G7V100 Series

System Board
User's Manual

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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.

Table of Contents

About this Manual

An electronic file of this manual is included in the CD. To view the user's manual in the CD, 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.

Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.

2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.

3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.

4. We will not be liable for any indirect, special, incidental or consequencial damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.

> **Important:**
> Electrostatic discharge (ESD) can damage your processor, disk drive 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.

Safety Measures

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.

About the Package

The system board package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- ☑ The system board
- ☑ One IDE cable
- ☑ One USB port cable (optional)
- ☑ One serial port cable
- ☑ One Serial ATA data cable
- ☑ One Serial ATA power cable
- ☑ One "Main Board Utility" CD
- ☑ One I/O shield
- ☑ One Quick Reference guide (QR)

The system board and accessories in the package may not come similar to the information listed above. This may differ in accordance to the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

Before Using the System Board

Before using the system board, prepare basic system components.

If you are installing the system board in a new system, you will need at least the following internal components.

- • A CPU
- • Memory module
- • Storage devices such as hard disk drive, CD-ROM, etc.

You will also need external system peripherals you intend to use which will normally include at least a keyboard, a mouse and a video display monitor.

Chapter 1 - Introduction

Specifications

Processor	• LGA 775 socket for:
	  - Intel® Pentium® 4 or Intel® Celeron
	  - Intel® Celeron D
	• Supports Intel Enhanced Memory 64 Technology (EMT64T)
	• Supports Enhanced Intel SpeedStep Technology (EIST)
	• Supports Intel Hyper-Threading Technology
	• Supports 800/533MHz FSB

Chipset	• Intel® chipset
	  - Intel® 915GV Graphics Memory Controller Hub (GMCH)
	  - Intel® 82801FB I/O Controller Hub (ICH6)

System Memory	• Two 240-pin DDR2 SDRAM DIMM sockets • Supports dual channel (128-bit wide) memory interface • 1.8V unbuffered non-ECC DDR2 400/533MHz SDRAM DIMM • Supports maximum of 4GB system memory using 256Mbit, 512Mbit or 1Gbit technology for x8 and x16 devices
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/Mouse
	  - Wake-On-LAN
	  - Wake-On-Ring
	  - 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 v1.0a specification
	• AC power failure recovery

Damage Free Intelligence	• Monitors CPU/system temperature and overheat alarm • Monitors 3VSB(V)/VBAT(V)/1.5V/3.3V/5V/12V/CPU(V)/1.8V voltages and failure alarm • Monitors CPU/system fan speed and failure alarm • Read back capability that displays temperature, voltage and fan speed • Watchdog timer function

Graphics	• Built-in Intel Graphics Media Accelerator 900
	• Graphics memory
	  - Shares 1MB/8MB of the system memory in DOS mode
	  - Uses Dynamic Video Memory Technology (DVMT) in Windows mode
	• Graphics controller
	  - Core frequency of 333MHz
	  - 400MHz integrated 24-bit RAMDAC
	  - Analog display up to 2048x1536 @ 85Hz refresh
	  - High quality 3D setup and render engine - Discrete, Triangles, Strips and fans
	  - Hardware Pixel Shader 2.0
	  - Supports D3D and OGL pixelization rules
	  - Per pixel perspective corrected texture mapping
	  - 533 MegaTexel/sec performance, 266 Mpixels/sec fill rate up to two bilinear textures
	• 2D graphics features
	  - Optimized 256-bit BLT engine
	  - 32-bit alpha blended cursor
	  - Programmable 3-color transparent cursor
	• 3D graphics features
	  - Supports maximum 3D resolution: 1600x1200x32 @ 85Hz
	  - Flat and Gouraud shading
	  - 16- and 24-bit Z-buffering and 8-bit Stencil buffering
	  - Vertex and programmable pixel fog and atmospheric effects
	  - Supports Double and triple render buffer

Audio	• Realtek ALC655 • 16-bit stereo full-duplex codec with independent variable sampling rate • High quality differential CD input • True stereo line level outputs • S/PDIF-in/out interface • 5.1-channel audio output

LAN	• G7V100-N/NC
	  - Two Marvell 88E8053 PCI Express Gigabit ethernet controllers
	  G7V100-B/BC
	  - One Marvell 88E8053 PCI Express Gigabit ethernet controller
	• Integrated power management functions
	• Full duplex support at 10 Mbps, 100 Mbps and 1Gbps
	• Supports IEEE 802.3u auto-negotiation
	• Supports wire for management

Serial ATA	• Supports two SATA (Serial ATA) interfaces which are compliant with SATA 1.0 specification (1.5Gbps interface)
IDE	• Supports up to UltraDMA 100Mbps hard drives • PIO Mode 4 Enhanced IDE (data transfer rate up to 14MB/sec.)
Digital I/O	• Supports 8 in or 8 out; or independent 4 in or 4 out

Rear Panel I/O Ports	• 1 mini-DIN-6 PS/2 mouse port • 1 mini-DIN-6 PS/2 keyboard port • 1 DB-9 serial port • 1 DB-15 VGA port • 2 RJ45 LAN ports (G7V100-N/NC only) 1 RJ45 LAN port (G7V100-B/BC only) • 4 USB 2.0/1.1 ports • Line-out, line-in and mic-in
I/O Connectors	• 1 CompactFlash socket (G7V100-NC and G7V100-BC only) • 2 connectors for 4 additional external USB 2.0/1.1 ports • 1 connector for an external serial port • 1 Digital I/O connector • 1 Digital I/O power connector • 1 front audio connector for line-out and mic-in jacks • 1 CD-in internal audio connector • 1 S/PDIF-in/out connector • 1 connector for IrDA interface • 2 Serial ATA connectors • 1 40-pin IDE connector • 1 floppy connector (FPC connector type) • 1 20-pin ATX power connector • 1 4-pin ATX 12V power connector • 2 fan connectors
Expansion Slots	• 1 PCI slot for PCI expansion card or customized riser card for 1, 2 or 3 PCI slots expansion (for low profile PCI card only)
Temperature	• Operating: 0°C to 60°C • Non-operating: -40°C to 85°C
Humidity	• Operating: 10% to 90%
Compatibility	• PCI 2.2 and AC '97 compliant
PCB	• 6 layers, Mini-ITX form factor • 17cm (6.7") x 17cm (6.7")

Features

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 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 about enabling the functionality of the Hyper-Threading Technology. For more information on Hyper-Threading Technology, go to: www.intel.com/info/hyperthreading.

COMPACTFLASH 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.

DDR2 DDR2 is a higher performance DDR technology whose data transfer rate delivers bandwidth of 4.3 GB per second and beyond. That is twice the speed of the conventional DDR without increasing its power consumption. DDR2 SDRAM modules work at 1.8V supply compared to 2.6V memory voltage for DDR modules. DDR2 also incorporates new innovations such as the On-Die Termination (ODT) as well as larger 4-bit prefetch against DDR which fetches 2 bits per clock cycle.

GRAPHICS The Intel 915GV Northbridge chip comes integrated with the Intel Graphics Media Accelerator 900 delivering exceptional 3D graphics performance.

5.1-CHANNEL AUDIO The audio jacks at the rear panel will support 5.1-channel audio only when the audio utility is configured to support this function. The mic-in at the rear will be disabled. Use the front audio's mic-in jack.

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.

SERIAL ATA Serial ATA is a storage interface that is compliant with SATA 1.0 specification. With speed of up to 1.5Gbps, it improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s.

GIGABIT LAN The Marvell 88E8053 Gigabit LAN chip supports up to 1Gbps data transmission.

IRDA 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 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 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:
The 5V_standby power source of your power supply must support ≥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 or via a PCI LAN card that uses the PCI PME (Power Management Event) signal. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.

Important:
The 5V_standby power source of your power supply must support ≥720mA.

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

Important:
The 5V_standby power source of your power supply must support ≥720mA.

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

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

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

ACPI STR 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® 98/2000/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® 98/2000/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 5V_standby power source of your power supply must support ≥720mA.*

Power failure recovery When power returns after an AC power failure, you may choose to either power-on the system manually or let the system power-on automatically.

Chapter 2 - Hardware Installation

System Board Layout
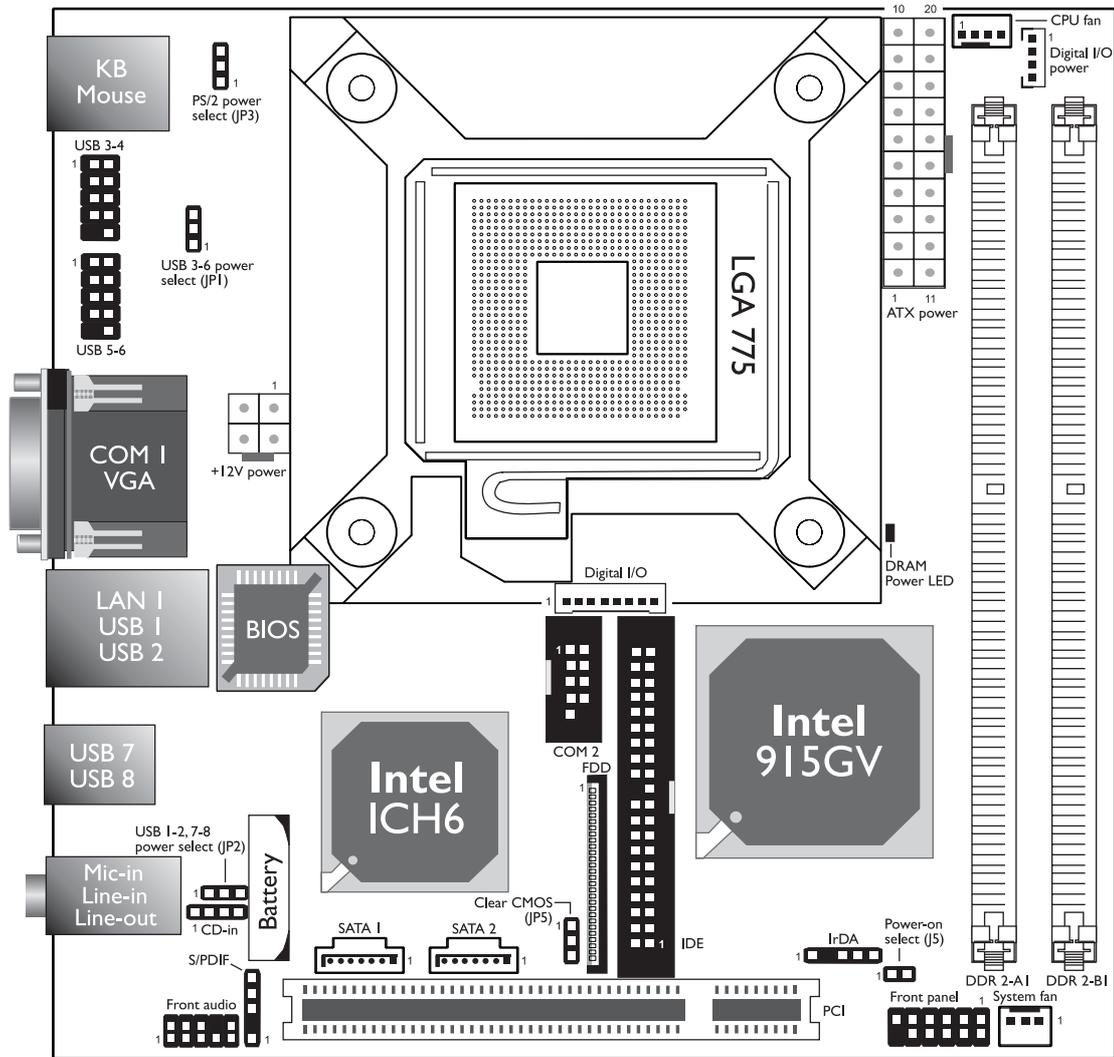
G7V100-B
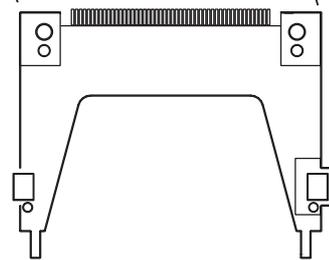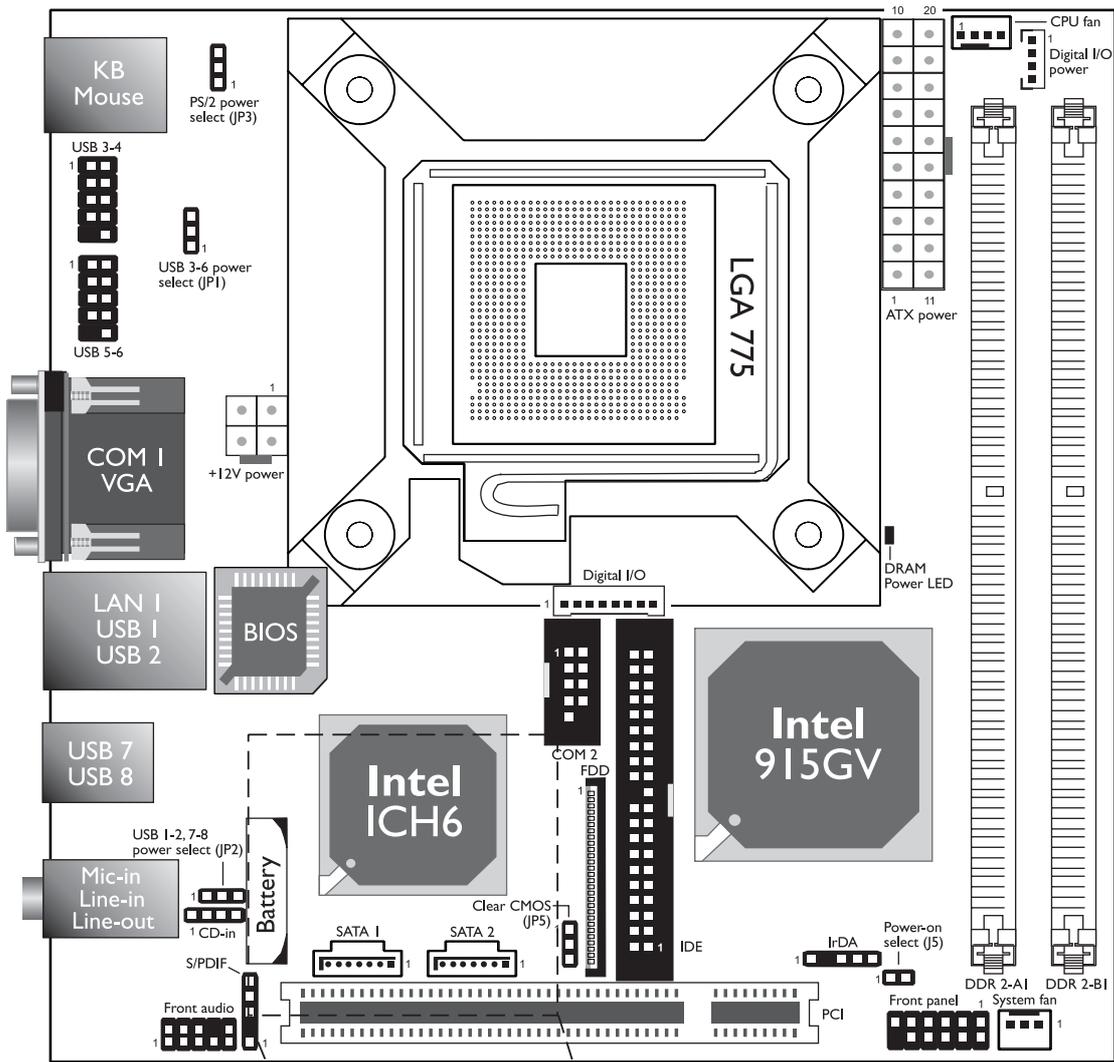
The CompactFlash socket is located on the solder side of the board.

G7V100-BC

G7V100-N

G7V100-NC

The CompactFlash socket is located on the solder side of the board.

Note:
The illustrations on the following pages are based on the G7V100-N system board.

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

Warning:

When the DRAM Power LED lit red, it indicates that power is present on the DDR2 sockets. Power-off the PC then unplug the power cord prior to installing any memory modules. Failure to do so will cause severe damage to the motherboard and components.
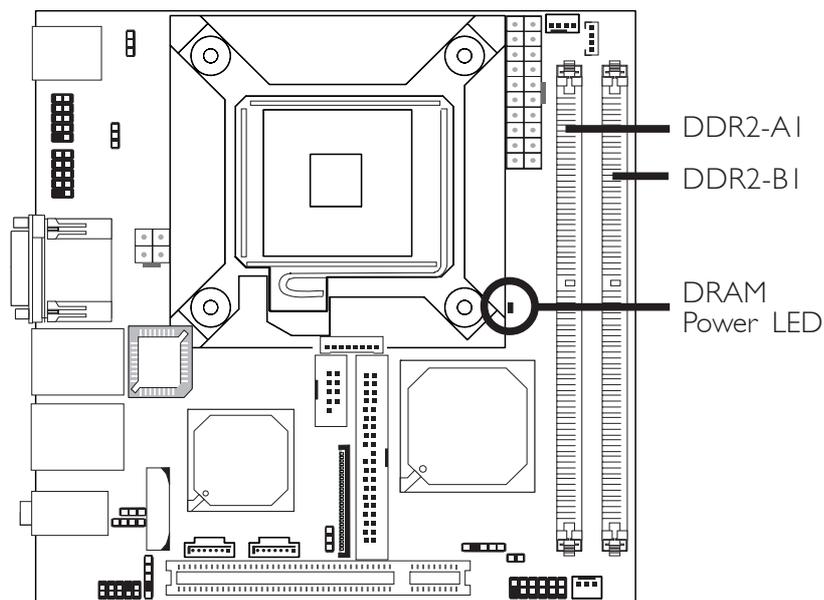
The system board supports DDR2 SDRAM DIMM. The two DDR2 DIMM sockets on the system board are divided into 2 channels:

Channel A - DDR2-A1
Channel B - DDR2-B1

The system board supports the following memory interface.

Single Channel (SC)

Data will be accessed in chunks of 64 bits (8B) from the memory channels.

Dual Channel (DC)

Data will be accessed in chunks of 128 bits from the memory chan-nels. Dual channel provides better system performance because it doubles the data transfer rate.

Single Channel	• Only one channel is populated with DIMM. • DIMMs of different memory configurations are on different channels.
Dual Channel	• DIMMs of the same memory configura-tion are on different channels.

BIOS Setting

Configure the system memory in the Advanced Chipset Features submenu of the BIOS. Refer to chapter 3 for more information.

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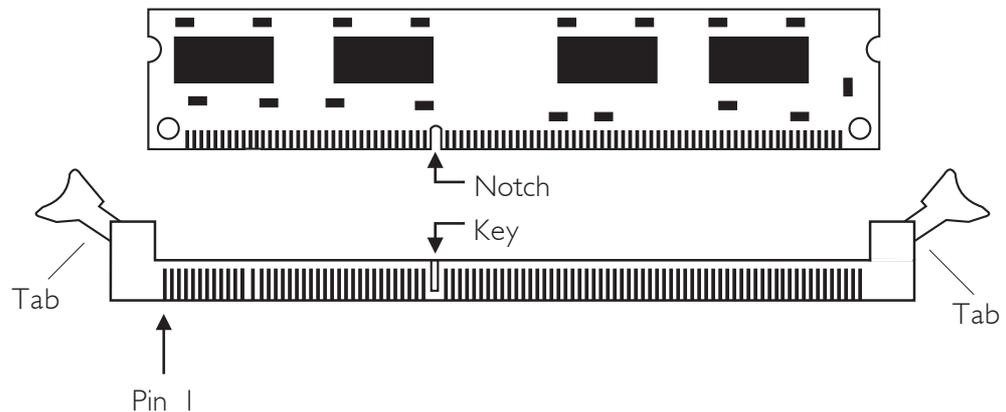
1. Pull the "tabs" which are at the ends of the socket to the side.

