following platforms.

Components:

- CPU - an Intel® Pentium® 4 Processor with HT Technology
- Chipset - an Intel® chipset that supports HT Technology
- BIOS - a BIOS that supports HT Technology and has it enabled
- OS - an operating system that includes optimizations for HT Technology

Please refer to Appendix A for information a bout enabling the functionality of the Hyper-Threading Technology. For more information on Hyper-Threading Technology, go to: www.intel.com/info/hyperthreading.

DDR

DDR (Double Data Rate) is a type of SDRAM that doubles the data rate through reading and writing at both the rising and falling edge of each clock. This effectively doubles the speed of operation therefore providing two times faster data transfer.

Dual Function Power Button

Depending on the setting in the "Soft-Off By PWR-BTTN" field of the Power Management Setup, this switch will allow the system to enter the Soft-Off or Suspend mode.

AGP (Accelerated Graphics Port)

The AGP slot only supports 1.5V AGP 4x (1066MB/sec. bandwidth) add-in cards. AGP is an interface designed to support high performance 3D graphics cards for 3D graphics applications. It handles large amounts of graphics data with the following features:

- Pipelined memory read and write operations that hide memory access latency.
- Demultiplexing of address and data on the bus for nearly 100 percent efficiency.

S/PDIF

S/PDIF is a standard audio file transfer format that transfers digital audio signals to a device without having to be converted first to an analog format. This prevents the quality of the audio signal from degrading whenever it is converted to analog. S/PDIF is usually found on digital audio equipment such as a DAT machine or audio processing device. The S/PDIF connector on the system board sends surround sound and 3D audio signal outputs to amplifiers and speakers and to digital recording devices like CD recorders.

IrDA Interface

The system board is equipped with an IrDA connector for wireless connectivity between your computer and peripheral devices. The IRDA (Infrared Data Association) specification supports data transfers of 115K baud at a distance of 1 meter.

USB Ports

The system board supports USB 2.0 and USB 1.1 ports. USB 1.1 supports 12Mb/second bandwidth while USB 2.0 supports 480Mb/ second bandwidth providing a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

Wake-On-Ring

This feature allows the system that is in the Suspend mode or Soft Power Off mode to wake-up/power-on to respond to calls coming from an external modem, internal modem or respond to calls from a modem PCI card that uses the PCI PME (Power Management Event) signal to remotely wake up the PC.

> **Important:**
> *If you are using a modem add-in card, the 5VSB power source of your power supply must support a minimum of ≥720mA.*

Wake-On-LAN

This feature allows the network to remotely wake up a Soft Power Down (Soft-Off) PC. It is supported via the onboard LAN port, via a PCI LAN card that uses the PCI PME (Power Management Event) signal or via a LAN card that uses the Wake-On-LAN connector. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.

> **Important:**
> *The 5VSB power source of your power supply must support ≥720mA.*

Wake-On-PS/2 Keyboard/Mouse

This function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system.

> **Important:**
> *The 5VSB power source of your power supply must support ≥720mA.*

Wake-On-USB Keyboard

This function allows you to use a USB keyboard to wake up a system from the S3 (STR - Suspend To RAM) state.

> **Important:**
> *If you are using the Wake-On-USB Keyboard function for 2 USB ports, the 5VSB power source of your power supply must support ≥1.5A. For 3 or more USB ports, the 5VSB power source of your power supply must support ≥2A.*

RTC Timer to Power-on the System

The RTC installed on the system board allows your system to automatically power-on on the set date and time.

ACPI

The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enables PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management. Currently, only Windows® 98SE/2000/ME/XP supports the ACPI function. ACPI when enabled in the Power Management Setup will allow you to use the Suspend to RAM function.

With the Suspend to RAM function enabled, you can power-off the system at once by pressing the power button or selecting "Standby" when you shut down Windows® 98SE/2000/ME/XP without having to go through the sometimes tiresome process of closing files, applications and operating system. This is because the system is capable of storing all programs and data files during the entire operating session into RAM (Random Access Memory) when it powers-off. The operating session will resume exactly where you left off the next time you power-on the system.

> **Important:**
> *The 5VSB power source of your power supply must support ≥1A.*

AC Power Failure Recovery

When power returns after an AC power failure, you may choose to either power-on the system manually, let the system power-on automatically or return to the state where you left off before power failure occurs.

Package Checklist

The system board package contains the following items:

- ☑ The system board
- ☑ A user's manual
- ☑ One IDE cable
- ☑ One floppy disk drive cable
- ☑ One "Main Board Utility" CD

If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

Chapter 2 - Hardware Installation

System Board Layout

G4E620-N

KB Mouse

COM 1

Parallel

COM 2

LAN USB 0-1

USB 2-3

Mic-in Line-in Line-out

USB 0-1 power select (JP7)

+12V power

Intel 82562ET

USB 2-3 power select (JP6)

82562ET settings (JP11)

Chassis open

Winbond W83627HF

IrDA

Game/MIDI

BIOS

Front audio

Audio Codec

AUX-in

CD-in

S/PDIF

CPU fan

DDR 1

DDR 2

DIMM Standby LED

Socket 478

Intel 845E

CPU FSB (JP1)

AGP

PCI 1

PCI 2

PCI Standby LED

PCI 3

USB 4-5

USB 4-5 power select (JP5)

Winbond W83628F

PCI 4

Battery

ISA 1

ISA 2

ISA 3

Chassis fan

ATX Power

IDE 2 IDE 1

FDD

Intel ICH4

CF card setting (JP10)

CompactFlash socket

Keylock

Clear CMOS (JP3)

Power-on select (JP9)

WOL

WOR

2nd fan

Front panel

G4E620-B

Note:

G4E620-N supports 2 LAN while G4E620-B supports 1 LAN only. The illustrations on the following pages are based on the system board that supports 2 LAN.

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Warning:

Electrostatic discharge (ESD) can damage your system board, processor, disk drives, add-in boards, and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

System Memory

DDR 1
DDR 2
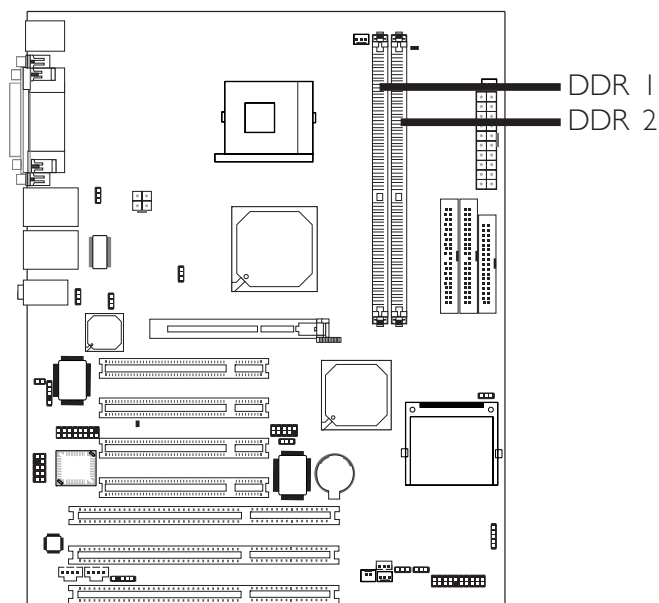
The system board supports DDR SDRAM DIMM. Double Data Rate SDRAM (DDR SDRAM) is a type of SDRAM that doubles the data rate through reading and writing at both the rising and falling edge of each clock. This effectively doubles the speed of operation therefore doubling the speed of data transfer.

BIOS Setting

Configure the system memory in the Advanced Chipset Features submenu of the BIOS.

Installing the DIM Module

A DIM module simply snaps into a DIMM socket on the system board. Pin 1 of the DIM module must correspond with Pin 1 of the socket.

Notch

Key

Tab

Tab

Pin 1
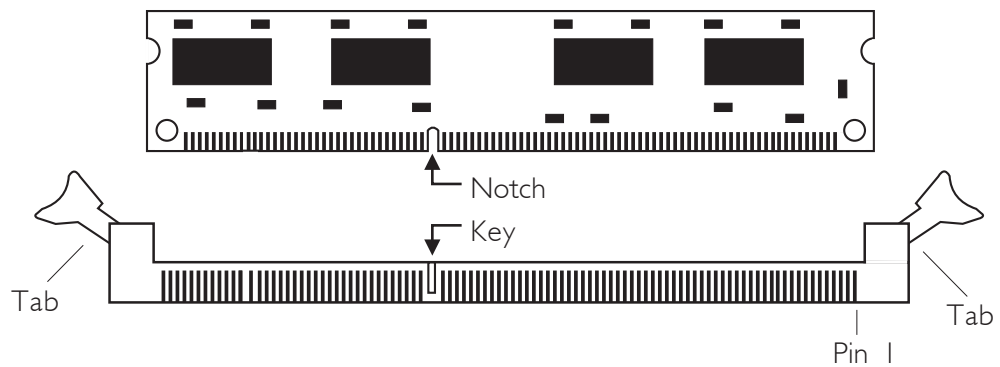
1. Pull the "tabs" which are at the ends of the socket to the side.

2. Position the DIMM above the socket with the "notch" in the module aligned with the "key" on the socket.

3. Seat the module vertically into the socket. Make sure it is completely seated. The tabs will hold the DIMM in place.

CPU

Overview

The system board is equipped with a surface mount 478-pin CPU socket. This socket is exclusively designed for installing an Intel processor.
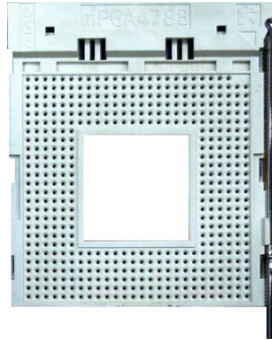
Installing the CPU

1. Locate Socket 478 on the system board.

2. Unlock the socket by pushing the lever sideways, away from the socket, then lifting it up to a 90° angle. Make sure the socket is lifted to at least this angle otherwise the CPU will not fit in properly.

Lever ———
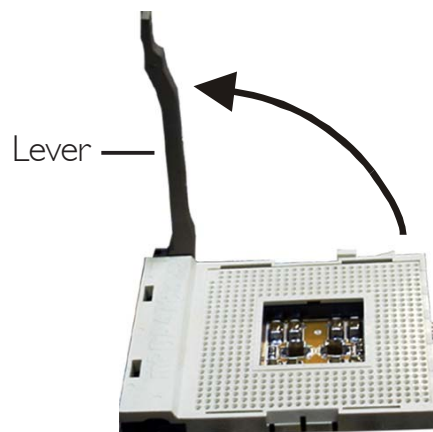
3. Position the CPU above the socket then align the gold mark on the corner of the CPU (designated as pin 1) with pin 1 of the socket.

> **Important:**
> *Handle the CPU by its edges and avoid touching the pins.*

Gold mark

Pin 1
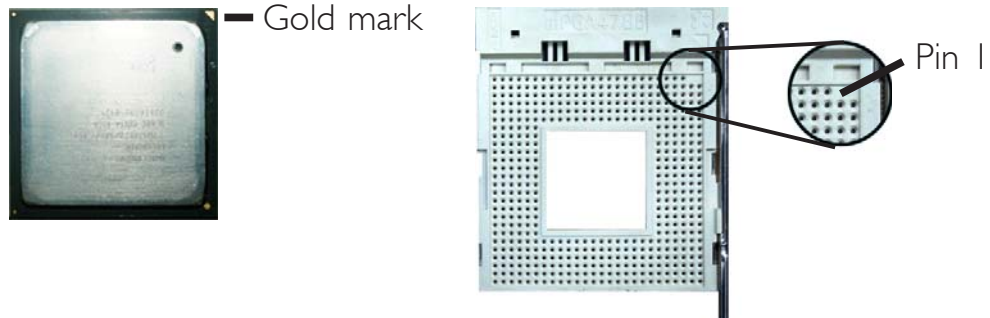
4. Insert the CPU into the socket until it is seated in place. The CPU will fit in only one orientation and can easily be inserted without exerting any force.

> **Important:**
> *Do not force the CPU into the socket. Forcing the CPU into the socket may bend the pins and damage the CPU.*
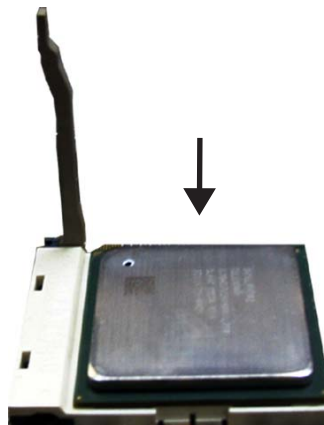
5. Once the CPU is in place, push down the lever to lock the socket. The lever should click on the side tab to indicate that the CPU is completely secured in the socket.

Installing the Fan and Heat Sink

The CPU must be kept cool by using a CPU fan with heatsink. Without sufficient air circulation across the CPU and heat sink, the CPU will overheat damaging both the CPU and system board.

> **Note:**
> - *Only use Intel® certified fan and heat sink.*
> - *An Intel® boxed processor package contains a retention mechanism, heat sink, fan and installation guide. If the installation procedure in the installation guide differs from the one in this section, please follow the installation guide in the package.*
> - *If you are installing a non-boxed processor, the heat sink, fan and retention mechanism assembly may look different from the one shown in this section but the procedure will more or less be the same.*

1. The system board comes with the retention module base already installed.

Retention
hole

Retention
hole

Retention
hole

Retention
hole

Retention
module base
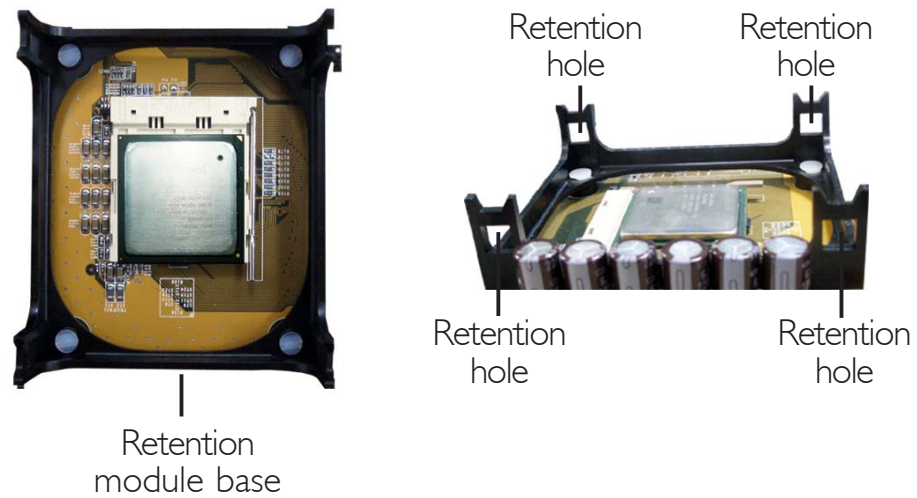
2. Position the fan / heat sink and retention mechanism assembly on the CPU, then align and snap the retention legs' hooks to the retention holes at the 4 corners of the retention module base.

Note:
You will not be able to snap the hooks into the holes if the fan / heat sink and retention mechanism assembly did not fit properly onto the CPU and retention module base.

Fan / heat sink
and retention
mechanism
assembly

Unsnapped

Snapped
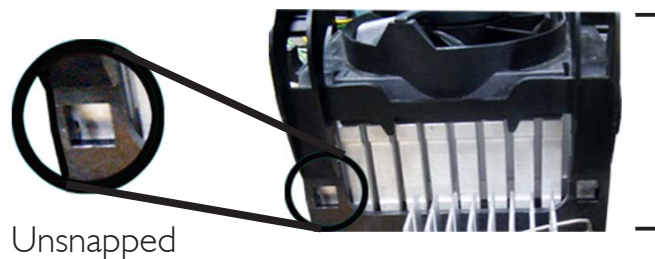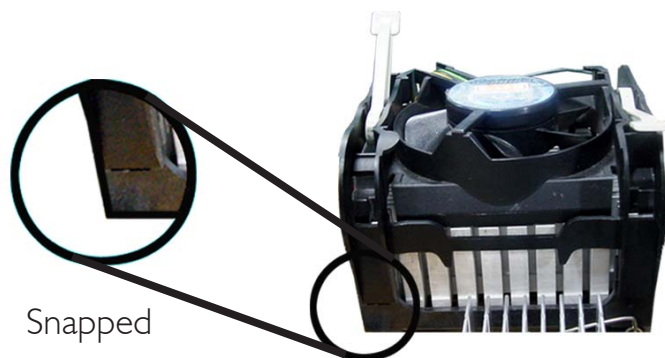
3. The retention levers at this time remains unlocked as shown in the illustration below.

Retention lever

Retention lever

4. Move the retention levers to their opposite directions then push them down. This will secure the fan / heat sink and retention mechanism assembly to the retention module base.

> **Note:**
> *You will not be able to push the lever down if the direction is incorrect.*

5. Connect the CPU fan's cable connector to the CPU fan connector on the system board.

Jumper Settings

Clear CMOS Data

JP3

1 2 3
1-2 On: Normal
(default)

1 2 3
2-3 On:
Clear CMOS Data
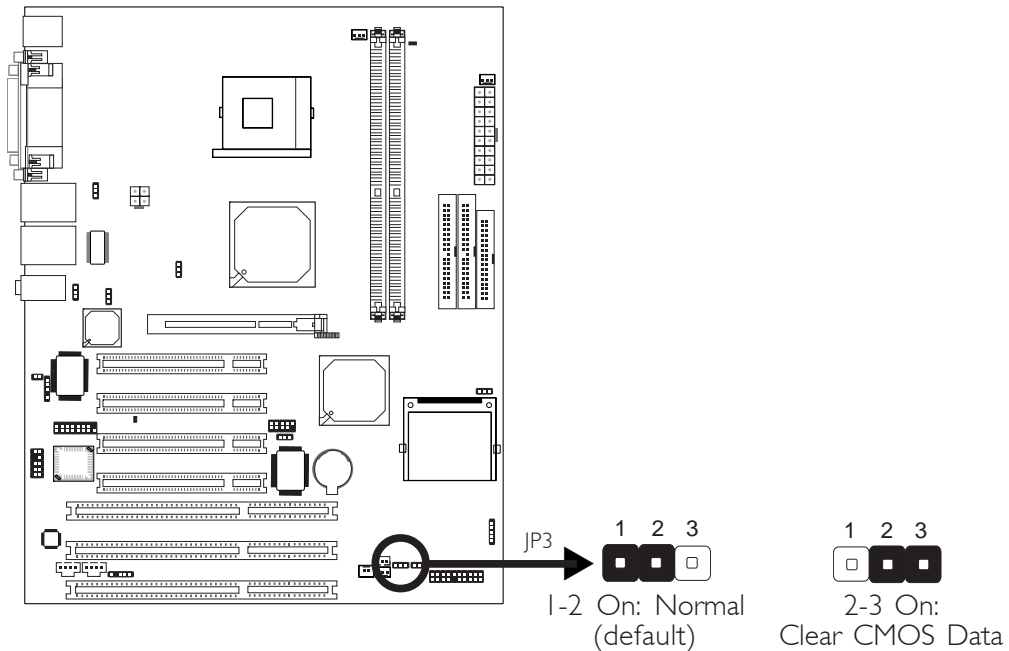
If you encounter the following,

a) CMOS data becomes corrupted.
b) You forgot the supervisor or user password.
c) You are unable to boot-up the computer system because the processor's ratio/clock was incorrectly set in the BIOS.

you can reconfigure the system with the default values stored in the ROM BIOS.

To load the default values stored in the ROM BIOS, please follow the steps below.

1. Power-off the system and unplug the power cord.

2. Set JP3 pins 2 and 3 to On. Wait for a few seconds and set JP3 back to its default setting, pins 1 and 2 On.

3. Now plug the power cord and power-on the system.

   If your reason for clearing the CMOS data is due to incorrect setting of the processor's ratio/clock in the BIOS, please proceed to step 4.

4. After powering-on the system, press <Del> to enter the main menu of the BIOS.

5. Select the Frequency/Voltage Control submenu and press <Enter>.

6. Set the processor's ratio/clock to its default setting or an appropriate ratio/clock. Refer to the Frequency/Voltage Control section in chapter 3 for more information.

