

790FX-M2R 

# 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.

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## 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 consequential 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 local ordinance.

## 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.

- ☑ One system board
- ☑ One Bernstein audio module with cable
- ☑ One Transpiper kit
  - One Transpiper
  - One 90° metal pipe
  - One thermal paste
- ☑ One IDE round cable
- ☑ One floppy round cable
- ☑ Four Serial ATA data cables
- ☑ Four Serial ATA power cables
- ☑ One I/O shield
- ☑ One RAID driver diskette
- ☑ One "Mainboard Utility" CD
- ☑ One user's manual

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 I - Introduction

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## Specifications

Processor	<ul style="list-style-type: none"><li>• AMD® Phenom™ / Athlon™ 64 X2 / Athlon 64 FX / Athlon™ 64</li><li>• Socket 940 AM2 65nm</li><li>• HyperTransport 3.0 and 1.0</li></ul>
Chipset	<ul style="list-style-type: none"><li>• AMD chipset<ul style="list-style-type: none"><li>- Northbridge: AMD 790FX</li><li>- Southbridge: AMD SB600</li></ul></li></ul>
System Memory	<ul style="list-style-type: none"><li>• Four 240-pin DDR2 DIMM sockets</li><li>• Supports DDR2 667 and DDR2 800 DIMMs</li><li>• Supports dual channel (128-bit wide) memory interface</li><li>• Supports up to 8GB system memory</li><li>• Supports unbuffered non-ECC x8 and x16 DIMMs</li></ul>
Expansion Slots	<ul style="list-style-type: none"><li>• 3 PCI Express (Gen 2) x16 slots<ul style="list-style-type: none"><li>- 2-way or 4-way CrossFire at x16/x16/NC bandwidth</li><li>- 3-way CrossFire at x16/x8/x8 bandwidth</li><li>- 2-way CrossFire + Physics at x16/x8/x8 bandwidth</li></ul></li><li>• 1 PCI Express x4 slot</li><li>• 3 PCI slots</li></ul>
BIOS	<ul style="list-style-type: none"><li>• Award BIOS</li><li>• CMOS Reloaded</li><li>• CPU/DRAM overclocking</li><li>• CPU/DRAM/Chipset overvoltage</li><li>• 8Mbit flash memory</li></ul>
Audio	<ul style="list-style-type: none"><li>• Bernstein audio module<ul style="list-style-type: none"><li>- Audio Codec options<ul style="list-style-type: none"><li>a) Realtek ALC885 8-channel HD Audio Codec<ul style="list-style-type: none"><li>- High-performance DACs with 106dB dynamic range (A-Weight), ADCs with 101dB dynamic range (A-Weight)</li></ul></li><li>b) Realtek ALC888T 8-channel HD Audio Codec<ul style="list-style-type: none"><li>- Supports VoIP connection using a standard phone</li><li>- High-performance DACs with 97dB SNR (A-Weighting), ADCs with 90dB SNR (A-Weighting)</li></ul></li></ul></li><li>- Center/subwoofer, rear R/L and side R/L jacks</li><li>- Line-in, line-out (front R/L) and mic-in jacks</li><li>- 2 coaxial RCA S/PDIF-in/out jacks</li><li>- 1 optical S/PDIF connector</li><li>- 1 CD-in connector</li><li>- 1 front audio connector</li></ul></li></ul>
LAN	<ul style="list-style-type: none"><li>• Marvell 88E8052 and Marvell 88E8053 PCIE Gigabit LAN controllers</li><li>• Fully compliant to IEEE 802.3 (10BASE-T), 802.3u (100BASE-TX) and 802.3ab (1000BASE-T) standards</li></ul>
IDE	<ul style="list-style-type: none"><li>• One IDE connector allows connecting up to two UltraDMA 133Mbps hard drives</li></ul>

<b>IEEE 1394</b>	<ul style="list-style-type: none"> <li>• VIA VT6307</li> <li>• Supports two 100/200/400 Mb/sec ports</li> </ul>
<b>Serial ATA with RAID</b>	<ul style="list-style-type: none"> <li>• AMD SB600               <ul style="list-style-type: none"> <li>- Supports up to 4 SATA devices</li> <li>- SATA speed up to 3Gb/s</li> <li>- RAID 0, RAID 1 and RAID 0+1</li> </ul> </li> <li>• Silicon Image SiI3132               <ul style="list-style-type: none"> <li>- Supports up to 2 SATA devices</li> <li>- SATA speed up to 3Gb/s</li> <li>- RAID 0, RAID 1 and RAID 0+1</li> </ul> </li> </ul>
<b>Rear Panel I/O</b>	<ul style="list-style-type: none"> <li>• 1 mini-DIN-6 PS/2 mouse port</li> <li>• 1 mini-DIN-6 PS/2 keyboard port</li> <li>• 1 IEEE 1394 port</li> <li>• 6 USB 2.0/1.1 ports</li> <li>• 2 RJ45 LAN ports</li> </ul>
<b>Internal I/O</b>	<ul style="list-style-type: none"> <li>• 2 connectors for 4 additional external USB 2.0 ports</li> <li>• 1 connector for an external COM port</li> <li>• 1 connector for an IEEE 1394 port</li> <li>• 1 connector for the Bernstein audio module</li> <li>• 1 front audio connector (on the Bernstein audio module)</li> <li>• 1 CD-in connector (on the Bernstein audio module)</li> <li>• 1 S/PDIF connector (on the Bernstein audio module)</li> <li>• 1 IrDA connector</li> <li>• 1 CIR connector</li> <li>• 6 Serial ATA connectors</li> <li>• 1 40-pin IDE connector</li> <li>• 1 floppy connector</li> <li>• 1 24-pin ATX power connector</li> <li>• 1 8-pin 12V power connector</li> <li>• 2 4-pin 5V/12V power connectors (FDD type)</li> <li>• 1 front panel connector</li> <li>• 6 fan connectors</li> <li>• 1 diagnostic LED</li> <li>• EZ touch switches (power switch and reset switch)</li> </ul>
<b>Power Management</b>	<ul style="list-style-type: none"> <li>• ACPI and OS Directed Power Management</li> <li>• ACPI STR (Suspend to RAM) function</li> <li>• Wake-On-PS/2 Keyboard/Mouse</li> <li>• Wake-On-USB Keyboard/Mouse</li> <li>• Wake-On-Ring</li> <li>• Wake-On-LAN</li> <li>• RTC timer to power-on the system</li> <li>• AC power failure recovery</li> </ul>
<b>Hardware Monitor</b>	<ul style="list-style-type: none"> <li>• Monitors CPU/system/chipset temperature</li> <li>• Monitors 12V/5V/3.3V/Vcore/Vbat/5Vsb/Vdimm/Vchip voltages</li> <li>• Monitors the speed of the cooling fans</li> <li>• CPU Overheat Protection function monitors CPU temperature during system boot-up</li> </ul>
<b>PCB</b>	<ul style="list-style-type: none"> <li>• ATX form factor</li> <li>• 24.5cm (9.64") × 30.5cm (12")</li> </ul>

## Features



The system board supports high performance DDR2 technology whose data transfer rate delivers bandwidth of 12.8 Gb/s 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 pre-fetch against DDR which fetches 2 bits per clock cycle.



ATI's CrossFire™ technology drives your PC to a new peak of performance by combining multiple GPUs in a single system. By connecting a Radeon CrossFire Edition graphics card and a standard PCI Express graphics card, the power of the dual GPUs (Graphics Processing Units) within the system will accelerate your gaming performance and improve image quality.

Aside from dual GPU for 3D rendering, CrossFire's new feature - asymmetric processing technology, allows adding another dedicated GPU for physics processing. The 3 GPUs simultaneously handle Data Parallel Processing (DPP) computing tasks such as game rendering and physics in a single system. This provides more realistic cutting edge 3D graphics to run at high resolutions.



PCI Express Gen 2 is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes. The x16 PCI Express lane supports transfer rate up to 5Gb/s.



The Realtek ALC885 on the Bernstein audio module supports 6 audio jacks that provide 8-channel audio output for advanced 7.1-channel super surround sound audio system. It is also equipped with a CD-in connector, front audio connector and S/PDIF output allowing digital connections with DVD systems or other audio/video multimedia.

If you are using the Bernstein audio module that comes with the Realtek ALC888T HD audio codec, it provides additional support for VoIP connection using a standard phone.



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 interface 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 is a storage interface that is compliant with SATA 1.0 specification. AMD SB600 and Silicon Image Sil3132 both support speed of up to 3Gb/s. Serial ATA improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s.



AMD SB600 and Silicon Image Sil3132 both allow configuring RAID on Serial ATA devices. It supports RAID 0, RAID 1 and RAID 0+1.



The Marvell 88E8052 and Marvell 88E8053 PCI Express Gigabit LAN controllers support up to 1 Gbps data rate.



IEEE 1394 is fully compliant with the 1394 OHCI (Open Host Controller Interface) 1.1 specification. It supports up to 63 devices that can run simultaneously on a system. 1394 is a fast external bus standard that supports data transfer rates of up to 400Mbps. In addition to its high speed, it also supports isochronous data transfer which is ideal for video devices that need to transfer high levels of data in real-time. 1394 supports both Plug-and-Play and hot plugging.



CMOS Reloaded is a technology that allows storing multiple user-defined BIOS settings by using the BIOS utility to save, load and name the settings. This is especially useful to overclockers who require saving a variety of overclocked settings and being able to conveniently switch between these settings simultaneously.



CPU Overheat Protection has the capability of monitoring the CPU's temperature during system boot up. Once the CPU's temperature exceeded the temperature limit pre-defined by the CPU, the system will automatically shut-down. This preventive measure has been added to protect the CPU from damage and insure a safe computing environment.



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.



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:**

*If you are using a modem add-in card, the 5VSB power source of your power supply must support a minimum of  $\geq 720\text{mA}$ .*

**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 5VSB power source of your power supply must support  $\geq 720\text{mA}$ .*

**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 5VSB power source of your power supply must support  $\geq 720\text{mA}$ .*

**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 5VSB power source of your power supply must support  $\geq 1.5\text{A}$ . For 3 or more USB ports, the 5VSB power source of your power supply must support  $\geq 2\text{A}$ .*

**RTC**

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

**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. 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 the system without having to go through the sometimes tiresome process of closing files, applications and operating system. This is because the system is capable of storing all programs and data files during the entire operating session into RAM (Random Access Memory) when it powers-off. The operating session will resume exactly where you left off the next time you power-on the system.