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 LGA 775 socket. This socket is exclusively designed for installing a LGA 775 packaged Intel CPU.

> **Important:**
> 1. *Before you proceed, make sure (1) the LGA775 socket comes with a protective cap, (2) the cap is not damaged and (3) the socket's contact pins are not bent. If the cap is missing or the cap and/or contact pins are damaged, contact your dealer immediately.*
> 2. *Make sure to keep the protective cap. RMA requests will be accepted and processed only if the LGA775 socket comes with the protective cap.*

Installing the CPU

1. Make sure the PC and all other peripheral devices connected to it has been powered down.

2. Disconnect all power cords and cables.

3. Locate the LGA 775 CPU socket on the system board.
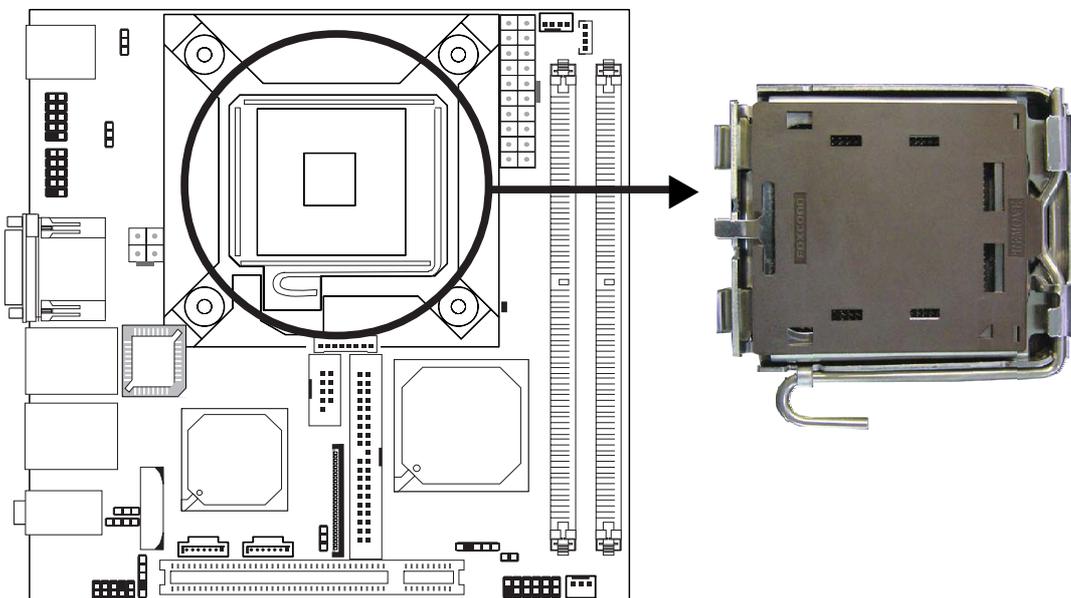
> **Important:**
> *The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.*

4. The CPU socket comes with a cover that is attached with a removable protective cap. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.

Cover

Protective cap
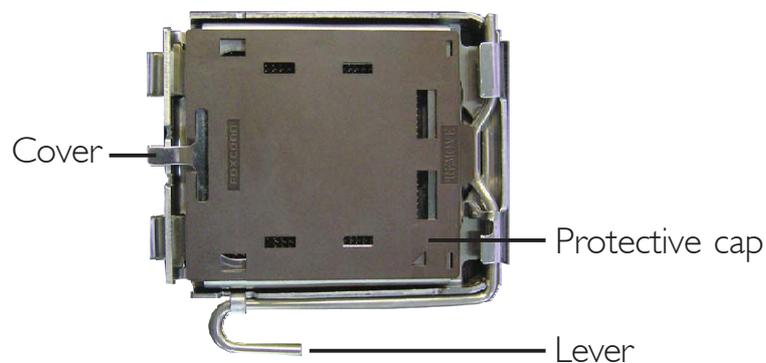
Lever

5. Lift the protective cap from the location pointed below to detach the cap from the cover.

Lift this part up
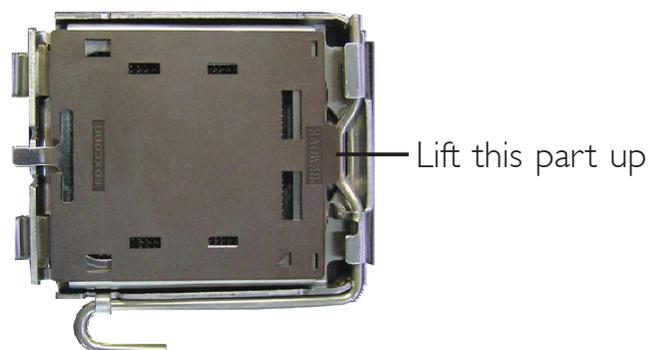
6. Unlock the socket by pushing the lever down, moving it away from the side tab of the socket, then lifting it up.

Tab

Lever lifted

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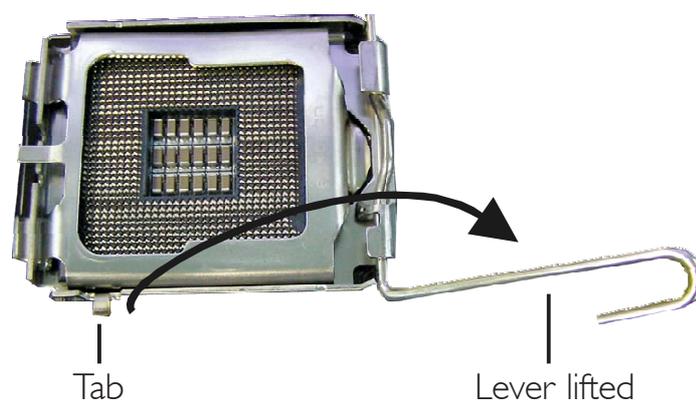
7. Now lift the cover.

Cover
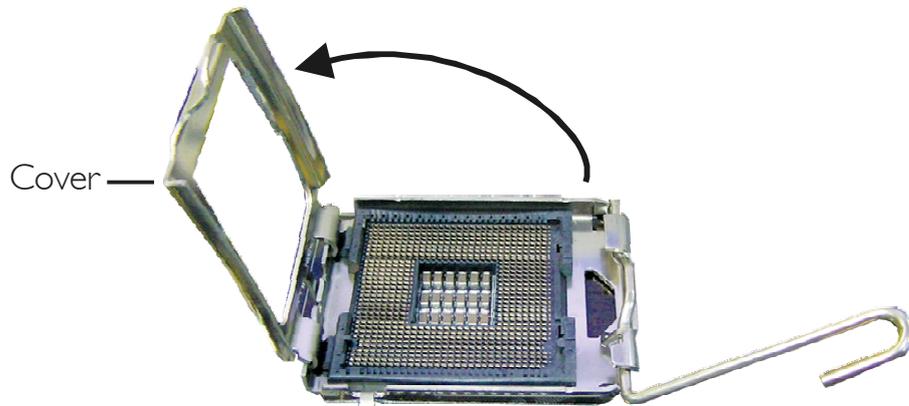
8. Position the CPU above the socket. The gold mark on the CPU must align with pin 1 of the CPU socket.

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

Gold mark

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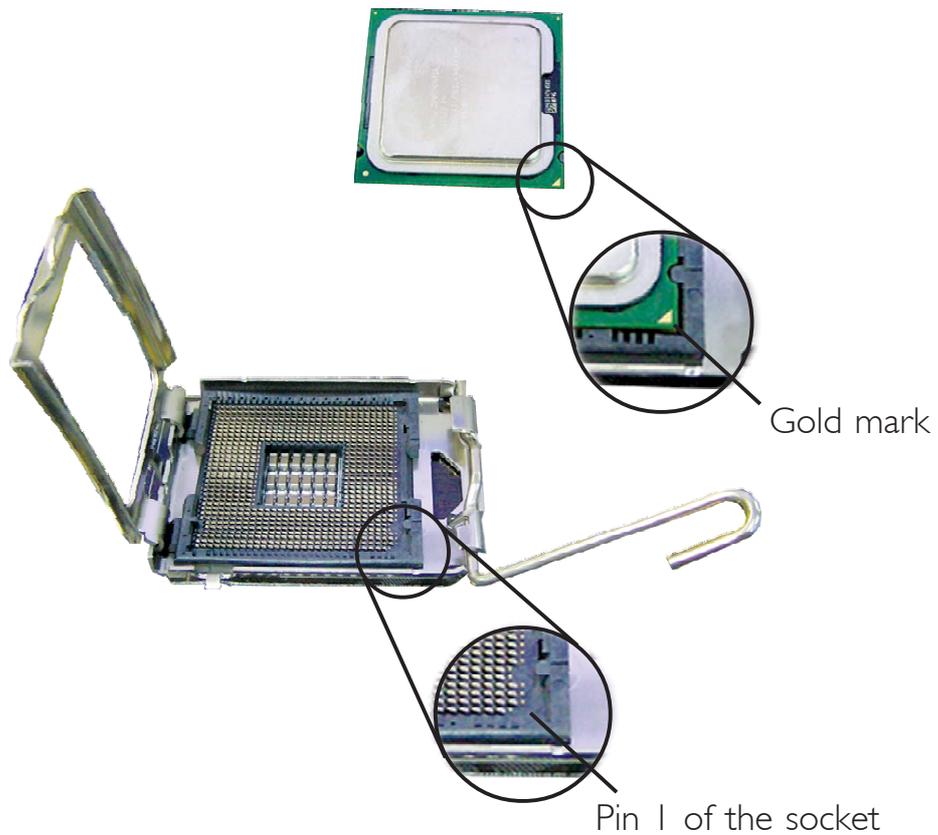
9. Insert the CPU into the socket until it is seated in place. The CPU will fit in only one orientation and can easily be inserted without exerting any force.

> **Important:**
> *Do not force the CPU into the socket. Forcing the CPU into the socket may bend the pins and damage the CPU.*

10. Once the CPU is in place, move the cover down.

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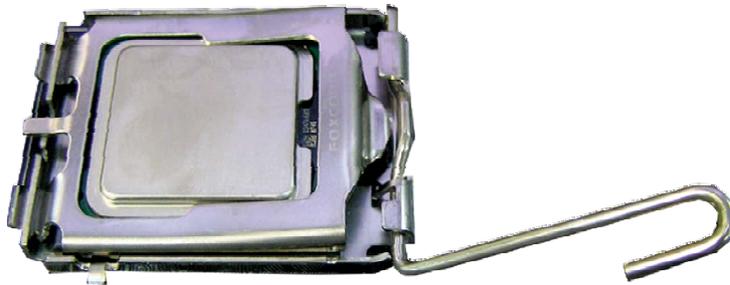
11. Push the lever down to lock the socket. The lever should hook onto the side tab to indicate that the CPU is completely secured in the socket.

Installing the Fan and Heat Sink

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

> **Note:**
> • *Use only certified fan and heat sink.*
> • *The fan and heat sink package usually contains the fan and heat sink assembly, and an 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.*

1. Before you install the fan / heat sink, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied when you purchase the CPU or fan heat sink assembly. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will disperse evenly.

Do not apply the paste if the fan / heat sink already has a patch of thermal paste on its underside. Peel the strip that covers the paste before you place the fan / heat sink on top of the CPU.

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2. Place the heat sink on top of the CPU. The 4 studs around the heat sink which are used to secure the heat sink onto the system board must match the 4 mounting holes around the socket.

   Position each stud so that the groove faces the heat sink then push it down firmly until it clicks into place.

   Note:
   You will not be able to secure the fan and heat sink assembly in place if the groove is not facing the heat sink.

Mounting hole

Mounting hole

Mounting hole

Mounting hole

Fan

Groove

Heat sink

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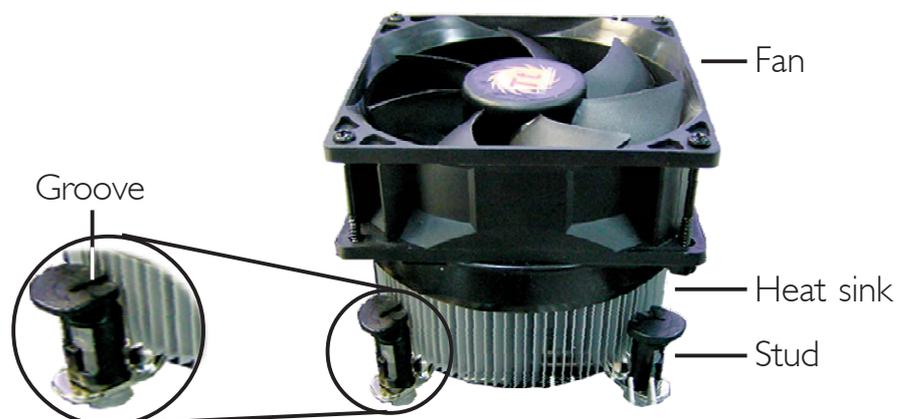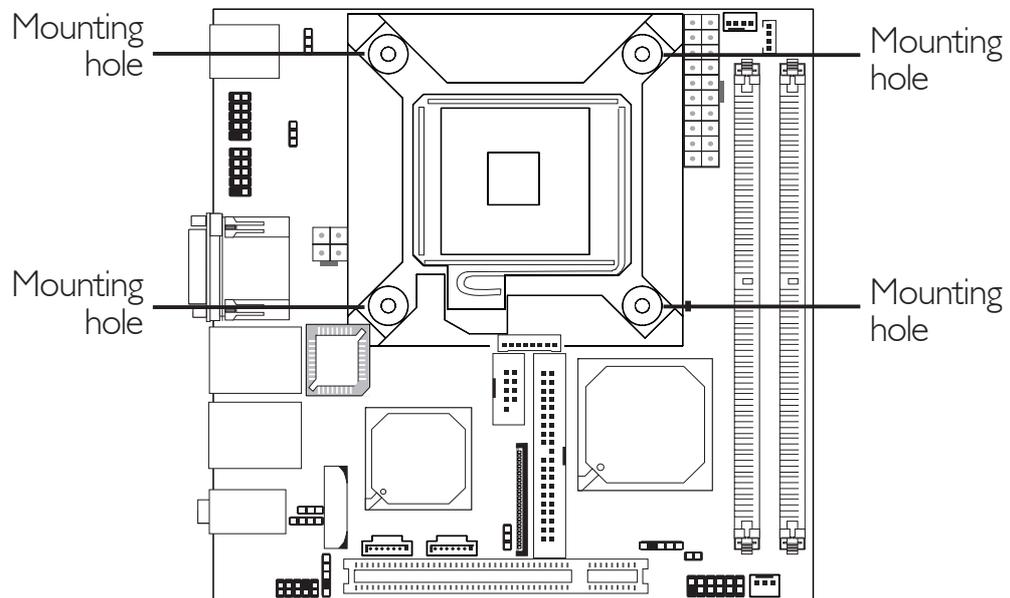
3. Connect the CPU fan's cable connector to the CPU fan connector on the system board.

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Jumper Settings

Clear CMOS Data

1-2 On: Normal
(default)

JP5

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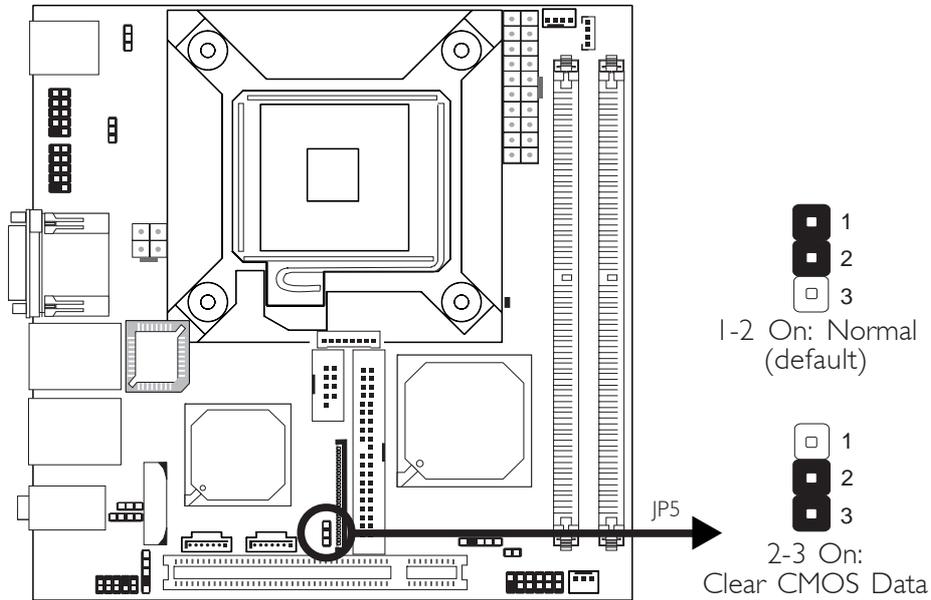
If you encounter the following,

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 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 JP5 pins 2 and 3 to On. Wait for a few seconds and set JP5 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 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 to its default setting or an appropriate setting. 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>.

PS/2 Power Select
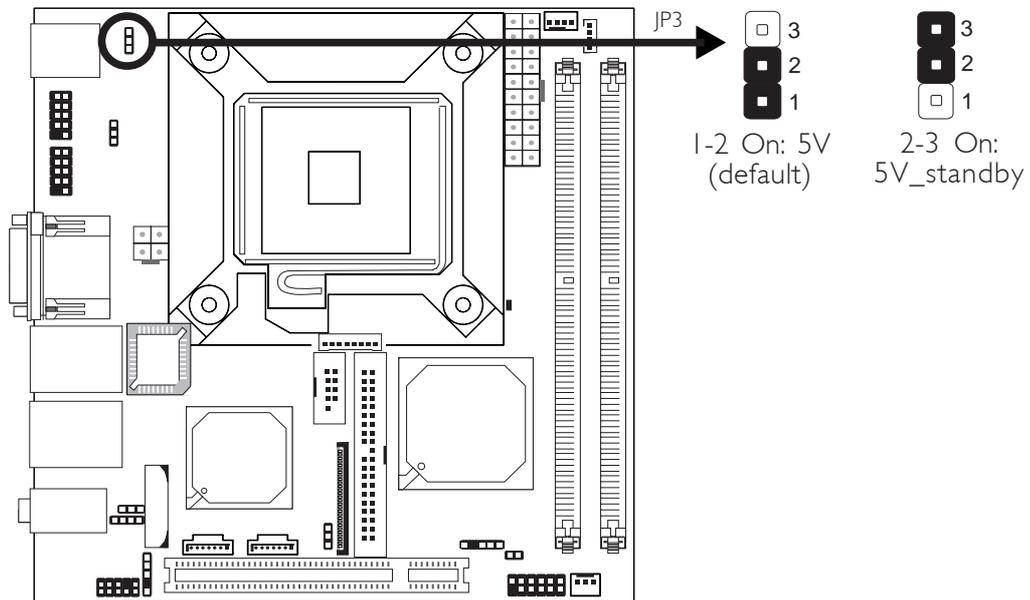
JP3 is used to select the power of the PS/2 keyboard/mouse port. Selecting 5V_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

BIOS Setting

Configure the PS/2 keyboard/mouse wake up function in the Integrated Peripherals submenu ("Super IO Device" section) of the BIOS. Refer to chapter 3 for more information.

Important:
The 5V_standby power source of your power supply must support ≥720mA.