7. Press <Esc> to return to the main menu of the BIOS setup utility. Select "Save & Exit Setup" and press <Enter>.

8. Type <Y> and press <Enter>.

USB Power Select

USB 0-1
(JP7)

1-2 On: 5V
(default)

2-3 On: 5VSB

USB 2-3
(JP6)

1-2 On: 5V
(default)

2-3 On: 5VSB

USB 4-5
(JP5)

1-2 On: 5V
(default)

2-3 On: 5VSB
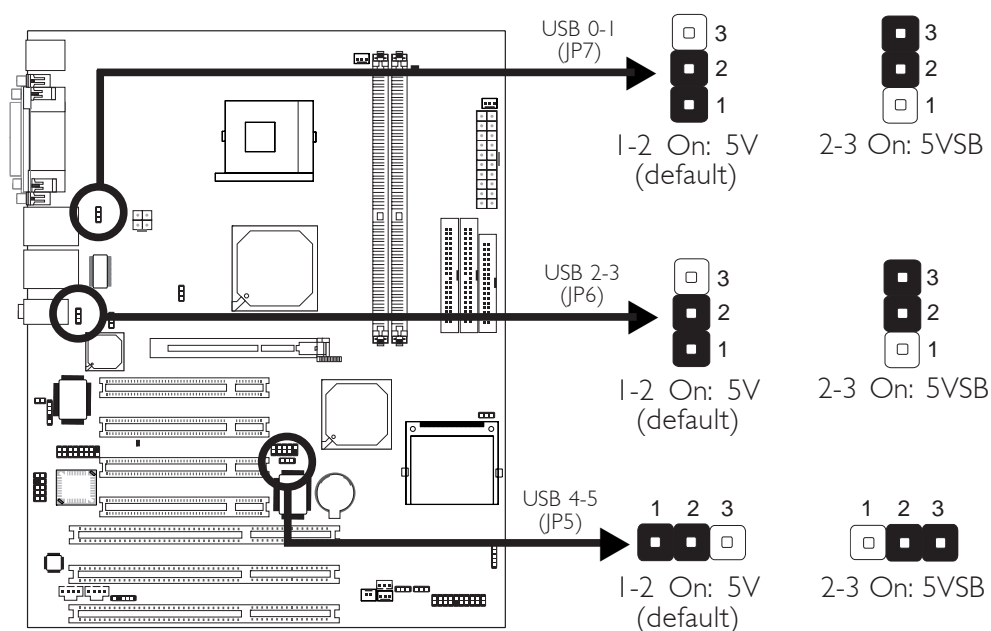
JP5, JP6 and JP7 are used to select the power of the USB ports. Selecting 5VSB will allow you to use the USB keyboard to wake up the system.

BIOS Setting:

"USB KB Wake-Up From S3" in the Power Management Setup submenu of the BIOS must be set to Enabled. Refer to chapter 3 for more information.

> **Important:**
> *If you are using the Wake-On-USB Keyboard function for 2 USB ports, the 5VSB power source of your power supply must support ≥2A. For 3 or more USB ports, the 5VSB power source of your power supply must support ≥2A.*

Power-on Select

JP9

1 2 3
1-2 On:
Power-on via
AC power

1 2 3
2-3 On:
Power-on via
power button
(default)
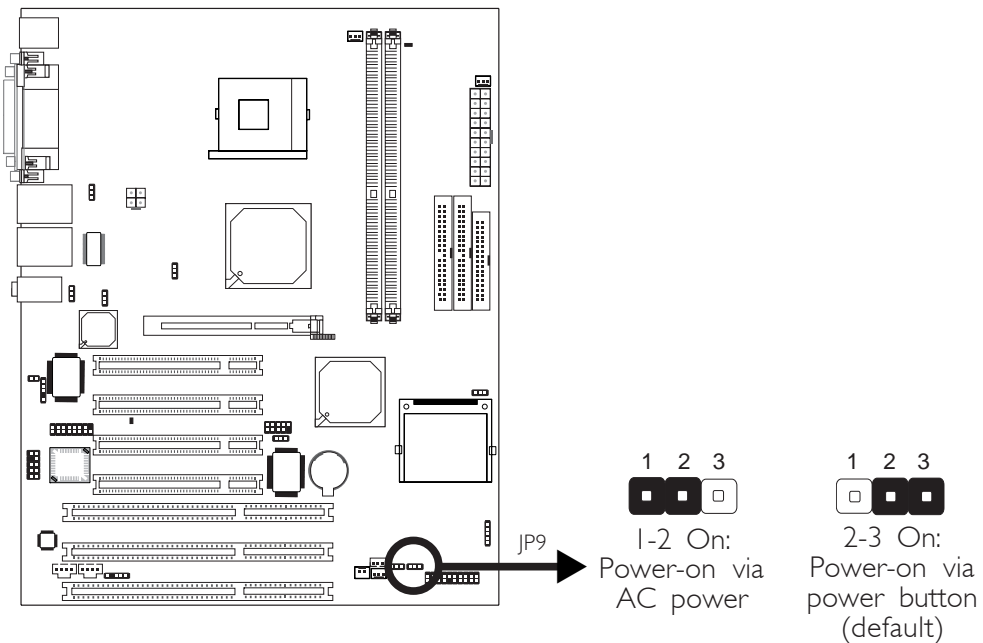
JP9 is used to select the method of powering on the system. If you want the system to power-on once AC power comes in, set JP9 pins 1 and 2 to On. If you want to use the power button, set pins 2 and 3 to On.

CPU FSB Select

JP1

	3
	2
	1

1-2 On: Auto
(default)

	3
	2
	1

2-3 On:
100MHz

	3
	2
	1

All Off:
133MHz

JP1 is used to select the front side bus of the processor.

Important:
Overclocking may result to the CPU's or system's instability and are not guaranteed to provide better system performance. If you are unable to boot your system due to overclocking, make sure to set this jumper back to its default settings.

CompactFlash Card Setting
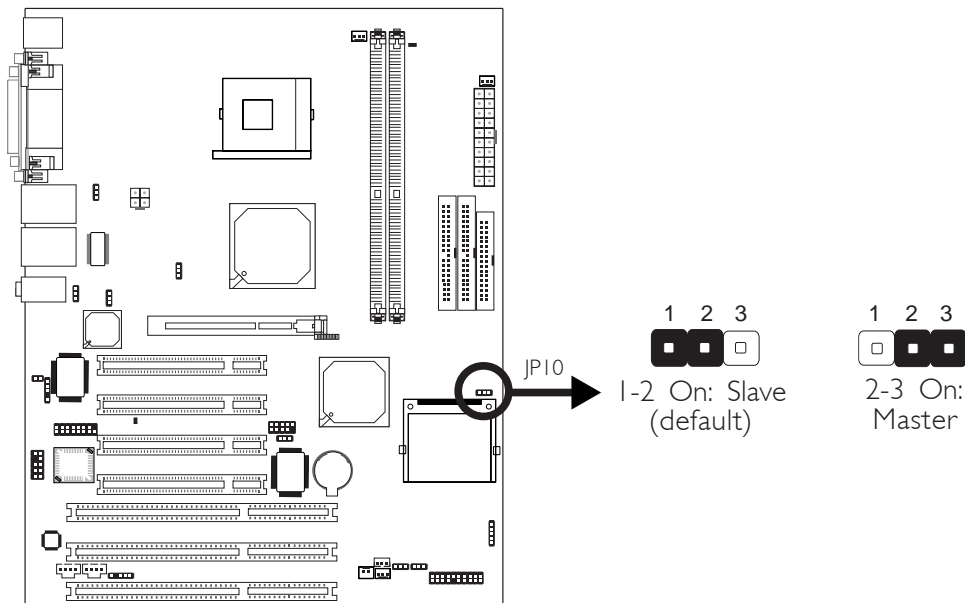
JP10 is used to set the CompactFlash™ socket to Master or Slave mode.

CompactFlash™ and IDE 2 share the same channel. The mode of the hard drive connected to the IDE 2 connector must differ from the one selected for CompactFlash™. In other words, if CompactFlash™ is set to Slave mode, then IDE 2's hard drive must be set to Master mode and vice versa. Under such circumstance, IDE 2 can only support one hard drive.

82562ET LAN Settings

JP11

3
2
1

1-2 On: Enabled (default)

3
2
1

2-3 On: Disabled
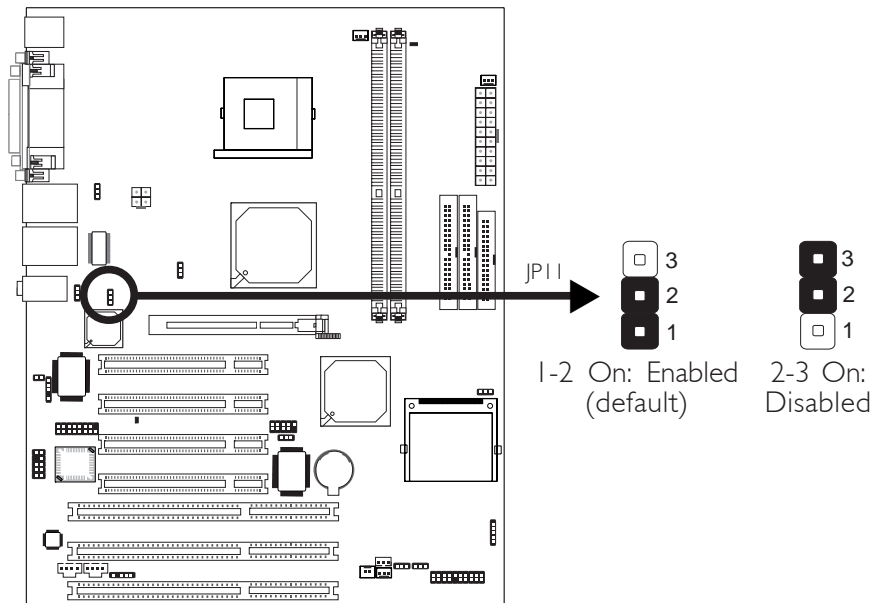
JP11 is used to enable or disable the onboard Intel 82562ET LAN chip that controls the onboard LAN 1 port.

Rear Panel I/O Ports
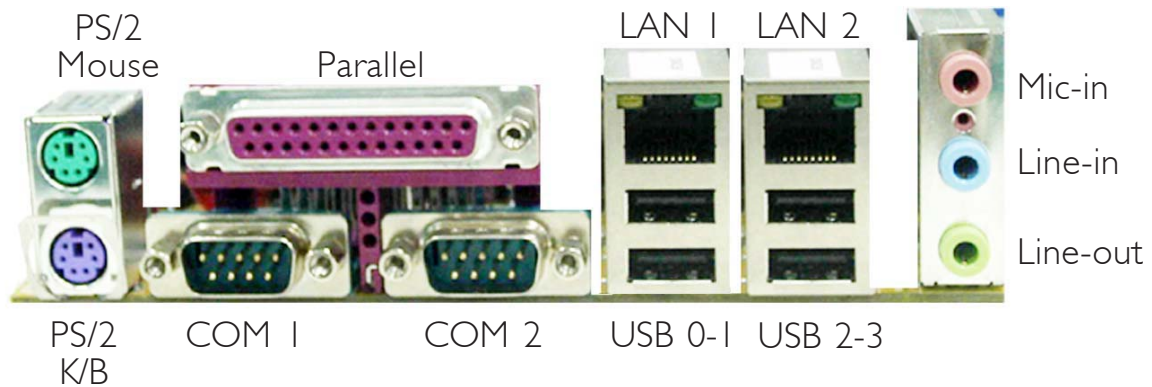
The rear panel I/O ports consist of the following:

- PS/2 mouse port
- PS/2 keyboard port
- Parallel port
- COM ports
- LAN 1 port (G4E620-N and G4E620-B)
- LAN 2 port (G4E620-N only)
- USB ports
- Mic-in jack
- Line-in jack
- Line-out jack

PS/2 Mouse and PS/2 Keyboard Ports

PS/2 Mouse
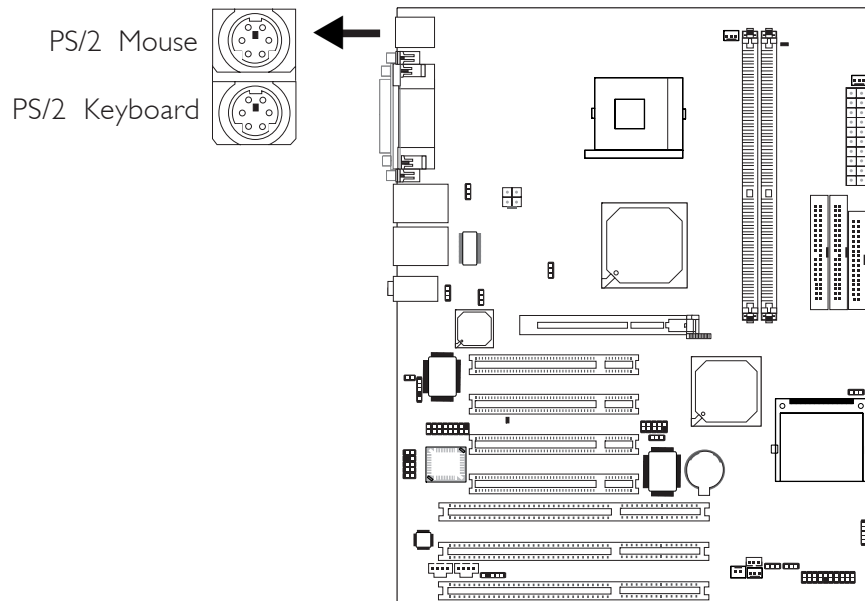
PS/2 Keyboard

The system board is equipped with an onboard PS/2 mouse (Green) and PS/2 keyboard (Purple) ports - both at location CN1 of the system board. The PS/2 mouse port uses IRQ12. If a mouse is not connected to this port, the system will reserve IRQ12 for other expansion cards.

Warning:
Make sure to turn off your computer prior to connecting or disconnecting a mouse or keyboard. Failure to do so may damage the system board.

Wake-On-PS/2 Keyboard/Mouse

The Wake-On-PS/2 Keyboard/Mouse function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system. To use this function:

- **BIOS Setting:**
  Configure the PS/2 wake up function in the Integrated Peripherals submenu ("Onboard Super I/O Device" section) of the BIOS. Refer to chapter 3 for more information.

Serial Ports
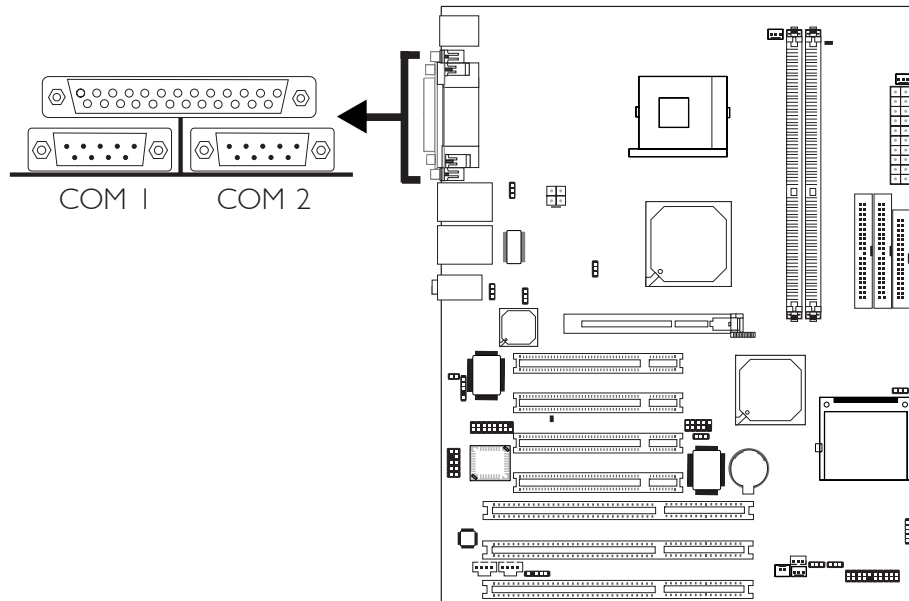
COM 1   COM 2

The system board is equipped with two onboard serial ports at locations CN4 (COM 1) and CN11 (COM 2). These serial ports are RS-232 asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

BIOS Setting

Configure the serial ports in the Integrated Peripherals submenu ("Onboard Super I/O Device" section) of the BIOS. Refer to chapter 3 for more information.

Parallel Port
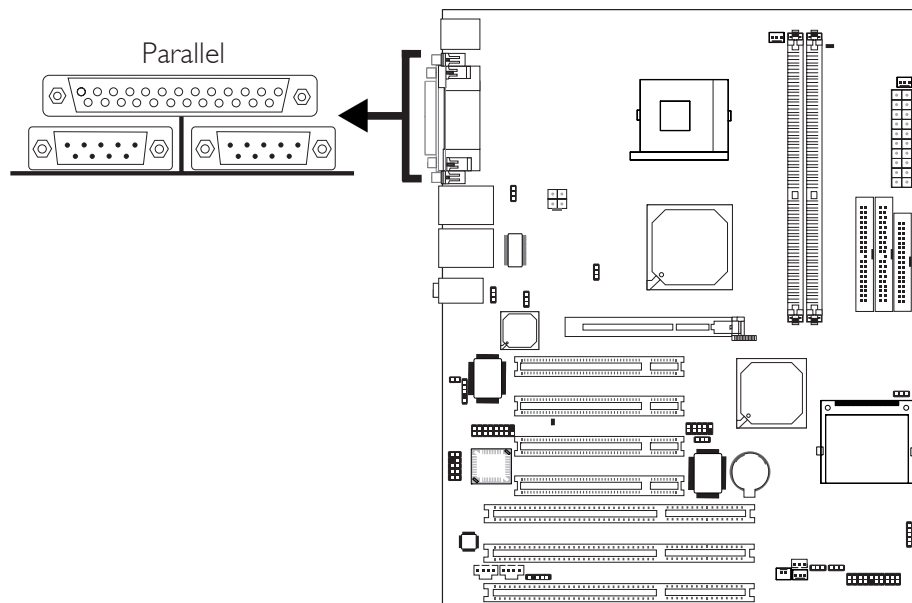
Parallel

The system board has a standard parallel port (Burgundy) at location CN7 for interfacing your PC to a parallel printer. It supports SPP, ECP and EPP.

Setting	Function
SPP (Standard Parallel Port)	Allows normal speed operation but in one direction only.
ECP (Extended Capabilities Port)	Allows parallel port to operate in bidirectional mode and at a speed faster than the SPP's data transfer rate.
EPP (Enhanced Parallel Port)	Allows bidirectional parallel port operation at maximum speed.

BIOS Setting

Configure the parallel port in the Integrated Peripherals submenu ("Onboard Super I/O Device" section) of the BIOS. Refer to chapter 3 for more information.

Universal Serial Bus Ports

USB 1
USB 0

USB 3
USB 2

USB 4-5

VCC
-Data
+Data
Ground
N. C.

2 ■■■■■ 10
1 ■■■■■ 9

VCC
-Data
+Data
Ground
Key

The system board supports USB 2.0/1.1 ports. USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The 4 onboard USB 2.0/1.1 ports (Black) are at locations CN5 (USB 0-1) and CN6 (USB 2-3).

J10 (USB 4-5) allows you to connect 2 additional USB 2.0/1.1 ports. The USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to the system chassis then insert the connector that is attached to the USB port cables to J10.

BIOS Setting

Configure USB in the Integrated Peripherals submenu of the BIOS. Refer to chapter 3 for more information.

Driver Installation

You may need to install the proper drivers in your operating system to use the USB device. Refer to your operating system's manual or documentation for more information.

Refer to chapter 4 for more information about USB 2.0 drivers.

Wake-On-USB Keyboard

The Wake-On-USB Keyboard function allows you to use a USB keyboard to wake up a system from the S3 (STR - Suspend To RAM) state. To use this function:

- **Jumper Setting:**
  JP5, JP6 and/or JP7 must be set to "2-3 On: 5VSB". Refer to "USB Power Select" in this chapter for more information.

- **BIOS Setting:**
  "USB KB Wake-Up From S3" in the Power Management Setup submenu of the BIOS must be set to Enabled. Refer to chapter 3 for more information.
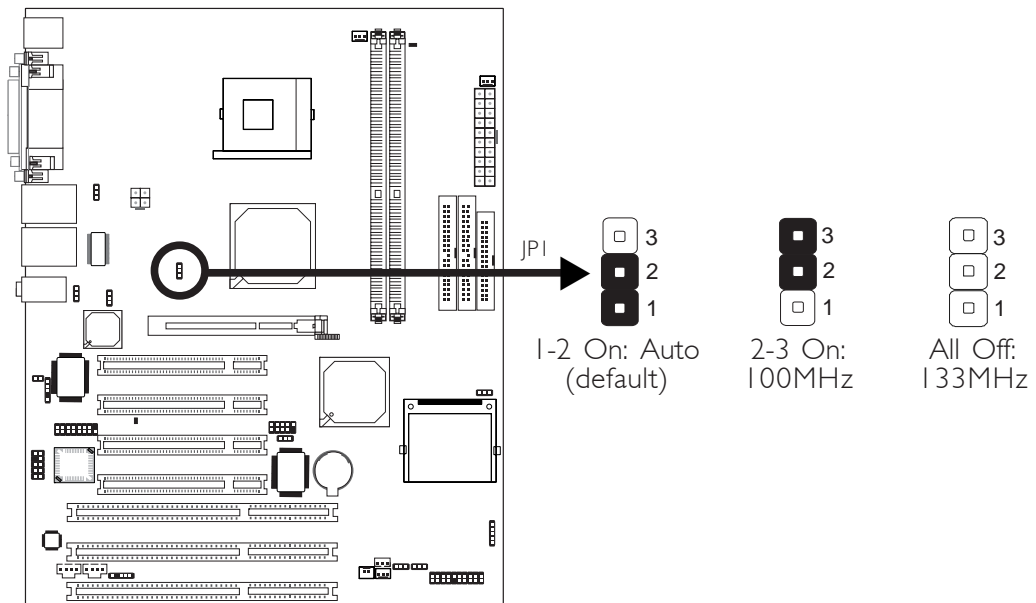
Important:

If you are using the Wake-On-USB Keyboard function for 2 USB ports, the 5VSB power source of your power supply must support ≥2A. For 3 or more USB ports, the 5VSB power source of your power supply must support ≥2A.