**Important:**

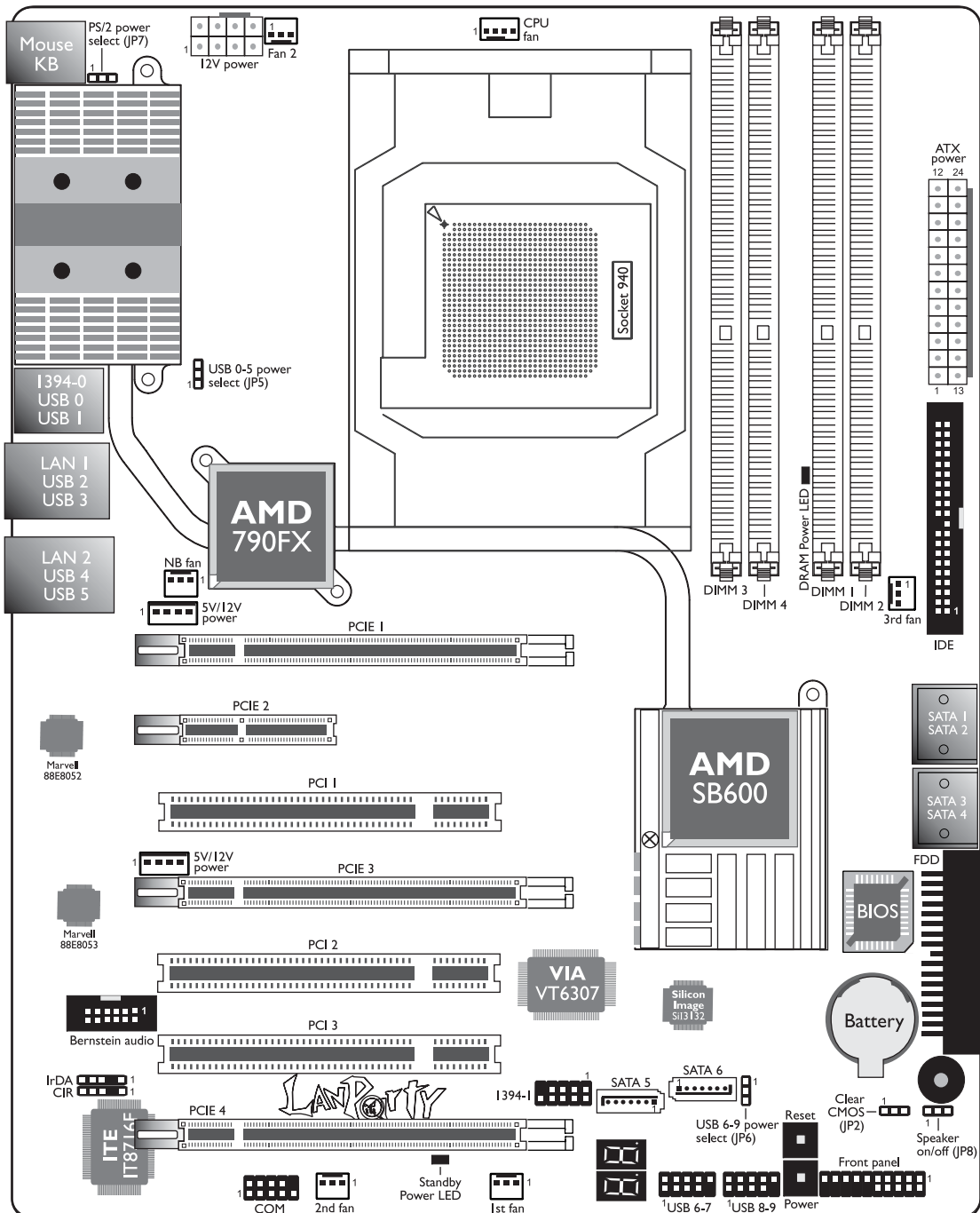
*The 5VSB power source of your power supply must support  $\geq 1\text{A}$ .*

**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



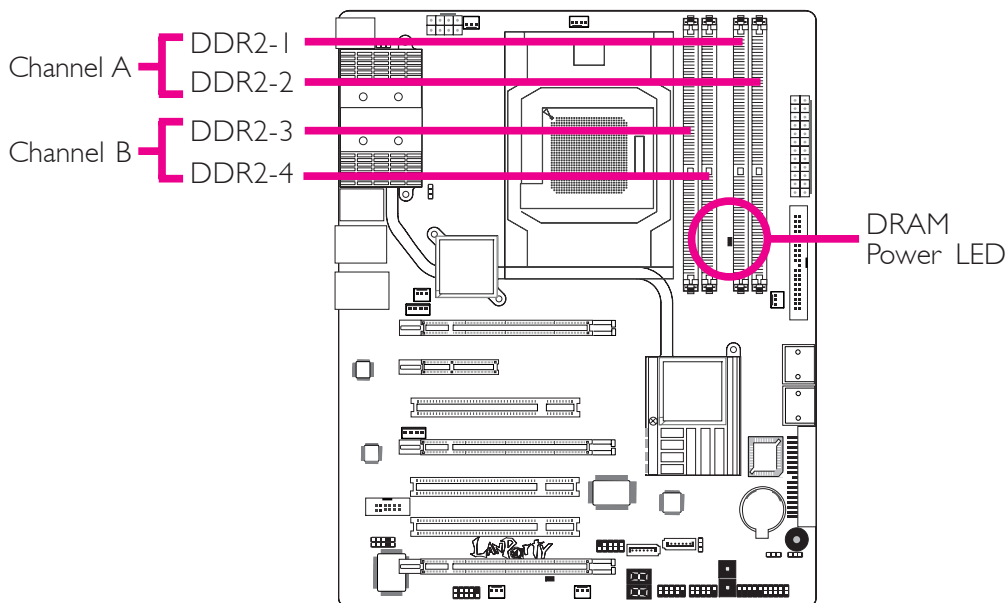
**Warning:**

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 DIMM 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 240-pin DDR2 DIMM sockets. The four DDR2 DIMM sockets on the system board are divided into 2 channels:

- Channel A - DDR2-1 and DDR2-2
- Channel B - DDR2-3 and DDR2-4

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.

### Virtual Single Channel (VSC)

If both channels are populated with different memory configurations, the MCH defaults to Virtual Single Channel.

### Dual Channel (DC)

Dual channel provides better system performance because it doubles the data transfer rate.

### Dynamic Mode Addressing

This mode minimizes the overhead of opening/closing pages in memory banks allowing for row switching to be done less often.

Single Channel	DIMMs are on the same channel. DIMMs in a channel can be identical or completely different. Not all slots need to be populated.
Virtual Single Channel	DIMMs of different memory configurations are on different channels. Odd number of slots can be populated.
Dual Channel	DIMMs of the same memory configuration are on different channels.
Dynamic Mode Addressing	In single channel, requires even number of rows (side of the DIMM) populated. This mode can be enabled with 1 SS, 2 SS or 2 DS.
	In VSC mode, both channels must have identical row structure.

### BIOS Setting

Configure the system memory in the BIOS.

The table below lists the various optimal operating modes that should be configured for the memory channel operation.

Config	DIMM 1	DIMM 2	DIMM 3	DIMM 4
No memory	E	E	E	E
Single channel A	P	E	E	E
Single channel A	P	P	E	E
Single channel A	E	P	E	E
Single channel B	E	E	P	E
Single channel B	E	E	P	P
Single channel B	E	E	E	P
Virtual single channel	E	P(**)	E	P(**)
Virtual single channel	E	P	P	E
Virtual single channel	E	P(**)	P	P(**)
Virtual single channel	P	E	E	P
Virtual single channel	P(**)	E	P(**)	E
Virtual single channel	p(**)	E	P(**)	P
Virtual single channel	P	P(**)	E	P(**)
Virtual single channel	P(**)	P	P(**)	E
Virtual single channel	P(**)	P(**)	P(**)	P(**)
Dual channel	E	P(*) (2,4)	E	P(*) (2,4)
Dual channel	P(*) (1,3)	E	P(*) (1,3)	E
Dual channel	P(*) (1,3)	P(*) (2,4)	P(*) (1,3)	P(*) (2,4)

*Continued on the next page...*

Config	DIMM 1	DIMM 2	DIMM 3	DIMM 4
Dynamic Mode Addressing	E	P(*) (2,4) DS	E	P(*) (2,4) DS
Dynamic Mode Addressing	P(*) (1,3) DS	E	P(*) (1,3) DS	E
Dynamic Mode Addressing	P(*) (1,3) DS	P(*) (2,4) DS	P(*) (1,3) DS	P(*) (2,4) DS
Dynamic Mode Addressing	E	P(*) (2,4) SS	E	P(*) (2,4) SS
Dynamic Mode Addressing	P(*) (1,3) SS	E	P(*) (1,3) SS	E
Dynamic Mode Addressing	P(*) (1,3) SS	P(*) (2,4) SS	P(*) (1,3) SS	P(*) (2,4) SS

P - denotes populated

E - denotes empty

\* - denotes DIMMs are identical

\*\* - denotes DIMMs are not identical

SS - denotes Single Sided DIMM

DS - denotes Double Sided DIMM

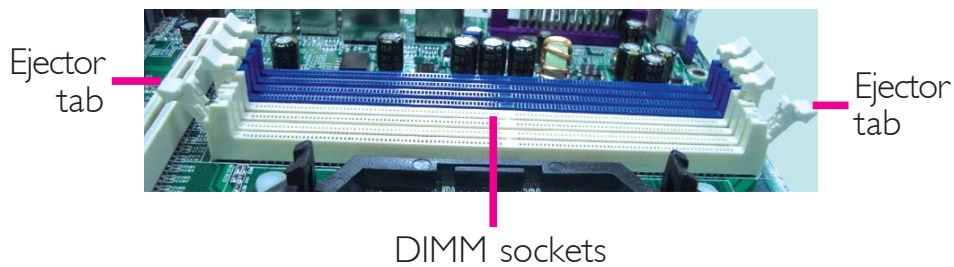
1, 2, 3 or 4 - denotes the DDR DIMM slot

## Installing the DIM Module

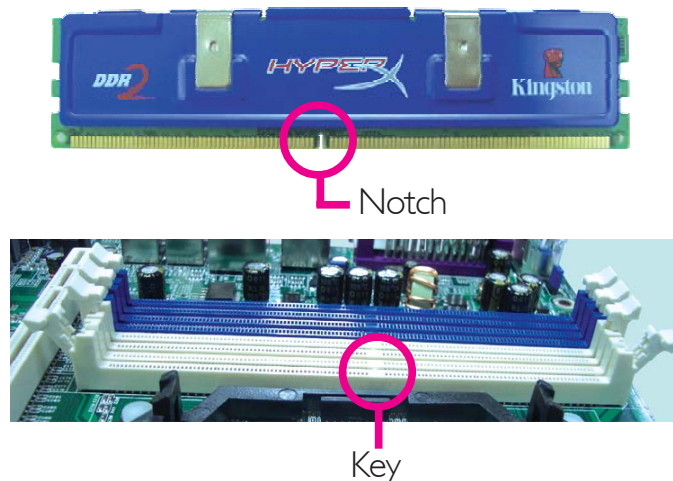
**Note:**

*The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.*

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 DIMM socket on the system board.
4. Push the “ejector tabs” which are at the ends of the socket to the side.



5. Note how the module is keyed to the socket.





6. Grasping the module by its edges, position the module above the socket with the “notch” in the module aligned with the “key” on the socket. The keying mechanism ensures the module can be plugged into the socket in only one way.



7. Seat the module vertically, pressing it down firmly until it is completely seated in the socket.



8. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.