USB Power Select

USB 3-6
(JP1)

1-2 On: 5V
(default)

2-3 On:
5V_standby

USB 1-2, 7-8
(JP2)

1-2 On: 5V
(default)

2-3 On:
5V_standby
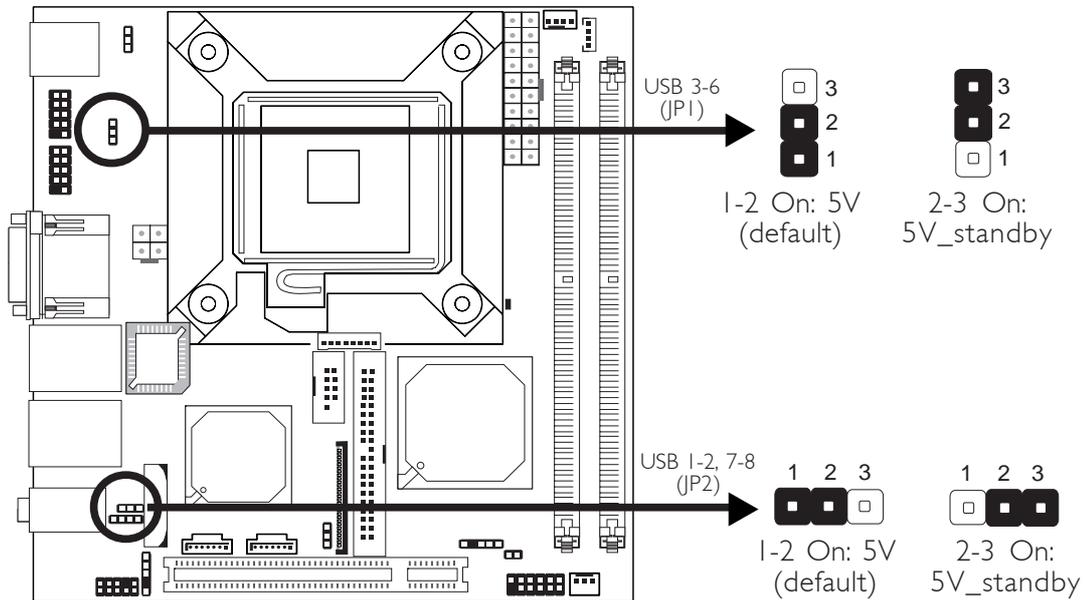
JP1 (for USB 3-6) and JP2 (for USB 1-2 and USB 7-8) are used to select the power of the USB ports. Selecting 5V_standby will allow you to use a USB device to wake up the system.

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/Mouse function for 2 USB ports, the 5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the 5V_standby power source of your power supply must support ≥2A.

Power-on Select

J5

1 2	1 2
On:	Off:
Power-on via AC power	Power-on via power button (default)
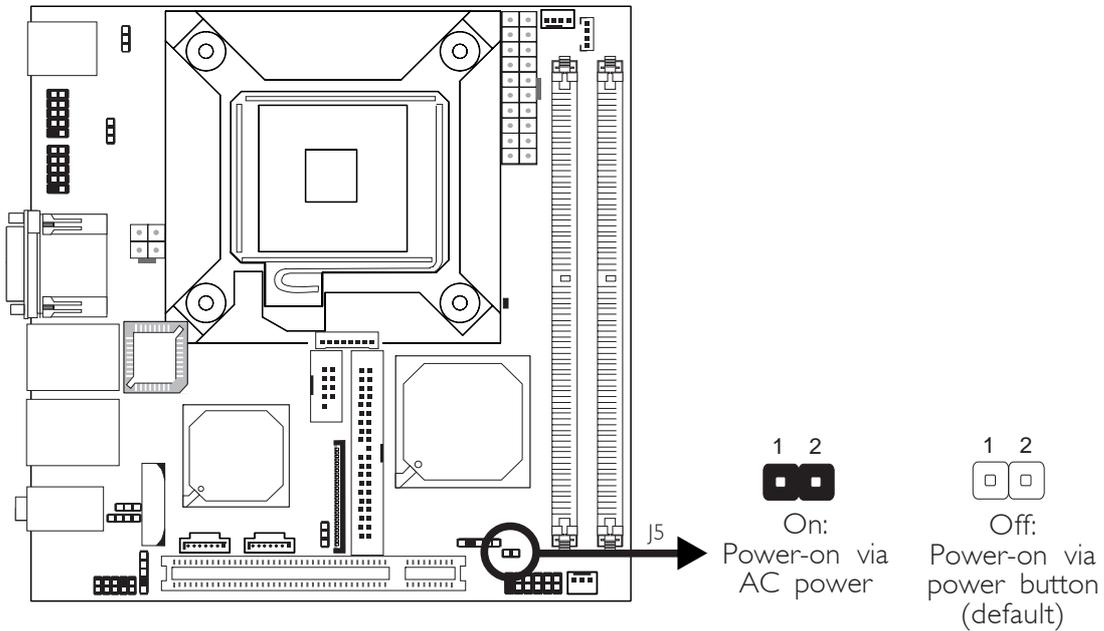
J5 is used to select the method of powering on the system. If you want the system to power-on whenever AC power comes in, set J5 to On. If you want to use the power button, set J5 to Off.

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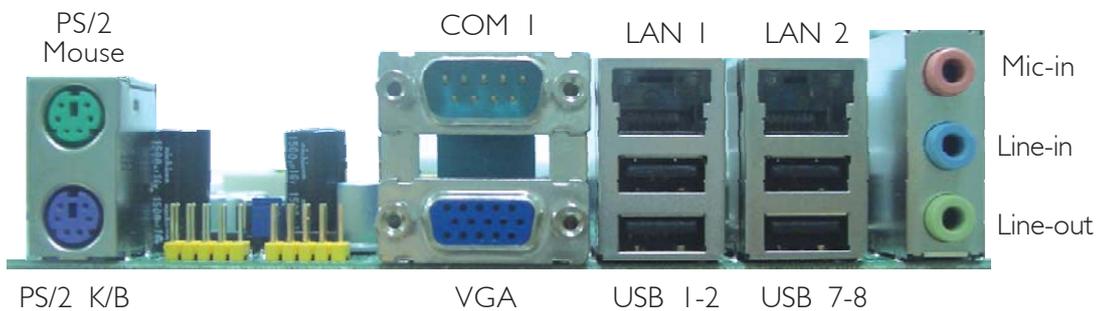
The rear panel I/O ports consist of the following:

- PS/2 mouse port
- PS/2 keyboard port
- DB-9 serial (COM) port
- DB-15 VGA port
- LAN 1 and LAN 2 ports (G7V100-N and G7V100-NC only)
  LAN 1 port (G7V100-B and G7V100-BC only)
- 4 USB ports
- Mic-in jack
- Line-in jack
- Line-out jack

PS/2 Mouse and PS/2 Keyboard Ports

PS/2 Mouse
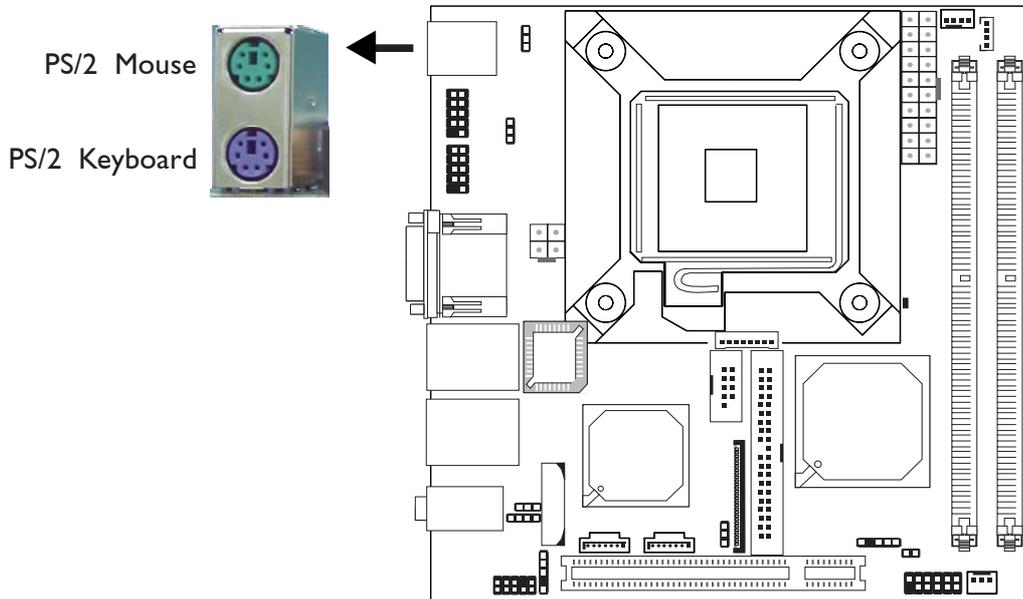
PS/2 Keyboard

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:

- **Jumper Setting:**
  JP3 must be set to "2-3 On: 5V_standby". Refer to "PS/2 Power Select" in this chapter for more information.

- **BIOS Setting:**

  Configure the PS/2 wake up function in the Integrated Peripherals submenu ("Super IO Device" section) of the BIOS. Refer to chapter 3 for more information.

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

Serial Ports

COM 1

1 2

CD — RD
TD — DTR
GND — DSR
RTS — CTS
RI

9
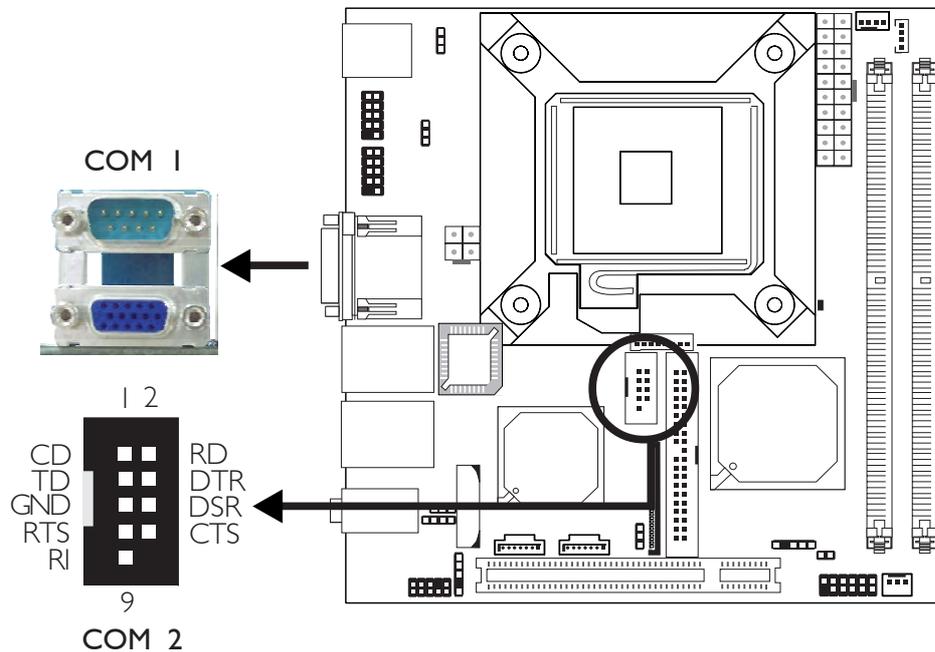
COM 2

The system board is equipped with an onboard serial port (Teal/Turquoise) at location CN7 (COM 1). It is also equipped with a 9-pin connector at location J2 (COM 2). The 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.

To connect COM 2, please refer to the following description. The serial port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the cable connector to J2. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of J2.

BIOS Setting

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

VGA Port

VGA
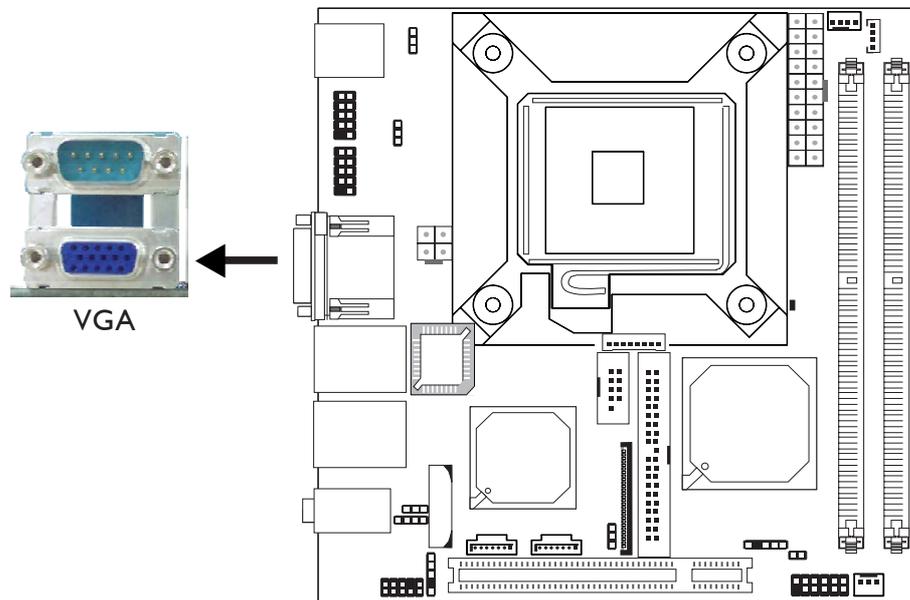
The VGA port is used for connecting a VGA monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port (Blue) at location CN7. After you plug the monitor's cable connector into the VGA port, gently tighten the cable screws to hold the connector in place.

BIOS Setting

Configure the onboard VGA in the Advanced Chipset Features submenu of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the graphics driver. Refer to chapter 4 for more information.

RJ45 Fast-Ethernet Ports

LAN 1
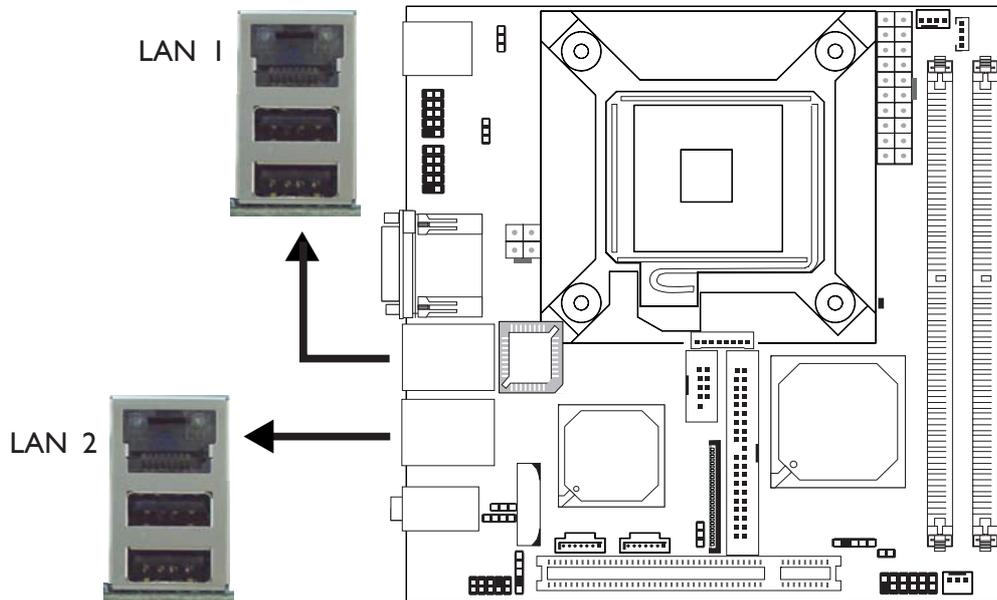
LAN 2

G7V100-N and G7V100-NC - equipped with LAN 1 (CN3) and LAN 2 (CN4).

G7V100-B and G7V100-BC - equipped with LAN 1 (CN3) only.

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

BIOS Setting

Configure the onboard LAN in the Integrated Peripherals submenu ("Onboard Device" section) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the LAN drivers. Refer to chapter 4 for more information.

Universal Serial Bus Connectors
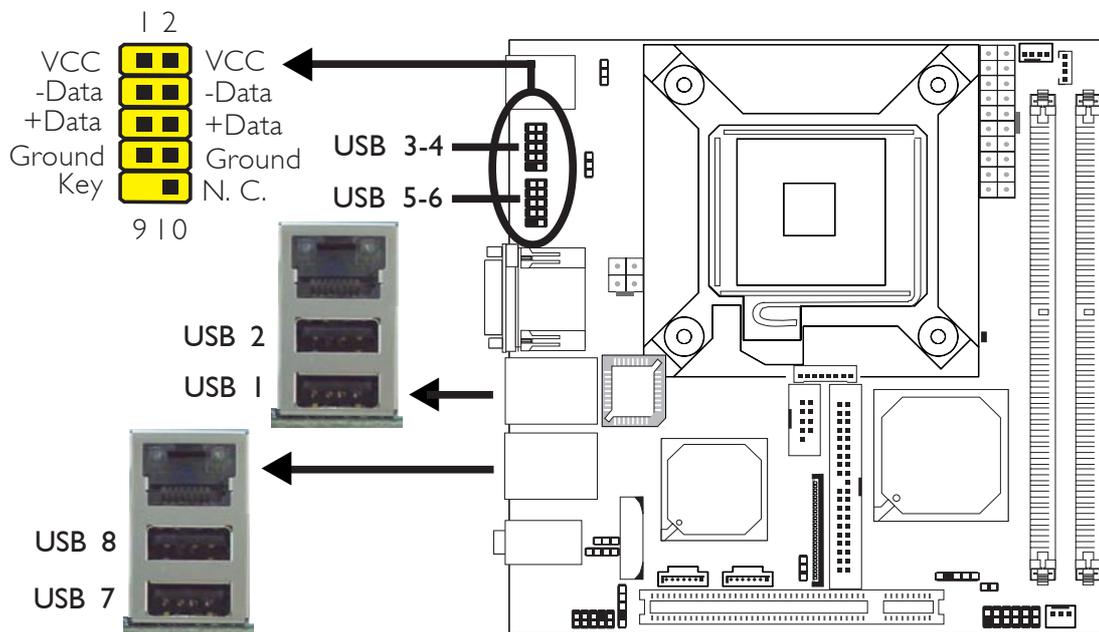
The system board supports 8 USB 2.0/1.1 ports. USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

Four onboard USB 2.0/1.1 ports (Black) are at locations CN3 (USB 1-2) and CN4 (USB 7-8) of the system board.

The J17 (USB 3-4) and J18 (USB 5-6) connectors allow you to connect 4 additional USB 2.0/1.1 ports. The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the connector that is attached to the USB port cables to J17 and/or J18.

BIOS Setting

Configure the onboard USB in the Integrated Peripherals submenu ("Onboard Device" section) 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 installing the USB 2.0 driver.

Wake-On-USB Keyboard/Mouse

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

- **Jumper Setting:**
  JP1 and/or JP2 must be set to "2-3 On: 5V_standby". 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/Mouse function for 2 USB ports, the 5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the 5V_standby power source of your power supply must support ≥2A.