RJ45 LAN Port

LAN 1
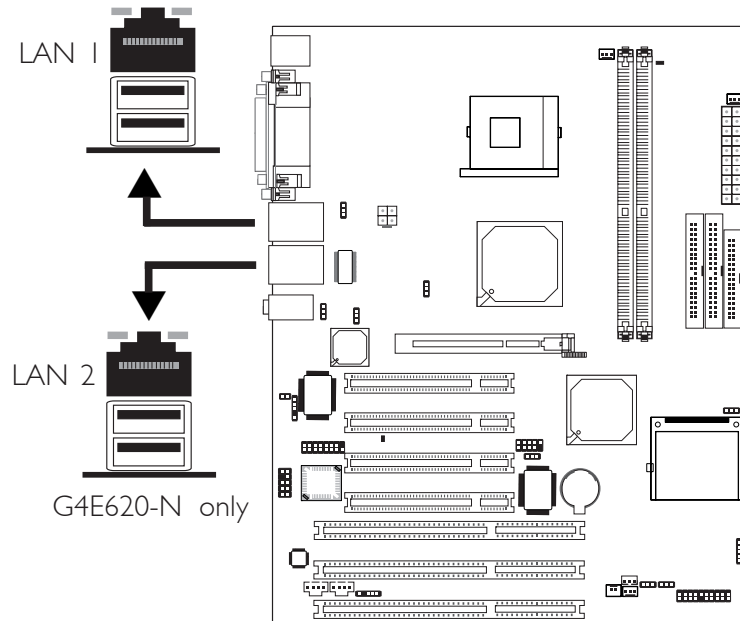
LAN 2

G4E620-N only

G4E620-N is equipped with 2 onboard RJ45 LAN ports. LAN 1 which is controlled by the Intel 82562ET chip is at location CN5 and LAN 2 which is controlled by the Intel 82551 chip is at location CN6.

G4E620-B is equipped with the LAN 1 port only.

LAN allows the system board to connect to a local area network by means of a network hub.

Jumper Setting

Use JP11 to enable or disable the Intel 82562ET LAN chip. Refer to "82562ET LAN Settings" in this chapter for more information.

BIOS Setting

Configure the onboard LAN in the Integrated Peripherals submenu of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install "Intel LAN Drivers". Refer to chapter 4 for more information.

Audio (Rear Audio and Front Audio)
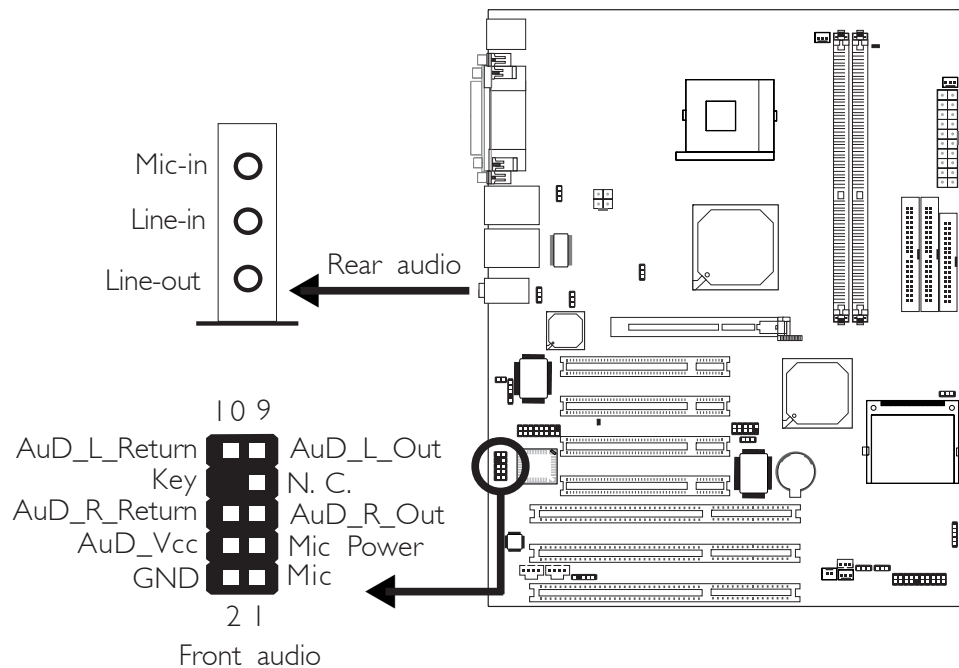
Rear Audio

The mic-in, line-in and line-out jacks are at location CN3 of the system board. A jack is a one-hole connecting interface for inserting a plug.

- **Mic-in Jack (Pink)**

  This jack is used to connect an external microphone.

- **Line-in Jack (Light Blue)**

  This jack is used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.

- **Line-out Jack (Lime)**

  This jack is used to connect a headphone or external speakers.

Front Audio

The front audio connector (J8) allows you to connect to the line-out and mic-in jacks that are at the front panel of your system. Using this connector will disable the rear audio's line-out and mic-in functions.

Remove the jumper caps from pins 5-6 and pins 9-10 of J8 prior to connecting the front audio cable connector. Make sure pin 1 of the cable connector is aligned with pin 1 of J8. If you are not using this connector, make sure to replace the jumper caps back to their original pin locations.

Pins 5-6 and 9-10 short (default)	The front audio is disabled. The rear audio is enabled.
Pins 5-6 and 9-10 open	The front audio is enabled. The rear audio is disabled.

Driver Installation

Install "Realtek Audio Drivers". Refer to chapter 4 for more information.

I/O Connectors

Game/MIDI Port
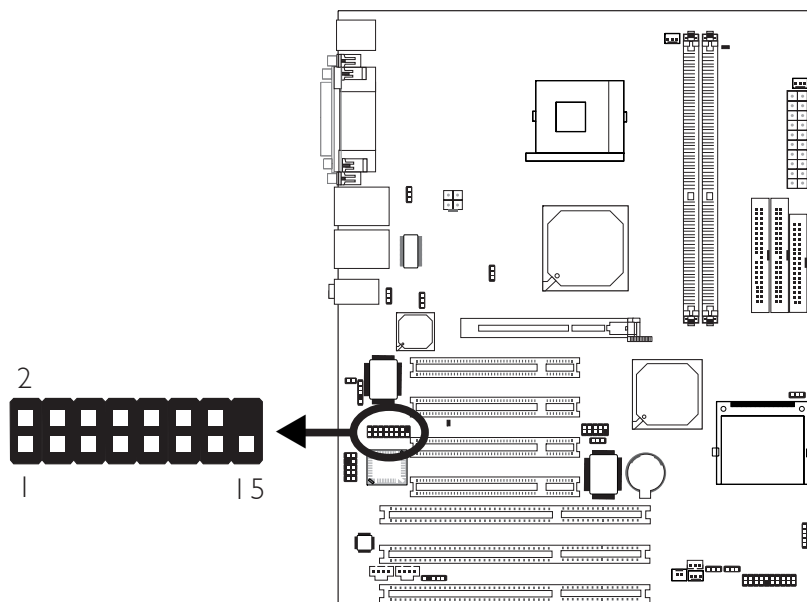
The system board is equipped with a 15-pin connector at location J4 for connecting an external game/MIDI port. The game/MIDI port may be mounted on a card-edge bracket. Install the card-edge bracket to the system chassis then connect the game/MIDI port cable to connector J4. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of connector J4.

BIOS Setting

Configure the game port in the Integrated Peripherals submenu ("Onboard Super I/O Device" section) of the BIOS. Refer to chapter 3 for more information.

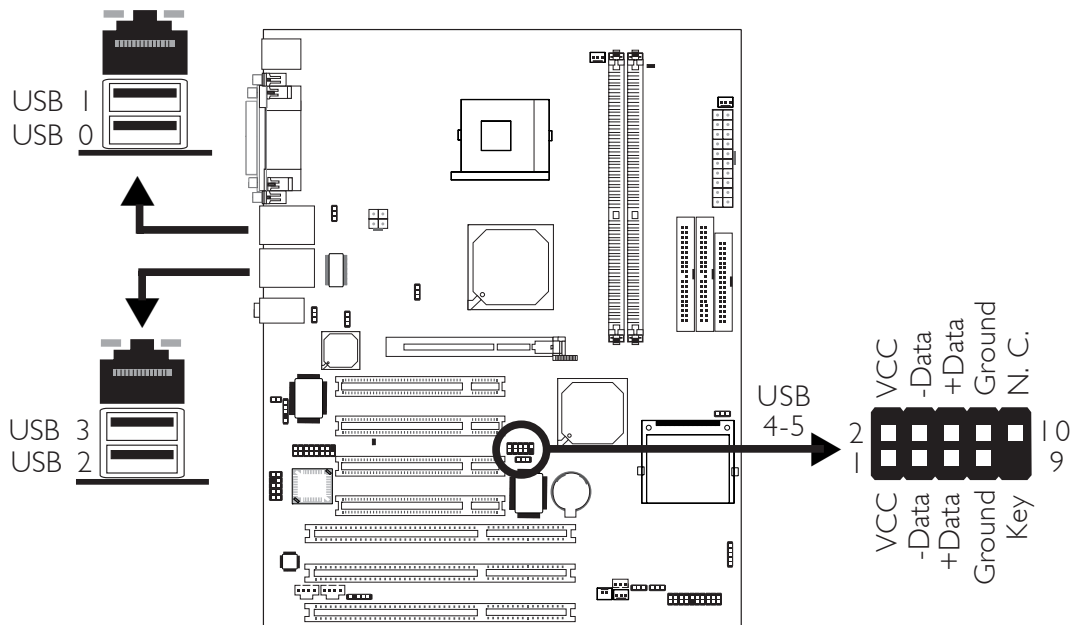# Hardware Installation ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

Internal Audio Connectors
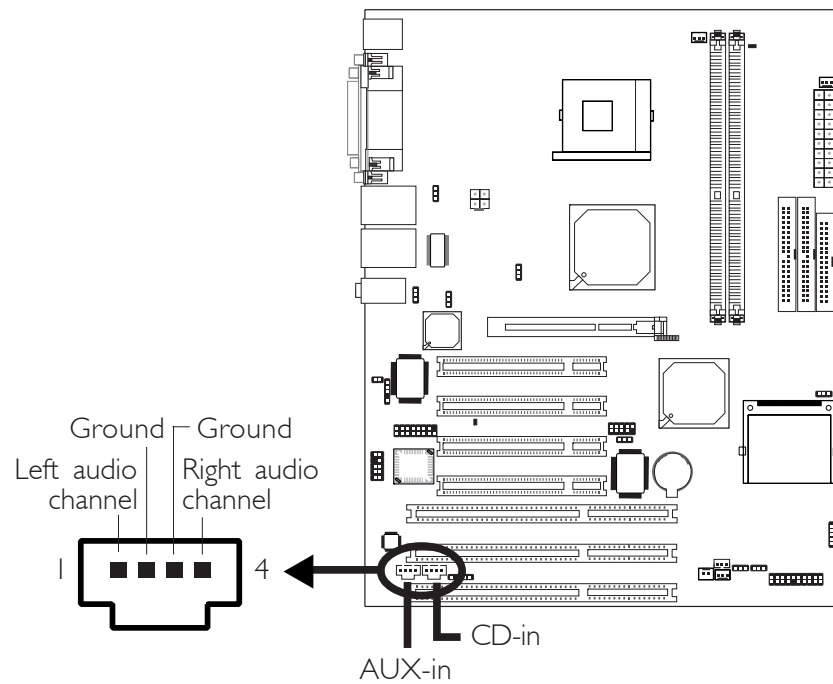
The CD-in (J7) and AUX-in (J6) connectors are used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

S/PDIF-out Connector

SPDIF out
Key | GND
+5V | | | N. C.
1 | 5
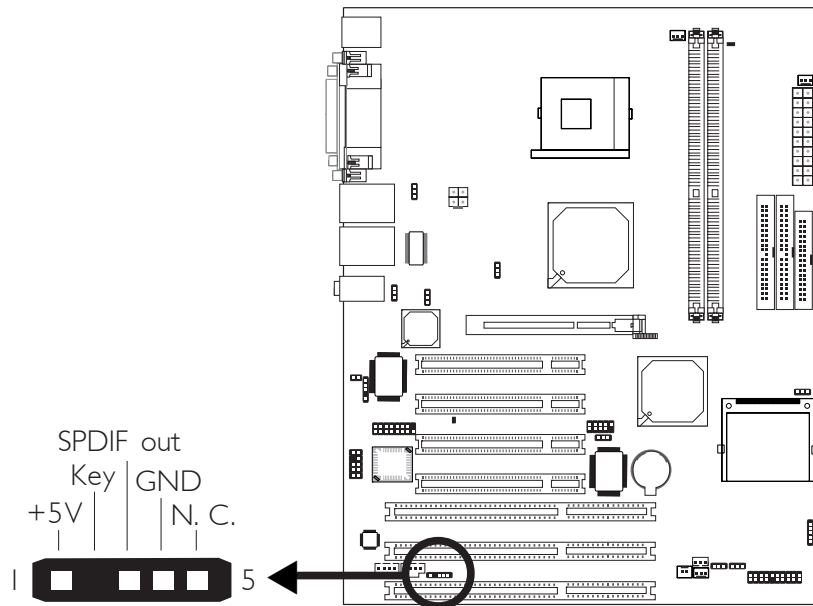
The S/PDIF-out connector (J5) is used to connect external S/PDIF-out port. The S/PDIF-out port may be mounted on a card-edge bracket. Install the card-edge bracket to the system chassis then connect the audio cable connector to J5. Make sure pin 1 of the audio cable connector is aligned with pin 1 of J5.

Floppy Disk Drive Connector
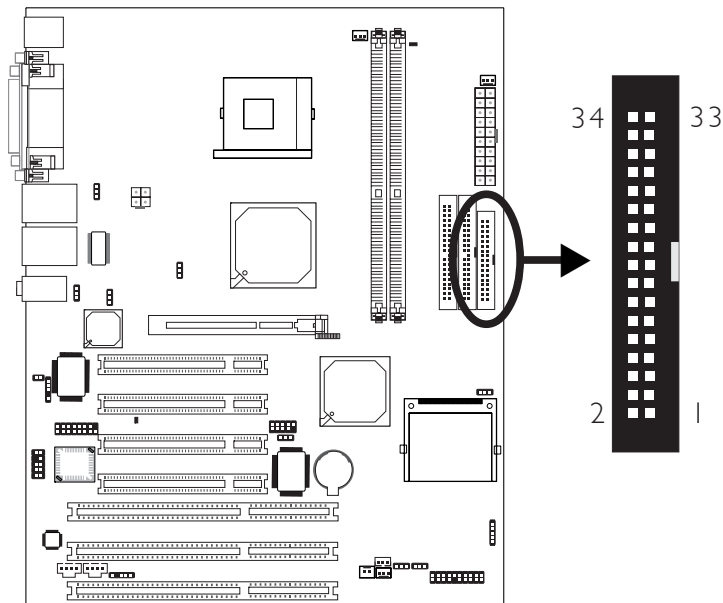
The system board is equipped with a shrouded floppy disk drive connector for connecting two standard floppy disk drives. To prevent improper floppy cable installation, the shrouded floppy disk header has a keying mechanism. The 34-pin connector on the floppy cable can be placed into the header only if pin 1 of the connector is aligned with pin 1 of the header.

Connecting the Floppy Disk Drive Cable

Install one end of the floppy disk drive cable into the shrouded floppy disk header (J19) on the system board and the other end-most connector to the drive you want to designate as Drive A. If you are connecting another drive (Drive B), install the middle connector of the cable to the drive. The colored edge of the daisy chained ribbon cable should be aligned with pin 1 of J19.

BIOS Setting

Enable or disable this function in the Integrated Peripherals submenu ("Onboard Super I/O Device" section) of the BIOS. Refer to chapter 3 for more information.

IDE Disk Drive Connector
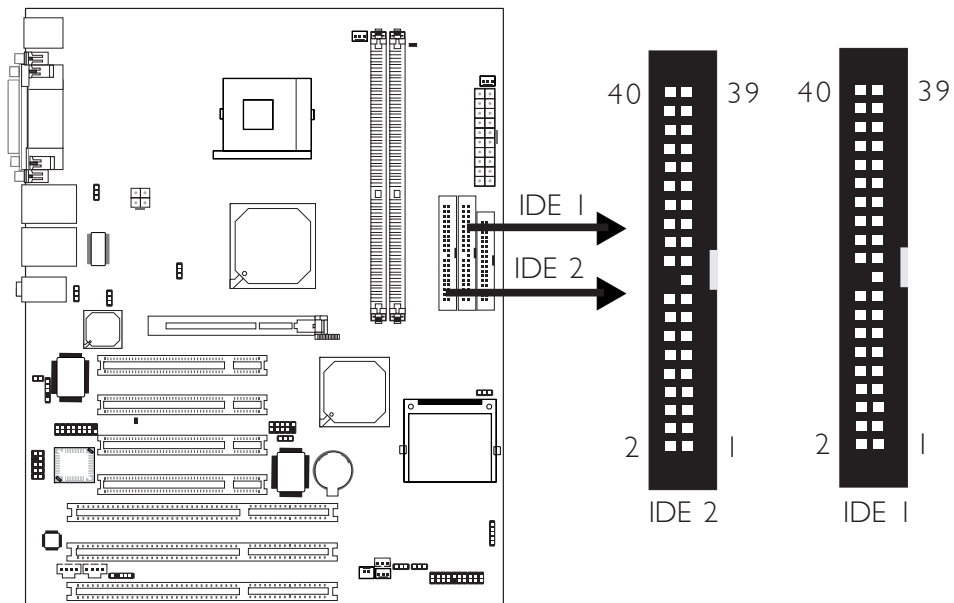
The system board is equipped with two shrouded PCI IDE headers that will interface four Enhanced IDE (Integrated Drive Electronics) disk drives. To prevent improper IDE cable installation, each shrouded PCI IDE header has a keying mechanism. The 40-pin connector on the IDE cable can be placed into the header only if pin 1 of the connector is aligned with pin 1 of the header.

Each IDE connector supports 2 devices, a Master and a Slave. Use an IDE ribbon cable to connect the drives to the system board. An IDE ribbon cable have 3 connectors on them, one that plugs into an IDE connector on the system board and the other 2 connects to IDE devices. The connector at the end of the cable is for the Master drive and the connector in the middle of the cable is for the Slave drive.

Connecting the IDE Disk Drive Cable

Install one end of the IDE cable into the IDE 1 header (J16) on the system board and the other connectors to the IDE devices.

If you are adding a third or fourth IDE device, use another IDE cable and install one end of the cable into the IDE 2 header (J15) on the system board and the other connectors to the IDE devices.

> **Note:**
> *Refer to your disk drive user's manual for information about selecting proper drive switch settings.*

Adding a Second IDE Disk Drive

When using two IDE drives, one must be set as the master and the other as the slave. Follow the instructions provided by the drive manufacturer for setting the jumpers and/or switches on the drives.

The system board supports Enhanced IDE or ATA-2, ATA/33, ATA/66 or ATA/100 hard drives. We recommend that you use hard drives from the same manufacturer. In a few cases, drives from two different manufacturers will not function properly when used together. The problem lies in the hard drives, not the system board.

> **Important:**
> *If you encountered problems while using an ATAPI CD-ROM drive that is set in Master mode, please set the CD-ROM drive to Slave mode. Some ATAPI CD-ROMs may not be recognized and cannot be used if incorrectly set in Master mode.*

CompactFlash™ and IDE 2

CompactFlash™ and IDE 2 share the same channel. The mode of the hard drive connected to the IDE 2 connector must differ from the one selected for CompactFlash™. In other words, if CompactFlash™ is set to Slave mode, then IDE 2's hard drive must be set to Master mode and vice versa. Under such circumstance, IDE 2 can only support one hard drive. Refer to "CompactFlash Card Setting" in this chapter for more information.

BIOS Setting

Enable or disable the onboard primary or secondary IDE in the Integrated Peripherals submenu ("OnChip IDE Device" section) of the BIOS. Refer to chapter 3 for more information.

IrDA Connector
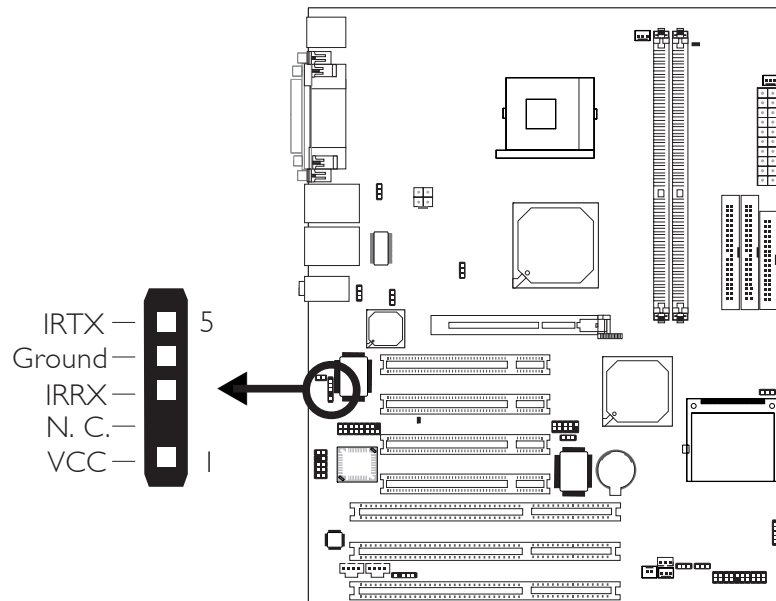
Connect your IrDA cable to connector J3 on the system board.