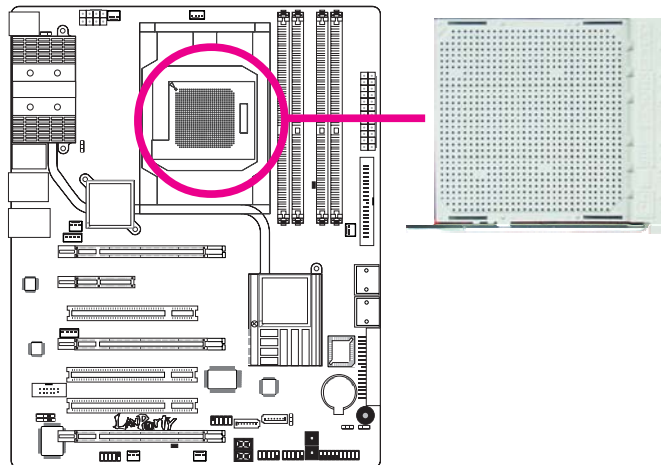
## CPU

### Overview

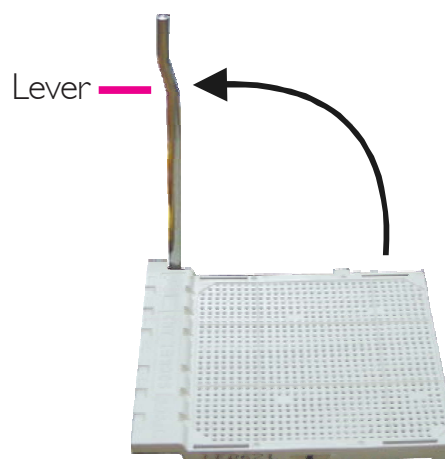
The system board is equipped with Socket AM2 for installing an AMD CPU designed for this socket.

### Installing the CPU

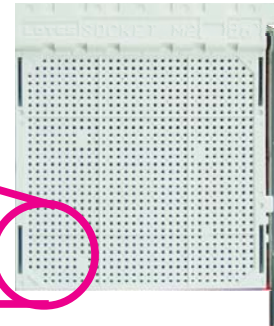
1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate Socket AM2 on the system board.



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

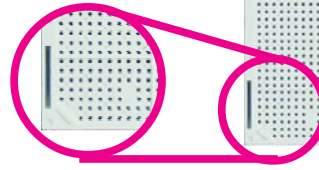


5. Position the CPU above the socket. The gold mark on the CPU must align with the corner of the CPU socket (refer to the enlarged image) mark

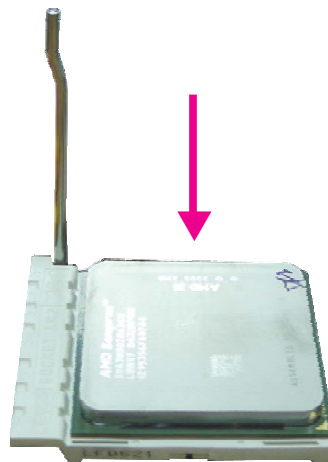


**Important:**

Handle the CPU by its edges and avoid touching the pins.



6. 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.

7. Once the CPU is in place, push down the lever to lock the socket. The lever should click on the side tab to indicate that the CPU is completely secured in the socket.



Side tab

## 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 over-heat damaging both the CPU and system board.

The fan / heat sink assembly must provide airflow adequate to ensure appropriate internal temperature and cooling of the components in the system. Failure to use the appropriate cooling system may result in reduced performance or, in some instances, damage to the 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.

- I. 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.



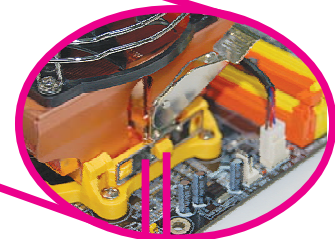
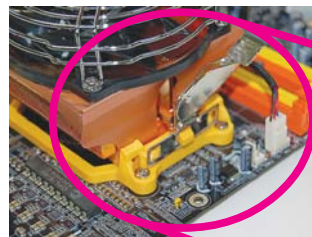
2. The system board comes with the retention module base already installed.



Retaining  
tab

Retention module base

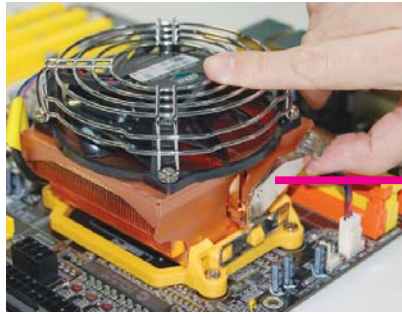
3. Place the heat sink on top of the CPU. Now hook one side of the retention clip onto the retention module base by fitting the hole(s) on the retention clip into the retaining tab(s) of the retention module base. Hook the other side of the retention clip so that the hole(s) on the retention clip also fit into the retaining tab(s) of the retention module base.



Retention clip

Retaining tab

4. Move the retention lever to its opposite side then push it down to lock the fan and heat sink assembly to the retention module base.



Retention  
lever

**Note:**

- You will not be able to secure the fan and heat sink assembly in place if it did not fit properly onto the retention module base.
- Make sure there is sufficient air circulation across the CPU fan and heat sink.

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



**Note:**

*The system board provides the option of using the Transpiper heat sink. Refer to the Transpiper Heat Sink section for details.*



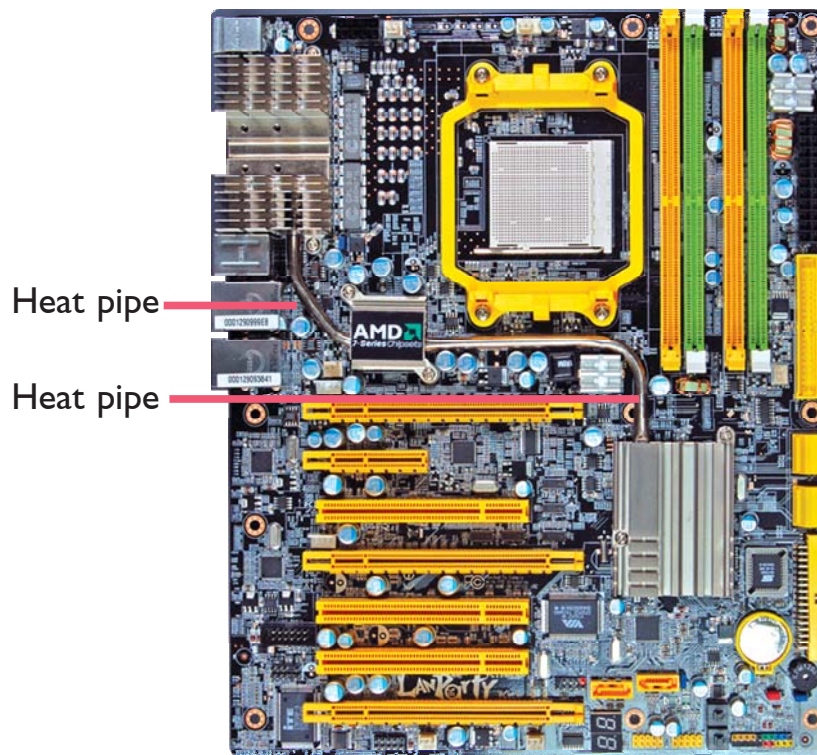
## Transpiper Heat Sink

Due to space restrictions, the heat dissipating effect of a heat sink mounted directly at the place where the heat is produced is usually limited. To overcome this problem, the system board uses the heat pipe design. Heat pipe is an extremely high thermal conductor that can quickly transfer heat from one point to another.

The heat pipe will transport heat generated by the chipsets or CPU to a place where more space for the Transpiper heat sink is available. By means of the airflow from the CPU fan and system fan, heat can be carried away and dissipated effectively.

**Note:**

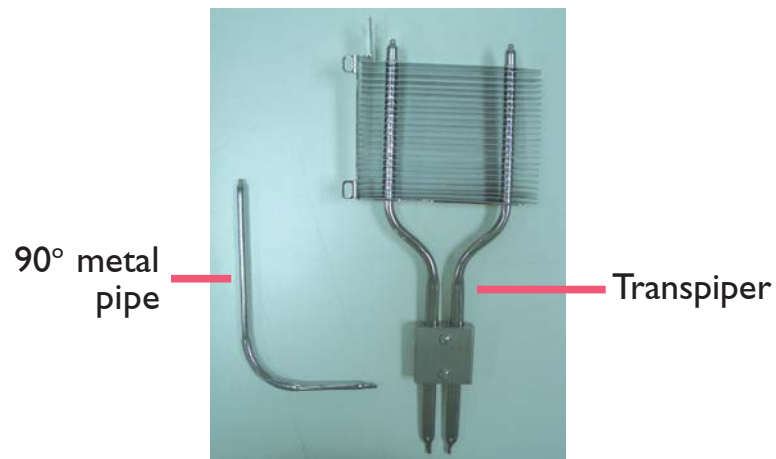
*The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.*



# 2

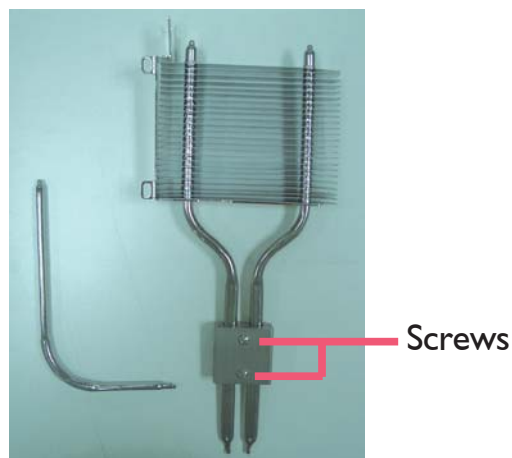
## Hardware Installation .....

The Transpiper heat sink is included in the package. Install the Transpiper either inside the chassis, anywhere along an available expansion slot or externally - both of which provide effective cooling to the entire system.



### Installing the Transpiper Inside the Chassis

1. Loosen the screws on the Transpiper.



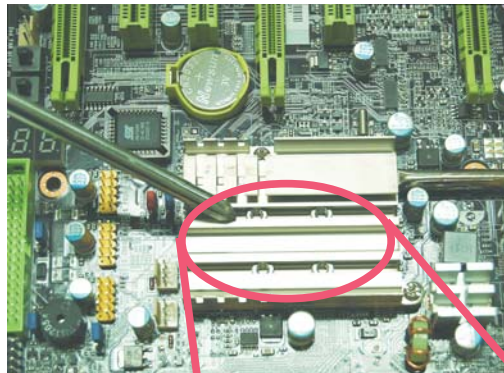


2. Insert the longer side of the 90° metal pipe into the Transpiper. You can adjust its length later on before you fix the Transpiper in place.