2

Audio

Rear audio

Mic-in

Line-in

Line-out

GND
AuD_Vcc
AuD_R_Return
Key
AuD_L_Return

2
1

10
9

Front audio

Mic
Mic Power
AuD_R_Out
N. C.
AuD_L_Out
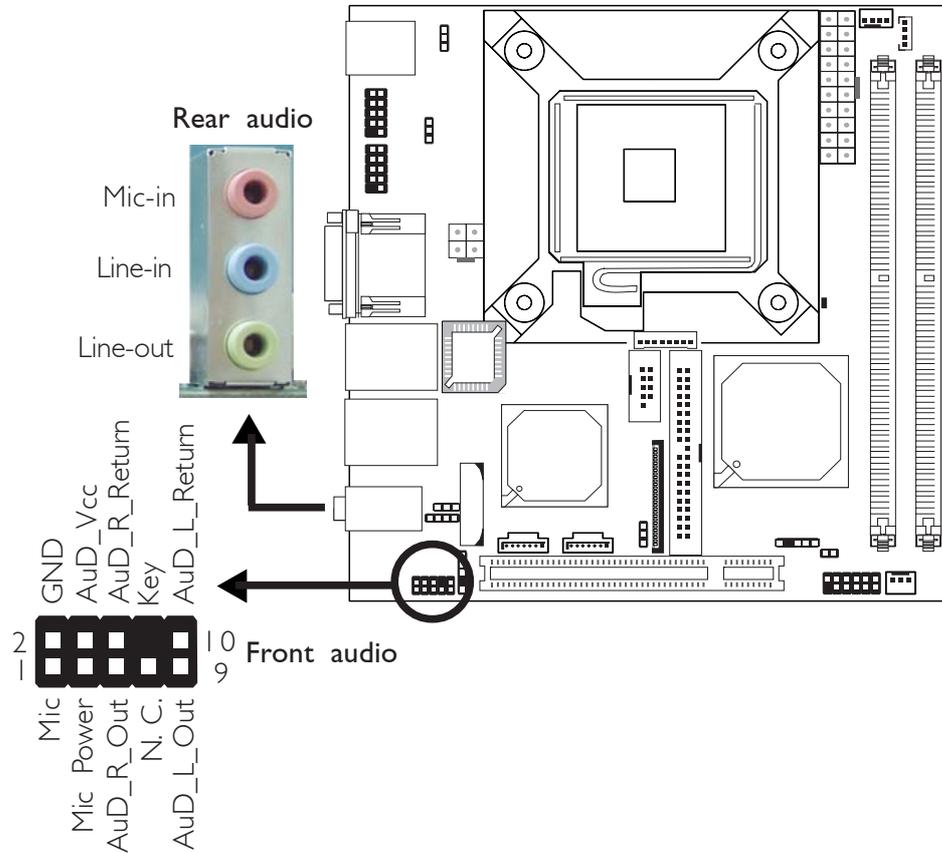
Rear Audio Jacks

The system board is equipped with 3 audio jacks at location CN2. 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 (J1) allows you to connect to the line-out and mic-in jacks that are at the front panel of your system. Using the line-out and mic-in jacks will disable the rear audio's line-out and mic-in functions.

Remove the jumper caps from pins 5-6 and pins 9-10 prior to connecting the front audio cable connector. Make sure pin 1 of the cable connector is aligned with pin 1 of the front audio connector. 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.

BIOS Setting

Configure the onboard audio in the Integrated Peripherals submenu ("Onboard Device" section) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the audio driver. Refer to chapter 4 for more information.

I/O Connectors

CD-in Internal Audio Connector

Ground Ground
Left audio   Right audio
channel   channel

1 ▭▭▭▭ 4
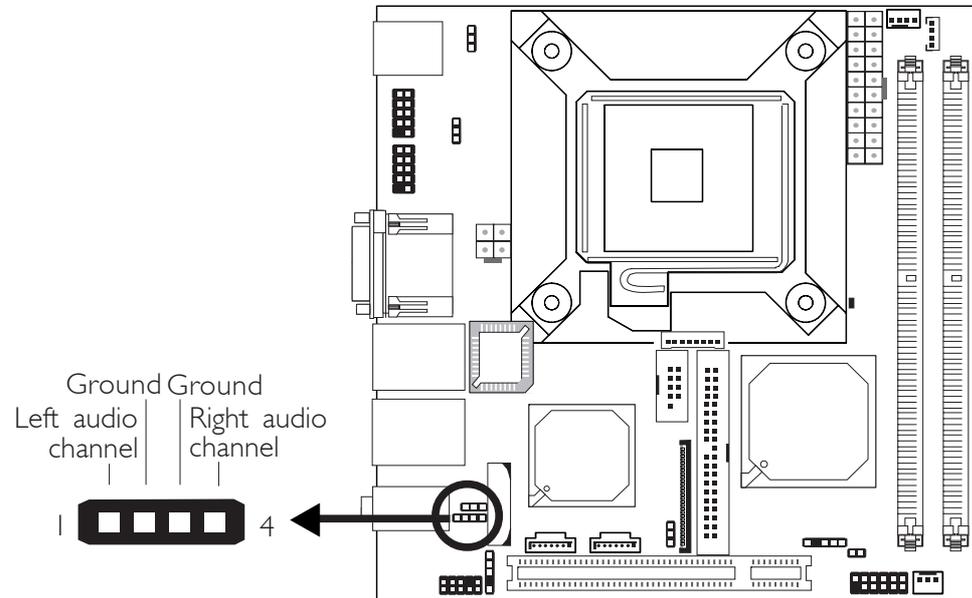
The CD-in connector (CDIN1) is used to receive audio from a CD-
ROM drive, TV tuner or MPEG card.

43

S/PDIF-in/out Connector

SPDIF in — 5
GND
SPDIF out
Key
+5V — 1
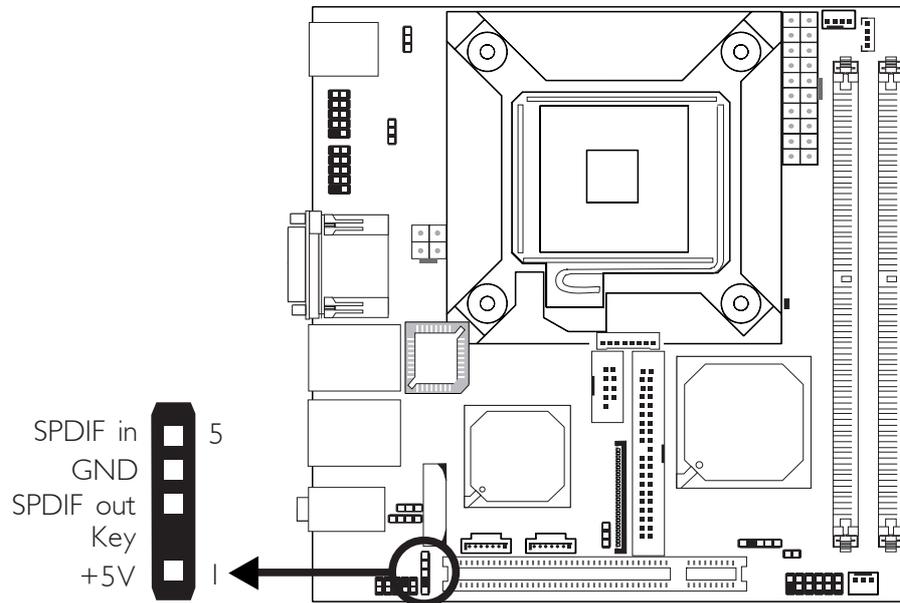
The S/PDIF-in/out connector (SPDIF1) is used to connect an external S/PDIF-in/out port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable connector to the SPDIF1 connector. Make sure pin 1 of the audio cable connector is aligned with pin 1 of the connector.

Digital I/O
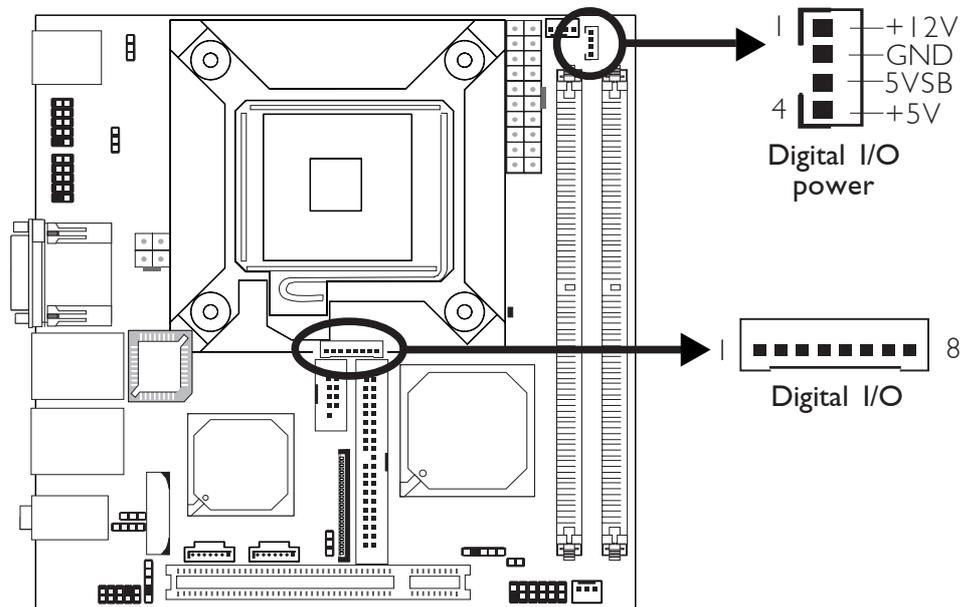
The Digital I/O connector (CN9) and Digital I/O power connector (J15) provide powering-on function of an external device that is connected to these connectors. The Digital I/O bus provides 8-bit write and 8-bit read.

Digital I/O Connector

Pins	Function	Pins	Function
1	Data I/O 0	5	Data I/O 4
2	Data I/O 1	6	Data I/O 5
3	Data I/O 2	7	Data I/O 6
4	Data I/O 3	8	Data I/O 7

Floppy Disk Drive Connector
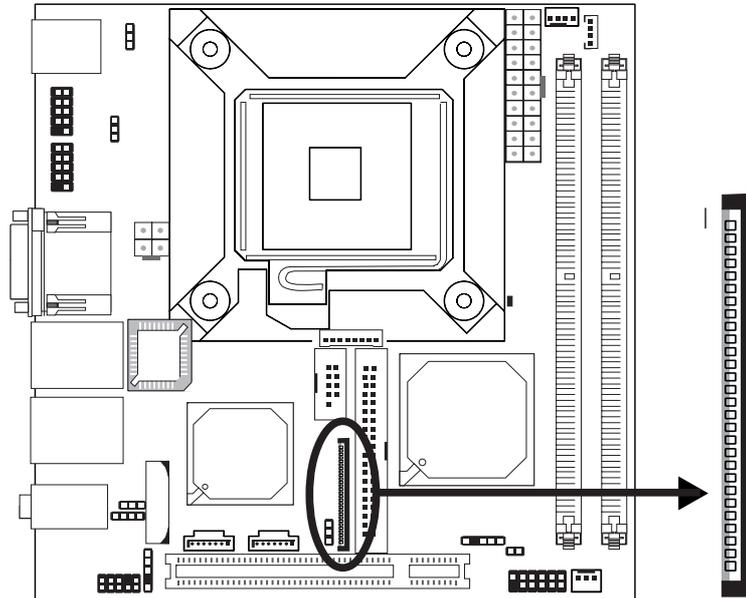
The system board is equipped with a 26-pin FPC type floppy disk drive connector. Only connect a 1.44MB slim-type floppy disk drive. Floppy drives other than the one mentioned above are optional. Refer to the next page for the pin function of this connector.

Connecting the Floppy Disk Drive Cable

Install one end of the floppy disk drive cable into the floppy disk connector (FDC1) on the system board and the other end connector to the floppy drive. Pin 1 of the cable must align with pin 1 of FDC1.

BIOS Setting

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

FPC Type FDD Connector

Pins	Function	Pins	Function
1	5V	2	INDEX#
3	5V	4	DR0#
5	5V	6	DSKCH#
7	N. C.	8	N. C.
9	N. C.	10	MTR0#
11	N. C.	12	DIR#
13	DRVDE0	14	STEP#
15	GND	16	WDATA#
17	GND	18	WGATE#
19	GND	20	TRK0#
21	GND	22	WRPRO#
23	GND	24	RDATA#
25	GND	26	HDSEL#

Serial ATA Connectors
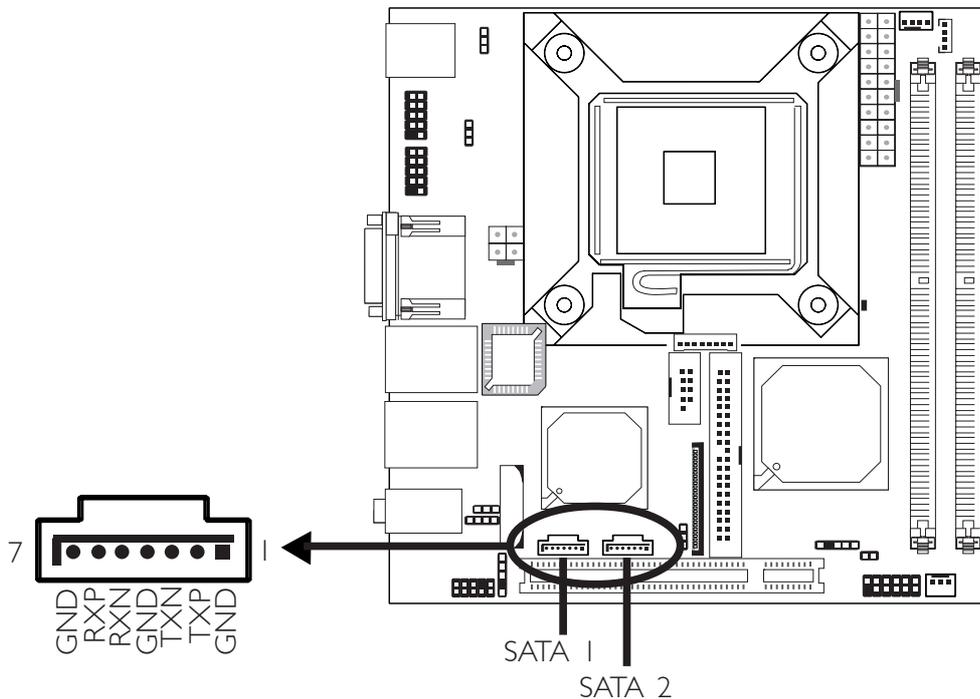
SATA 1

SATA 2

The system board is equipped with two Serial ATA connectors for connecting Serial ATA devices. Connect one end of the Serial ATA cable to SATA 1 or SATA 2 connector and the other end to your Serial ATA device.

BIOS Setting

Configure the Serial ATA drives in the Integrated Peripherals submenu ("OnChip IDE Device" field) of the BIOS. Refer to chapter 3 for more information.

IDE Disk Drive Connector
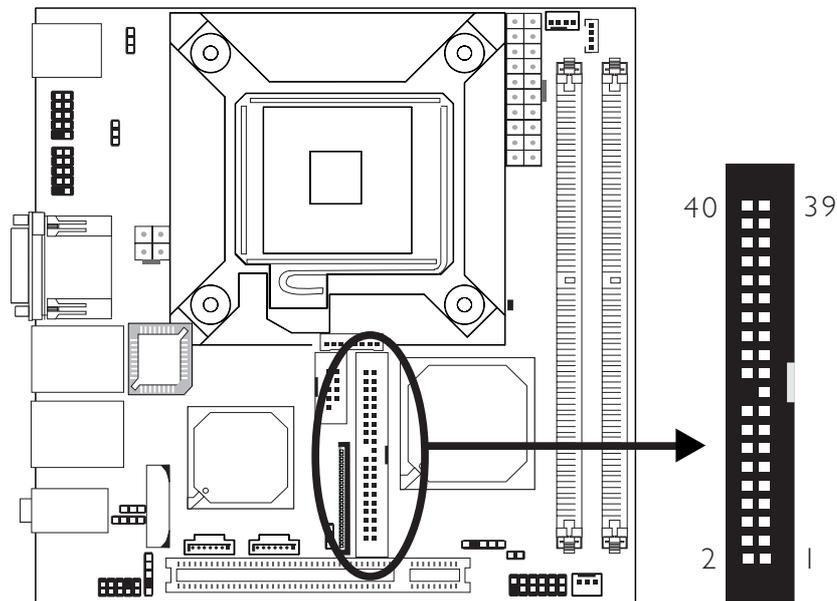
The system board is equipped with a 40-pin IDE (IDE1) connector for connecting 3.5" hard drives. To prevent improper IDE cable installation, the IDE connector has a keying mechanism. The connector on the IDE cable can be inserted into IDE1 only if pin 1 of the cable connector is aligned with pin 1 of IDE1.

The 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.

Note:

CompactFlash™ and IDE share the same channel. The Master/ Slave mode of CompactFlash™ and IDE are fixed. CompactFlash™ is internally designed fixed in Master mode while IDE in Slave mode. Make sure the CompactFlash™ card and the hard drive connected to the IDE connector are configured properly.

Connecting the IDE Disk Drive Cable

Install one end of the IDE cable into IDE1 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 and 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 to-gether. 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.*

BIOS Setting

Configure the onboard IDE in the Integrated Peripherals submenu ("OnChip IDE Device" section) of the BIOS. Refer to chapter 3 for more information.

IrDA Connector

IRRX
N. C. | Ground
VCC | | IRTX

1 5
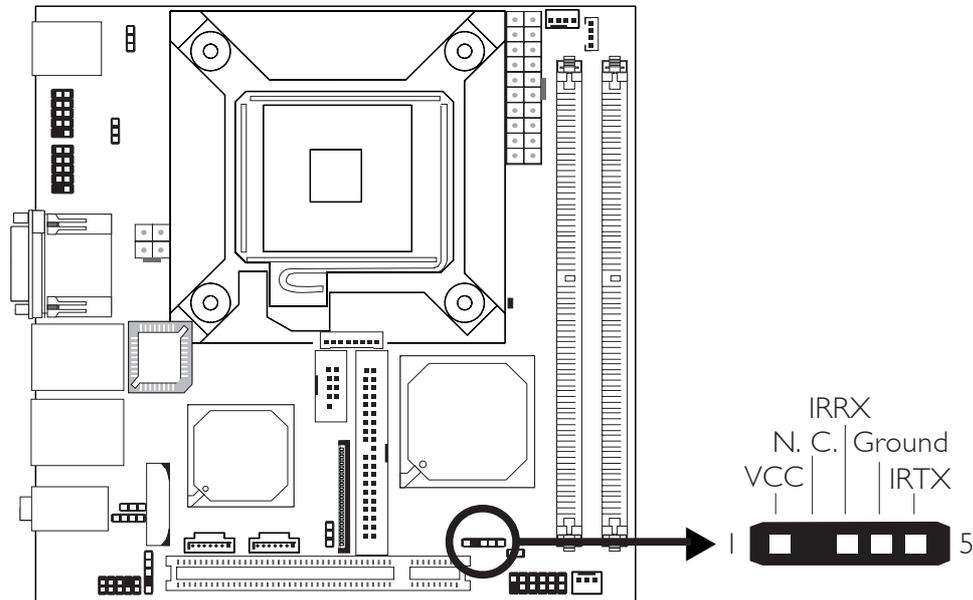
Connect your IrDA cable to the J4 connector on the system board.

> **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 ("Super IO Device" section) 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 IrDA function. Refer to your operating system's manual or documentation for more information.