Note:

The sequence of the pin functions on some IrDA cable may be reversed from the pin function defined on the system board. Make sure to connect the cable to the IrDA connector according to their pin functions.

BIOS Setting

Configure IrDA in the Integrated Peripherals submenu ("Onboard Super I/O Device" section) of the BIOS.

Driver Installation

You may need to install the proper drivers in your operating system to use the IrDA function. Refer to your operating system's manual or documentation for more information.

Cooling Fan Connectors

Power
Ground | Sense

1 3

CPU fan

Power
Ground | Sense

1 3

Chassis fan

Power
Ground | Sense

1 3
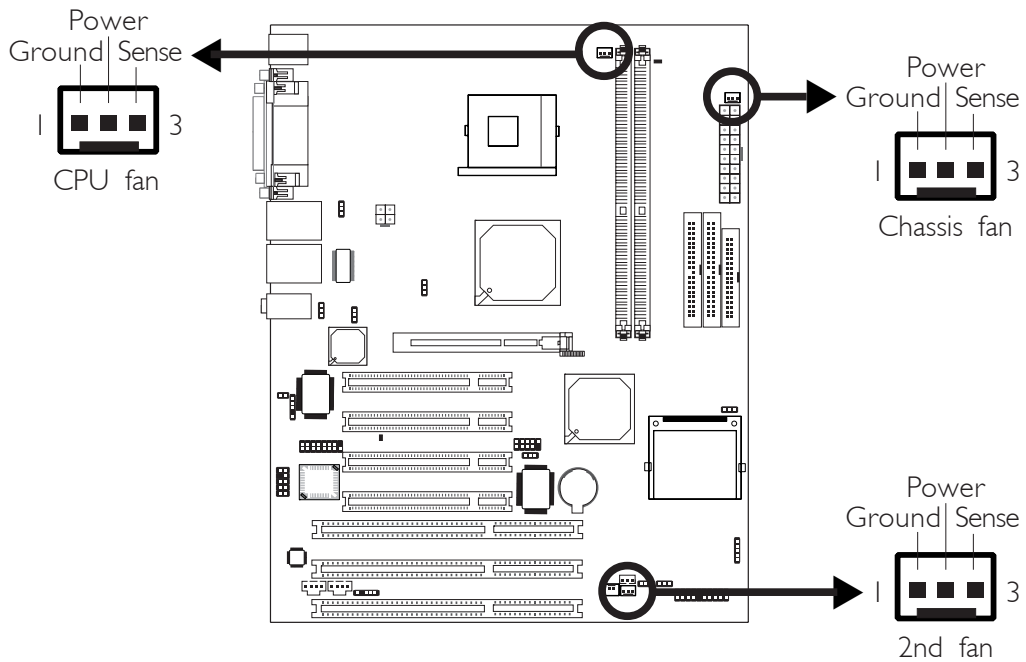
2nd fan

Connect the CPU fan's cable connector to the CPU fan connec-
tor (J11) on the system board. The chassis fan (J18) and 2nd fan
(J14) connectors are used to connect additional cooling fans. The
cooling fans will provide adequate airflow throughout the chassis to
prevent overheating the CPU and system board components.

BIOS Setting

The system is capable of monitoring the speed of the cooling fans.
The "PC Health Status" submenu of the BIOS will display the current
speed of these cooling fans. Refer to chapter 3 for more information.

Wake-On-LAN Connector

Ground
5VSB | WOL

1 3
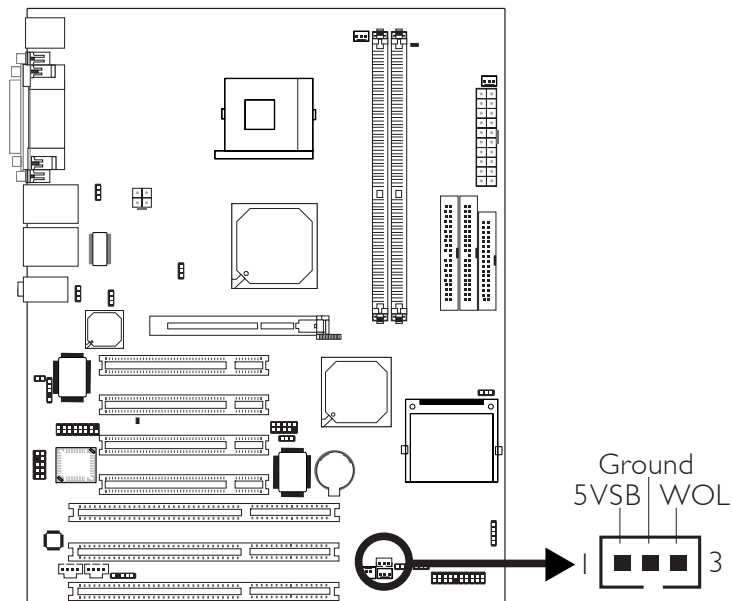
Your LAN card package should include a cable. Connect one end of the cable to the wakeup header on the card and the other end to location J13 on the system board. The network will detect Magic Packet and assert a wake up signal to power-up the system. Refer to the add-in card's manual for details. Note: Your LAN card must support the remote wake up function.

> **Important:**
> *The 5VSB power source of your power supply must support ≥720mA.*

BIOS Setting

To use the Wake-On-LAN function, you must enable the "Wake Up On LAN" field in the Power Management Setup submenu ("Wake-Up Event Setup" section) of the BIOS.

Wake-On-Ring Connector
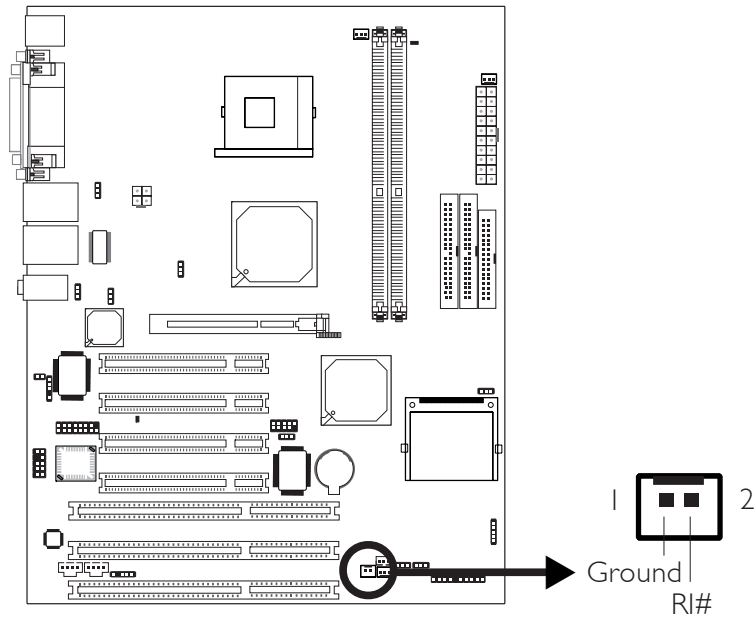
The Wake-On-Ring connector is used to connect to an internal modem add-in card that has the same connector. It will allow the system that is in the Suspend mode or Soft Power Off mode to wake-up/power-on to respond to calls coming through the internal modem card.

To use this function, connect one end of the cable (that came with the card) to the card's wake-on-ring connector and the other end to location J12 on the system board.

If you are using an external modem, the ring-on function will come through the serial port where the external modem is connected.

> **Important:**
> *If you are using a modem add-in card, the 5VSB power source of your power supply must support ≥720mA.*

BIOS Setting

To use the Wake-On-Ring function, you must enable the "Power On By Ring" in the Power Management Setup submenu ("Wake-Up Event Setup" section) of the BIOS.

Chassis Open Connector

Chassis
signal
Ground

1 □ 2
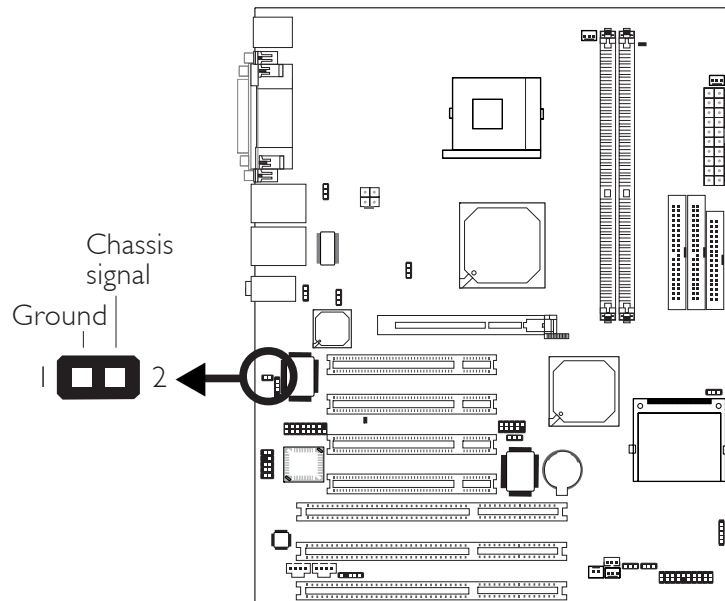
The system board supports the chassis intrusion detection function. To use this function, connect the chassis intrusion sensor cable from the chassis to J1. Whenever a chassis component has been removed, the sensor sends signal to J1 alerting you of a chassis intrusion event. To disable this function, place a jumper cap over J1.

Hardware Doctor Utility

Install "Hardware Doctor". By default, the chassis intrusion detection function is disabled. When enabled, a warning message will appear when the chassis is open. The utility can also be configured so that a beeping alarm will sound when the chassis is open. Refer to the "Hardware Doctor" section in chapter 4 for more information.

LEDs

DIMM Standby LED
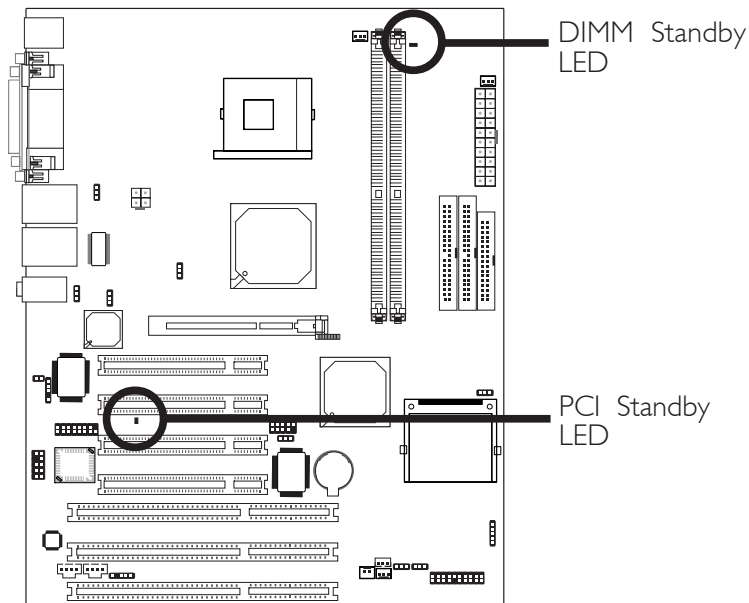
PCI Standby LED

DIMM Standby LED

This LED will turn red when the system's power is on or when it is in the Suspend state (Power On Suspend or Suspend to RAM). It will not light when the system is in the Soft-Off state.

PCI Standby LED

This LED will turn red when the system is in the power-on, Soft-Off or Suspend (Power On Suspend or Suspend to RAM) state.

> **Important:**
> *If the DIMM Standby LED or PCI Standby LED is lighted, you must power-off the system then turn off the power supply's switch or unplug the power cord prior to installing any memory modules or add-in cards.*

Power Connectors

```
                                    10 20
                          +12V    • •    +5V
                          5VSB    • •    +5V
                          PW-OK   • •    -5V
                          Ground  • •    Ground
                          +5V     • •    Ground
                          Ground  • •    Ground
                          +5V     • •    PS-ON
                          Ground  • •    Ground
                          3.3V    • •    -12V
                          3.3V    • •    3.3V
                                  1  11

                                    2  1
                          Ground  • •  Ground
                          +12V    • •  +12V
                                  4  3
```

We recommend that you use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply has a standard 20-pin ATX main power connector and a 4-pin +12V power connector that must be inserted onto CN10 and CN8 connectors respectively.

The 4-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

The system board requires a minimum of 250 Watt power supply to operate. Your system configuration (amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement. To ensure that adequate power is provided, use a 300 Watt (or greater) power supply.

Keylock Connector

To lock the keyboard, connect the keyboard lock's cable connector from the front panel of the system chassis to J20.

Front Panel Connectors
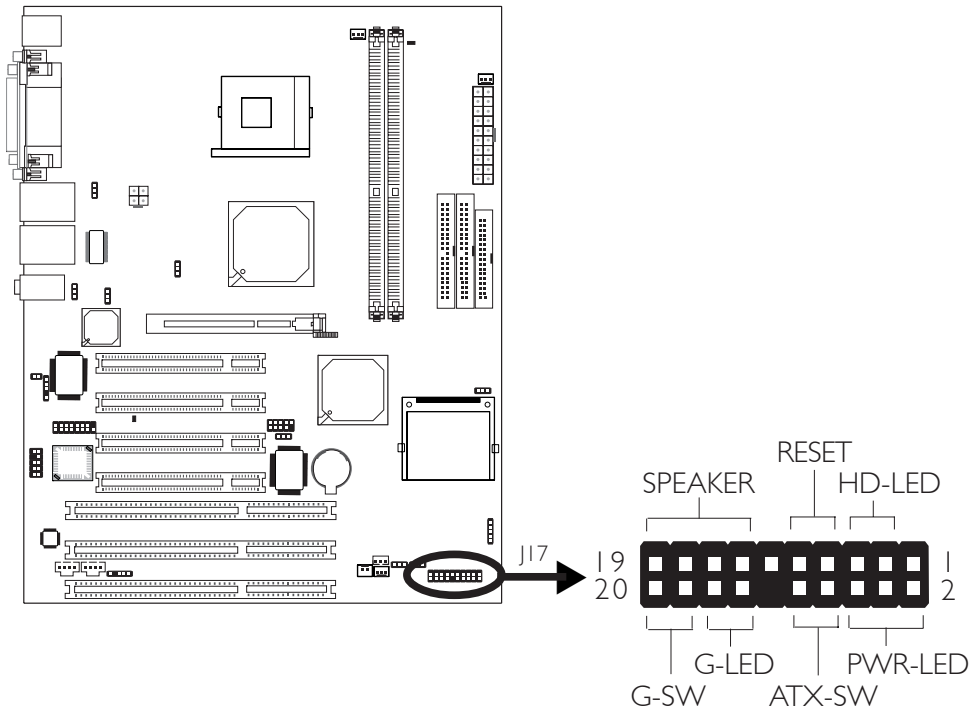
HD-LED: Primary/Secondary IDE LED

This LED will light when the hard drive is being accessed.

RESET: Reset Switch

This switch allows you to reboot without having to power off the system thus prolonging the life of the power supply or system.

SPEAKER: Speaker Connector

This connects to the speaker installed in the system chassis.

G-SW: Green Switch

This switch will allow your system to enter the Suspend mode.

G-LED: Green LED

This LED will not light when the system's power is on or when the system is in the S3 (STR - Suspend To RAM) state. It will blink every second when the system is in the S1 (POS - Power On Suspend) state.

ATX-SW: ATX Power Switch

Depending on the setting in the BIOS setup, this switch is a "dual function power button" that will allow your system to enter the Soft-Off or Suspend mode. Refer to "Soft-Off By PWR-BTTN" in the Power Management Setup (Chapter 3).

PWR-LED: Power/Standby LED

When the system's power is on, this LED will light. When the system is in the S1 (POS - Power On Suspend) or S3 (STR - Suspend To RAM) state, it will blink every second.

> **Note:**
> *If a system did not boot-up and the Power/Standby LED did not light after it was powered-on, it may indicate that the CPU or memory module was not installed properly. Please make sure they are properly inserted into their corresponding socket.*

	Pin	Pin Assignment
HD-LED (Primary/Secondary IDE LED)	3 5	HDD LED Power HDD
G-LED (Green LED)	14 16	Green LED Power Ground
ATX-SW (ATX power switch)	8 10	PWRBT+ PWRBT-
G-SW (Green switch)	18 20	Ground SMI
RESET (Reset switch)	7 9	Ground H/W Reset
SPEAKER (Speaker connector)	13 15 17 19	Speaker Data N. C. Ground Speaker Power
PWR-LED (Power/Standby LED)	2 4 6	LED Power (+) LED Power (+) LED Power (-) or Standby Signal

CompactFlash Socket

CompactFlash socket
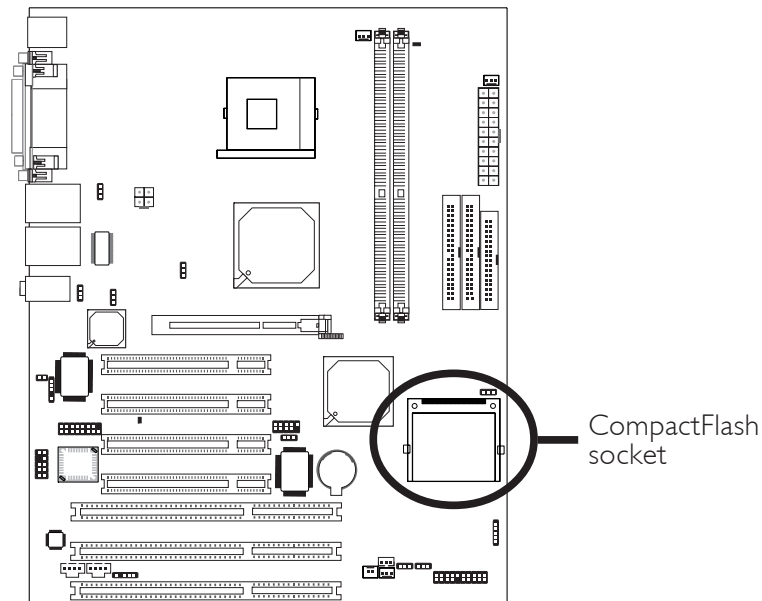
The system board is equipped with the CompactFlash™ socket for inserting a CompactFlash™ card. CompactFlash™ card is a small removable mass storage device designed with flash technology - a non-volatile storage solution that does not require a battery to retain data indefinitely. The CompactFlash™ technology is widely used in products such as portable and desktop computers, digital cameras, handheld data collection scanners, PDAs, Pocket PCs, handy terminals and personal communicators.

CompactFlash™ and IDE 2

CompactFlash™ and IDE 2 share the same channel. The mode of the hard drive connected to the IDE 2 connector must differ from the one selected for CompactFlash™. In other words, if CompactFlash™ is set to Slave mode, then IDE 2's hard drive must be set to Master mode and vice versa. Under such circumstance, IDE 2 only supports one hard drive. Refer to "CompactFlash Card Setting" in this chapter for more information.

Chapter 3 - BIOS Setup

Award BIOS Setup Utility

The Basic Input/Output System (BIOS) is a program that takes care of the basic level of communication between the processor and peripherals. In addition, the BIOS also contains codes for various advanced features found in this system board. This chapter explains the Setup Utility for the Award BIOS.

After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the following message will appear on the screen:

Press DEL to enter setup

If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and <Del> keys simultaneously.

When you press <Del>, the main menu screen will appear.

```
            Phoenix - AwardBIOS CMOS Setup Utility

   ▶ Standard CMOS Features        ▶ Frequency/Voltage Control

   ▶ Advanced BIOS Features          Load Fail-Safe Defaults

   ▶ Advanced Chipset Features       Load Optimized Defaults

   ▶ Integrated Peripherals          Set Supervisor Password

   ▶ Power Management Setup           Set User Password

   ▶ PnP/PCI Configurations          Save & Exit Setup

   ▶ PC Health Status                Exit Without Saving

   Esc : Quit                      ↑ ↓ → ←   : Select Item
   F10 : Save & Exit Setup

                Time, Date, Hard Disk Type...
```

Standard CMOS Features

Use the arrow keys to highlight "Standard CMOS Features" and press <Enter>. A screen similar to the one below will appear.

```
                 Phoenix - AwardBIOS CMOS Setup Utility
                       Standard CMOS Features

    Date (mm:dd:yy)            Thu, Apr 21 2005         Item Help
    Time (hh:mm:ss)            11 :  2 : 34
                                                    Menu Level    ▶
  ▶ IDE Primary Master
  ▶ IDE Primary Slave                               Change the day, month,
  ▶ IDE Secondary Master      None                  year and century
  ▶ IDE Secondary Slave       None

    Drive A                   1.44M, 3.5 in.
    Drive B                   None

    Video                     EGA/VGA
    Halt On                   All , But Keyboard

    Base Memory                     640K
    Extended Memory               65472K
    Total Memory                   1024K


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

The settings on the screen are for reference only. Your version may not be identical to this one.

Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1990 to 2098.

Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

IDE Primary Master, IDE Primary Slave, IDE Secondary Master and IDE Secondary Slave

Move the cursor to one of the fields listed above then press <Enter>.
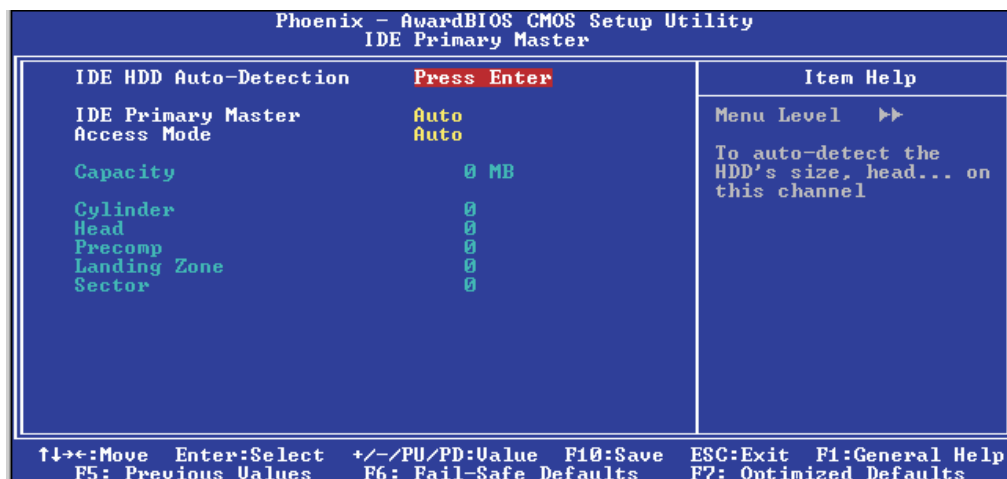
```
          Phoenix - AwardBIOS CMOS Setup Utility
                     IDE Primary Master

  IDE HDD Auto-Detection    Press Enter    │        Item Help

  IDE Primary Master        Auto           │  Menu Level    ▶▶
  Access Mode               Auto
                                           │  To auto-detect the
  Capacity                  0 MB           │  HDD's size, head... on
                                           │  this channel
  Cylinder                  0
  Head                      0
  Precomp                   0
  Landing Zone              0
  Sector                    0




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

The settings on the screen are for reference only. Your version may not be identical to this one.