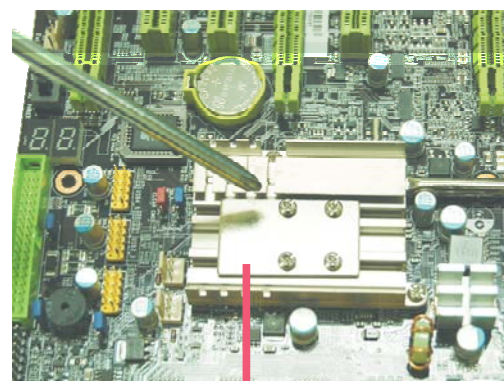
90° metal

3. Insert the nuts into the southbridge's heat sink as shown.



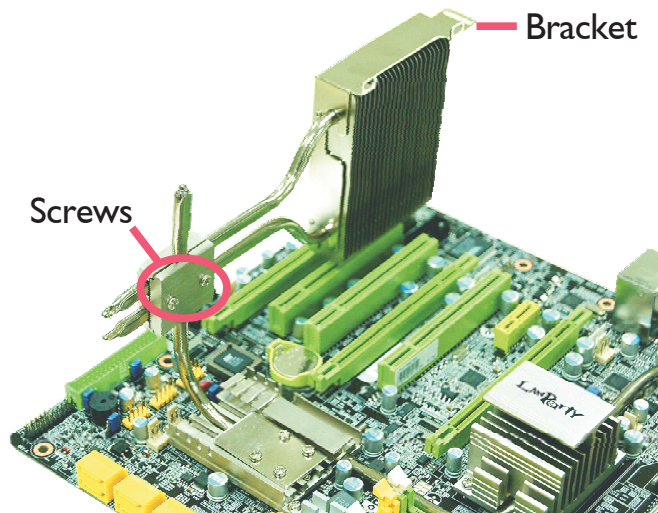
Nut

4. Place the rectangular metal plate on top then fasten bolts into the nuts.



Metal plate

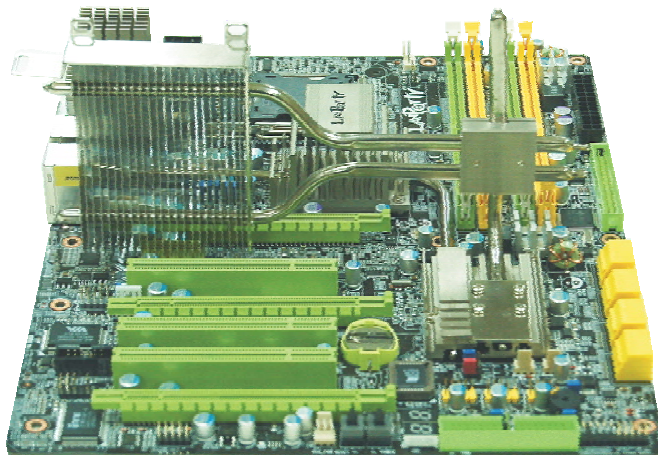
5. Coming from a side of the board, insert the Transpiper under the metal plate. Adjust the Transpiper to an available expansion slot then tighten its screws. The right photo shows the Transpiper on the PCI 3 slot.



**Note:**

*Before you install the Transpiper, make sure the bracket side is facing upward otherwise the Transpiper will not install properly.*

6. The Transpiper can also be installed from the opposite side. The installation steps are the same but make sure it is the longer side of the 90° metal pipe that is inserted into the Transpiper and the shorter side goes under the metal plate. The right photo shows the Transpiper on the PCIE 2 slot.



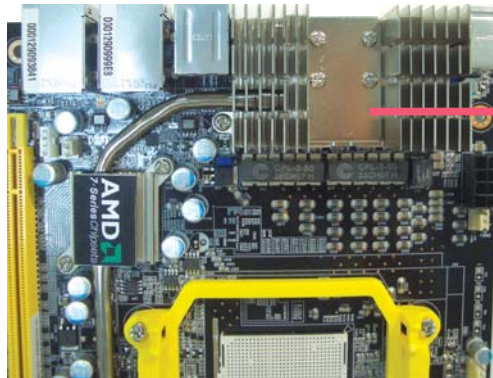
## Installing the Transpiper Outside the Chassis

1. The package includes a metal plate and screws.



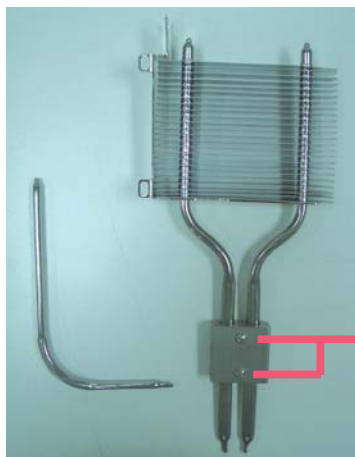
2. Place the rectangular metal plate on top of the heat sink then secure it with four screws.

Now install the system board into the chassis.



Metal plate

3. Loosen the screws on the Transpiper.



Screws

4. Insert the longer side of the 90° metal pipe into the Transpiper. You can adjust its length later on before you fix the Transpiper in place.

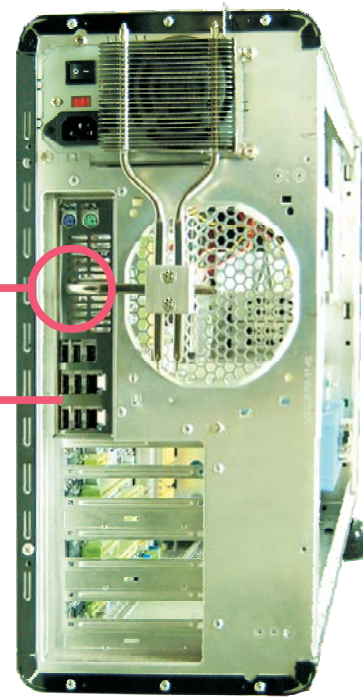


90° metal

5. From the rear outside of the chassis, insert the shorter side of the 90° metal pipe through the I/O shield so that it goes under the metal plate which you have installed in step 2.

Location where  
the 90° metal  
pipe is inserted

I/O shield

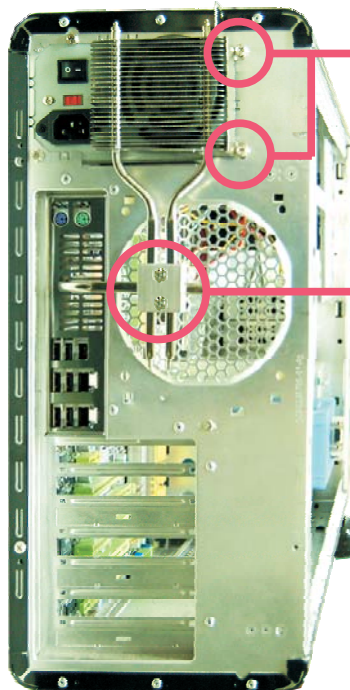


6. Adjust the Transpiper so that its fins faces the power supply fan. This will allow air from the power supply to blow directly on the fins of the Transpiper. Tighten the screws on the Transpiper to secure it in place.

Fasten screws on the Transpiper's bracket to fix it in place.

Screws on  
bracket

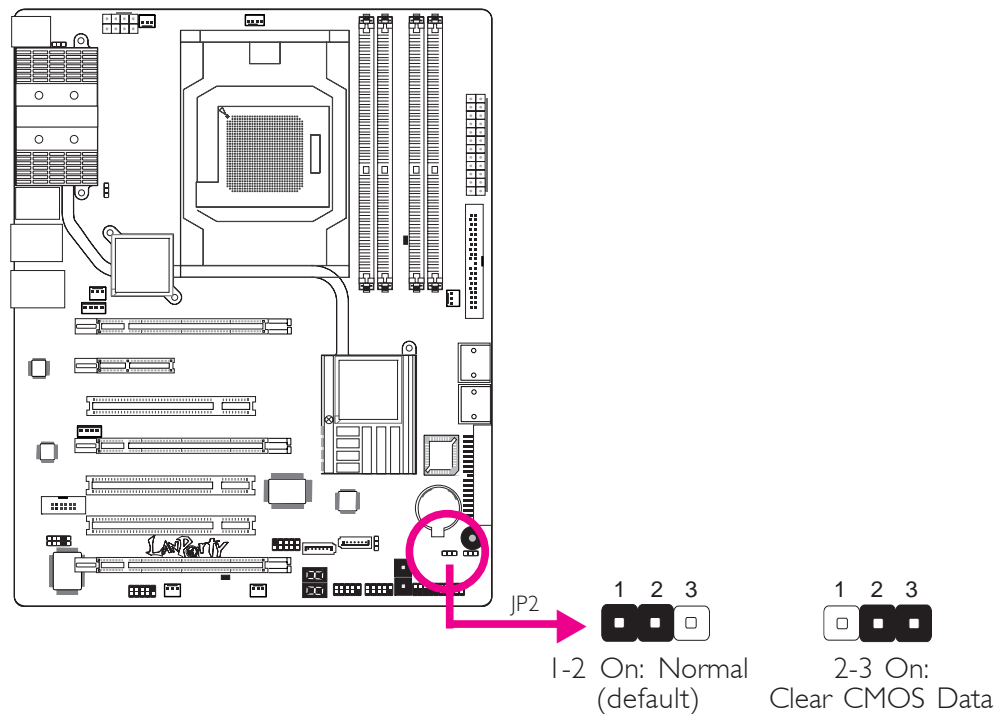
Screws



## Jumper Settings

### Clear CMOS Data

#### Clearing CMOS Data using JP2



If you encounter the following,

- CMOS data becomes corrupted.*
- You forgot the supervisor or user password.*
- The overclocked settings in the BIOS resulted to the system's instability or caused system boot up problems.*

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 JP2 pins 2 and 3 to On. Wait for a few seconds and set JP2 back to its default setting, pins 1 and 2 On.
3. Now plug the power cord and power-on the system.



### Clearing CMOS Data using the EZ Clear® Function

EZ Clear® bypasses the manual process of using a jumper to clear the CMOS by simply using the reset and power buttons.

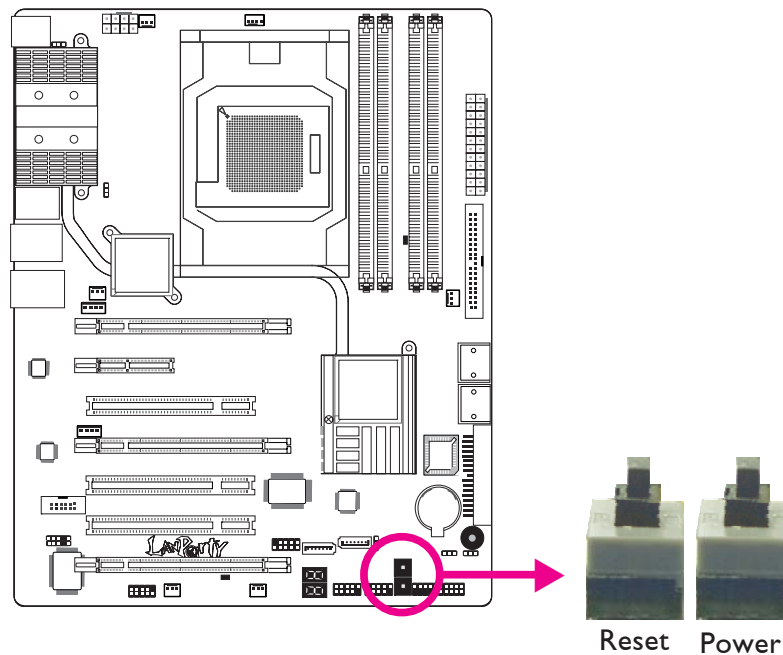


**Important:**

*EZ Clear® is supported only if standby power is present in the system.*

To use EZ Clear®:

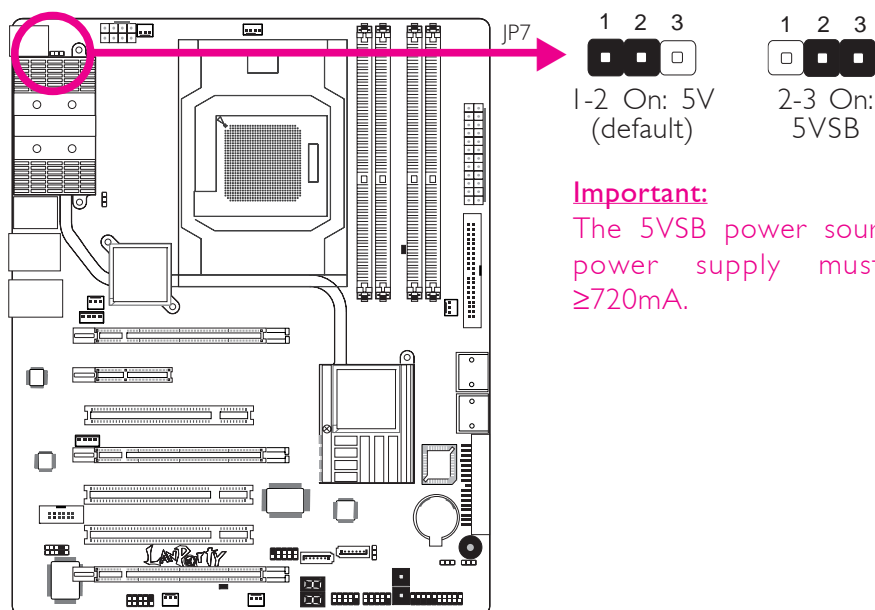
1. Make sure the standby power is present.
2. Using the EZ touch switches on the system board, first press the Reset button then the Power button simultaneously for approximately 4 seconds.