Cooling Fan Connectors
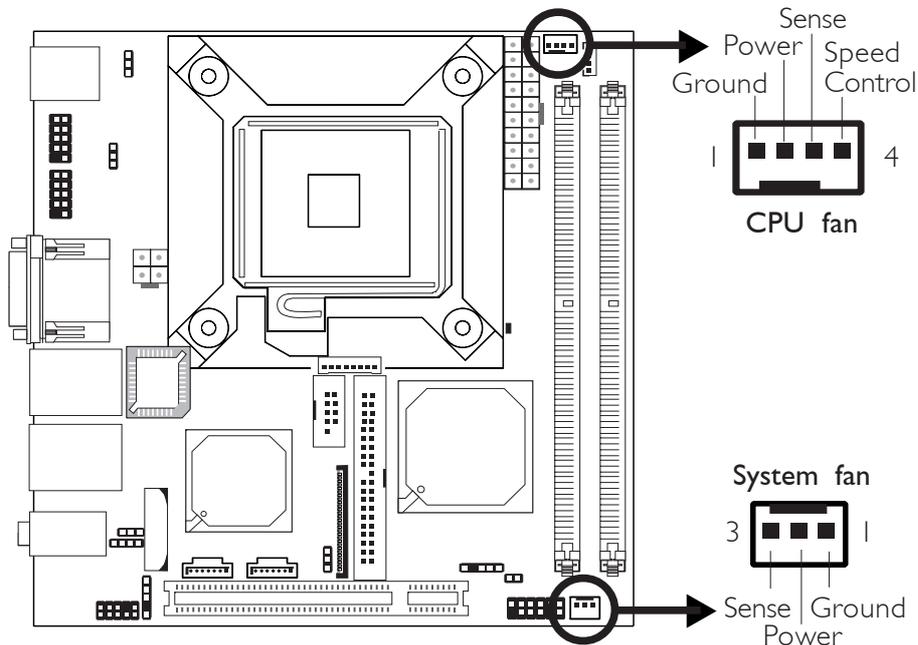
Connect the CPU fan's cable connector to the CPU fan connector (J3) on the system board. The system fan connector (J7) is used to connect an additional cooling fan. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

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

Power Connector
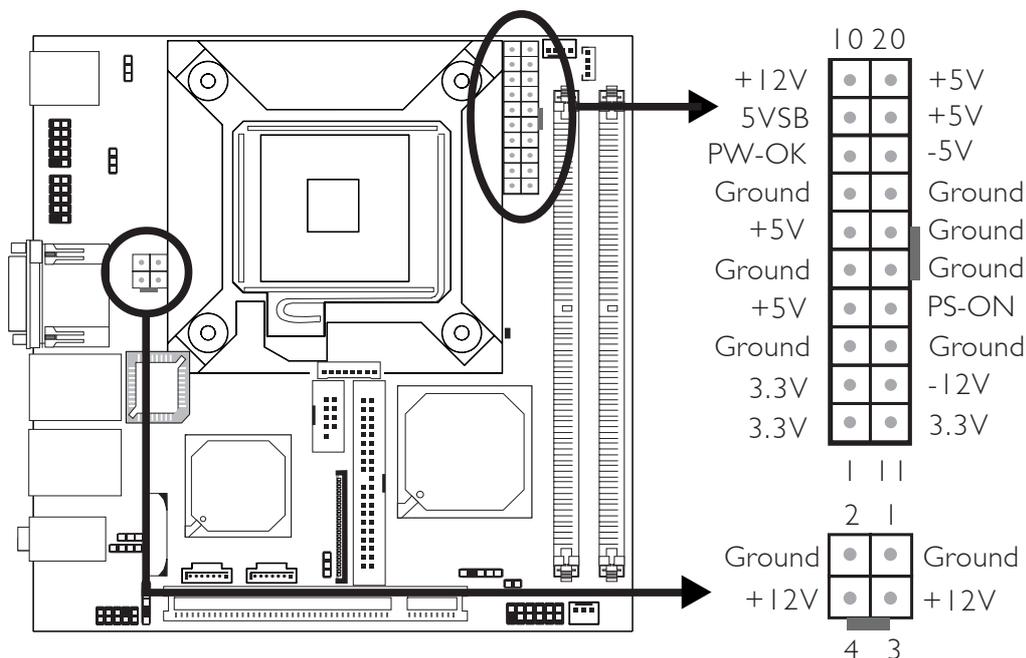
We recommend that you use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply has a standard 20-pin ATX main power connector and a 4-pin +12V power connector that must be inserted onto P1 and CN8 connectors respectively.

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 300 Watt power supply to operate. Your system configuration (CPU power, amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement. To ensure that adequate power is provided, **we strongly recommend that you use a minimum of 400 Watt (or greater) power supply.**

> **Important:**
> *Insufficient power supplied to the system may result in instability or the add-in boards and peripherals not functioning properly. Calculating the system's approximate power usage is important to ensure that the power supply meets the system's consumption requirements.*

DRAM Power LED
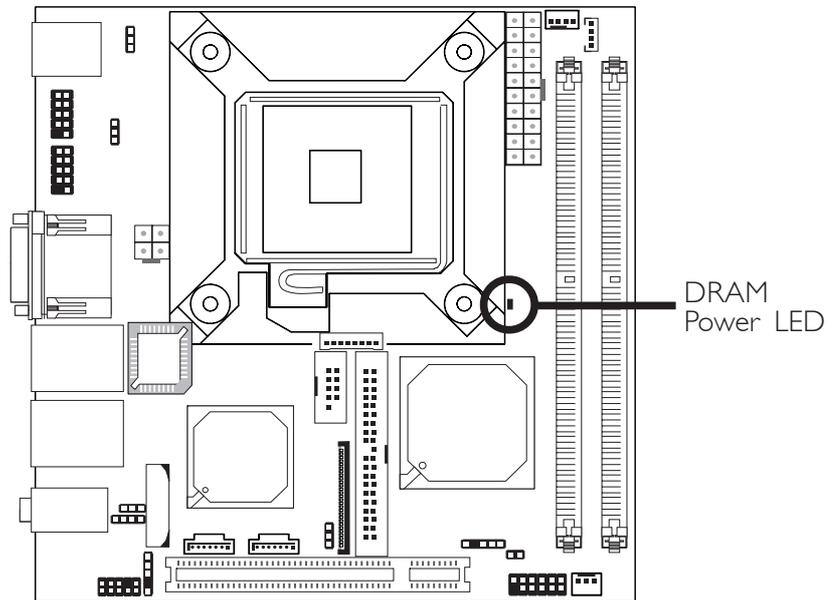
DRAM
Power LED

DRAM Power 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.

> **Important:**
> *If the DRAM Power 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.*

Front Panel Connectors

RESET SW
HDD-LED
11 ... 1
12 ... 2
PWR-LED
J6
PWR-BTN
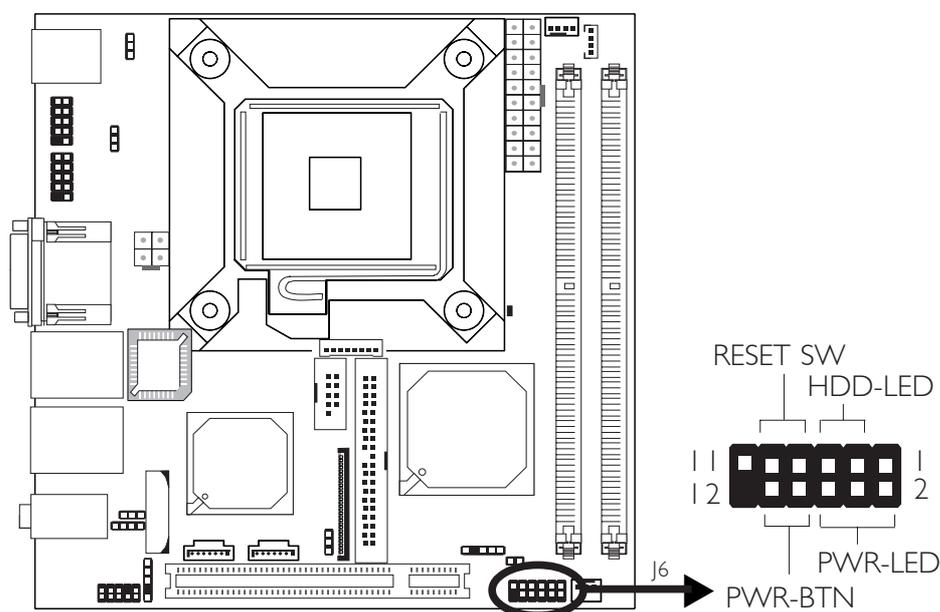
HDD-LED - HDD LED
This LED will light when the hard drive is being accessed.

RESET SW - Reset Switch
This switch allows you to reboot without having to power off the system.

PWR-BTN - Power Switch
This switch is used to power on or off the system.

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) state, it will blink every second. When the system is in the S3 (STR - Suspend To RAM) state, it will blink every 4 seconds.

	Pin	Pin Assignment		Pin	Pin Assignment
N. C.	1	N. C.	PWR-LED	2 4 6	LED Power LED Power Signal
HDD-LED	3 5	HDD Power Signal	PWR-BTN	8 10	3V_DUAL Signal
RESET SW	7 9	Ground RST Signal			
N. C.	11	N. C.	Key	12	Key

PCI Slot
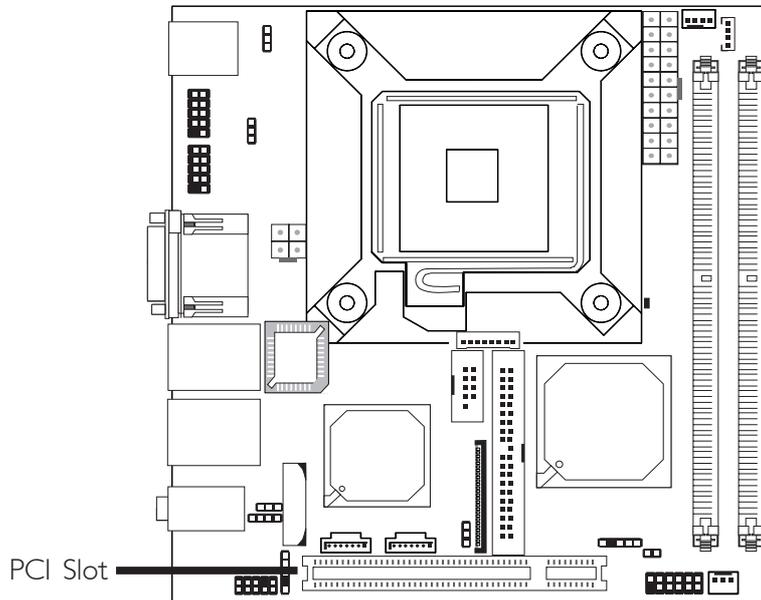
PCI Slot

You can install a PCI expansion card or a customized riser card designed for 1, 2 or 3 PCI slots expansion (for low profile PCI card only) into the PCI slot.

CompactFlash™ Socket (G7V100-NC and G7V100-BC only)
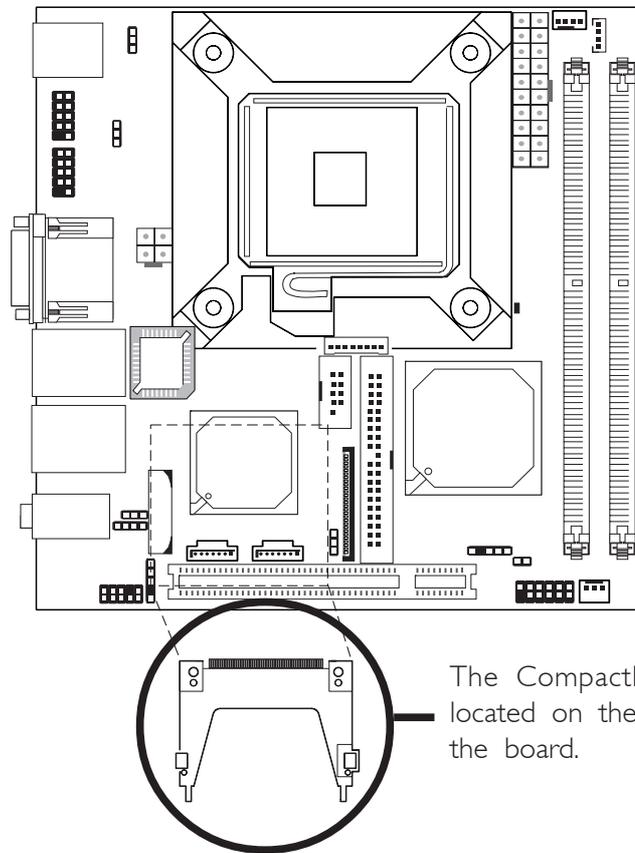
The CompactFlash socket is located on the solder side of the board.

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 share the same channel. The Master/Slave mode of CompactFlash™ and IDE are fixed. CompactFlash™ is internally designed fixed in Master mode while IDE in Slave mode. Make sure the CompactFlash™ card and the hard drive connected to the IDE connector are configured properly.

Battery
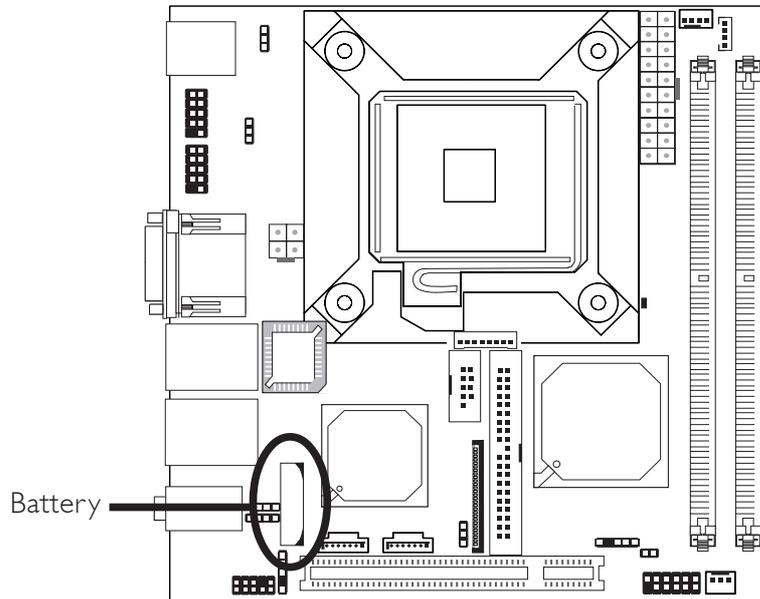
The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

Safety Measures

- 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.

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:

<p align="center">Press DEL to enter setup</p>

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, Aug 17 2006        Item  Help
   Time <hh:mm:ss>          20 : 20 : 30
 ▶ IDE Channel 0 Master                            Menu Level    ▶
 ▶ IDE Channel 0 Slave     None
 ▶ IDE Channel 1 Master                            Change the day, month,
 ▶ IDE Channel 1 Slave     None                    year  and  century

   Drive A                 None

   Video                   EGA/VGA
   Halt On                 All , But Keyboard

   Base Memory                 1K
   Extended Memory             1K
   Total Memory              512K


↑↓→←: 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 1999 to 2099.

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 Channel 0 Master/Slave and IDE Channel 1 Master/Slave

To configure the IDE drives, move the cursor to a field then press <Enter>. The following screen will appear:
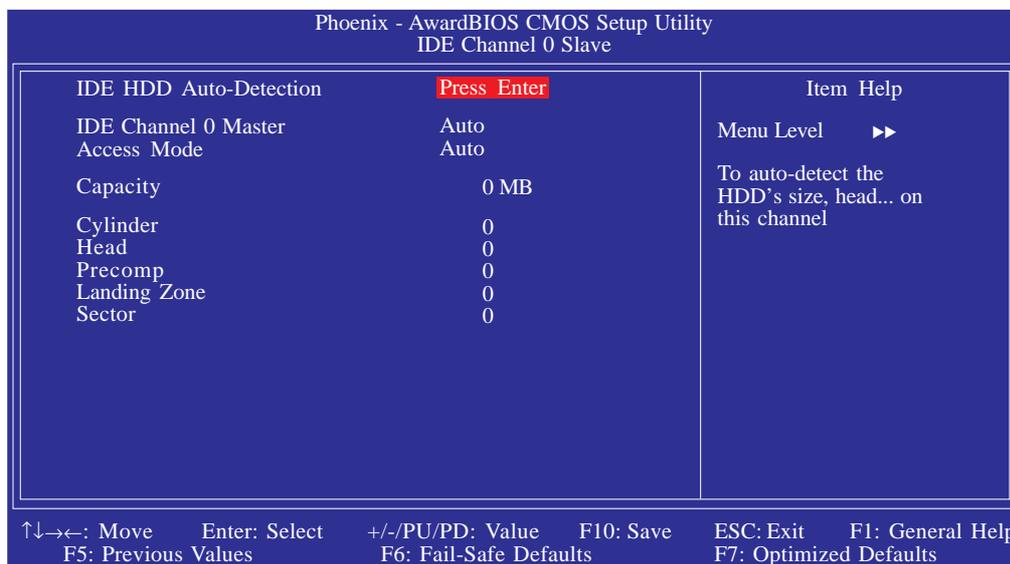
```
                    Phoenix - AwardBIOS CMOS Setup Utility
                            IDE Channel 0 Slave

   IDE HDD  Auto-Detection          Press  Enter              Item  Help

   IDE Channel 0 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 Channel 0 Master/Slave and IDE Channel 1 Master/Slave

If you wish to define your own drive type manually, select "Manual". 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 Normal 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

This field identifies the type of floppy disk drive 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 mono-chrome 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
   ▶ Hard Disk Boot Priority        Press  Enter
     CPU L1 & L2 Cache              Enabled             Menu Level      ▶
     CPU L3 Cache                   Enabled
     Hyper-Threading  Technology    Enabled             Select Removable Boot
     Quick Power On Self Test       Enabled             Device  Priority
     First Boot Device              Floppy
     Second Boot Device             Hard Disk
     Third Boot Device              CDROM
     Boot Other Device              Enabled
     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
     Report No FDD For WIN 95       No
     Small Logo(EPA) Show           Disabled             ▼


   ↑↓→←: 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.
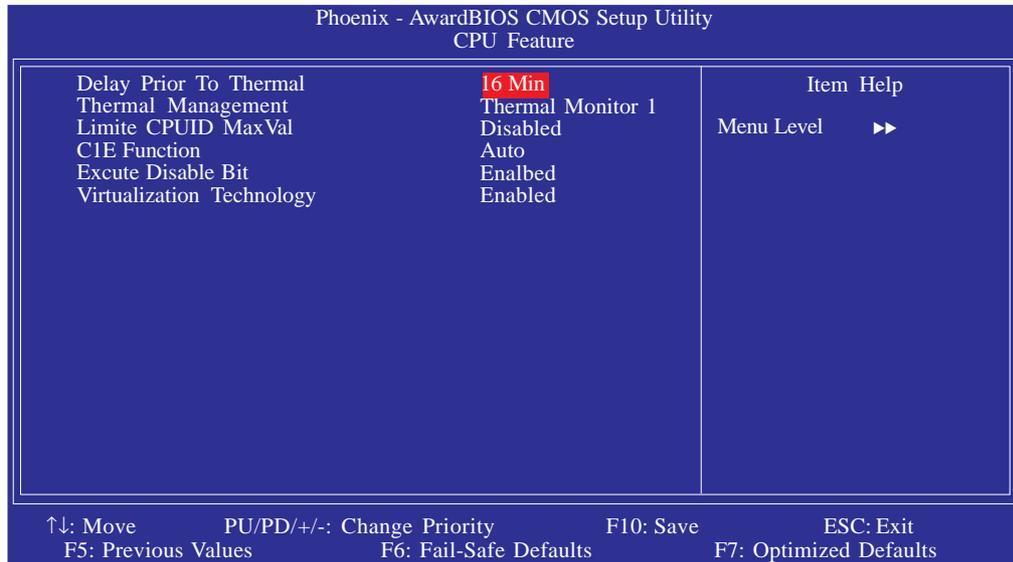
```
                   Phoenix - AwardBIOS CMOS Setup Utility
                                CPU  Feature

    Delay  Prior  To  Thermal        16 Min              Item  Help
    Thermal  Management              Thermal  Monitor  1
    Limite  CPUID  MaxVal            Disabled         Menu Level    ▶▶
    C1E Function                     Auto
    Excute  Disable  Bit             Enalbed
    Virtualization  Technology       Enabled




    ↑↓: Move          PU/PD/+/-: Change  Priority      F10: Save          ESC: Exit
      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.

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..

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.

Limit CPUID MaxVal

The CPUID instruction of some newer CPUs will return a value greater than 3. Problems will occur only in certain operating systems. 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 tihs problem, enable this field to limit the return value to 3 or lesser than 3.

C1E Function

The options are Auto and Disabled.