IDE HDD Auto Detection

Detects the parameters of the drive. The parameters will automatically be shown on the screen.

IDE Primary Master/Slave and IDE Secondary Master/Slave

The drive type information should be included in the documentation from your hard disk vendor. If you select "Auto", the BIOS will auto-detect the HDD & CD-ROM drive at the POST stage and show the IDE for the HDD & CD-ROM drive. If a hard disk has not been installed, select "None".

Access Mode

For hard drives larger than 528MB, you would typically select the LBA type. Certain operating systems require that you select CHS or Large. Please check your operating system's manual or Help desk on which one to select.

Capacity

Displays the approximate capacity of the disk drive. Usually the size is slightly greater than the size of a formatted disk given by a disk checking program.

Cylinder

This field displays the number of cylinders.

Head

This field displays the number of read/write heads.

Precomp

This field displays the number of cylinders at which to change the write timing.

Landing Zone

This field displays the number of cylinders specified as the landing zone for the read/write heads.

Sector

This field displays the number sectors per track.

Drive A and Drive B

These fields identify the types of floppy disk drives installed.

None No floppy drive is installed
360K, 5.25 in. 5-1/4 in. standard drive; 360KB capacity
1.2M, 5.25 in. 5-1/4 in. AT-type high-density drive; 1.2MB capacity
720K, 3.5 in. 3-1/2 in. double-sided drive; 720KB capacity
1.44M, 3.5 in. 3-1/2 in. double-sided drive; 1.44MB capacity
2.88M, 3.5 in. 3-1/2 in. double-sided drive; 2.88MB capacity

Video

This field selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type. The default setting is EGA/VGA.

EGA/VGA Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA and PGA monitor adapters.

CGA 40 Color Graphics Adapter. Power up in 40-column mode.

CGA 80 Color Graphics Adapter. Power up in 80-column mode.

Mono Monochrome adapter. Includes high resolution monochrome adapters.

Halt On

This field determines whether the system will stop if an error is detected during power up. The default setting is All Errors.

No Errors The system boot will not stop for any errors detected.

All Errors The system boot will stop whenever the BIOS detects a non-fatal error.

All, But Keyboard The system boot will not stop for a keyboard error; it will stop for all other errors.

All, But Diskette The system boot will not stop for a disk error; it will stop for all other errors.

All, But Disk/Key The system boot will not stop for a disk or keyboard error; it will stop for all other errors.

Base Memory

Displays the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard or 640K for systems with 640K or more memory installed on the motherboard.

Extended Memory

Displays the amount of extended memory detected during boot-up.

Total Memory

Displays the total memory available in the system.

Advanced BIOS Features

The Advanced BIOS Features allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

```
                 Phoenix - AwardBIOS CMOS Setup Utility
                         Advanced BIOS Features

 ▶ CPU Feature                   Press Enter        ▲        Item Help
 ▶ Virus Warning                 Disabled
   CPU L1 & L2 Cache             Enabled                Menu Level    ▶
   CPU L3 Cache                  Enabled
   Hyper-Threading Technology    Enabled
   Quick Power On Self Test      Enabled
   First Boot Device             Floppy
   Second Boot Device            HDD-0
   Third Boot Device             CDROM
   Boot Other Device             Enabled
   On-Chip Lan Boot ROM          Disabled
   Onboard Lan Boot ROM          Disabled
   Swap Floppy Drive             Disabled
   Boot Up Floppy Seek           Enabled
   Boot Up NumLock Status        On
   Gate A20 Option               Fast
   Typematic Rate Setting        Disabled
 x Typematic Rate (Chars/Sec)    6
 x Typematic Delay (Msec)        250
   Security Option               Setup
   APIC Mode                     Enabled
   MPS Version Control For OS    1.4
   OS Select For DRAM > 64MB     Non-OS2
   HDD S.M.A.R.T. Capability     Disabled
   Report No FDD For WIN 95      No
   Small Logo(EPA) Show          Enabled        ▼

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

The screen above list all the fields available in the Advanced BIOS Features submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

CPU Feature

Move the cursor to this field and press <Enter>. The following screen will appear.
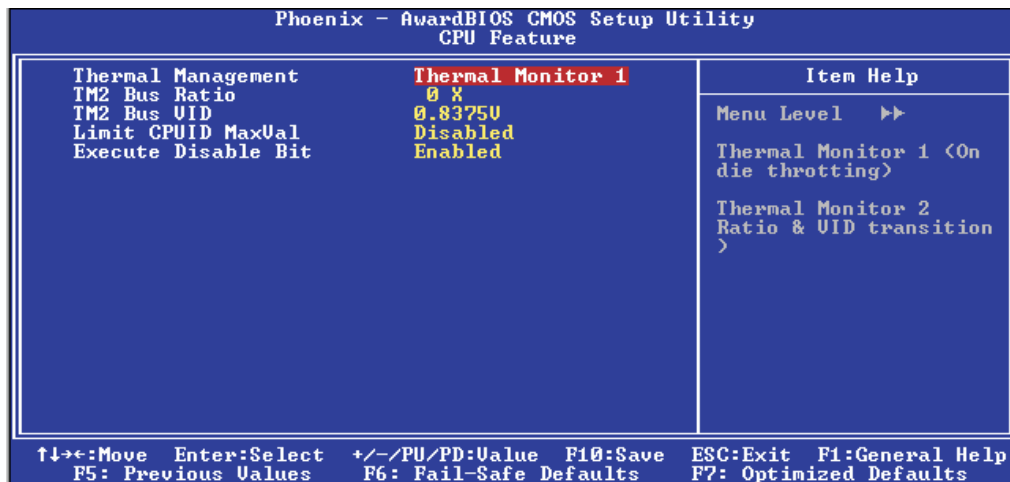
```
            Phoenix - AwardBIOS CMOS Setup Utility
                        CPU Feature
┌─────────────────────────────────────────┬──────────────────────┐
│ Thermal Management     Thermal Monitor 1 │      Item Help       │
│ TM2 Bus Ratio          0 X               │                      │
│ TM2 Bus UID            0.8375U           │ Menu Level    ▶▶     │
│ Limit CPUID MaxUal     Disabled          │                      │
│ Execute Disable Bit    Enabled           │ Thermal Monitor 1 (On│
│                                          │ die throtting)       │
│                                          │                      │
│                                          │ Thermal Monitor 2    │
│                                          │ Ratio & UID transition│
│                                          │ )                    │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
│                                          │                      │
├─────────────────────────────────────────┴──────────────────────┤
│ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help│
│   F5: Previous Values    F6: Fail-Safe Defaults  F7: Optimized Defaults │
└─────────────────────────────────────────────────────────────────┘
```

The settings on the screen are for reference only. Your version may not be identical to this one.

Thermal Management

Select a "thermal monitor" in this field to enable the CPU's speedstep function. Restart the system then go to the operating system's "Control Panel". Double-click "Power Options". The "Power Options Properties" dialog box will appear. In the "Power Schemes" menu, select "Portable/Laptop". Speedstep reduces the CPU's frequency and voltage in accordance to its load.

Thermal Monitor 1   On die throtting.
Thermal Monitor 2   Ratio and VID transition.

TM2 Bus Ratio

This field is used to select the frequency (bus ratio) of the throttled performance state that will be initiated when the on-die sensor turns from cool to hot.

TM2 Bus VID

This field is used to select the voltage of the throttled performance state that will be initiated when the on-die sensor turns from cool to hot.

Limit CPUID MaxVal

The CPUID instruction of some newer CPUs will return a value greater than 3. The default is Disabled because this problem does not exist in the Windows series operating systems. If you are using an operating system other than Windows, this problem may occur. To avoid this problem, enable this field to limit the return value to 3 or lesser than 3.

Execute Disable Bit

When this field is set to Disabled, it will force the XD feature flag to always return to 0.

Virus Warning

This field protects the boot sector and partition table of your hard disk drive. When this field is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive. If an attempt is made to write to the boot sector or partition table of the hard disk drive, the BIOS will halt the system and an error message will appear.

After seeing the error message, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

Many disk diagnostic programs which attempt to access the boot sector table will cause the warning message to appear. If you are running such a program, we recommend that you first disable this field. Also, disable this field if you are installing or running certain operating systems like Windows® 95/98/2000 or the operating system may not install nor work.

CPU L1 & L2 Cache

These fields speed up the memory access. The default value is enabled. Enable the external cache for better performance.

CPU L3 Cache

This field is used to enable or disable the CPU's L3 cache.

Hyper-Threading Technology (for Intel® Pentium® 4 Processor with Hyper-Threading Technology only)

This field is used to enable the functionality of the Intel® Pentium® 4 Processor with Hyper-Threading Technology and will appear only when using this processor.

Quick Power On Self Test

This field speeds up Power On Self Test (POST) whenever the system is powered on. The BIOS will shorten or skip some check items during POST. To attain the shortest POST time, select "Fast".

First Boot Device, Second Boot Device, Third Boot Device and Boot Other Device

Select the drive to boot first, second and third in the "First Boot Device" "Second Boot Device" and "Third Boot Device" fields respectively. The BIOS will boot the operating system according to the sequence of the drive selected. Set "Boot Other Device" to Enabled if you wish to boot from another device.

On-Chip LAN Boot ROM

This field refers to the G4E620-B and G4E620-N board that uses the Intel 82562ET chip.

Enable this field if you wish to use the boot ROM (instead of a disk drive) to boot-up the system and access the local area network directly.

If you wish to change the boot ROM's settings, type the <Shift> and <F10> keys simultaneously when prompted during boot-up. Take note: you will be able to access the boot ROM's program (by typing <Shift> + <F10>) only when this field is enabled.

Onboard LAN Boot ROM (G4E620-N only)

This field refers to the G4E620-N board that uses the Intel 82551 chip.

Enable this field if you wish to use the boot ROM (instead of a disk drive) to boot-up the system and access the local area network directly.

If you wish to change the boot ROM's settings, type the <Shift> and <F10> keys simultaneously when prompted during boot-up. Take note: you will be able to access the boot ROM's program (by typing <Shift> + <F10>) only when this field is enabled.

Swap Floppy Drive

When this field is enabled and the system is booting from the floppy drive, the system will boot from drive B instead of drive A. When this field is disabled and the system is booting from the floppy drive, the system will boot from drive A. You must have two floppy drives to use this function.

Boot Up Floppy Seek

When enabled, the BIOS will check whether the floppy disk drive installed is 40 or 80 tracks. Note that the BIOS cannot distinguish between 720K, 1.2M, 1.44M and 2.88M drive types as they are all 80 tracks. When disabled, the BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360KB.

Boot Up NumLock Status

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Gate A20 Option

This entry allows you to select how gate A20 is handled. Gate A20 is a device used to address memory above 1 Mbyte. Initially, gate A20 was handled via the keyboard controller. Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20.

Fast   The chipset controls Gate A20.
Normal   A pin in the keyboard controller controls Gate A20.

Typematic Rate Setting

Disabled   Continually holding down a key on your keyboard will cause the BIOS to report that the key is down.

Enabled   The BIOS will not only report that the key is down, but will first wait for a moment, and, if the key is still down, it will begin to report that the key has been depressed repeatedly. For example, you would use such a feature to accelerate cursor movements with the arrow keys. You can then select the typematic rate and typematic delay in the "Typematic Rate (Chars/Sec)" and "Typematic Delay (Msec)" fields below.

Typematic Rate (Chars/Sec)

This field allows you to select the rate at which the keys are accelerated.

Typematic Delay (Msec)

This field allows you to select the delay between when the key was first depressed and when the acceleration begins.

Security Option

This field determines when the system will prompt for the password - everytime the system boots or only when you enter the BIOS setup. Set the password in the Set Supervisor/User Password submenu.

System   The system will not boot and access to Setup will be denied unless the correct password is entered at the prompt.

Setup   The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.

APIC Mode

Leave this field in its default setting.

MPS Version Control for OS

This field is used to select the MPS version that the system board is using.

OS Select for DRAM > 64MB

This field allows you to access the memory that is over 64MB in OS/2.

HDD S.M.A.R.T. Capability

The system board supports SMART (Self-Monitoring, Analysis and Reporting Technology) hard drives. SMART is a reliability prediction technology for ATA/IDE and SCSI drives. The drive will provide sufficient notice to the system or user to backup data prior to the drive's failure. The default is Disabled. If you are using hard drives that support S.M.A.R.T., set this field to Enabled. SMART is supported in ATA/33 or later hard drives.

Report No FDD For WIN 95

The options are Yes and No.

Small Logo(EPA) Show

Enabled   The EPA logo will appear during system boot-up.
Disabled   The EPA logo will not appear during system boot-up.

Advanced Chipset Features

```
                 Phoenix - AwardBIOS CMOS Setup Utility
                        Advanced Chipset Features

   DRAM Timing Selectable       By SPD          ┌──────────────────────┐
   CAS Latency Time             1.5             │     Item Help        │
   Active to Precharge Delay    7               ├──────────────────────┤
   DRAM RAS# to CAS# Delay      3               │ Menu Level    ▶      │
   DRAM RAS# Precharge          3               │                      │
   DRAM Data Integrity Mode     Non-ECC         │                      │
   Memory Frequency For         Auto            │                      │
   Dram Read Thermal Mgmt       Disabled        │                      │
   System BIOS Cacheable        Enabled         │                      │
   Video  BIOS Cacheable        Disabled        │                      │
   Memory Hole At 15M-16M       Disabled        │                      │
   Delayed Transaction          Enabled         │                      │
   Delay Prior to Thermal       16 Min          │                      │
   AGP Aperture Size (MB)       128             │                      │
                                                │                      │
                                                │                      │
                                                └──────────────────────┘
 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```

The settings on the screen are for reference only. Your version may not be identical to this one.

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources. **These items should not be altered unless necessary.** The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered some incompatibility or that data was being lost while using your system.

DRAM Timing Selectable

This field is used to select the timing of the DRAM.

By SPD   The EEPROM on a DIMM has SPD (Serial Presence Detect) data structure that stores information about the module such as the memory type, memory size, memory speed, etc. When this option is selected, the system will run according to the information in the EEPROM. This option is the default setting because it provides the most stable condition for the system. The "CAS Latency Time" to "DRAM RAS# Precharge" fields will show the default settings by SPD.

Manual   If you want your system to run at a performance better than the one "by SPD", select "Manual" then select the best option in the "CAS Latency Time" to "DRAM RAS# Precharge" fields.

CAS Latency Time

This field is used to select the local memory clock periods.

Active to Precharge Delay

The options are 5, 6, 7 and 8.

DRAM RAS# to CAS# Delay

The options are 2, 3 and 4.

DRAM RAS# Precharge

This field controls RAS# precharge (in local memory clocks).

DRAM Data Integrity Mode

The ECC (Error Checking and Correction) function is supported only in x72 (72-bit) PC SDRAM DIMMs. If you are using x64 (64-bit) PC SDRAM DIMMs, set this field to Non-ECC.

Non-ECC   Uses x64 PC SDRAM DIMM.
ECC   This option allows the system to recover from memory failure. It detects single-bit and multiple-bit errors, then automatically corrects single-bit error.

Memory Frequency For

This field is used to select the memory clock speed of the DIMM.

DRAM Read Thermal Mgmt

This field is used to detect the DDR's thermal condition.

System BIOS Cacheable

When this field is enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is enabled. The larger the range of the Cache RAM, the higher the efficiency of the system.

Video BIOS Cacheable

As with caching the system BIOS, enabling the Video BIOS cache will allow access to video BIOS addresssed at C0000H to C7FFFH to be cached, if the cache controller is also enabled. The larger the range of the Cache RAM, the faster the video performance.

Memory Hole At 15M-16M

In order to improve system performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16MB. When enabled, the CPU assumes the 15-16MB memory range is allocated to the hidden ISA address range instead of the actual system DRAM. When disabled, the CPU assumes the 15-16MB address range actually contains DRAM memory. If more than 16MB of system memory is installed, this field must be disabled to provide contiguous system memory.

Delayed Transaction

When enabled, this function frees up the PCI bus for other PCI masters during the PCI-to-ISA transactions. This allows PCI and ISA buses to be used more efficiently and prevents degradation of performance on the PCI bus when ISA accesses are made.

Delay Prior To Thermal

This field is used to select the time that would force the CPU to a 50% duty cycle when it exceeds its maximum operating temperature therefore protecting the CPU and the system board from overheating to ensure a safe computing environment..

AGP Aperture Size (MB)

This field is relevant to the memory-mapped graphics data of the AGP card installed in your system. Leave this in its default setting.

Integrated Peripherals

```
          Phoenix - AwardBIOS CMOS Setup Utility
                  Integrated Peripherals

  ▶ OnChip IDE Device              Press Enter        │    Item Help
  ▶ Onboard Super I/O Device       Press Enter        │
    USB Controller                 Enabled            │  Menu Level   ▶
    USB 2.0 Controller             Enabled            │
    USB Keyboard Support           Disabled           │
    AC97 Audio                     Auto               │
    Init Display First             AGP                │
    On-Chip LAN control            Enabled            │
    OnBoard LAN control            Enabled            │

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

The settings on the screen are for reference only. Your version may not be identical to this one.

OnChip IDE Device

Move the cursor to this field and press <Enter>. The following screen will appear.

```
          Phoenix - AwardBIOS CMOS Setup Utility
                   OnChip IDE Device

    IDE DMA transfer access      Enabled        │    Item Help
    On-Chip Primary   PCI IDE    Enabled        │
    IDE Primary Master PIO       Auto           │  Menu Level   ▶▶
    IDE Primary Slave  PIO       Auto           │
    IDE Primary Master UDMA      Auto           │
    IDE Primary Slave  UDMA      Auto           │
    On-Chip Secondary PCI IDE    Enabled        │
    IDE Secondary Master PIO     Auto           │
    IDE Secondary Slave  PIO     Auto           │
    IDE Secondary Master UDMA    Auto           │
    IDE Secondary Slave  UDMA    Auto           │
    IDE HDD Block Mode           Enabled        │

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

The settings on the screen are for reference only. Your version may not be identical to this one.

IDE DMA Transfer Access

This field is used to enable or disable the DMA transfer function of an IDE hard drive.

On-Chip Primary PCI IDE and On-Chip Secondary PCI IDE

These fields allow you to enable or disable the primary and secondary IDE controller. The default is Enabled. Select Disabled if you want to add a different hard drive controller.

IDE Primary Master/Slave PIO and IDE Secondary Master/Slave PIO

PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by themselves. Your system supports five modes, 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode after checking your drive.

Auto   The BIOS will automatically set the system according to your hard disk drive's timing.

Mode 0-4 You can select a mode that matches your hard disk drive's timing. Caution: Do not use the wrong setting or you will have drive errors.

IDE Primary Master/Slave UDMA and IDE Secondary Master/Slave UDMA

These fields allow you to set the Ultra DMA in use. When Auto is selected, the BIOS will select the best available option after checking your hard drive or CD-ROM.

Auto   The BIOS will automatically detect the settings for you.

Disabled The BIOS will not detect these categories.

IDE HDD Block Mode

Enabled   The IDE HDD uses the block mode. The system BIOS will check the hard disk drive for the maximum block size the system can transfer. The block size will depend on the type of hard disk drive.

Disabled   The IDE HDD uses the standard mode.