If the system board is already enclosed in a chassis, apply the same method using the Reset button and Power button located at the front panel of the chassis.

3. After 4 seconds, release the power button first then the Reset button.
4. The CMOS will restore the clock settings back to their default values.

## PS/2 Power Select

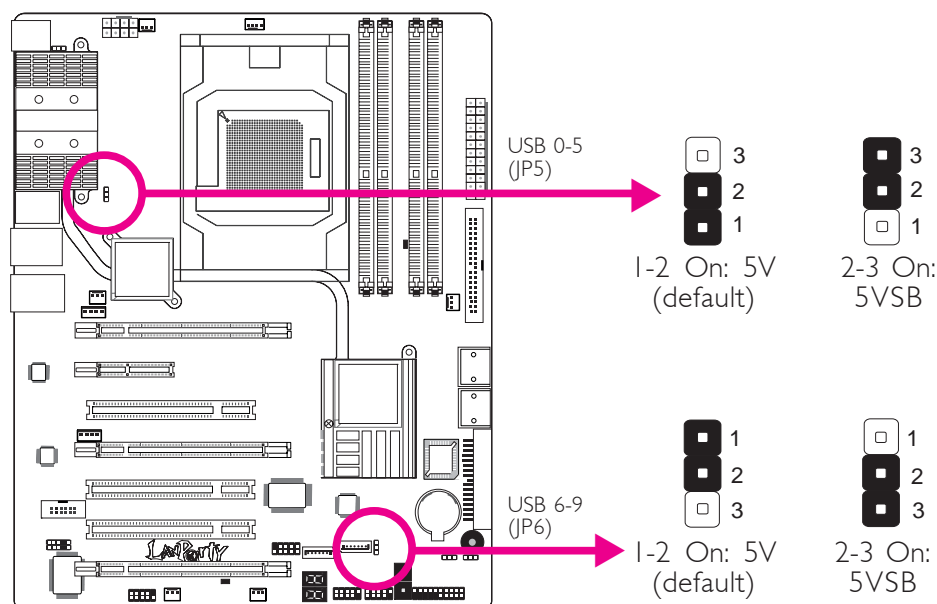


### Important:

The 5VSB power source of your power supply must support  $\geq 720\text{mA}$ .

Selecting 5VSB will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

## USB Power Select

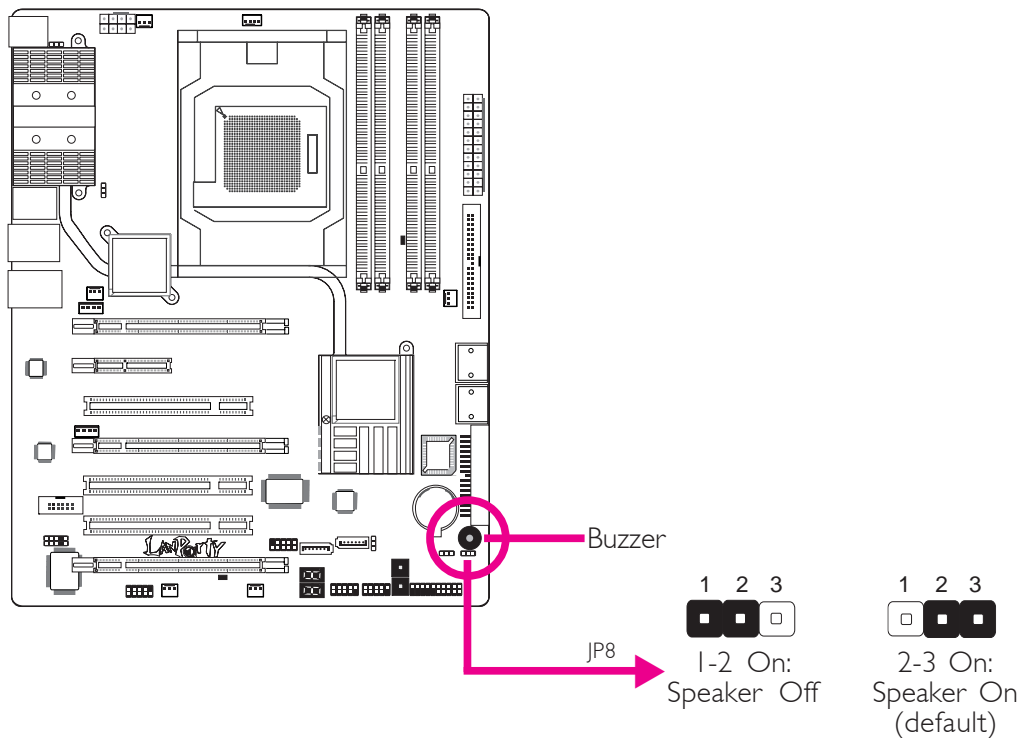


Selecting 5VSB will allow you to use the USB keyboard or USB mouse to wake up the system..

### Important:

If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5VSB power source of your power supply must support  $\geq 1.5\text{A}$ . For 3 or more USB ports, the 5VSB power source of your power supply must support  $\geq 2\text{A}$ .

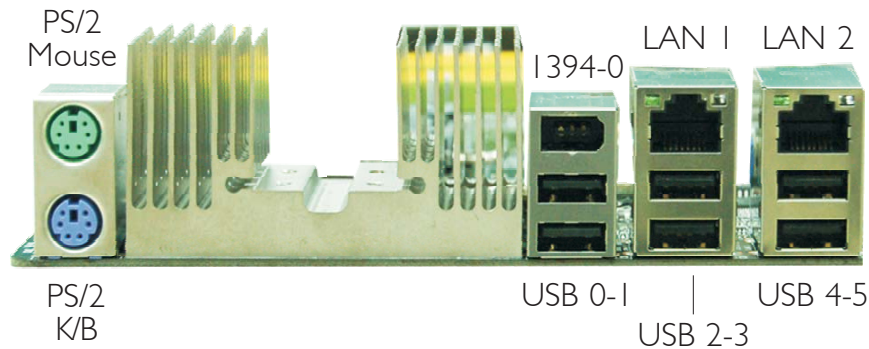
## Speaker On/Off Select



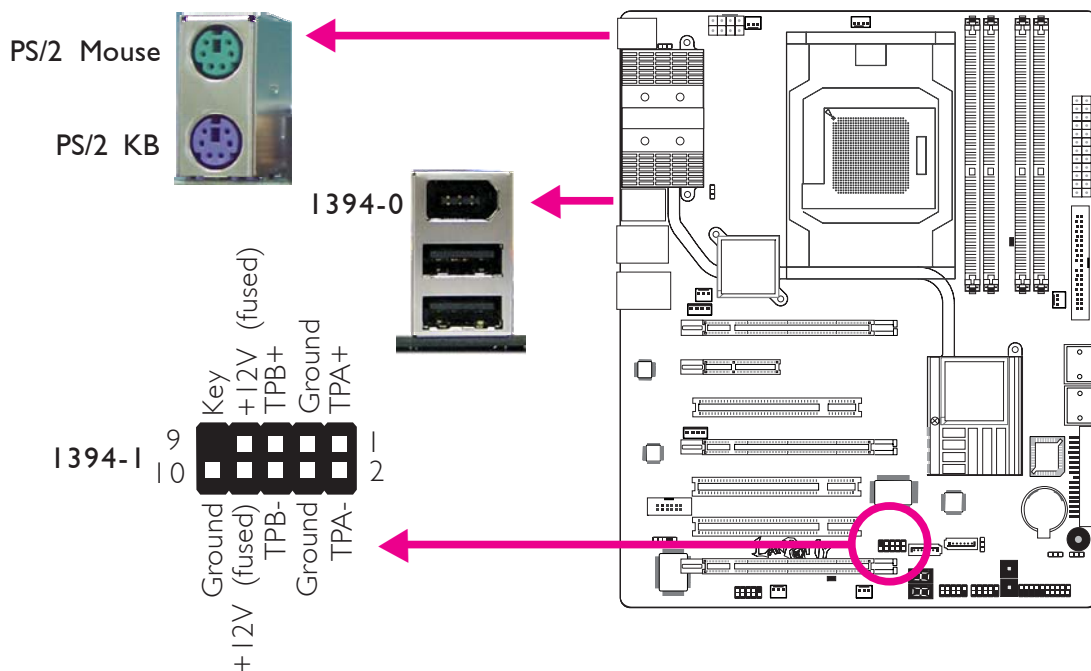
The system board is equipped with a buzzer which serves as the PC's speaker. By default the buzzer is "on" allowing you to hear the system's beep messages and warnings. If you intend to use an external speaker, turn this function off by setting JP8 pins 1 and 2 to On.



## Rear Panel I/O Ports



## PS/2 Ports and IEEE 1394 Ports



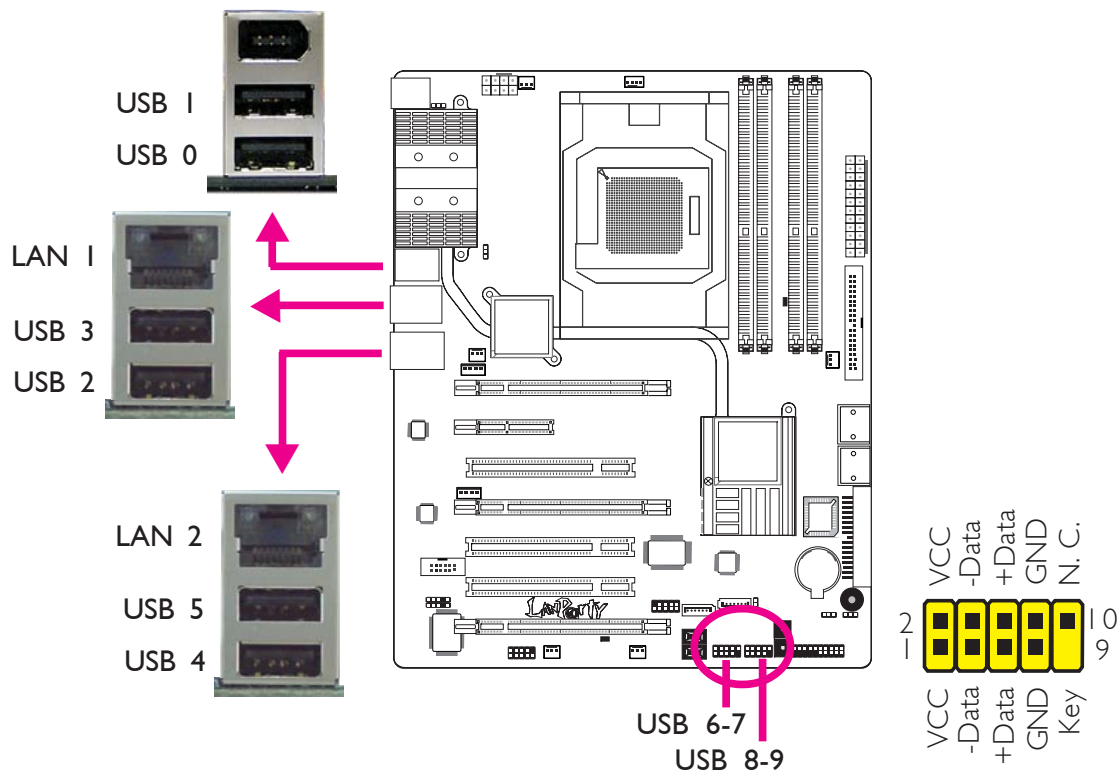
## PS/2 Mouse and PS/2 Keyboard Ports

These ports are used to connect a PS/2 mouse and a PS/2 keyboard.