Execute Disable Bit

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

Virtualization Technology

When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hard Disk Boot Priority

Move the cursor to this field and press <Enter>. The following screen will appear:
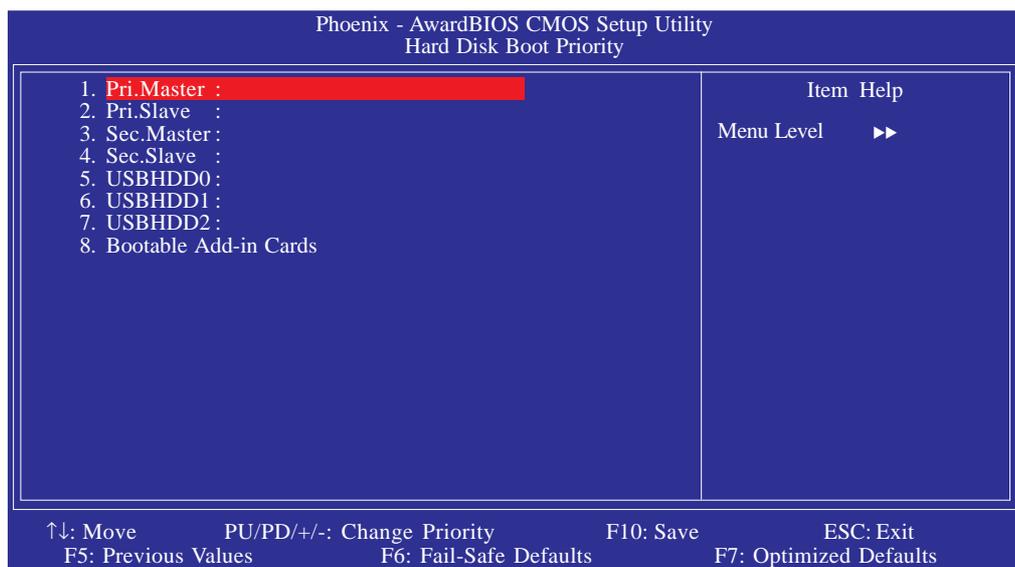
```
                 Phoenix - AwardBIOS CMOS Setup Utility
                        Hard Disk Boot Priority

      1. Pri.Master :                              Item  Help
      2. Pri.Slave   :
      3. Sec.Master :                         Menu Level    ▶▶
      4. Sec.Slave   :
      5. USBHDD0 :
      6. USBHDD1 :
      7. USBHDD2 :
      8. Bootable Add-in Cards




   ↑↓: Move        PU/PD/+/-: Change  Priority      F10: Save          ESC: Exit
     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 L1 and L2 Cache

This field is used to speed up the memory access. 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

This field is used to enable the functionality of the Intel® 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) after you power on the system. When Enabled, the BIOS will shorten or skip some check items during POST.

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.

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 field 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. A20 refers to the first 64KB of extended memory.

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.

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            Item  Help
   CAS Latency Time             Auto
   DRAM RAS# to CAS # Delay     Auto          Menu Level    ▶
   DRAM RAS# Precharge          Auto
   Precharge  Delay  (tRAS)     Auto
   System  Memory  Frequency    Auto
   SLP_S4# Assertion Width      4 to 5 Sec.
   System BIOS Cacheable        Enabed
   Video BIOS Cacheable         Disabled
   Memory Hole At 15M-16M       Disabled
 ▶ PCIE Express Root Port Func  Press  Enter

   ** VGA Setting **
   On-Chip Frame Buffer Size    8MB
   DVMT Mode                    DVMT
   DVMT/FIXED  Memory  Size     128MB


 ↑↓→←: 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.

Manual If you want better performance for your system other than the settings "by SPD", select "Manual".

70

CAS Latency Time

This field is used to select the clock cycle of the CAS latency time. The option selected specifies the timing delay before SDRAM starts a read command after receiving it.

DRAM RAS# to CAS# Delay

This field is used to select the latency between the DRAM active command and the read/write command.

DRAM RAS# Precharge

This field is used to select the idle clocks after issuing a precharge command to the DRAM.

Precharge Delay (tRAS)

The options are Auto, 4 to 15.

System Memory Frequency

This field is used to select the frequency of the system memory.

SLP_S4# Assertion Width

The options are 1 to 2 Sec., 2 to 3 Sec., 3 to 4 Sec. and 4 to 5 Sec.

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.

PCI Express Root Port Func

Move the cursor to this field and press <Enter>. The following screen will appear.
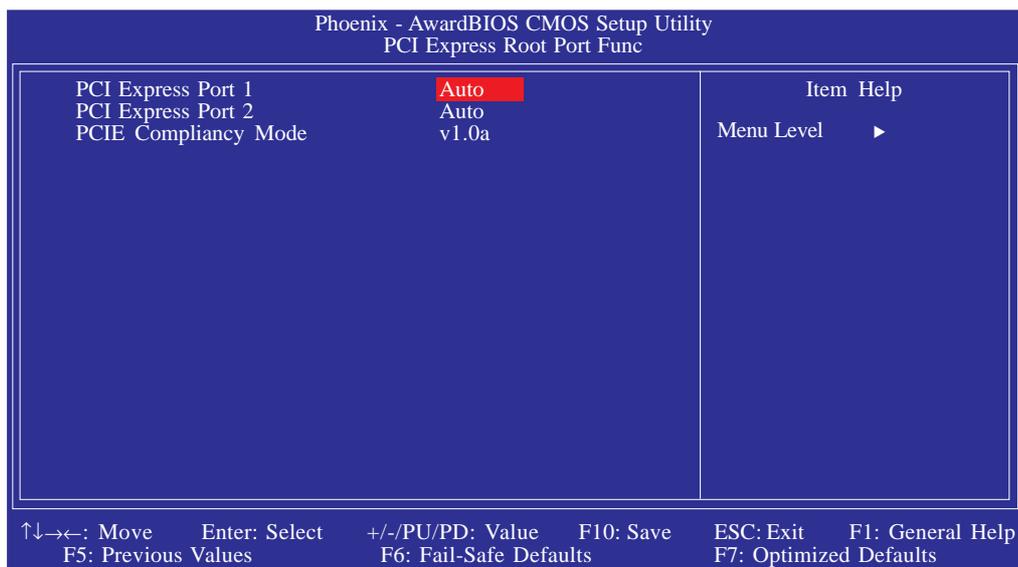
```
                    Phoenix - AwardBIOS CMOS Setup Utility
                          PCI Express Root Port Func

      PCI Express Port 1           Auto                    Item  Help
      PCI Express Port 2           Auto
      PCIE  Compliancy  Mode       v1.0a             Menu Level      ▶




↑↓→←: 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.

PCI Express Port 1 and PCI Express Port 2

These fields are used to enable or disable the PCI Express port function.

PCI-E Compliancy Mode

This field is used to select the mode for the PCI Express add-in card.

On-Chip Frame Buffer Size

This field is used to select the onboard VGA's frame buffer size that is shared from the system memory.

DVMT Mode

The options are DVMT, Fixed and Both.

DVMT/Fixed Memory Size

This field is used to select the graphics memory size used by DVMT/ Fixed mode.

Integrated Peripherals
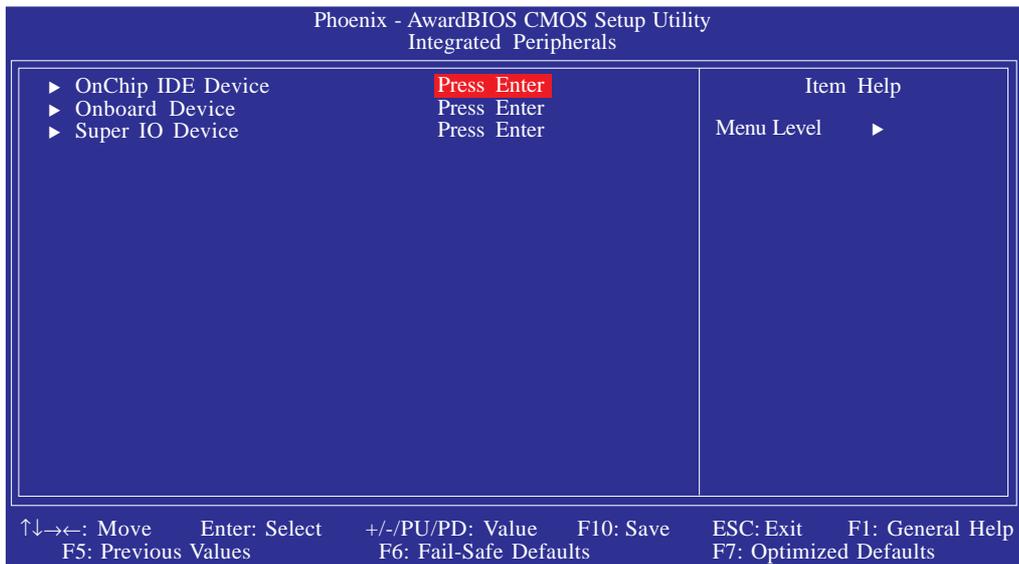
```
                      Phoenix - AwardBIOS CMOS Setup Utility
                              Integrated  Peripherals

    ▶  OnChip IDE Device             Press  Enter          Item  Help
    ▶  Onboard  Device               Press  Enter
    ▶  Super IO Device               Press  Enter       Menu Level      ▶




  ↑↓→←: 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 HDD Block Mode              Enabled           Item  Help
    IDE DMA Transfer Access         Enabled
    On-Chip  Primary  PCI  IDE      Enabled        Menu Level      ▶▶
    IDE  Primary  Master  PIO       Auto
    IDE  Primary  Slave  PIO        Auto           If your IDE hard drive
    IDE  Primary  Master  UDMA      Auto           supports block mode
    IDE  Primary  Slave  UDMA       Auto           select Enabled for
    On-Chip  Secondary  PCI  IDE    Enabled        automatic detection  of
    IDE  Secondary  Master  PIO     Auto           the optimal number of
    IDE  Secondary  Slave  PIO      Auto           block read/writes per
    IDE  Secondary  Master  UDMA    Auto           sector the drive can
    IDE  Secondary  Slave  UDMA     Auto           support

    ******** On-Chip Serial ATA Setting *********
    On-Chip  Serial  ATA            Auto
    PATA  IDE  Mode                 Primary
    SATA  Port                      P1, P3 is Secondary




  ↑↓→←: 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 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.

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.

On-Chip Serial ATA

Disabled   Disables the onboard SATA.

Auto   The system will detect the existing SATA and IDE drives then automatically set them to the available master/slave mode.

Combined Mode   This option allows you to combine both IDE and SATA drives; supporting maximum of 2 drives on each channel.

Enhanced Mode   This option allows you to use both IDE and SATA drives; allowing a maximum of 4 drives - 1 IDE Master, 1 IDE Slave and 2 SATA.

SATA Only   This option automatically sets the SATA drives to Primary Master mode. Since the SATA drives are in Master mode, you cannot set the IDE drive to Master mode.

PATA IDE Mode and SATA Port

This field is used to select the function mode for the IDE 1 connector and its relation to the SATA ports.

Primary   IDE 1 serves as Primary Master and Primary Slave channel. SATA 1 and SATA 2 serve as Secondary Master and Secondary Slave channel.

Secondary   IDE 1 serves as Secondary Master and Secondary Slave channel. SATA 1 and SATA 2 serve as Primary Master and Primary Slave channel.

Onboard Device

Move the cursor to this field and press <Enter>. The following screen will appear.
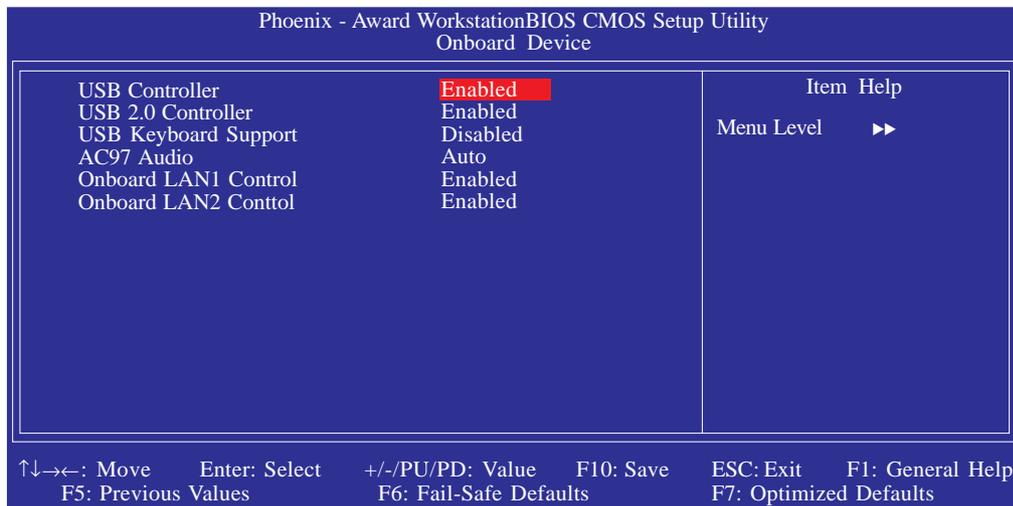
```
            Phoenix - Award WorkstationBIOS CMOS Setup Utility
                           Onboard  Device

     USB Controller                  Enabled                  Item  Help
     USB 2.0 Controller              Enabled
     USB Keyboard Support            Disabled         Menu Level      ▶▶
     AC97 Audio                      Auto
     Onboard LAN1 Control            Enabled
     Onboard LAN2 Conttol            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.

USB Controller

This field is used to enable or disable the onboard USB function.

USB 2.0 Controller

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

USB Keyboard Support

Due to the limited space of the BIOS ROM, the support for legacy USB keyboard (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices.

If a PS/2 keyboard is not available and you need to use a USB keyboard to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

AC97 Audio

Auto   Select this option when using the onboard audio codec.

Disabled   Select this option when using a PCI sound card.

Onboard LAN1 Control and Onboard LAN2 Control

These fields are used to enable or disable the onboard LAN 1 and/ or onboard LAN 2.

Super IO Device

Move the cursor to this field and press <Enter>. The following screen will appear..
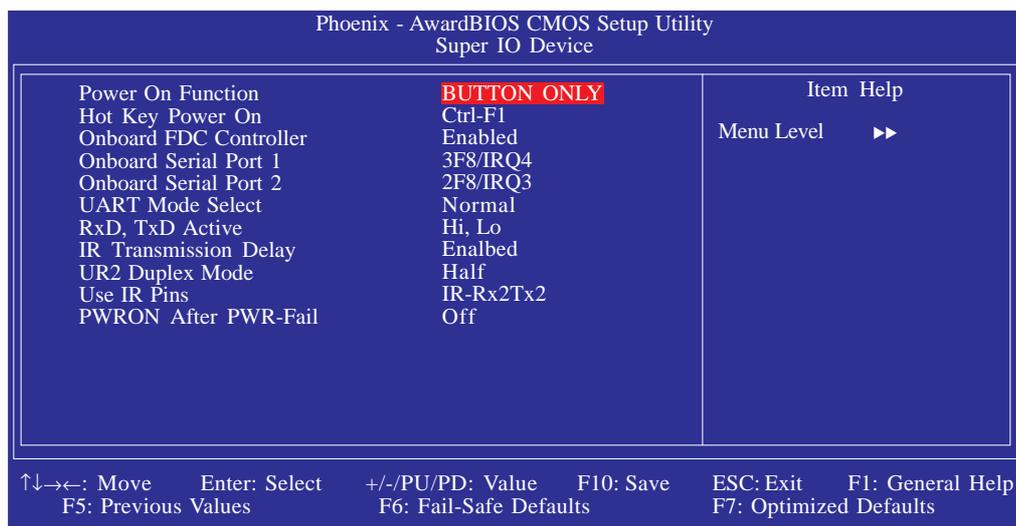
```
                  Phoenix - AwardBIOS CMOS Setup Utility
                              Super IO Device

    Power On Function             BUTTON ONLY          Item  Help
    Hot Key Power On              Ctrl-F1
    Onboard FDC Controller        Enabled          Menu Level    ▶▶
    Onboard Serial Port 1         3F8/IRQ4
    Onboard Serial Port 2         2F8/IRQ3
    UART Mode Select              Normal
    RxD, TxD Active               Hi, Lo
    IR Transmission Delay         Enalbed
    UR2 Duplex Mode               Half
    Use IR Pins                   IR-Rx2Tx2
    PWRON  After PWR-Fail         Off




   ↑↓→←: 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.

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.

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.

PWRON After PWR-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.

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      ►
   Power  Management                User Define
   Video Off Method                 DPMS
   Video Off In Suspend             Yes
   Suspend  Type                    Stop Grant
   Modem Use IRQ                    3
   Suspend Mode                     Disabled
   HDD Power Down                   Disabled
   Soft-Off By PWR-BTTN             Instant→Off
   Wake-up By PCI Card              Disabled
   Power On By Ring                 Disabled
 x USB KB Wake-up From S3           Disabled
   Resume  By  Alarm                Disabled
 x Date(of Month) Alarm             0
 x Time(hh:mm:ss)  Alarm            0:0:0


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

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® 98/2000/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)".

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" field is activated.

Min Saving   Minimum power saving time for Suspend mode = 1 hr.

Max Saving   Maximum power saving time for Suspend mode = 1 min.

User Define   Allows you to set the power saving time in the "Suspend Mode" field.

Video Off Method

This determines the manner in which the monitor is blanked.

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

Blank Screen   This only writes blanks to the video buffer.

DPMS Support   Initializes display power management signaling. Select this 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.

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

When the system enters the Suspend mode, 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 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.

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)".

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 shows how to configure 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.
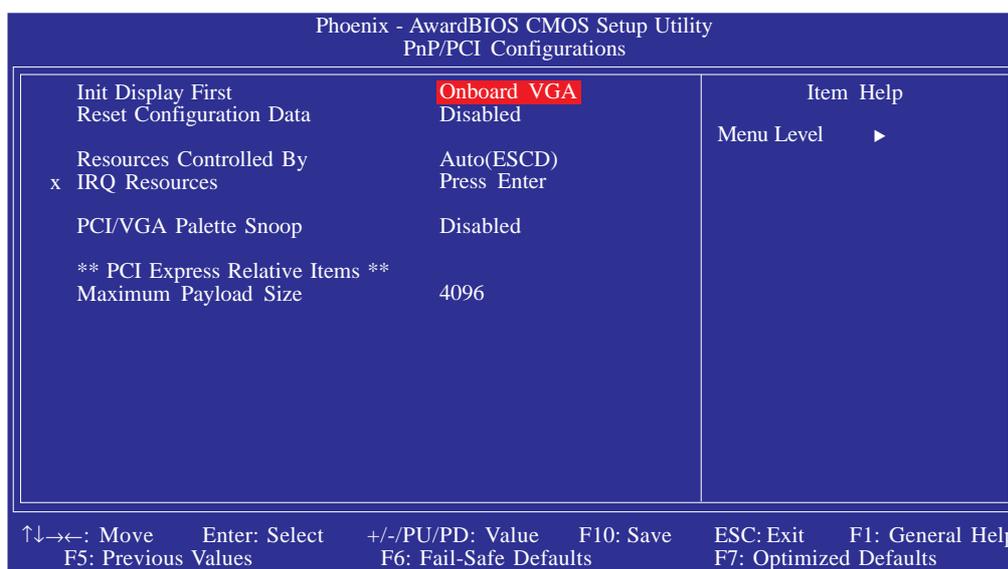
```
            Phoenix - AwardBIOS CMOS Setup Utility
                   PnP/PCI Configurations

   Init Display First               Onboard VGA          Item  Help
   Reset Configuration Data         Disabled
                                                      Menu Level    ▶
   Resources Controlled By          Auto(ESCD)
 x IRQ Resources                    Press  Enter

   PCI/VGA Palette Snoop            Disabled

   ** PCI Express Relative Items **
   Maximum  Payload  Size           4096




 ↑↓→←: 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.