Onboard Super I/O Device

Move the cursor to this field and press <Enter>. The following screen will appear.

```
                Phoenix - AwardBIOS CMOS Setup Utility
                        Onboard Super I/O Device

    POWER ON Function          BUTTON ONLY        │     Item Help
    KB Power ON Password       Enter              │
    Hot Key Power ON           Ctrl-F1            │  Menu Level   ▶▶
    Onboard FDC Controller     Enabled            │
    Onboard Serial Port 1      3F8/IRQ4           │
    Onboard Serial Port 2      2F8/IRQ3           │
    UART Mode Select           Normal             │
    RxD , TxD Active           Hi,Lo              │
    IR Transmission Delay      Enabled            │
    UR2 Duplex Mode            Half               │
    Use IR Pins                IR-Rx2Tx2          │
    Onboard Parallel Port      378/IRQ7           │
    Parallel Port Mode         SPP                │
    EPP Mode Select            EPP1.7             │
    ECP Mode Use DMA           3                  │
    PWRON After PWR-Fail       Off                │
    Game Port Address          201                │
    Midi Port Address          330                │
    Midi Port IRQ              10                 │

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

The settings on the screen are for reference only. Your version may not be identical to this one.

Power On Function

This field allows you to use the keyboard or PS/2 mouse to power-on the system.

Button only   Default setting. Uses the power button to power on the system.

Password   When this option is selected, set the password you would like to use to power-on the system in the "KB Power On Password" field.

Hot Key   When this option is selected, select the function key you would like to use to power-on the system in the "Hot Key Power On" field.

Mouse Left   When this option is selected, double-click the left button of the mouse to power-on the system.

Mouse Right   When this option is selected, double-click the right button of the mouse to power-on the system.

Any Key   Press any key to power-on the system.

Keyboard 98   When this option is selected, press the "wake up" key of the Windows® 98 compatible keyboard to power-on the system.

KB Power On Password

Move the cursor to this field and press <Enter>. Enter your password. You can enter up to 5 characters. Type in exactly the same password to confirm, then press <Enter>.

The power button will not function once a keyboard password has been set in this field. You must type the correct password to power-on the system. If you forgot the password, power-off the system and remove the battery. Wait for a few seconds and install it back before powering-on the system.

Hot Key Power On

This field is used to select a function key that you would like to use to power-on the system.

Onboard FDC Controller

Enabled   Enables the onboard floppy disk controller.
Disabled Disables the onboard floppy disk controller.

Onboard Serial Port 1 and Onboard Serial Port 2

Auto   The system will automatically select an I/O address for the onboard serial port 1 and serial port 2.
3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3   Allows you to manually select an I/O address for the onboard serial port 1 and serial port 2.
Disabled Disables the onboard serial port 1 and/or serial port 2.

UART Mode Select

This field is used to select the type of IrDA standard supported by your IrDA device. For better transmission of data, your IrDA peripheral device must be within a 30° angle and within a distance of 1 meter.

RxD, TxD Active

The options are Hi, Lo; Lo, Hi; Lo, Lo; and Hi, Hi.

IR Transmission Delay

If this field is Enabled, transmission of data will be slower. This is recommended when you encounter transmission problem with your device. The options are: Enabled and Disabled.

UR2 Duplex Mode

Half   Data is completely transmitted before receiving data.
Full   Transmits and receives data simultaneously.

Use IR Pins

The options are IR-Rx2Tx2 and RxD2TxD2.

Onboard Parallel Port

378/IRQ7, 3BC/IRQ7, 278/IRQ5   Selects the I/O address and IRQ for the onboard parallel port.
Disabled   Disables the onboard parallel port.

Parallel Port Mode

The options are SPP, EPP, ECP and ECP+EPP. These apply to a standard specification and will depend on the type and speed of your device. Refer to your peripheral's manual for the best option.

SPP
Allows normal speed operation but in one direction only.

"ECP (Extended Capabilities Port)"
Allows parallel port to operate in bidirectional mode and at a speed faster than the normal mode's data transfer rate.

"EPP (Enhanced Parallel Port)"
Allows bidirectional parallel port operation at maximum speed.

EPP Mode Select

This field is used to select the EPP mode of the parallel port.

ECP Mode Use DMA

This is used to select a DMA channel of the parallel port.

PWRON After Power-Fail

Off   When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.

On   When power returns after an AC power failure, the system will automatically power-on.

Former-Sts When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Game Port Address

This field is used to select the game port's address.

Midi Port Address

This field is used to select the midi port's address. If you have selected the midi port's address, you may select its IRQ in the "Midi Port IRQ" field.

Midi Port IRQ

This field is used to select the midi port's IRQ.

USB Controller

Enabled Enables the onboard USB.
Disabled Disables the onboard USB.

USB 2.0 Controller

If you are using a USB 2.0 device, this field must be set to Enabled.

USB Keyboard Support

By default, this field is Disabled. However, if you are using a USB keyboard under DOS, make sure to enable this function.

AC97 Audio

Auto   Select this option when using the onboard AC97 codec.
Disabled Select this option when using a PCI sound card.

Init Display First

This field is used to select whether to initialize the AGP or PCI first when the system boots.

AGP   When the system boots, it will first initialize the AGP.
PCI Slot   When the system boots, it will first initialize PCI.

On-Chip LAN Control

This field is used to enable or disable the Intel 82562ET LAN chip.

Onboard LAN Control (G4E620-N only)

This field is used to enable or disable the Intel 82551 LAN chip.

Power Management Setup

The Power Management Setup allows you to configure your system to most effectively save energy.

```
            Phoenix - AwardBIOS CMOS Setup Utility
                     Power Management Setup

   ACPI Function            Enabled          │      Item Help
   ACPI Suspend Type        S1(POS)          │
 x Run VGABIOS if S3 Resume Auto             │ Menu Level    ▶
 x USB KB Wake-Up From S3   Disabled         │
   Power Management         User Define      │
   Video Off Method         DPMS             │
   Video Off In Suspend     Yes              │
   Suspend Type             Stop Grant       │
   MODEM Use IRQ            3                │
   Suspend Mode            Disabled          │
   HDD Power Down          Disabled          │
   Soft-Off by PWR-BTTN    Instant-Off       │
 ▶ Wake-Up Event Setup     Press Enter       │
                                             │
                                             │
─────────────────────────────────────────────────────────────────
  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```

The screen above list all the fields available in the Power Management Setup submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

ACPI Function

This function should be enabled only in operating systems that support ACPI. Currently, only Windows® 98SE/2000/ME/XP supports this function. If you want to use the Suspend to RAM function, make sure this field is enabled then select "S3(STR)" in the "ACPI Suspend Type" field.

ACPI Suspend Type

This field is used to select the type of Suspend mode.

S1(POS)   Enables the Power On Suspend function.
S3(STR)   Enables the Suspend to RAM function.

Run VGABIOS if S3 Resume

When this field is set to Auto, the system will initialize the VGA BIOS when it wakes up from the S3 state. This can be configured only if the "ACPI Suspend Type" field is set to "S3(STR)".

USB KB Wake-Up From S3

This field, when enabled, allows you to use a USB keyboard to wake up a system that is in the S3 (STR - Suspend To RAM) state. This can be configured only if the "ACPI Suspend Type" field is set to "S3(STR)".

Power Management

This field allows you to select the type (or degree) of power saving by changing the length of idle time that elapses before the Suspend mode and HDD Power Down fields are activated.

Min Saving   Minimum power saving time for the Suspend Mode (1 hour) and HDD Power Down (15 min.)

Max Saving   Maximum power saving time for the. Suspend Mode and HDD Power Down = 1 min.

User Define   Allows you to set the power saving time in the "Suspend Mode" and "HDD Power Down" fields.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC + Blank   This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.

Blank Screen   This option only writes blanks to the video buffer.

DPMS   Initializes display power management signaling. Use this option if your video board supports it.

Video Off In Suspend

This field is used to activate the video off feature when the system enters the Suspend mode. The options are Yes and No.

Suspend Type

The options are Stop Grant and PwrOn Suspend.

MODEM Use IRQ

This field is used to set an IRQ channel for the modem installed in your system.

Suspend Mode

This is selectable only when the Power Management field is set to User Define. When the system enters the Suspend mode according to the power saving time selected, the CPU and onboard peripherals will be shut off.

HDD Power Down

This is selectable only when the Power Management field is set to User Define. When the system enters the HDD Power Down mode according to the power saving time selected, the hard disk drive will be powered down while all other devices remain active.

Soft-Off by PWR-BTTN

This field allows you to select the method of powering off your system.

Delay 4 Sec.   Regardless of whether the Power Management function is enabled or disabled, if the power button is pushed and released in less than 4 sec, the system enters the Suspend mode. The purpose of this function is to prevent the system from powering off in case you accidentally "hit" or pushed the power button. Push and release again in less than 4 sec to restore. Pushing the power button for more than 4 seconds will power off the system.

Instant-Off   Pressing and then releasing the power button at once will immediately power off your system.

Wake-Up Event Setup

Wake-Up by PCI Card

Enabled   This field should be set to Enabled only if your PCI card such as LAN card or modem card uses the PCI PME (Power Management Event) signal to remotely wake up the system. Access to the LAN card or PCI card will cause the system to wake up. Refer to the card's documentation for more information.

Disabled The system will not wake up despite access to the PCI card.

Power On by Ring

Set this field to Enabled to use the modem ring-on function. This will allow your system to power-on to respond to calls coming from an external modem.

Wake Up On LAN

Set this field to Enabled to allow the network to remotely wake up a Soft Power Down (Soft-Off) PC. However, if your system is in the Suspend mode, you can wake up the system only through an IRQ or DMA interrupt.

Resume By Alarm

Enabled   When Enabled, you can set the date and time you would like the Soft Power Down (Soft-Off) PC to power-on in the "Date (of Month) Alarm" and "Time (hh:mm:ss) Alarm" fields. However, if the system is being accessed by incoming calls or the network (Resume On Ring/LAN) prior to the date and time set in these fields, the system will give priority to the incoming calls or network.

Disabled Disables the automatic power-on function. (default)

Date (of Month) Alarm

0	The system will power-on everyday according to the time set in the "Time (hh:mm:ss) Alarm" field.
1-31	Select a date you would like the system to power-on. The system will power-on on the set date, and time set in the "Time (hh:mm:ss) Alarm" field.

Time (hh:mm:ss) Alarm

This is used to set the time you would like the system to power-on. If you want the system to power-on everyday as set in the "Date (of Month) Alarm" field, the time set in this field must be later than the time of the RTC set in the Standard CMOS Features submenu.

PnP/PCI Configurations

This section describes configuring the PCI bus system. It covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

```
          Phoenix - AwardBIOS CMOS Setup Utility
                   PnP/PCI Configurations

    PNP OS Installed          No                Item Help
    Reset Configuration Data  Disabled
                                            Menu Level    ▶
    Resources Controlled By   Auto(ESCD)
  x IRQ Resources             Press Enter     Select Yes if you are
  x DMA Resources             Press Enter     using a Plug and Play
                                              capable operating
    PCI/VGA Palette Snoop     Disabled        system Select No if
                                              you need the BIOS to
                                              configure non-boot
                                              devices




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

The settings on the screen are for reference only. Your version may not be identical to this one.

PNP OS Installed

If you selected "Yes", the BIOS will detect the Plug and Play devices for some compatible resources.

Reset Configuration Data

Enabled   The BIOS will reset the Extended System Configuration Data (ESCD) once automatically. It will then recreate a new set of configuration data.

Disabled The BIOS will not reset the configuration data.

Resources Controlled By

The Award Plug and Play BIOS has the capability to automatically configure all of the boot and Plug and Play compatible devices.

Auto   The system will automatically detect the settings for you.

Manual   Choose the specific IRQ and DMA in the "IRQ Resources" and "DMA Resources" field respectively.

IRQ Resources

Move the cursor to this field and press <Enter>.

```
            Phoenix - AwardBIOS CMOS Setup Utility
                         IRQ Resources

   IRQ-3   assigned to        PCI/ISA PnP          Item Help
   IRQ-4   assigned to        PCI/ISA PnP
   IRQ-5   assigned to        PCI/ISA PnP      Menu Level    ▶▶
   IRQ-7   assigned to        PCI/ISA PnP
   IRQ-9   assigned to        PCI/ISA PnP      Legacy ISA for devices
   IRQ-10  assigned to        PCI/ISA PnP      compliant with the
   IRQ-11  assigned to        PCI/ISA PnP      original PC AT bus
   IRQ-12  assigned to        PCI/ISA PnP      specification, PCI/ISA
   IRQ-14  assigned to        PCI/ISA PnP      PnP for devices
   IRQ-15  assigned to        PCI/ISA PnP      compliant with the
                                               Plug and Play standard
                                               whether designed for
                                               PCI or ISA bus
                                               architecture




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

The settings on the screen are for reference only. Your version may not be identical to this one.

Set each system interrupt to either PCI/ISA PnP or Legacy ISA.

PCI/ISA PnP   For devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

Legacy ISA   For devices compliant with the original PC AT bus specification.

DMA Resources

Move the cursor to this field and press <Enter>.

```
                  Phoenix - AwardBIOS CMOS Setup Utility
                              DMA Resources

     DMA-0 assigned to        PCI/ISA PnP              Item Help
     DMA-1 assigned to        PCI/ISA PnP
     DMA-3 assigned to        PCI/ISA PnP        Menu Level   ▶▶
     DMA-5 assigned to        PCI/ISA PnP
     DMA-6 assigned to        PCI/ISA PnP        Legacy ISA for devices
     DMA-7 assigned to        PCI/ISA PnP        compliant with the
                                                 original PC AT bus
                                                 specification, PCI/ISA
                                                 PnP for devices
                                                 compliant with the
                                                 Plug and Play standard
                                                 whether designed for
                                                 PCI or ISA bus
                                                 architecture




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

The settings on the screen are for reference only. Your version may not be identical to this one.
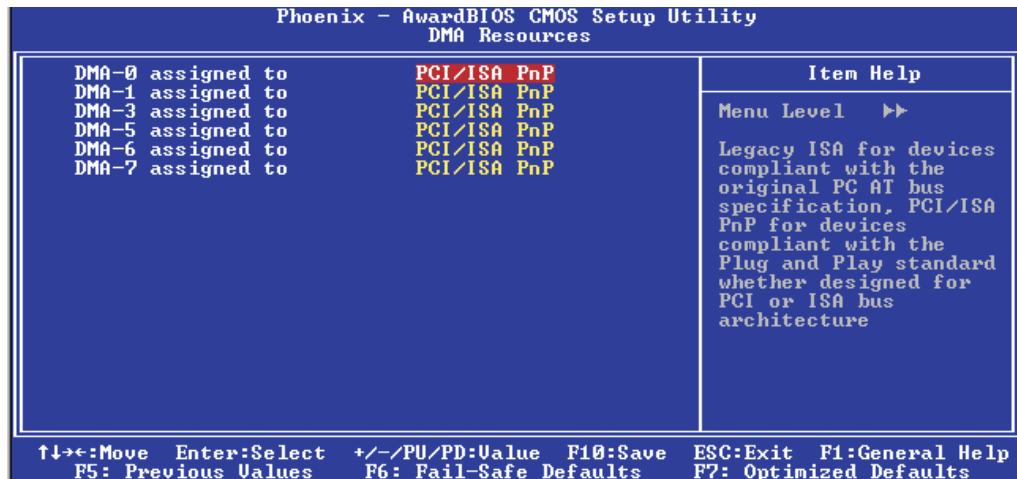
Set each system interrupt to either PCI/ISA PnP or Legacy ISA.

PCI/ISA PnP   For devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

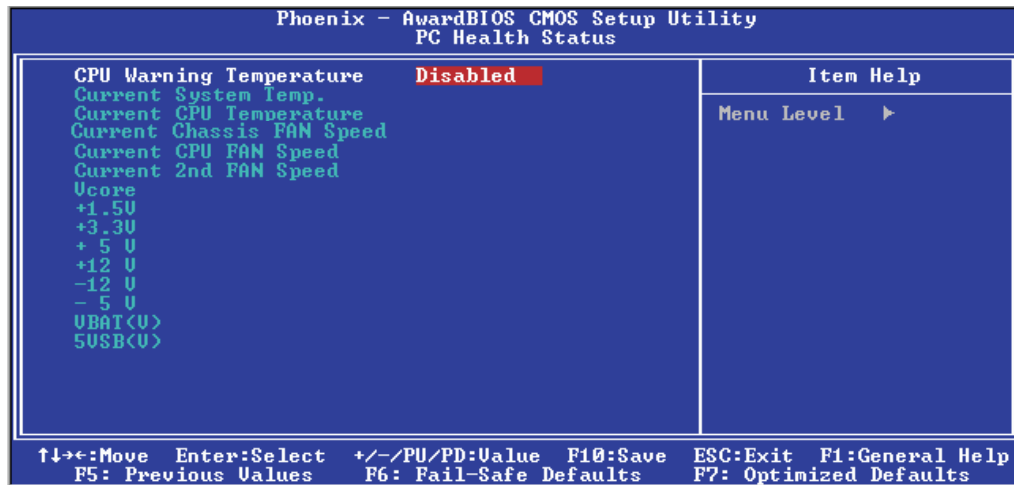*Legacy ISA*   For devices compliant with the original PC AT bus specification.

PCI/VGA Palette Snoop

This field determines whether the MPEG ISA/VESA VGA cards can work with PCI/VGA or not. The default value is Disabled.

Enabled   MPEG ISA/VESA VGA cards work with PCI/VGA.

Disabled   MPEG ISA/VESA VGA cards does not work with PCI/VGA.

PC Health Status

```
          Phoenix - AwardBIOS CMOS Setup Utility
                     PC Health Status
┌──────────────────────────────────────┬──────────────────────┐
│ CPU Warning Temperature    Disabled   │      Item Help       │
│ Current System Temp.                  │                      │
│ Current CPU Temperature               │ Menu Level    ▶      │
│ Current Chassis FAN Speed             │                      │
│ Current CPU FAN Speed                 │                      │
│ Current 2nd FAN Speed                 │                      │
│ Vcore                                 │                      │
│ +1.5U                                 │                      │
│ +3.3U                                 │                      │
│ + 5 U                                 │                      │
│ +12 U                                 │                      │
│ -12 U                                 │                      │
│ - 5 U                                 │                      │
│ UBAT(U)                               │                      │
│ 5USB(U)                               │                      │
│                                       │                      │
├──────────────────────────────────────┴──────────────────────┤
│ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
│   F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults │
└──────────────────────────────────────────────────────────────┘
```

The settings on the screen are for reference only. Your version may not be identical to this one.

CPU Warning Temperature

This field is used to select the CPU's temperature limit. Once the system has detected that the CPU's temperature exceeded the limit, warning beeps will sound.

Current System Temperature, Current CPU Temperature, Current Chassis Fan, Current CPU Fan and Current Second Fan

These fields show the internal temperature of the system, current temperature of the CPU, and the current fan speed of the cooling fans in RPM (Revolutions Per Minute).

Vcore

This field shows the voltage of the processor.

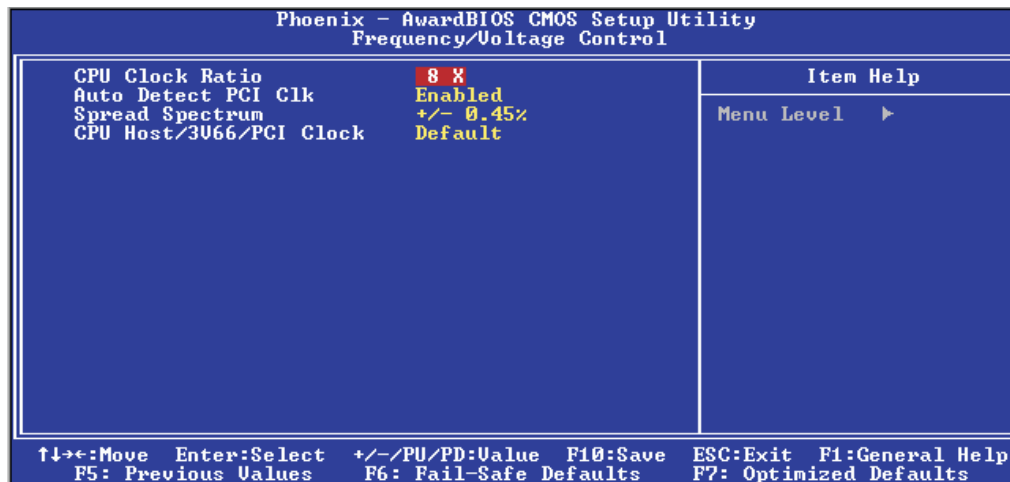## +1.5V, +3.3V, +5V, +12V, -12V, -5V, VBAT(V) and 5VSB(V)

These fields show the output voltage of the power supply.

Note:
The onboard hardware monitor function is capable of detecting the system's conditions but if you want a warning message to pop-up or a warning alarm to sound when an abnormal condition occurs, you must install the Hardware Doctor utility. This utility is included in the CD that came with the system board. Refer to the Hardware Doctor section in chapter 4 for more information.

Frequency/Voltage Control

```
                   Phoenix - AwardBIOS CMOS Setup Utility
                          Frequency/Voltage Control

  CPU Clock Ratio            8 X                   Item Help
  Auto Detect PCI Clk       Enabled
  Spread Spectrum           +/- 0.45%      Menu Level    ▶
  CPU Host/3V66/PCI Clock   Default




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

The settings on the screen are for reference only. Your version may not be identical to this one.

CPU Clock Ratio

This field is used to select the CPU's frequency ratio.