## IEEE 1394 Ports

The IEEE 1394-0 port is used to connect audio/video devices or storage peripherals. The 10-pin connector allows you to connect an additional 1394 device. Your 1394 port may come 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 1394 port cable to this connector.

## USB Ports and LAN Ports



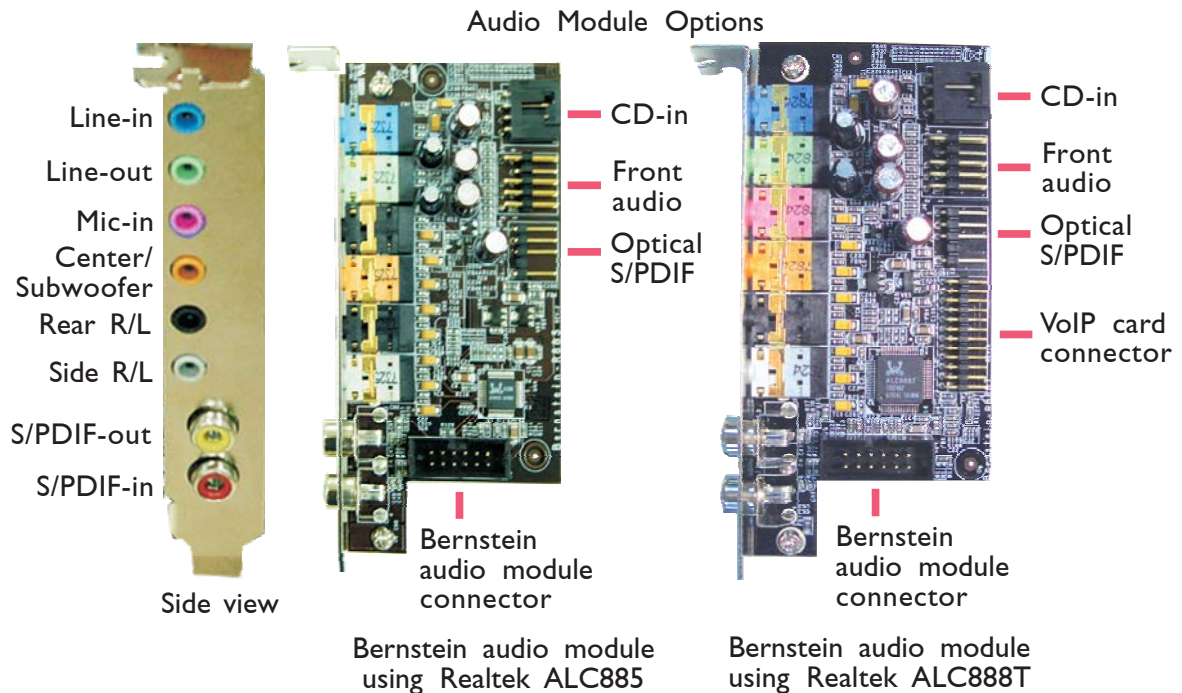
### USB Ports

The USB ports are used to connect USB 2.0/1.1 devices. The 10-pin connectors allow you to connect 4 additional USB 2.0/1.1 ports. Your USB ports may come 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 USB port cables to these connectors.

### LAN Ports

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

## Bernstein Audio Module



### 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 to the front right and front left speakers of the audio system.

### Mic-in Jack (Pink)

This jack is used to connect an external microphone.

### Center/Subwoofer Jack (Orange)

This jack is used to connect to the center and subwoofer speakers of the audio system.

### Rear Right/Left Jack (Black)

This jack is used to connect to the rear right and rear left speakers of the audio system.

### Side Right/Left Jack (Gray)

This jack is used to connect to the side left and side right speakers of the audio system.

### Coaxial RCA S/PDIF-in and SPDIF-out Jacks

These jacks are used to connect external audio output devices using coaxial S/PDIF cables.

### CD-in Connector

The CD-in connector is used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

### Front Audio Connector

The front audio connector is used to connect to the line-out and mic-in jacks that are at the front panel of your system.

### Optical S/PDIF Connector

The optical S/PDIF connector is used to connect an external audio output device using an optical S/PDIF cable.



#### Important:

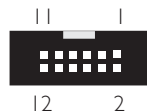
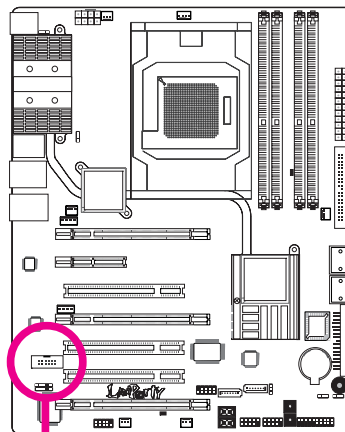
*DO NOT use optical S/PDIF and coaxial RCA S/PDIF at the same time.*

### Installing the Bernstein Audio Module

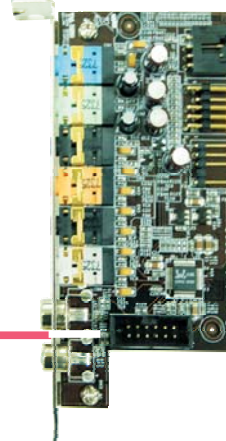
1. The Bernstein audio module connects to the system board by means of the provided audio cable.



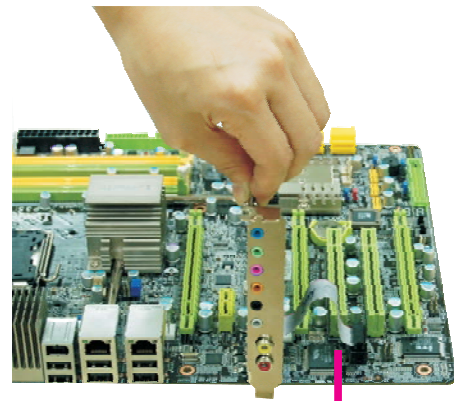
2. Insert one end of the cable to the Bernstein audio connector on the system board and the other end to the corresponding connector on the audio module.



Bernstein audio module connector



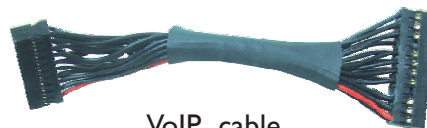
3. The length of the audio cable provides the option and flexibility of installing the module on any available expansion bracket slot at the rear of the system chassis. Remove the screw of the bracket where you want the audio module installed then remove the bracket. Place the Bernstein audio module on the expansion bracket slot then secure the module by replacing the bracket screw you removed earlier.



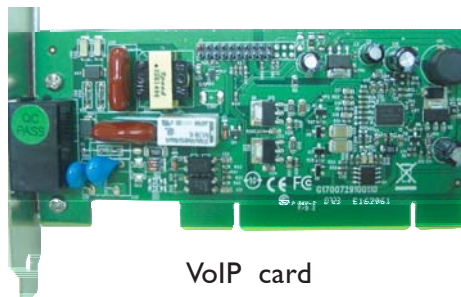
Audio cable

### Installing the VoIP Card (optional)

1. The cable included in the VoIP kit is used to connect the VoIP card to the Bernstein audio module.



VoIP cable

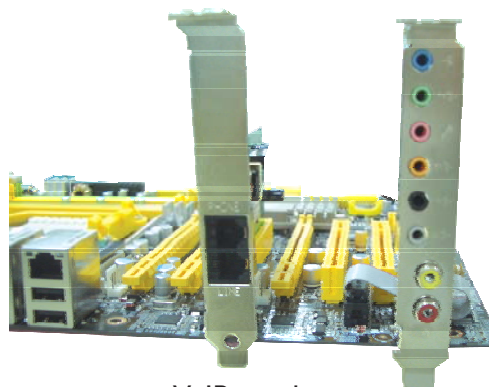


VoIP card

2. Install the VoIP card into an available expansion slot - near the Bernstein audio module you installed earlier.

#### **Important:**

To use VoIP, make sure the Bernstein audio module installed earlier uses Realtek ALC888T.