Init Display First

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

Onboard VGA   When the system boots, it will first initialize the onboard VGA.

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

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(ESCD)   The system will automatically detect the settings for you.

Manual   Choose the specific IRQ resources in the "IRQ Resources" field.

IRQ Resources

Move the cursor to this field and press <Enter>. Set each system interrupt to either PCI Device or Reserved.

```
                 Phoenix - AwardBIOS CMOS Setup Utility
                              IRQ Resources

      IRQ-3    assigned to      PCI  Device          Item  Help
      IRQ-4    assigned to      PCI  Device
      IRQ-5    assigned to      PCI  Device      Menu Level   ▶▶
      IRQ-7    assigned to      PCI  Device
      IRQ-9    assigned to      PCI  Device      Legacy  ISA  for devices
      IRQ-10 assigned to        PCI  Device      compliant with the
      IRQ-11 assigned to        PCI  Device      original PC AT bus
      IRQ-12 assigned to        PCI  Device      specification.  PCI/ISA
      IRQ-14 assigned to        PCI  Device      PnP  for  devices
      IRQ-15 assigned to        PCI  Device      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.

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.

Maximum Payload Size

This field is used to select the maximum TLP payload size of the PCI Express devices. The unit is byte.

PC Health Status
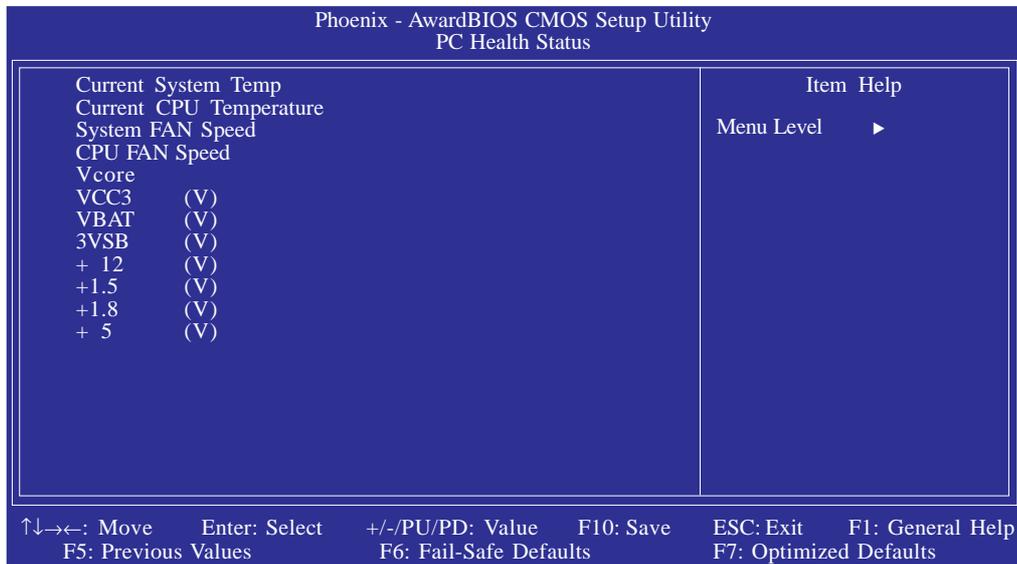
```
                  Phoenix - AwardBIOS CMOS Setup Utility
                            PC Health Status

  Current  System  Temp                        Item  Help
  Current  CPU  Temperature
  System FAN Speed                      Menu Level        ▶
  CPU FAN Speed
  Vcore
  VCC3        (V)
  VBAT        (V)
  3VSB        (V)
  + 12        (V)
  +1.5        (V)
  +1.8        (V)
  + 5         (V)




  ↑↓→←: 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.

Current System Temperature, Current CPU Temperature, System Fan Speed and CPU Fan Speed

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

Vcore

This field will show the voltage of the processor.

VCC3 to +5 (V)

These fields will show the monitored output voltages.

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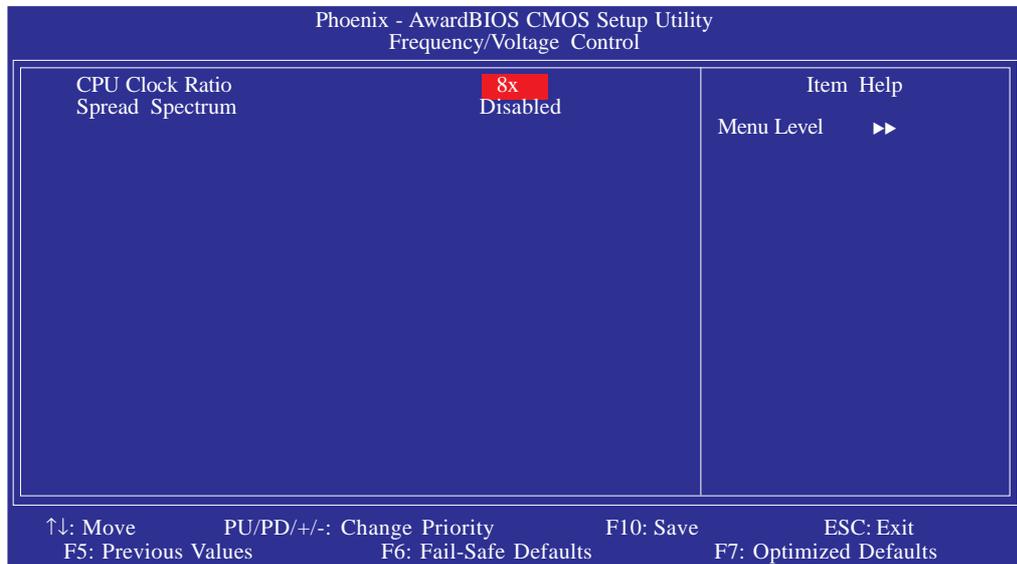
```
                    Phoenix - AwardBIOS CMOS Setup Utility
                            Frequency/Voltage  Control

    CPU Clock Ratio                      8x                    Item  Help
    Spread  Spectrum                  Disabled
                                                          Menu Level    ▶▶













    ↑↓: Move        PU/PD/+/-: Change  Priority    F10: Save          ESC: Exit
      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.*

Spread Spectrum

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

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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 Configurat    │  Load Fail-Safe Defaults (Y/N)? │ etup   │
  │  ▶ PC Health Status      └──────────────────────────────┘ aving    │
  ├──────────────────────────────────────────────────────────────────┤
  │  Esc  : Quit                      ↑ ↓ → ← : 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)? │etup
  ▶ PC Health Status  └──────────────────────────┘aving

  Esc  :  Quit                    ↑ ↓ → ← : 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>.
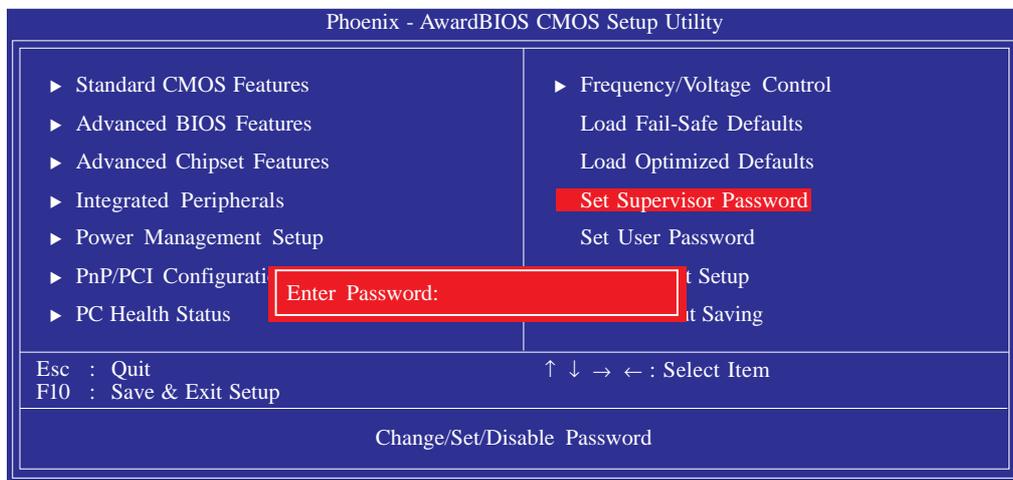
```
                  Phoenix - AwardBIOS CMOS Setup Utility