> **Important:**
> *The frequency ratio of some processors may have been locked by the manufacturer. If you are using this kind of processor, setting an extended ratio for the processor will have no effect. The system will instead use its factory default ratio.*

Auto Detect PCI Clk

When enabled, the system will automatically send clock signals to existing PCI devices.

Spread Spectrum

Leave this field in its default setting. Do not alter this setting unless advised by an engineer or technician.

CPU Host/3V66/PCI Clock

This field provides several options for selecting the external system bus clock of the processor. The AGP clock and PCI clock will at the same time appear next to the external bus clock selected. For example, if you selected "100/66/33MHz", "100" is the external bus clock, "66" is the AGP clock and "33" is the PCI clock. The default setting is "Default". Under this setting, the system will run according to the processor's clock frequency.
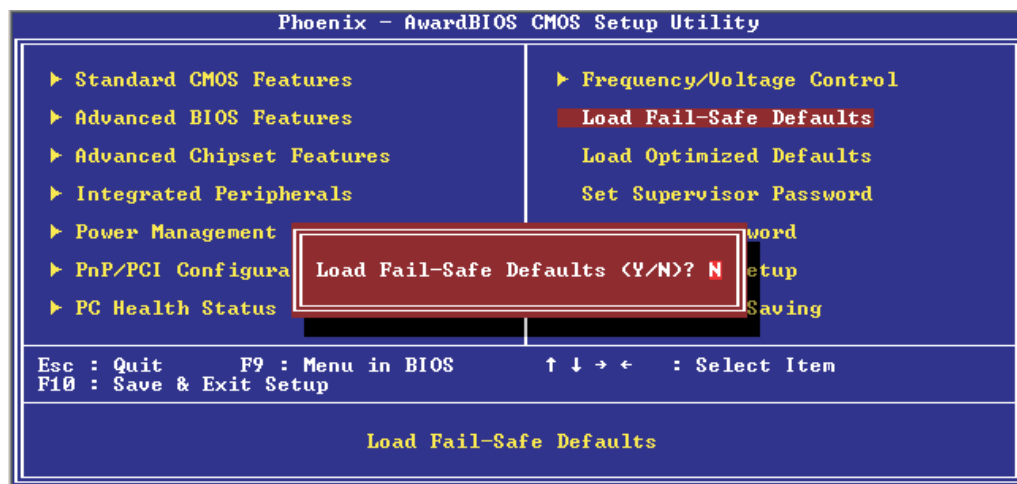
> **Important:**
> *Overclocking may result to the processor's or system's instability and are not guaranteed to provide better system performance.*
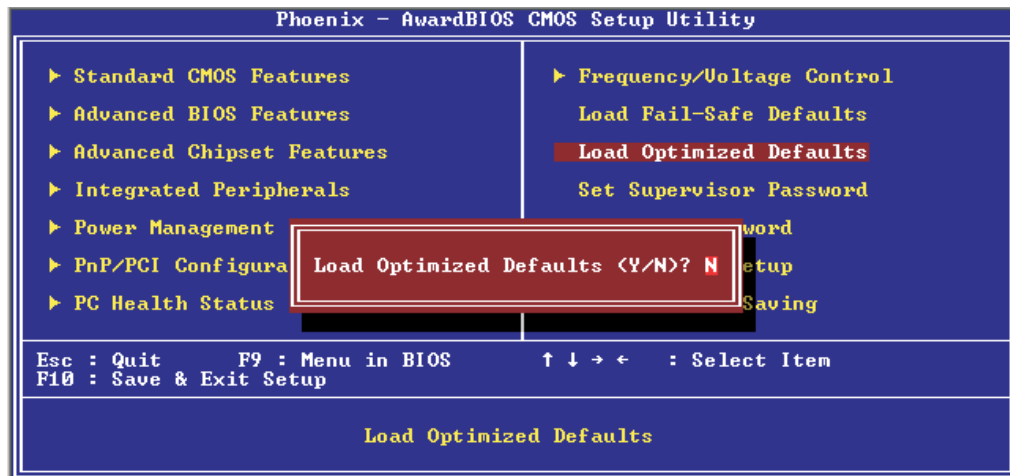
Load Fail-Safe Defaults

The "Load Fail-Safe Defaults" option loads the troubleshooting default values permanently stored in the ROM chips. These settings are not optimal and turn off all high performance features. You should use these values only if you have hardware problems. Highlight this option in the main menu and press <Enter>.

```
              Phoenix - AwardBIOS CMOS Setup Utility

  ▶ Standard CMOS Features          ▶ Frequency/Voltage Control
  ▶ Advanced BIOS Features             Load Fail-Safe Defaults
  ▶ Advanced Chipset Features          Load Optimized Defaults
  ▶ Integrated Peripherals             Set Supervisor Password
  ▶ Power Management              ┌─────────────────────────┐word
  ▶ PnP/PCI Configura            │ Load Fail-Safe Defaults (Y/N)? N │etup
  ▶ PC Health Status             └─────────────────────────┘Saving

  Esc : Quit        F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item
  F10 : Save & Exit Setup

                      Load Fail-Safe Defaults
```

If you want to proceed, type <Y> and press <Enter>. The default settings will be loaded.

Load Optimized Defaults

The "Load Optimized Defaults" option loads optimized settings from the BIOS ROM. Use the default values as standard values for your system. Highlight this option in the main menu and press <Enter>.
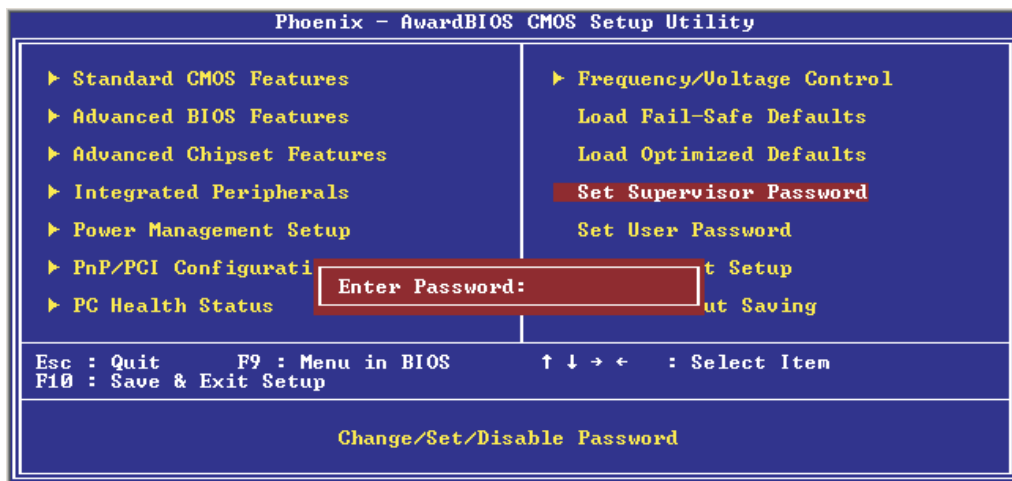
```
                Phoenix - AwardBIOS CMOS Setup Utility
 ┌─────────────────────────────────────────────────────────────────────┐
 │ ▶ Standard CMOS Features        ▶ Frequency/Voltage Control          │
 │ ▶ Advanced BIOS Features           Load Fail-Safe Defaults           │
 │ ▶ Advanced Chipset Features        Load Optimized Defaults           │
 │ ▶ Integrated Peripherals           Set Supervisor Password           │
 │ ▶ Power Management        ┌──────────────────────────────┐ word      │
 │ ▶ PnP/PCI Configura       │ Load Optimized Defaults (Y/N)? N │ etup   │
 │ ▶ PC Health Status        └──────────────────────────────┘ Saving    │
 │                                                                       │
 ├─────────────────────────────────────────────────────────────────────┤
 │ Esc : Quit        F9 : Menu in BIOS     ↑ ↓ → ←   : Select Item      │
 │ F10 : Save & Exit Setup                                              │
 ├─────────────────────────────────────────────────────────────────────┤
 │                     Load Optimized Defaults                           │
 └─────────────────────────────────────────────────────────────────────┘
```

Type <Y> and press <Enter> to load the Setup default values.

Set Supervisor Password

If you want to protect your system and setup from unauthorized entry, set a supervisor's password with the "System" option selected in the Advanced BIOS Features. If you want to protect access to setup only, but not your system, set a supervisor's password with the "Setup" option selected in the Advanced BIOS Features. You will not be prompted for a password when you cold boot the system.

Use the arrow keys to highlight "Set Supervisor Password" and press <Enter>.

```
                 Phoenix - AwardBIOS CMOS Setup Utility

    ▶ Standard CMOS Features          ▶ Frequency/Voltage Control
    ▶ Advanced BIOS Features             Load Fail-Safe Defaults
    ▶ Advanced Chipset Features          Load Optimized Defaults
    ▶ Integrated Peripherals             Set Supervisor Password
    ▶ Power Management Setup             Set User Password
    ▶ PnP/PCI Configurati┌───────────────────────┐t Setup
    ▶ PC Health Status    │ Enter Password:       │ut Saving
                          └───────────────────────┘

    Esc : Quit       F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item
    F10 : Save & Exit Setup

                     Change/Set/Disable Password
```
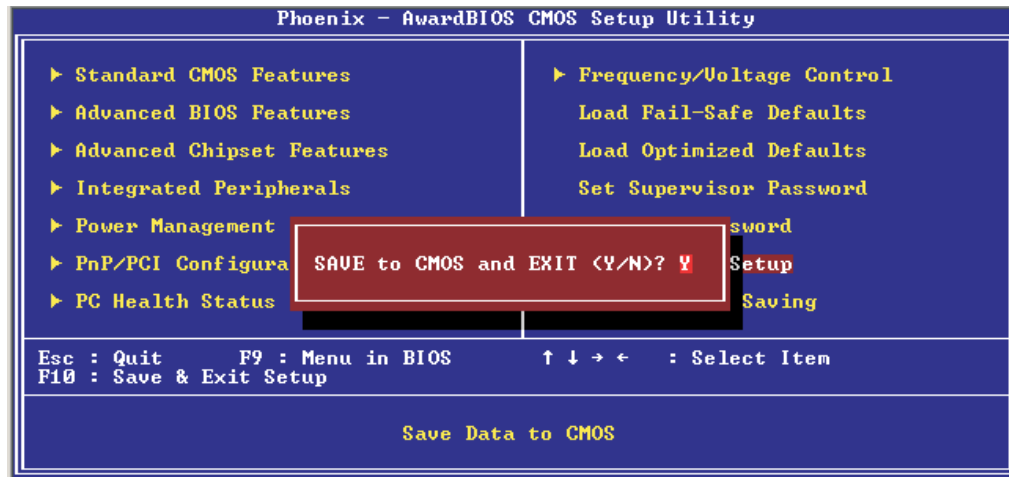
Type in the password. You are limited to eight characters. When done, the message below will appear:

Confirm Password:

You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set Supervisor Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.
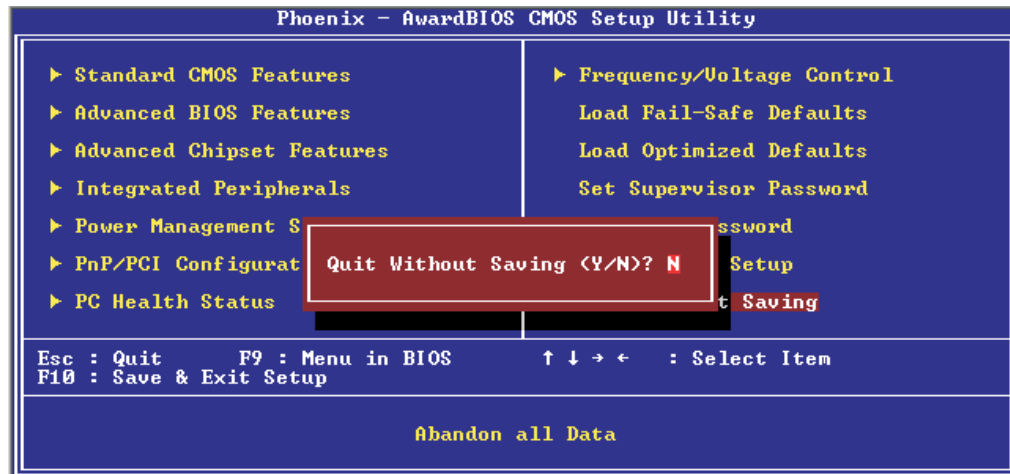
Set User Password

If you want another user to have access only to your system but not to setup, set a user's password with the "System" option selected in the Advanced BIOS Features. If you want a user to enter a password when trying to access setup, set a user's password with the "Setup" option selected in the Advanced BIOS Features.

Using user's password to enter Setup allows a user to access only "Set User Password" that appears in the main menu screen. Access to all other options is denied.

Use the arrow keys to highlight "Set User Password" and press <Enter>.
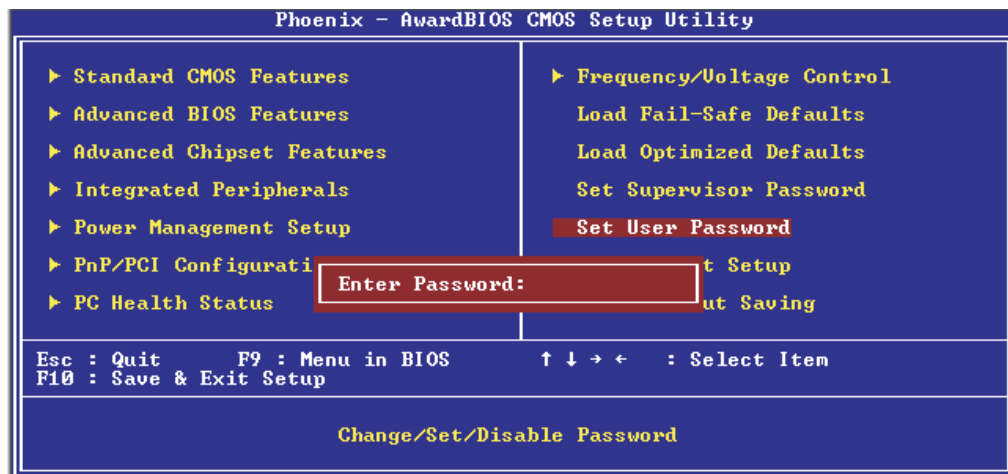
```
             Phoenix - AwardBIOS CMOS Setup Utility

   ▶ Standard CMOS Features          ▶ Frequency/Voltage Control
   ▶ Advanced BIOS Features             Load Fail-Safe Defaults
   ▶ Advanced Chipset Features          Load Optimized Defaults
   ▶ Integrated Peripherals             Set Supervisor Password
   ▶ Power Management Setup             Set User Password
   ▶ PnP/PCI Configurati ┌──────────────────────────┐ t Setup
                         │ Enter Password:          │
   ▶ PC Health Status    └──────────────────────────┘ ut Saving

   Esc : Quit      F9 : Menu in BIOS       ↑ ↓ → ←   : Select Item
   F10 : Save & Exit Setup

             Change/Set/Disable Password
```

Type in the password. You are limited to eight characters. When done, the message below will appear:

Confirm Password:

You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set User Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

Save & Exit Setup

When all the changes have been made, highlight "Save & Exit Setup" and press <Enter>.

```
              Phoenix - AwardBIOS CMOS Setup Utility

  ▶ Standard CMOS Features          ▶ Frequency/Voltage Control
  ▶ Advanced BIOS Features             Load Fail-Safe Defaults
  ▶ Advanced Chipset Features          Load Optimized Defaults
  ▶ Integrated Peripherals             Set Supervisor Password
  ▶ Power Management              ┌──────────────────────────┐sword
  ▶ PnP/PCI Configura            │ SAVE to CMOS and EXIT (Y/N)? Y │Setup
  ▶ PC Health Status             └──────────────────────────┘Saving

  Esc : Quit        F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item
  F10 : Save & Exit Setup

                      Save Data to CMOS
```

Type "Y" and press <Enter>. The modifications you have made will be written into the CMOS memory, and the system will reboot. You will once again see the initial diagnostics on the screen. If you wish to make additional changes to the setup, press <Ctrl> <Alt> <Esc> simultaneously or <Del> after memory testing is done.

Exit Without Saving

When you do not want to save the changes you have made, highlight "Exit Without Saving" and press <Enter>.

```
              Phoenix - AwardBIOS CMOS Setup Utility

 ▶ Standard CMOS Features          ▶ Frequency/Voltage Control
 ▶ Advanced BIOS Features             Load Fail-Safe Defaults
 ▶ Advanced Chipset Features          Load Optimized Defaults
 ▶ Integrated Peripherals             Set Supervisor Password
 ▶ Power Management S┌──────────────────────────────┐ssword
 ▶ PnP/PCI Configurat│ Quit Without Saving (Y/N)? N │ Setup
 ▶ PC Health Status   └──────────────────────────────┘t Saving

 Esc : Quit        F9 : Menu in BIOS     ↑ ↓ → ←   : Select Item
 F10 : Save & Exit Setup

                      Abandon all Data
```

Type "Y" and press <Enter>. The system will reboot and you will once again see the initial diagnostics on the screen. If you wish to make any changes to the setup, press <Ctrl> <Alt> <Esc> simultaneously or <Del> after memory testing is done.

Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AWDFLASH.EXE. Please contact technical support or your sales representative for the files.

Note:
AWDFLASH.EXE works only in DOS mode.

1. Save the new BIOS file along with the flash utility AWDFLASH.EXE to a floppy disk.

2. Reboot the system and enter the Award BIOS Setup Utility to set the first boot drive to "Floppy".

3. Save the setting and reboot the system.

4. After the system booted from the floppy disk, execute the flash utility by typing AWDFLASH.EXE. The following screen will appear:

```
Award BIOS Flash Utility V.8.15B
(C) Phoenix Technologies Ltd. All Rights Reserved.

(The current BIOS information will appear in this area.)

File Name to Program :
```

5. Type the new BIOS file name onto the gray area that is next to "File Name to Program" then press <Enter>.

6. The following will appear.

     Do You Want to Save BIOS (Y/N)

This question refers to the current existing BIOS in your system. We recommend that you save the current BIOS and its flash utility; just in case you need to reinstall the BIOS. To save the current BIOS, press <Y> then enter the file name of the current BIOS. Otherwise, press <N>.

7. The following will then appear.

     Press "Y" to Program or "N" to Exit

8. Press <Y> to flash the new BIOS.

Chapter 4 - Supported Software

Drivers, Utilities and Software Applications

The CD that came with the system board contains drivers, utilities and software applications required to enhance the performance of the system board.

Insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. If after inserting the CD, "Autorun" did not automatically start (which is, the Main Board Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".
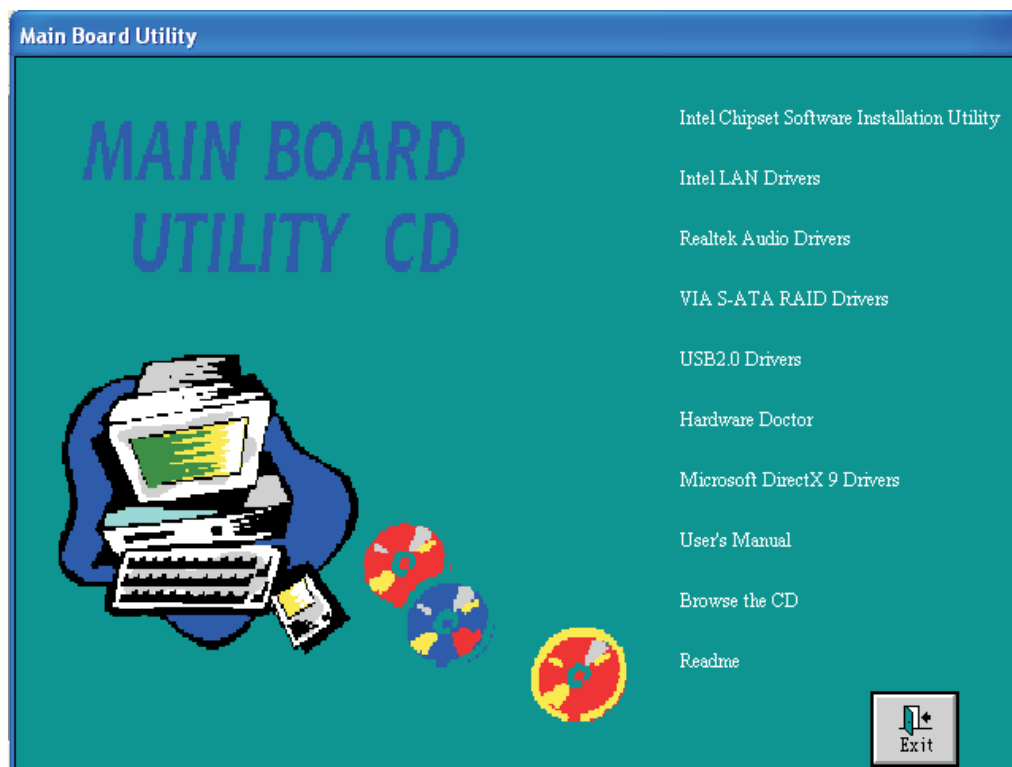
Intel Chipset Software Installation Utility

The Intel Chipset Software Installation Utility is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, please follow the steps below.