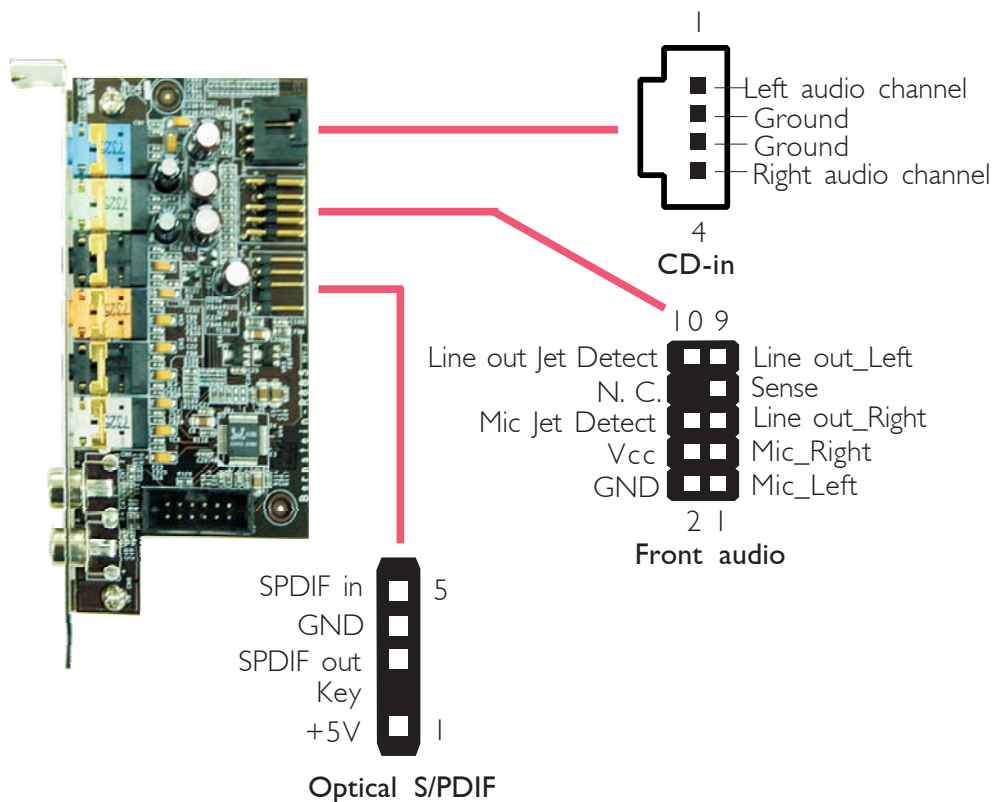
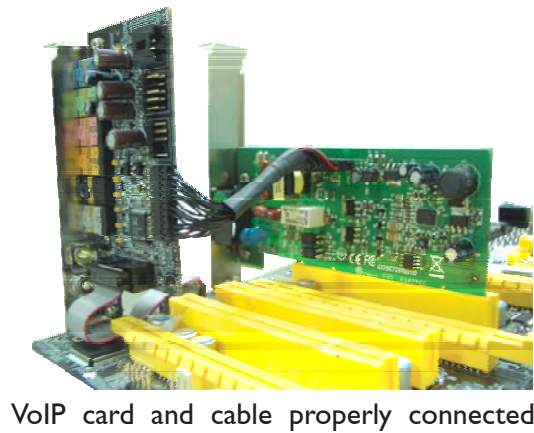
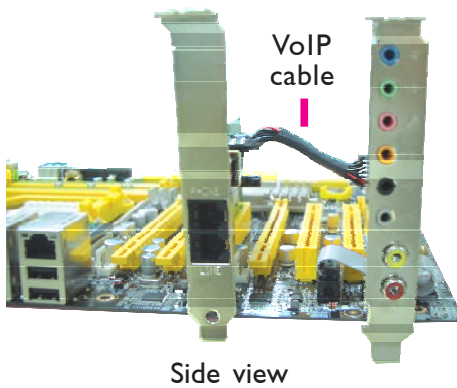
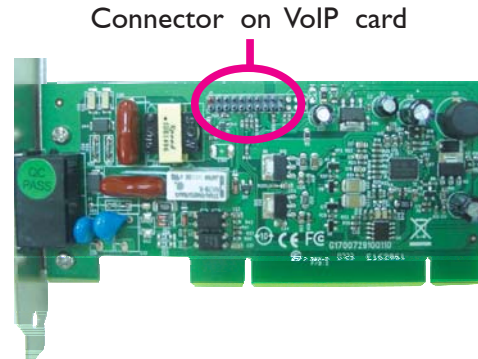
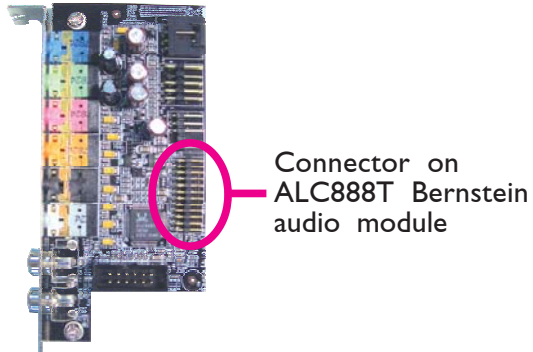


VoIP card

ALC888T Bernstein audio module

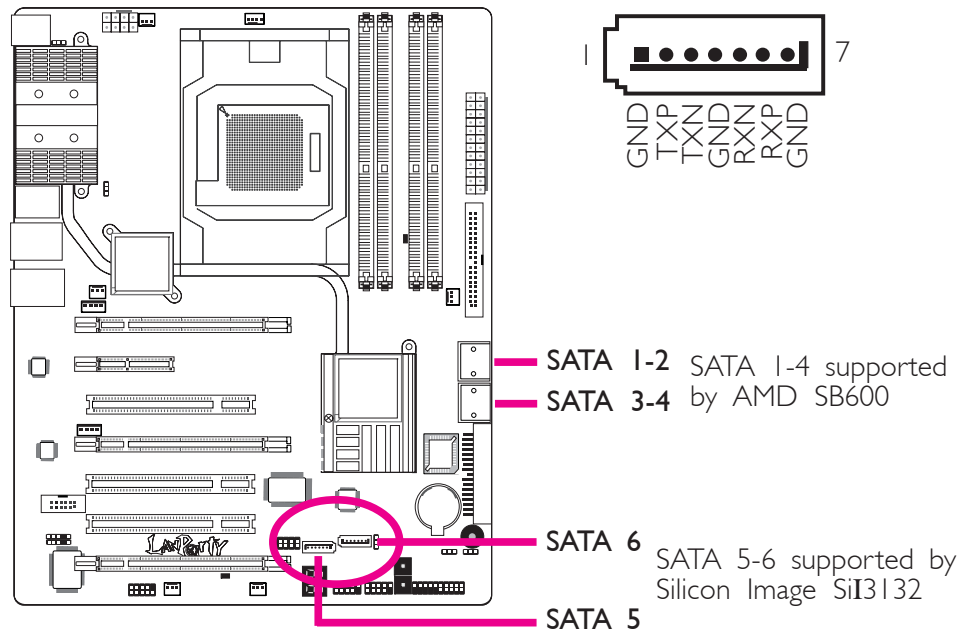


3. Connect one end of the VoIP cable to the Bernstein audio module and the other end to the connector on the VoIP card.



## I/O Connectors

### Serial ATA Connectors

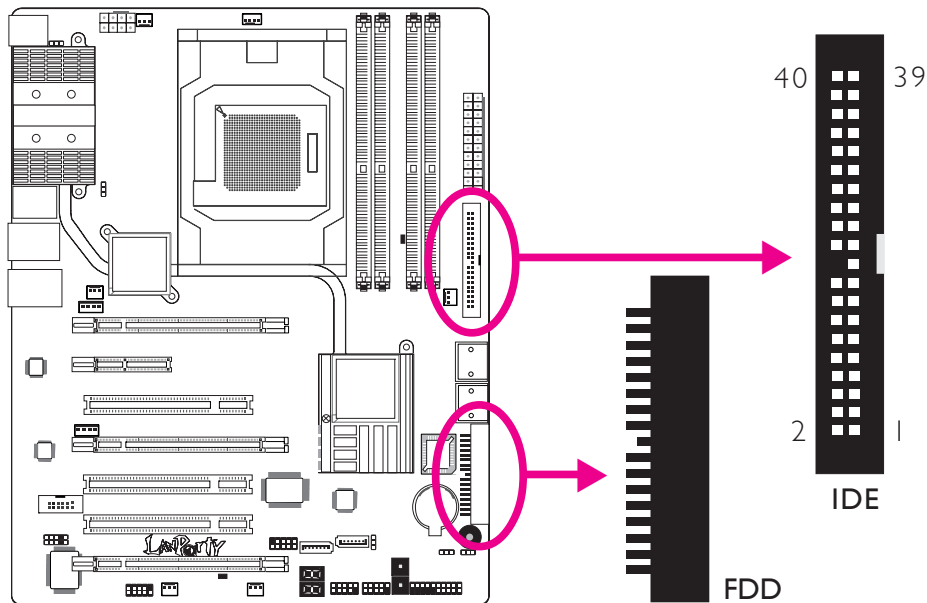


The Serial ATA (SATA) connectors are used to connect Serial ATA drives. Connect one end of the Serial ATA cable to the Serial ATA connector and the other end to your Serial ATA device.

### Configuring RAID

Refer to the RAID chapter in this manual for more information about creating RAID on Serial ATA drives.

## Floppy Disk Drive Connector and IDE Connector



### Floppy Disk Drive Connector

The 90° floppy disk drive connector is used to connect a floppy drive. It has a keying mechanism to prevent improper floppy cable installation. Insert one end of the floppy cable into this connector and the other end-most connector to the floppy drive. The colored edge of the cable should be aligned with pin 1 of this connector.

### IDE Disk Drive Connector

The IDE disk drive connector is used to connect 2 IDE disk drives. It has a keying mechanism to prevent improper IDE cable installation. An IDE cable have 3 connectors on them, one that plugs into this connector 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. The colored edge of the cable should be aligned with pin 1 of this connector.

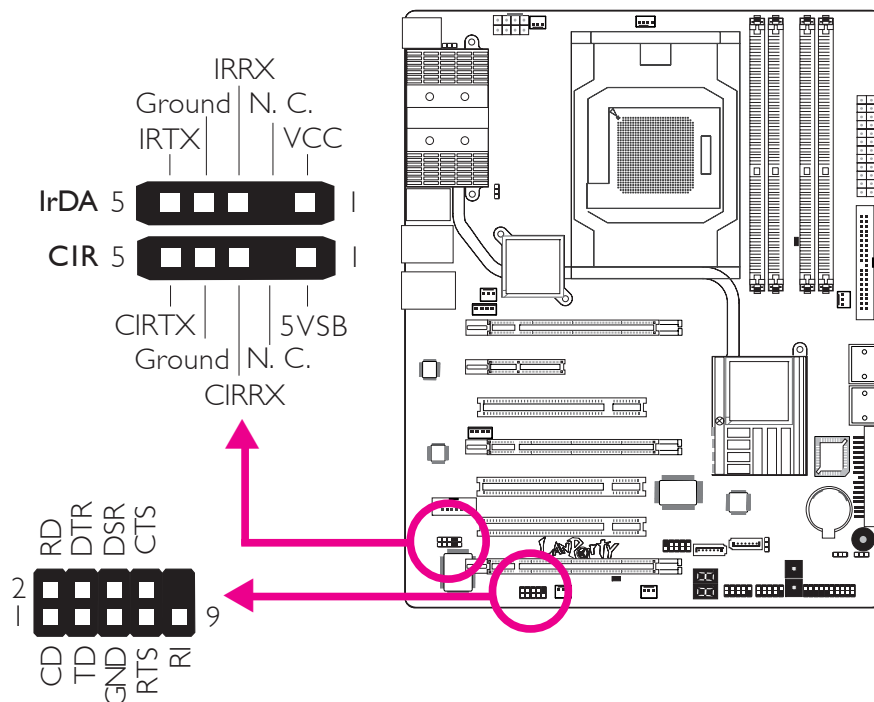


#### Note:

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.



## IrDA, CIR and Serial (COM) Connectors



### IrDA and CIR Connectors

These connectors are used to connect an IrDA module and/or CIR module.