   ▶ 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:    │t Saving
                        └─────────────────────┘
   Esc  :  Quit                      ↑ ↓ → ← : 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>.
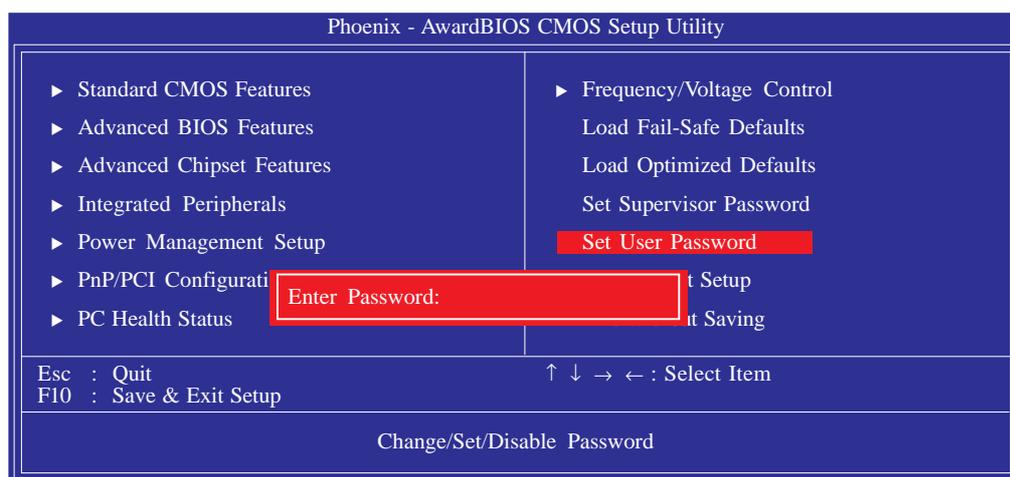
```
          Phoenix - AwardBIOS CMOS Setup Utility

 ▶  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                                 t Saving

 Esc  :  Quit                        ↑ ↓ → ← : 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 Configurat        SAVE to CMOS and EXIT (Y/N)?        Setup

    ▶  PC Health Status                          Saving

    Esc  :  Quit                       ↑ ↓ → ← : 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, high-light "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          ┌───────────────────────┐ ssword      │
 │  ▶ PnP/PCI Configurat        │ Quit Without Saving (Y/N)? N │ Setup │
 │  ▶ PC Health Status          └───────────────────────┘ t Saving    │
 ├──────────────────────────────────────────────────────────────────┤
 │  Esc  :  Quit                   ↑ ↓ → ← : 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> simulta-neously 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.

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 :  [                    ]


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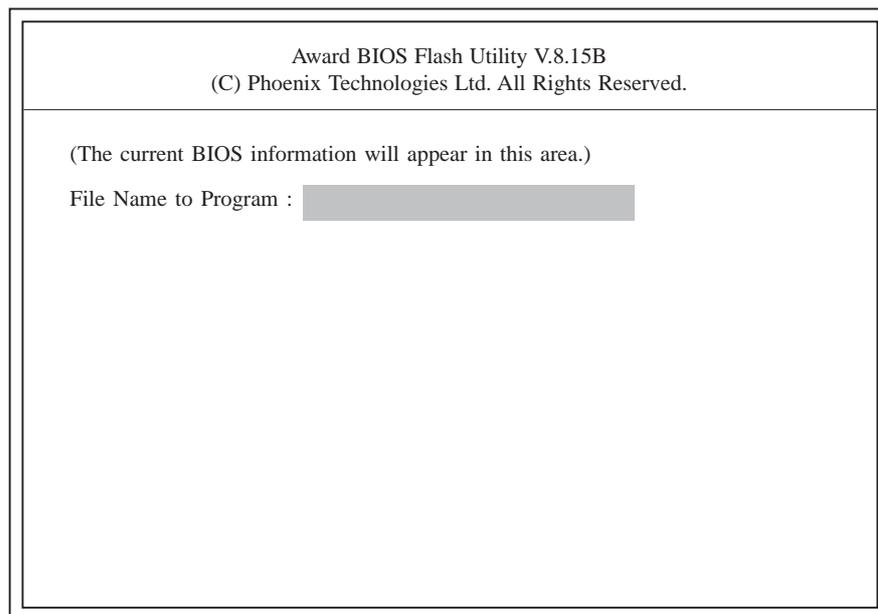
5. Type the new BIOS file name onto the gray area that is next to "File Name to Program" then press <Enter>.

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 (Mainboard Utility CD) will appear. If after inserting the CD, "Autorun" did not automatically start (which is, the Mainboard 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.
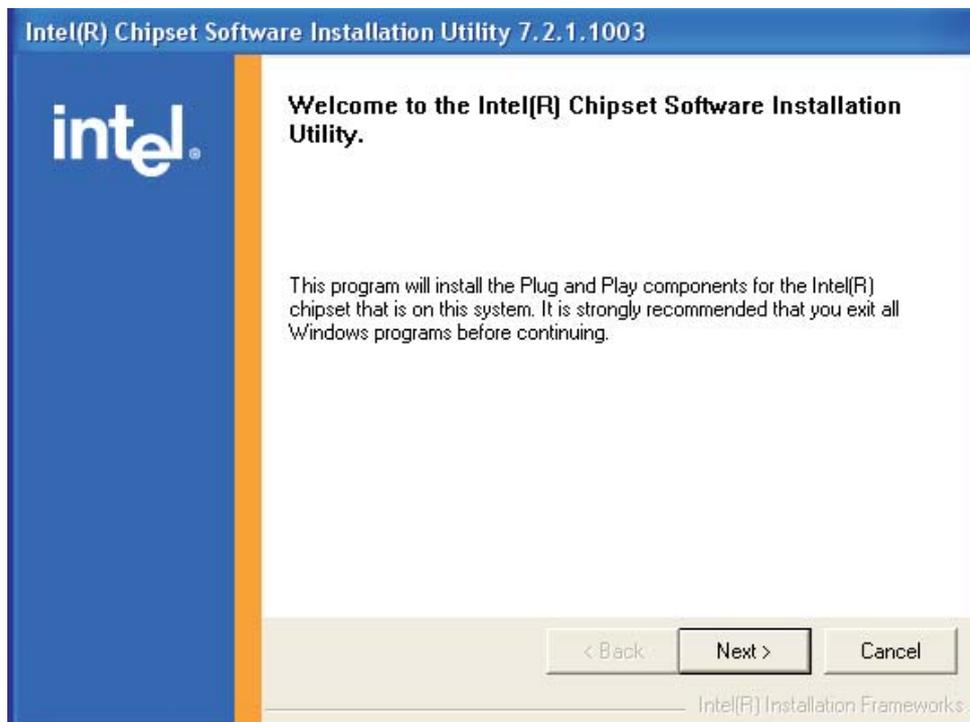
2. Follow the prompts on the screen to complete installation.

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

Supported Software ▪▪

Intel Graphics Drivers

To install the driver, please follow the steps below.

1. Click "Intel Graphics Drivers" on the main menu. The following screen will appear.
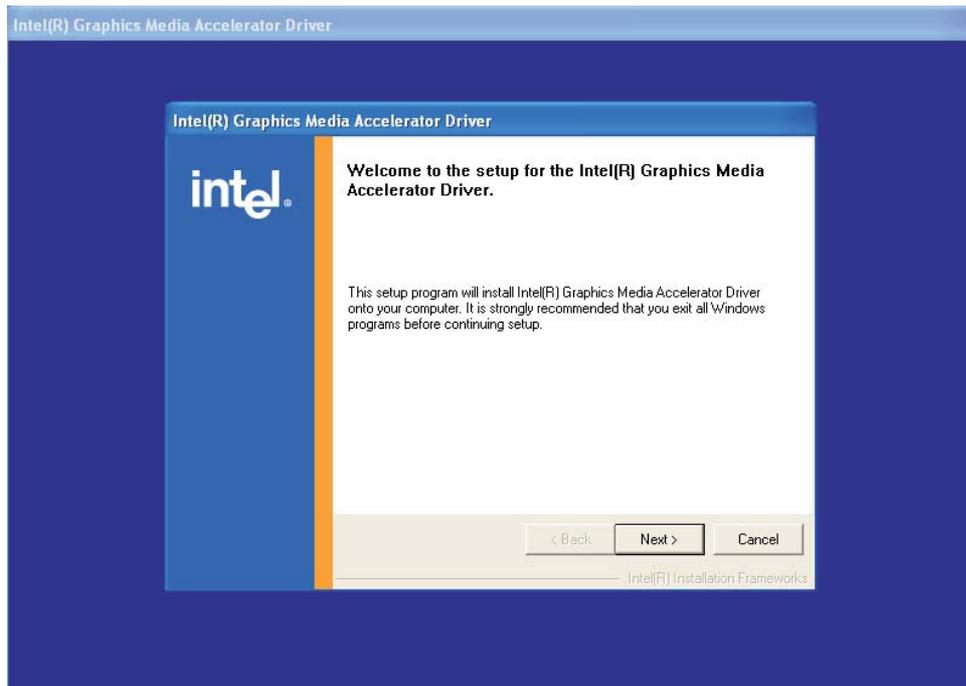

2. Follow the prompts on the screen to complete installation.

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

Audio Drivers

To install the driver, please follow the steps below.

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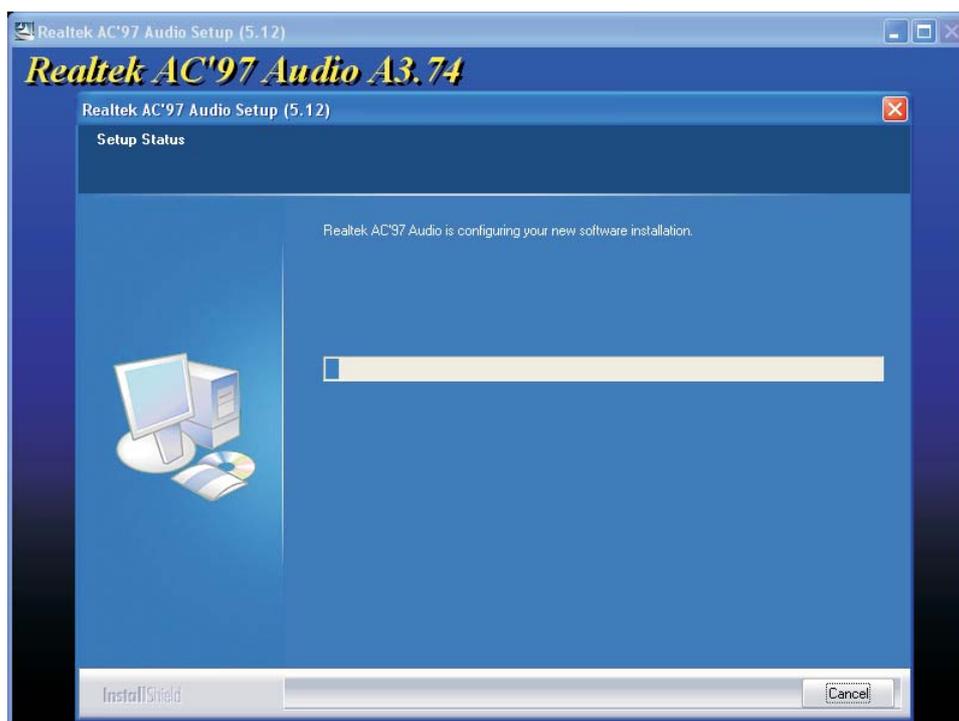
2. Follow the prompts on the screen to complete installation.

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

Supported Software ■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■

LAN Driver

To install the driver, please follow the steps below.

1. Click "LAN Drivers" on the main menu. The following screen will appear.
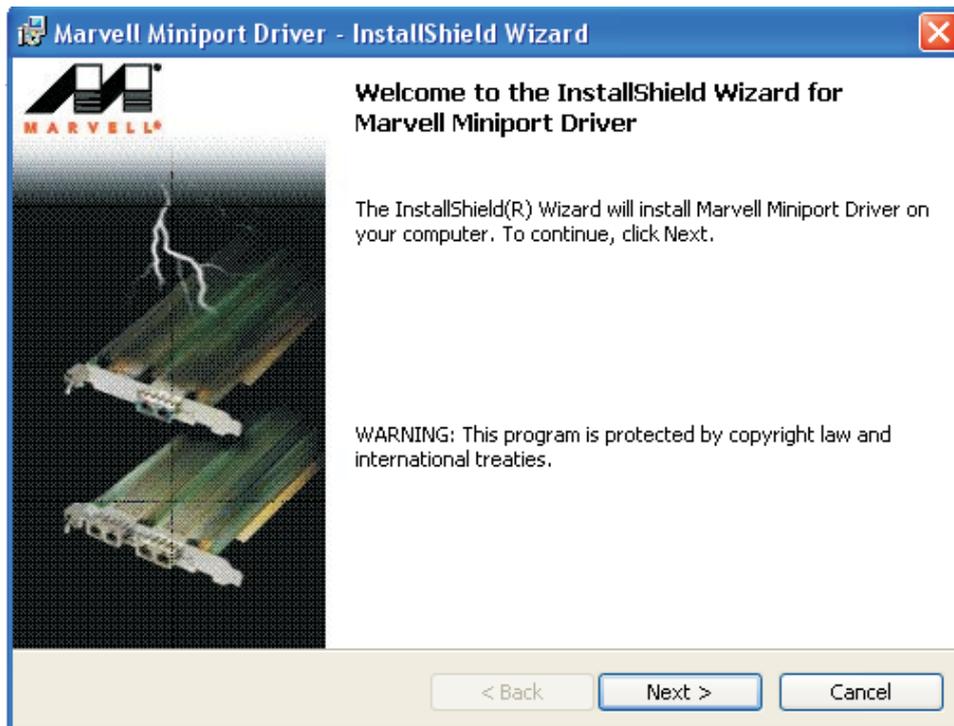
2. Follow the prompts on the screen to complete installation.

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

Hardware Monitor for Windows

The system board comes with the Hardware Monitor for Windows utility contained in the provided CD. This utility is capable of monitoring the system's "health" conditions and allows you to manually set a range (Highest and Lowest Limit) to the items being monitored. If the settings/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, please follow the steps below.

1. Click "Hardware Monitor for Windows" on the main menu. The following screen will appear.
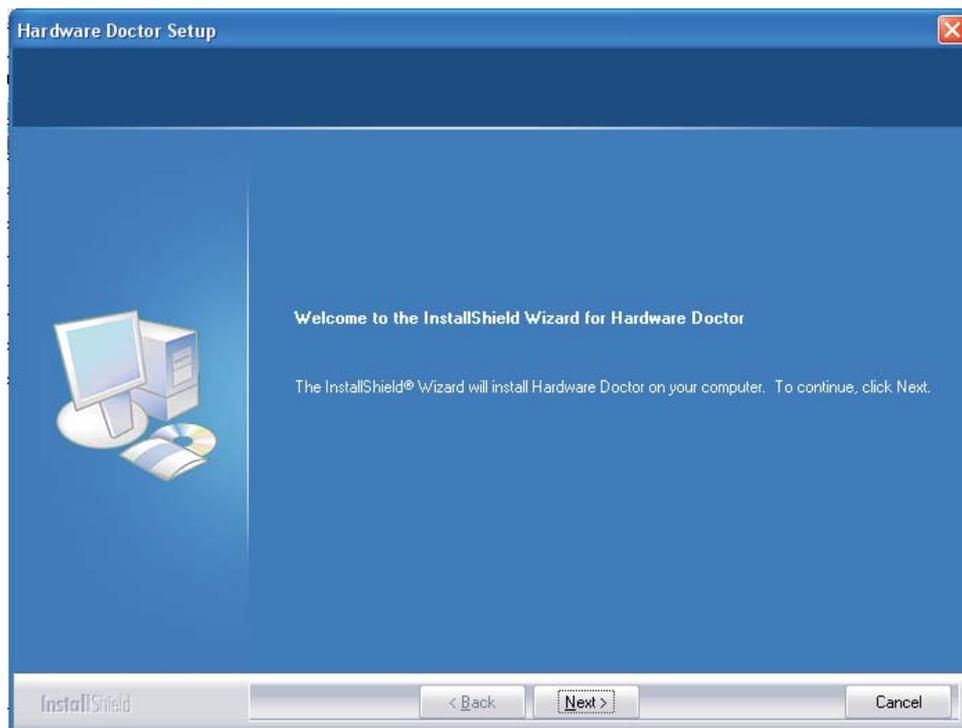
2. Follow the prompts on the screen to complete installation.

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

Microsoft DirectX 9.0C Driver

To install, please follow the steps below.

1. Click "Microsoft DirectX 9.0C Driver" on the main menu. The following screen will appear.
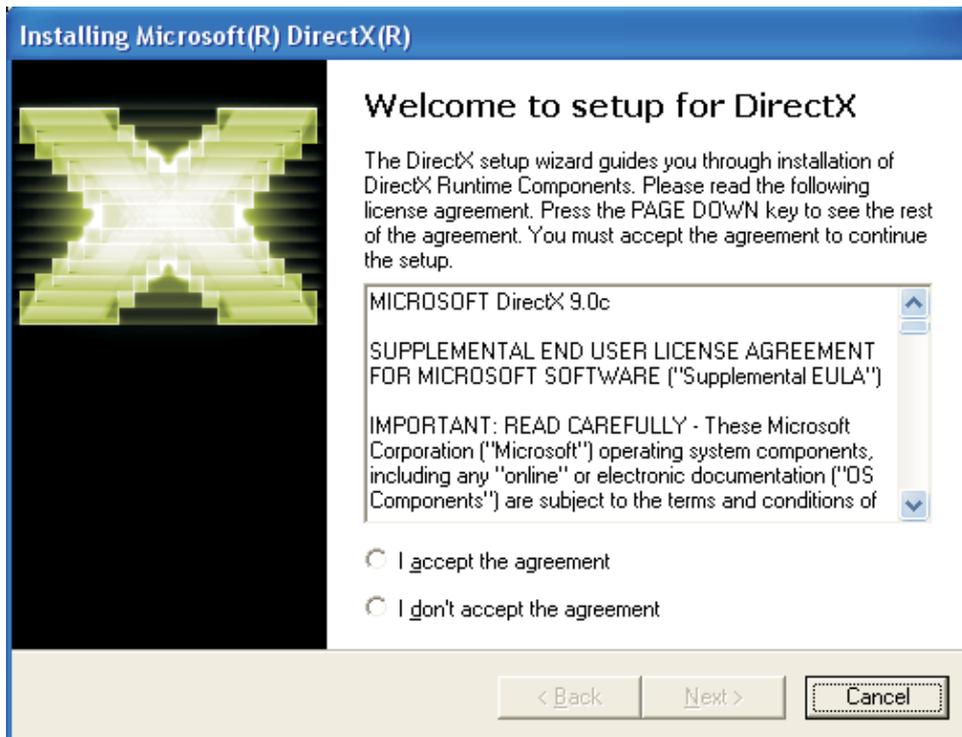
2. Click "I accept the agreement" then click "Next".

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

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

Intel USB 2.0 Drivers

The Intel chipset does not support USB 2.0 drivers for Windows®
98 SE and Windows® ME.

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.

Installation Notes

1. "Autorun" ONLY supports the 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.

Appendix A - Enabling Hyper-Threading Technology

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.
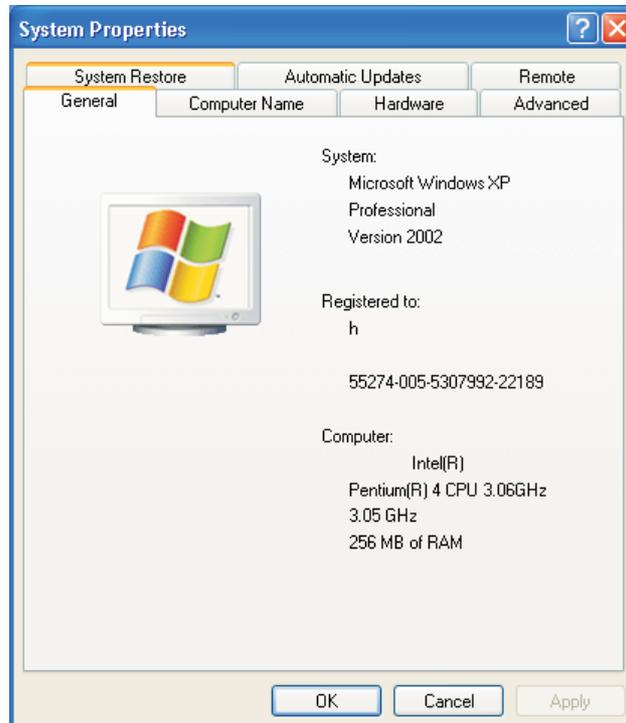

d. Now click the Hardware tab then click Device Manager. The items shown under Computer and Processors should resemble the ones shown below.
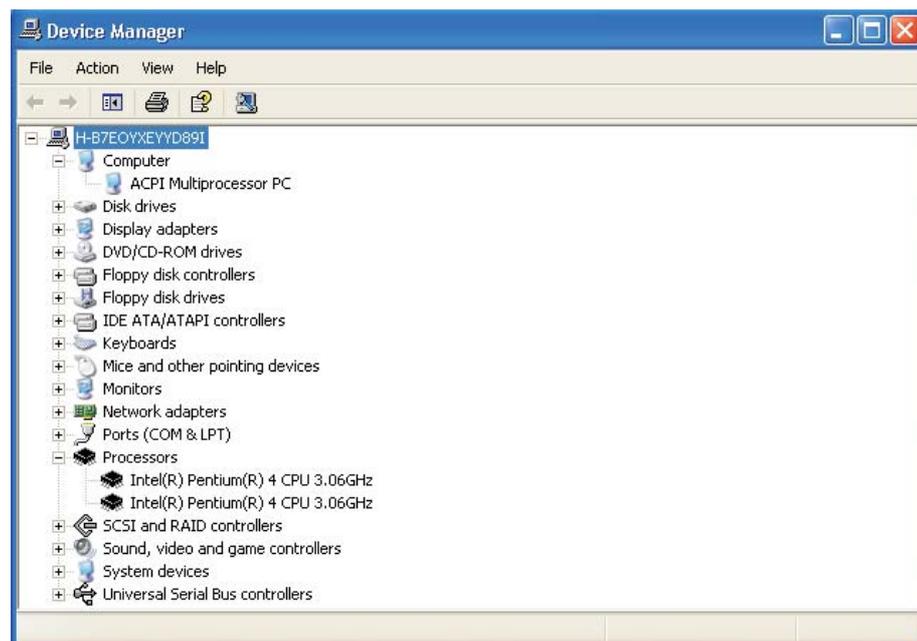
e. Lastly, press the <Ctrl> <Alt> and <Del> keys
    simultaneously. The Windows Task Manager dialog box will
    appear. Click the Performance tab. The diagram under CPU
    Usage History should resemble the one shown below.
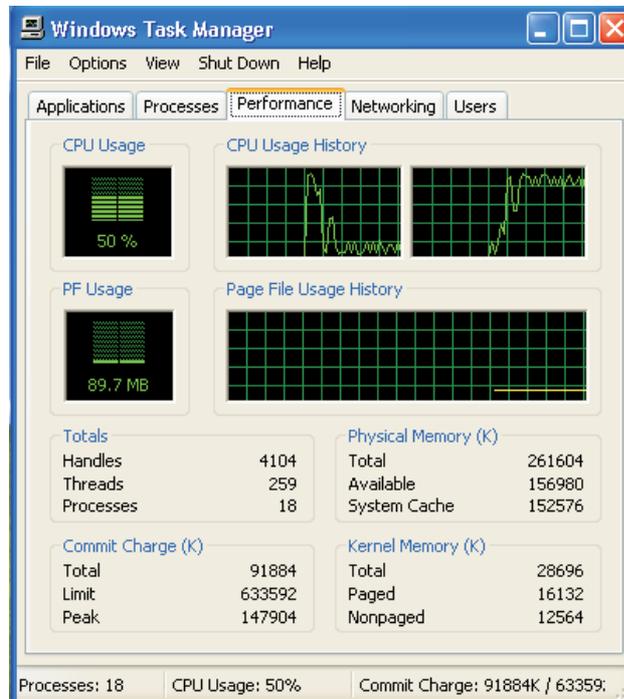
Appendix B - System Error Message

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 or DEL TO ENTER SETUP, will be shown in the information box at the bottom. Enter Setup to correct the error.

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

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.

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.

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.

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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 Sample Code

```asm
.MODEL SMALL
.386
.stack
.DATA
.CODE

newiodelay      macro       ;macro dealy
out             0ebh,al
endm

;=============== PROGRAM START ===============
SIO_CON_PORT    EQU     2EH
SIO_DATA            EQU     2FH

begin:
MOV     DX,SIO_CON_PORT     ;SUPERIO ENTER CONFIG
MOV     AL,87H
OUT     DX,AL
OUT     DX,AL

MOV     DX,SIO_CON_PORT
MOV     AL,2DH                      ;GPIO5 AND POWER CONTROL
                                    SIGNALS MULTI-FUNCTION PIN
                                    SELECTION
OUT     DX,AL                       ;BIT 0 PIN77 SELECT (0= WDTO#,
                                    1= GPIO50)

MOV     DX,SIO_DATA
IN      AL,DX
AND     AL,0FEH                     ;SELECT PIN TO WATCH DOG
OUT     DX,AL

MOV     DX,SIO_CON_PORT
MOV     AL,07H                      ;LOGIC DEVICE SELECT
OUT     DX,AL
```

```
    MOV     DX,SIO_DATA
    MOV     AL,08H                  ;SELECT DEVICE 8 (WATCH DOG)
    OUT     DX,AL

    MOV     DX,SIO_CON_PORT
    MOV     AL,030H                 ;ACTIVATE REGISTER
    OUT     DX,AL

    MOV     DX,SIO_DATA
    OR      AL,01H                  ;0= INACTIVATE, 1=ACTIVATE
    OUT     DX,AL

    MOV     DX,SIO_CON_PORT
    MOV     AL,0F5H                 ;WATCH DOG CONTROL REGISTER
    OUT     DX,AL

    MOV     DX,SIO_DATA             ;BIT1 DIS/EN WDTO# OUTPUT
                                     LOW PULSE TO KBRST#PIN(0=DIS,
                                     1=ENABLE)
    IN      AL,DX                   ;BIT3 COUNTER MODE SLEECT
                                     (0=SECOND MODE, 1=MINUTE
                                     MODE)
    OR      AL,02H
    OUT     DX,AL

    MOV     DX,SIO_CON_PORT
    MOV     AL,0F6H                 ;WATCH DOG COUNTER
    OUT     DX,AL

    MOV     DX,SIO_DATA
    MOV     AL,0AH                  ;SET COUNTER (EX 10 SEC)
    OUT     DX,AL

    mov     DX,SIO_CON_PORT         ;SUPERIO EXIT CONFIG
    mov     al, 0AAh
    out     dx, al

;================= RETURN DOS =================
    mov     ah,4ch                  ;return dos
    int     21h

    end begin                       ;procdure pclock.asm end
```

Appendix E - Digital I/O Input Sample Code

```
.MODEL SMALL
.386
.stack
.DATA
.CODE


newiodelay    macro         ;macro dealy
out           0ebh,al
endm


;=============== PROGRAM START ===============
SIO_CON_PORT      EQU      2EH
SIO_DATA          EQU      2FH


begin:
MOV     DX,SIO_CON_PORT     ;SUPERIO ENTER CONFIG
MOV     AL,87H
OUT     DX,AL
OUT     DX,AL


MOV     DX,SIO_CON_PORT
MOV     AL,29H                 ;OVT#/HM_SMI#,UART A,GAME
                               PORT AND MIDI PIN SELECT
OUT     DX,AL                  ;BIT 0 PIN121~128 FUNCTION
                               SELECT (0= GAME PORT, 1=
                               GPIO1)


MOV     DX,SIO_DATA
IN      AL,DX
OR      AL,01H                 ;SELECT PIN 121-128 TO GPIO
OUT     DX,AL


MOV     DX,SIO_CON_PORT
MOV     AL,07H                 ;LOGIC DEVICE SLELCT
OUT     DX,AL
```

```
MOV     DX,SIO_DATA
MOV     AL,07H                  ;SELECT DEVICE 7 (GAME PORT)
OUT     DX,AL

MOV     DX,SIO_CON_PORT
MOV     AL,0F0H                 ;GPIO1 CONTROL REGISTER
OUT     DX,AL

MOV     DX,SIO_DATA
OR      AL,0FFH                 ;1 = GPI (ALL SELECT GPI)
OUT     DX,AL

MOV     DX,SIO_CON_PORT
MOV     AL,0F1H                 ;GPIO1 DATA REGISTER
OUT     DX,AL

MOV     DX,SIO_DATA
IN      AL,DX                   ;READ GPI STATUS

mov     DX,SIO_CON_PORT    ;SUPERIO EXIT CONFIG
mov     al, 0AAh
out     dx, al

;=============== RETURN DOS =================
mov     ah,4ch                                  ;return dos
int     21h

end begin                       ;procdure pclock.asm end
```

Appendix F - Digital I/O Output Sample Code

```
.MODEL SMALL
.386
.stack
.DATA
.CODE


newiodelay          macro           ;macro dealy
out                 0ebh,al
endm


;=============== PROGRAM START ===============
SIO_CON_PORT        EQU     2EH
SIO_DATA            EQU     2FH


begin:
MOV     DX,SIO_CON_PORT     ;SUPERIO ENTER CONFIG
MOV     AL,87H
OUT     DX,AL
OUT     DX,AL


MOV     DX,SIO_CON_PORT
MOV     AL,29H              ;OVT#/HM_SMI#,UART  A,GAME
                            PORT AND MIDI PIN SELECT
OUT     DX,AL               ;BIT  0  PIN121~128  FUNCTION
                            SELECT   (0=  GAME  PORT,  1=
                            GPIO1)


MOV     DX,SIO_DATA
IN      AL,DX
OR      AL,01H              ;SELECT PIN 121-128 TO GPIO
OUT     DX,AL


MOV     DX,SIO_CON_PORT
MOV     AL,07H              ;LOGIC DEVICE SLELCT
OUT     DX,AL
```

```
       MOV    DX,SIO_DATA
       MOV    AL,07H                 ;SELECT DEVICE 7 (GAME PORT)
       OUT    DX,AL


       MOV    DX,SIO_CON_PORT
       MOV    AL,0F0H                ;GPIO1 CONTROL REGISTER
       OUT    DX,AL


       MOV    DX,SIO_DATA
       IN     AL,DX
       AND    AL,00H                 ;0 = GPO (ALL SELECT GPO)
       OUT    DX,AL


       MOV    DX,SIO_CON_PORT
       MOV    AL,0F1H                ;GPIO1 DATA REGISTER
       OUT    DX,AL


       MOV    DX,SIO_DATA
       IN     AL,DX
       OR     AL,01H                 ;0= LOW, 1=HIGH, (EX:GPIO 10 TO
                                     HIGH)

       OUT    DX,AL

       mov    DX,SIO_CON_PORT  ;SUPERIO EXIT CONFIG
       mov    al, 0AAh
       out    dx, al

;=============== RETURN DOS ================
       mov    ah,4ch                 ;return dos
       int    21h

       end begin                     ;procdure pclock.asm end
```