1. Click "Intel Chipset Software Installation Utility" on the main menu. The following screen will appear.
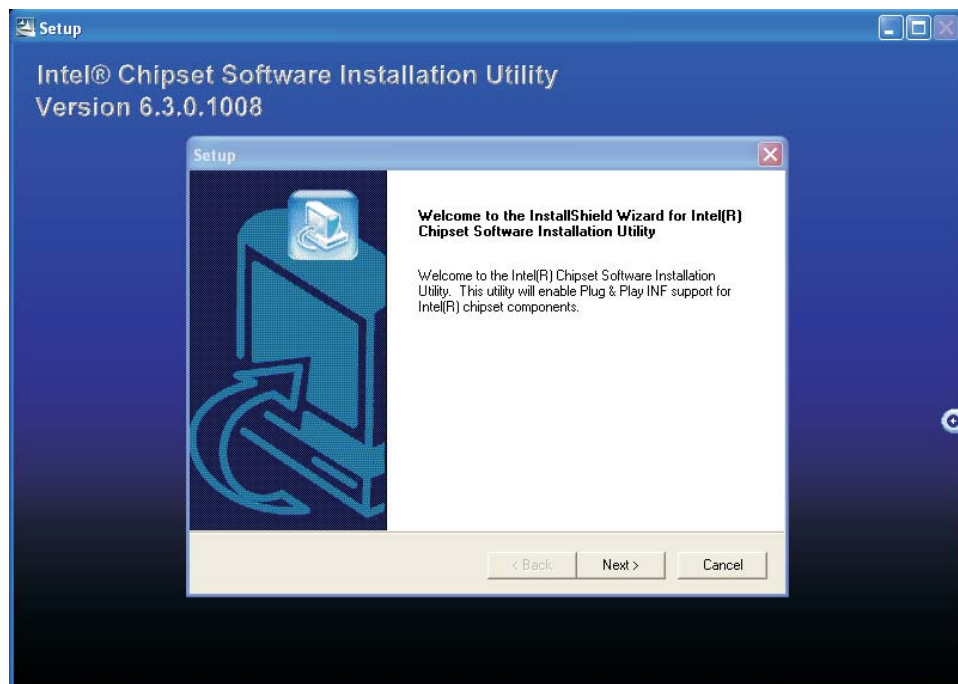
2. Follow the prompts on the screen to complete installation.

3. Reboot the system for the utility to take effect.

Supported Software ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

Intel LAN Drivers

To install the driver, please follow the steps below.

1. Click "Intel LAN Drivers" on the main menu.

2. Click "Wired LAN Adapters". The following screen will appear.
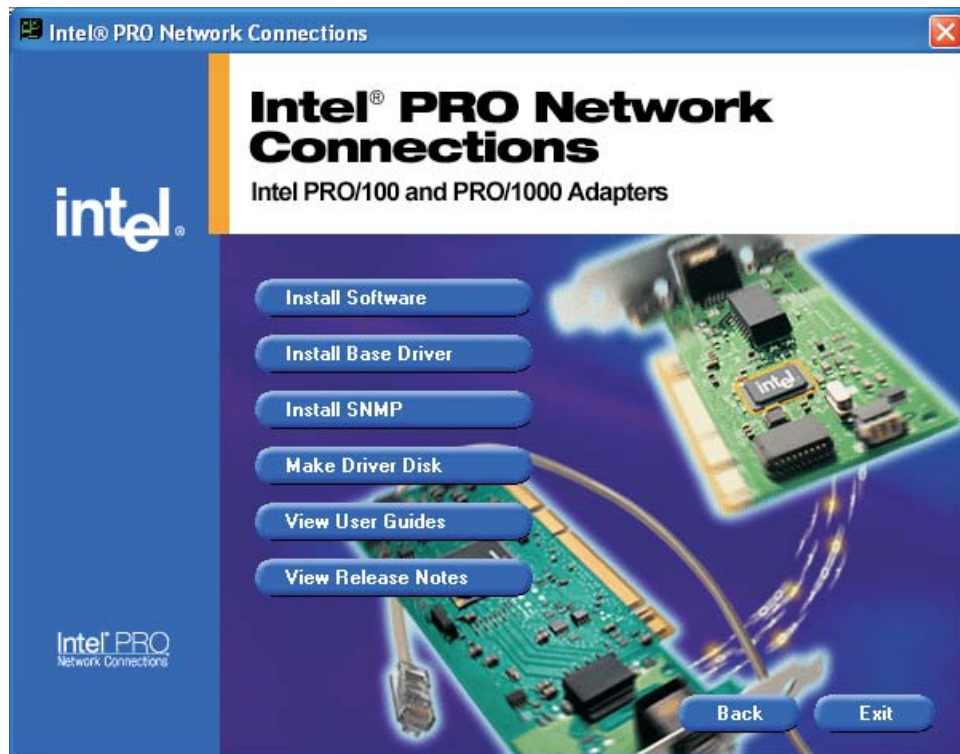
3. Click "Install Software". This will install the LAN application software. After installing the software, run the application software by double-clicking the icon on the lower right of the taskbar. The "Intel(R) PROSet II" screen will appear. For more information about using the utility, click "View User Guide" on the screen above.

4. Go back to the screen above to install the LAN driver. Click "Install Base Driver".

5. Follow the prompts on the screen to complete installation.

6. Reboot the system for the driver to take effect.

Realtek Audio Drivers

To install the driver, please follow the steps below.

1. Click "Realtek Audio Drivers". The following screen will appear.
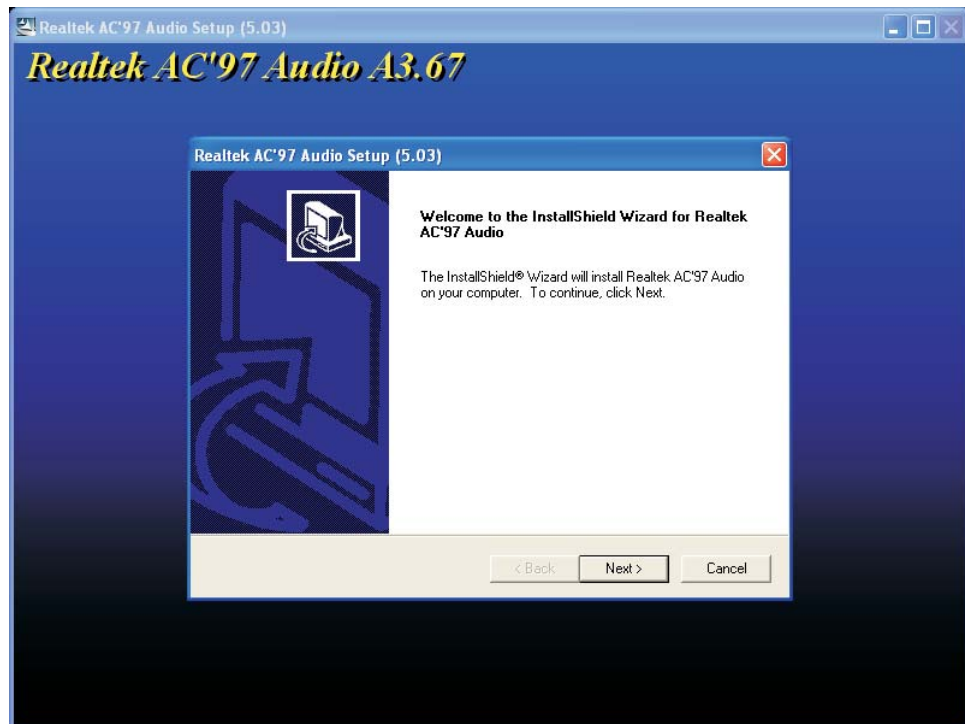
2. Follow the prompts on the screen to complete installation.

3. Reboot the system for the driver to take effect.

USB 2.0 Drivers

Click "USB 2.0 Drivers" on the main menu. A readme file about the driver will appear.

Windows® XP

If your Windows® XP CD already includes Service Pack 1, the USB 2.0 driver will automatically install when you install the operating system. If the CD does not include Service Pack 1, it is available for download at Microsoft's Windows Update website.

Windows® 2000

If your Windows® 2000 CD already includes Service Pack 4, the USB 2.0 driver will automatically install when you install the operating system. If the CD does not include Service Pack 4, it is available for download at Microsoft's Windows Update website.

Hardware Doctor

Hardware Doctor is capable of monitoring the system's hardware conditions such as the temperature of the CPU and system, voltage, and speed of the cooling fans. It also allows you to manually set a range to the items being monitored. If the values are over or under the set range, a warning message will pop-up. The utility can also be configured so that a beeping alarm will sound whenever an error occurs. We recommend that you use the "Default Setting" which is the ideal setting that would keep the system in good working condition.

To install the utility, please follow the steps below.

1. Click "Hardware Doctor" on the main menu. The screen below will appear.
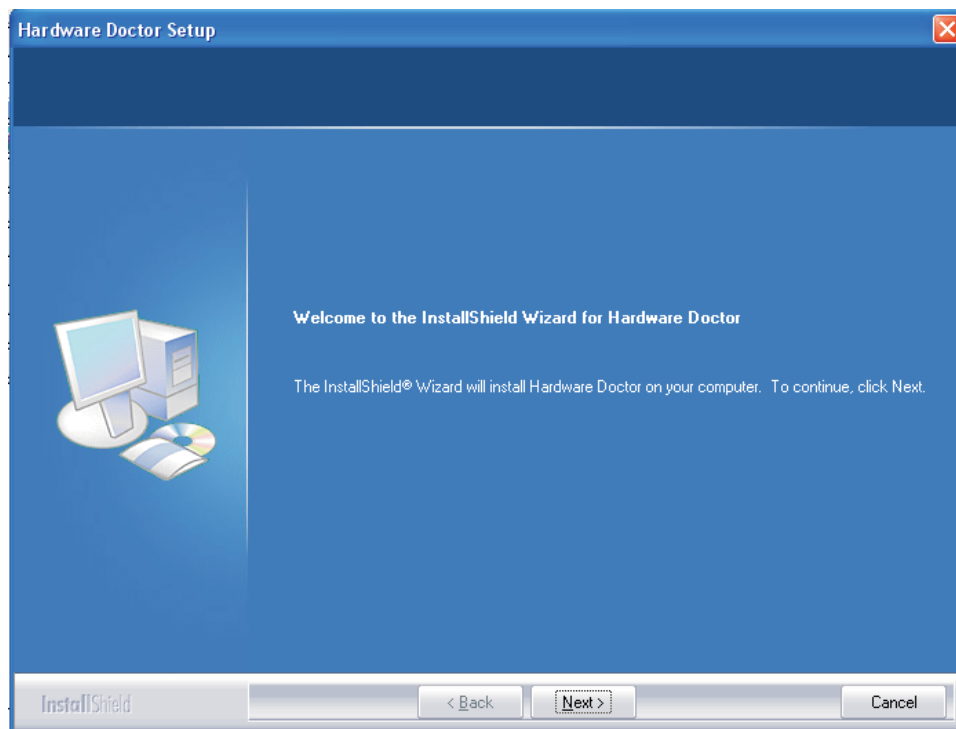
2. Follow the prompts on the screen to complete installation.

3. Restart the system.

Microsoft DirectX 9 Driver

To install, please follow the steps below.

1. Click "Microsoft DirectX 9 Driver" on the main menu. The following screen will appear.
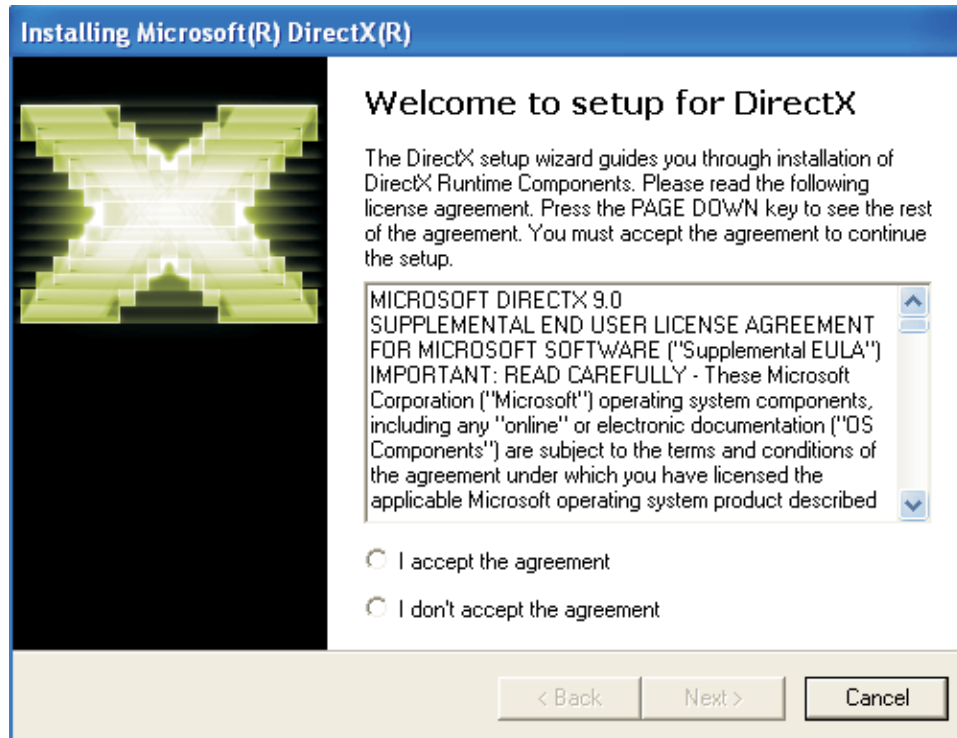
2. Click "I accept the agreement" then click "Next".

3. Follow the prompts on the screen to complete installation.

4. Reboot the system for the driver to take effect.

Installation Notes

1. "Autorun" ONLY supports the Windows® 98 SE, Windows® ME, Windows® 2000, Windows NT® 4.0 and Windows® XP operating systems. If after inserting the CD, "Autorun" did not automatically start (which is, the Main Board Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".

2. All steps or procedures to install software drivers are subject to change without notice as the softwares are occassionally updated. Please contact technical support or your sales representative for the latest version of the drivers or software applications.

Enabling Hyper-Threading Technology

To enable the functionality of the Hyper-Threading Technology, please follow the requirements and steps below. Basically, the following presumes that you have already installed an Intel® Pentium® 4 Processor with Hyper-Threading Technology.

1. The system requires a minimum of 300 Watt ATX 12V power supply.

2. Aside from installing a CPU fan on the Intel® Pentium® 4 Processor with Hyper-Threading Technology, make sure to install cooling fans. The system requires adequate airflow throughout the chassis to prevent overheating the processor.

3. The "CPU Hyper-Threading" field in the Advanced BIOS Features submenu of the Award BIOS setup will appear. Make sure this field is set to Enabled.

4. Currently, only Windows® XP supports the Hyper-Threading Technology. If this OS has been previously installed, you must **REINSTALL** it.

5. After installing Windows® XP, please check the following to ensure that the operating system has been properly installed.

   a. Click Start, point to Settings then click Control Panel.

   b. Double-click the System icon. The System Properties dialog box will appear.

c. Click the General tab. The processor shown under Computer should resemble the one shown below.
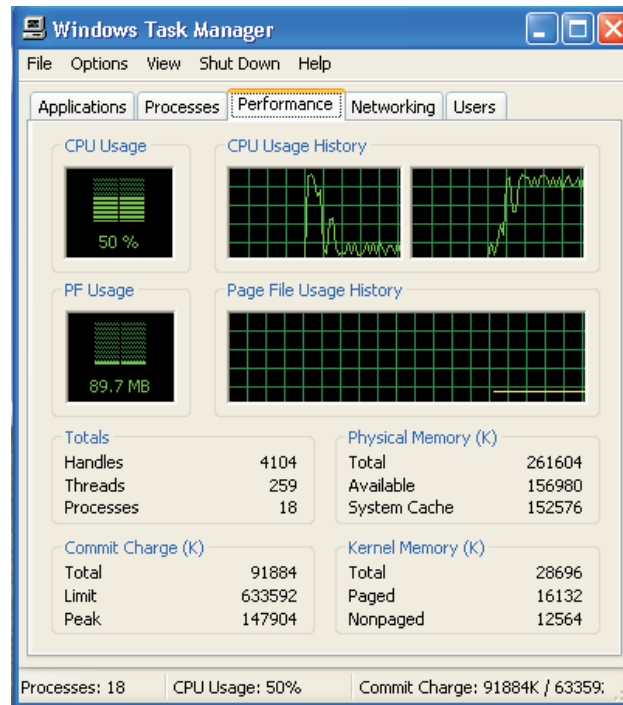

d. Now click the Hardware tab then click Device Manager. The items shown under Computer and Processors should resemble the ones shown below.

e. Lastly, press the <Ctrl> <Alt> and <Del> keys simultaneously. The Windows Task Manager dialog box will appear. Click the Performance tab. The diagram under CPU Usage History should resemble the one shown below.

Appendix B - System Error Message

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message, PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP, will be shown in the information box at the bottom. Enter Setup to correct the error.

B.1 POST Beep

There are two kinds of beep codes in the BIOS. One code indicates that a video error has occured and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps. The other code indicates that a DRAM error has occured. This beep code consists of a single long beep.

B.2 Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error messages for all Awards BIOSes:

CMOS BATTERY HAS FAILED
The CMOS battery is no longer functional. It should be replaced.

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

CMOS CHECKSUM ERROR
Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISPLAY SWITCH IS SET INCORRECTLY
The display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different

setting than indicated in Setup. Determine which setting is correct, either turn off the system and change the jumper or enter Setup and change the VIDEO selection.

FLOPPY DISK(S) fail (80)
Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)
Floppy type mismatch.

Hard Disk(s) fail (80)
HDD reset failed.

Hard Disk(s) fail (40)
HDD controller diagnostics failed.

Hard Disk(s) fail (20)
HDD initialization error.

Hard Disk(s) fail (10)
Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)
Sector Verify failed.

Keyboard is locked out - Unlock the key
The BIOS detects that the keyboard is locked. Keyboard controller is pulled low.

Keyboard error or no keyboard present
Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

Manufacturing POST loop
System will repeat POST procedure infinitely while the keyboard controller is pull low. This is also used for the M/B burn in test at the factory.

BIOS ROM checksum error - System halted
The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail
The BIOS reports memory test fail if the memory has error(s).

Appendix C - Troubleshooting

C.1 Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

Some of the most common things to check when you encounter problems while using your system are listed below.

1. The power switch of each peripheral device is turned on.
2. All cables and power cords are tightly connected.
3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.
4. The monitor is turned on.
5. The display's brightness and contrast controls are adjusted properly.
6. All add-in boards in the expansion slots are seated securely.
7. Any add-in board you have installed is designed for your system and is set up correctly.

Monitor/Display

If the display screen remains dark after the system is turned on:

1. Make sure that the monitor's power switch is on.
2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.
3. Check that the video input cable is properly attached to the monitor and the system's display adapter.
4. Adjust the brightness of the display by turning the monitor's brightness control knob.

The picture seems to be constantly moving.

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.
2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.
3. Make sure your video card's output frequencies are supported by this monitor.

The screen seems to be constantly wavering.

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

Power Supply

When the computer is turned on, nothing happens.

1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.
2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.
3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

Floppy Drive

The computer cannot access the floppy drive.

1. The floppy diskette may not be formatted. Format the diskette and try again.
2. The diskette may be write-protected. Use a diskette that is not write-protected.
3. You may be writing to the wrong drive. Check the path statement to make sure you are writing to the targeted drive.
4. There is not enough space left on the diskette. Use another diskette with adequate storage space.

Hard Drive

Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.
2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

Excessively long formatting period.

1. If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem. However, if your hard drive has a large capacity, it will take a longer time to format.

Parallel Port

The parallel printer doesn't respond when you try to print.

1. Make sure that your printer is turned on and that the printer is on-line.
2. Make sure your software is configured for the right type of printer attached.
3. Verify that the onboard LPT port's I/O address and IRQ settings are configured correctly.
4. Verify that the attached device works by attaching it to a parallel port that is working and configured correctly. If it works, the printer can be assumed to be in good condition. If the printer remains inoperative, replace the printer cable and try again.

C

Serial Port

The serial device (modem, printer) doesn't output anything or is outputting garbled characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.
2. Verify that the device is plugged into the correct serial port on the rear of the computer.
3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.
4. Make sure the COM settings and I/O address are configured correctly.

Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.
2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.
2. Check the jumper settings to ensure that the jumpers are properly set.
3. Verify that all memory modules are seated securely into the memory sockets.
4. Make sure the memory modules are in the correct locations.
5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.
6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.

Appendix D - Watchdog Timer

Watchdog Timer

The following parameters are references for setting the time interval of the Watchdog Timer function. The system will regularly be "cleared" according to the set time interval. If the system hangs or fails to function, it will also reset according to the time interval so that your system will continue to operate.

```
mov dx,02e <Enter>
mov al,87 <Enter>
out dx,al <Enter>
out dx,al <Enter>
mov dx,02e <Enter>
mov al,07 <Enter>
out dx,al <Enter>
inc dx <Enter>
inc al <Enter>
out dx,al <Enter>
dec dx <Enter>
mov al,f6 <Enter>
out dx,al <Enter>
inc dx <Enter>
mov al,xy <Enter>
out dx,al <Enter>
```

"XY" is the Watchdog Time count value for the "00h to "FFh" range wherein the time can be set from 0 sec. to 255 sec.