#### Note:

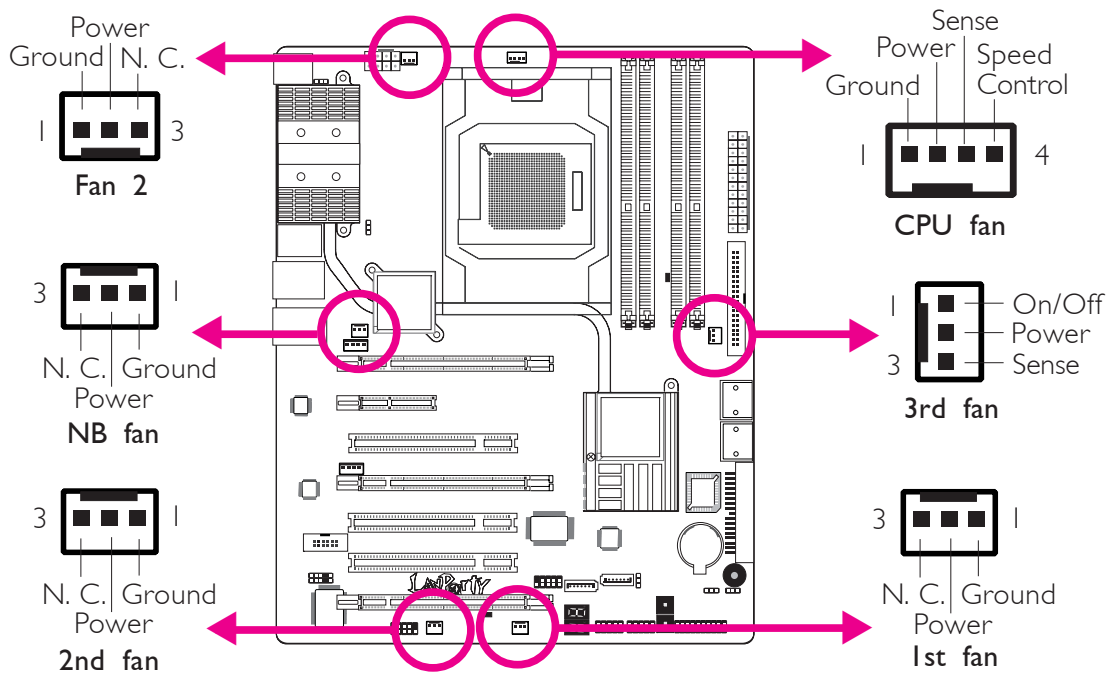
*The sequence of the pin functions on some IrDA/CIR cable may be reversed from the pin function defined on the system board. Make sure to connect the cable connector to the IrDA/CIR connector according to their pin functions.*

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

### Serial (COM) Connector

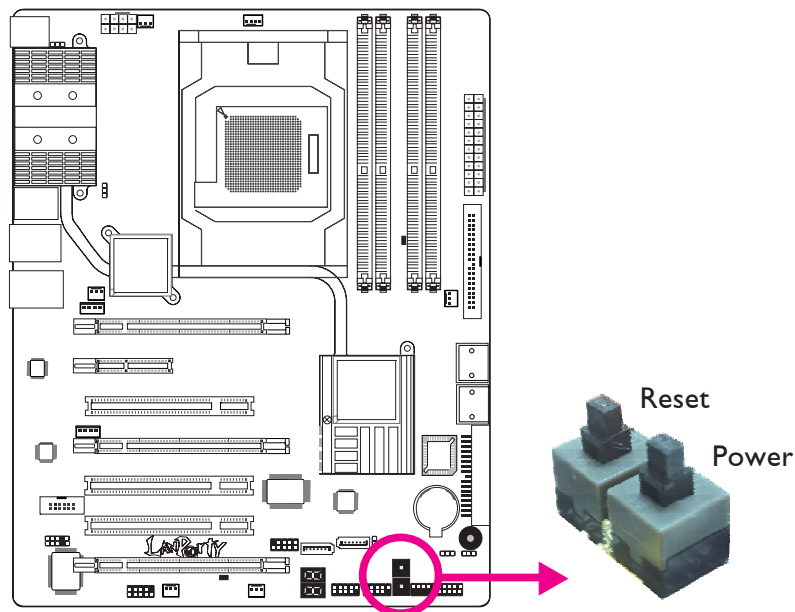
The serial (COM) connector is used to connect modems, serial printers, remote display terminals, or other serial devices. Your COM port may come mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the serial port cable to this connector. The colored edge of the cable should be aligned with pin 1 of this connector.

## Cooling Fan Connectors



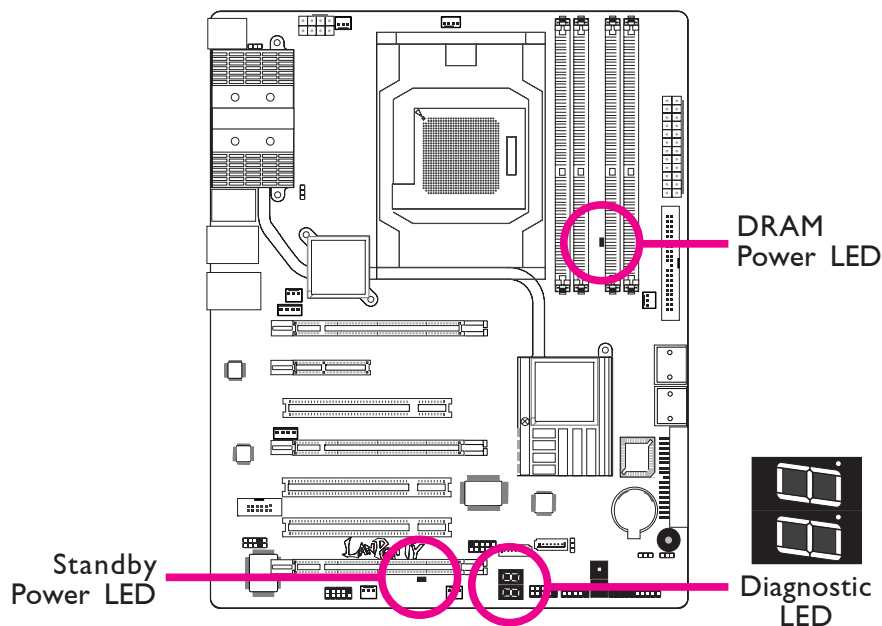
These fan connectors are used to connect cooling fans. Cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

## EZ Touch Switches



The presence of the power switch and reset switch on the system board are user-friendly especially to DIY users. They provide convenience in powering on and/or resetting the system while fine tuning the system board before it is installed into the system chassis.

## LEDs



### DRAM Power LED

This LED will light when the system's power is on.

### Standby Power LED

This LED will light when the system is in the standby mode.

### Diagnostic LED

The Diagnostic LED displays POST codes. POST (Power-On Self Tests) which is controlled by the BIOS is performed whenever you power-on the system. POST will detect the status of the system and its components. Each code displayed on the LED corresponds to a certain system status.

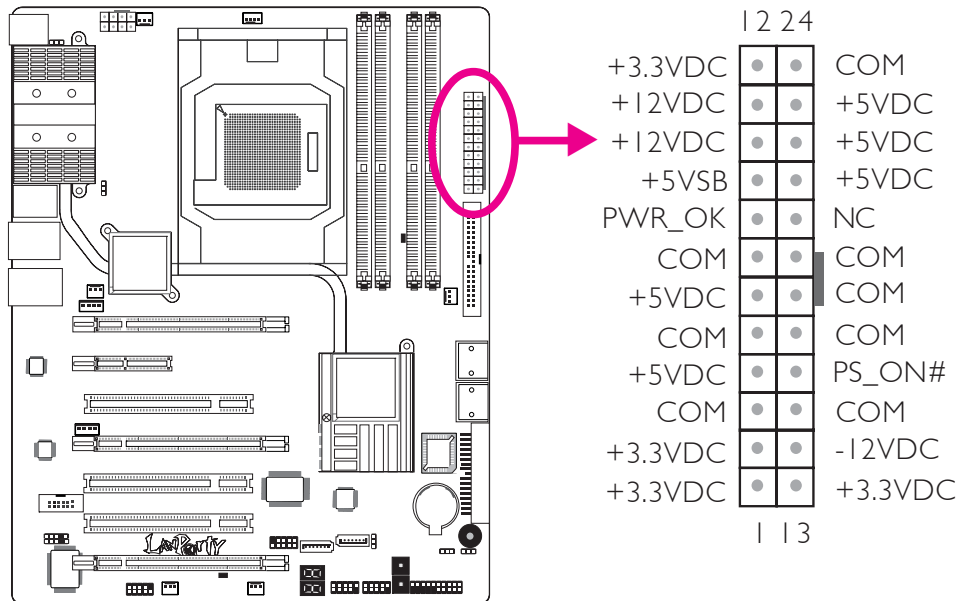


#### **Warning:**

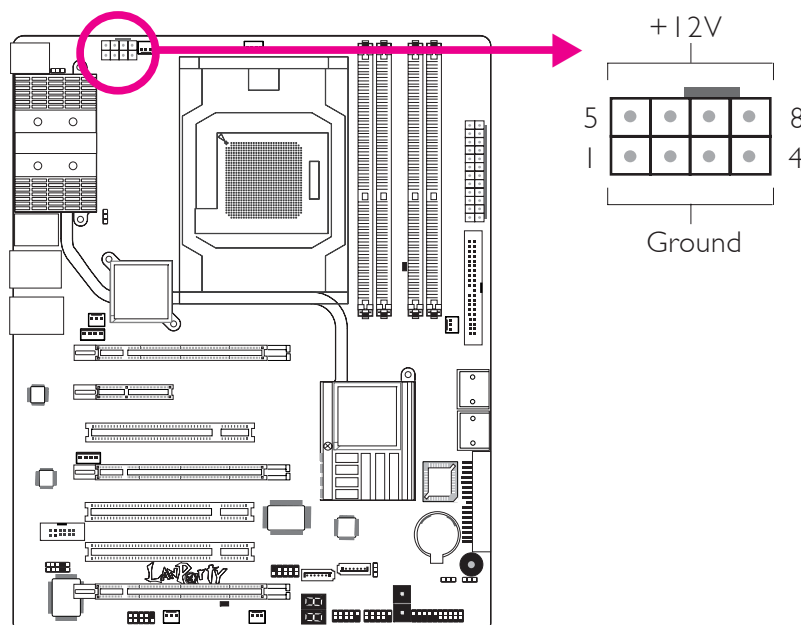
*When the DRAM Power LED and/or Standby Power LED lit red, it indicates that power is present on the DIMM sockets and/or PCI slots. Power-off the PC then unplug the power cord prior to installing any memory modules or add-in cards. Failure to do so will cause severe damage to the motherboard and components.*

## Power Connectors

Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into this connector:

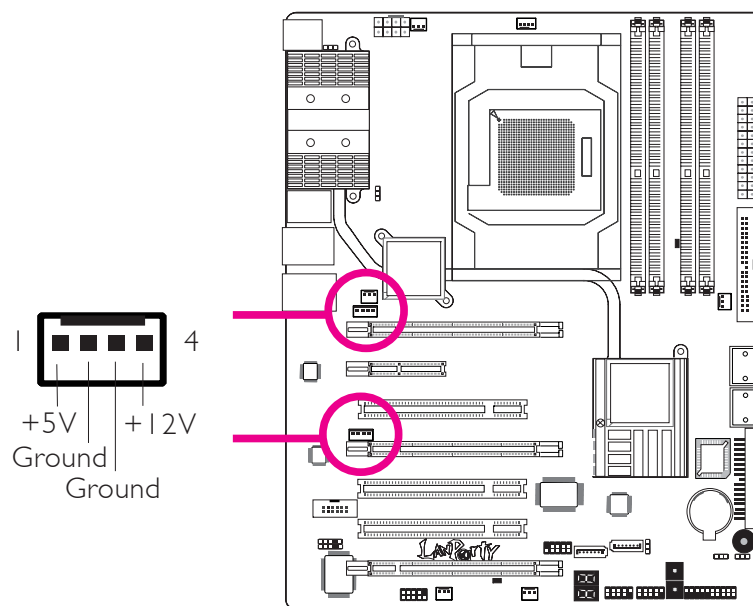


Your power supply unit may come with an 8-pin or 4-pin +12V power connector. The +12V power enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM). If available, it is preferable to use the 8-pin power; otherwise connect a 4-pin power to this connector:



The power connectors from the power supply unit are designed to fit the 24-pin and 8-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.

The FDD-type power connectors are additional power connectors. If you are using more than one graphics cards, we recommend that you plug power cables from your power supply unit onto the 5V/12V power connectors. This will provide more stability to the entire system. The system board will still work even if the additional power connector is not connected.



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.*

### Restarting the PC

Normally, you can power-off the PC by:

1. Pressing the power button at the front panel of the chassis.  
*or*
2. Pressing the power switch that is on the system board (note: not all system boards come with this switch).

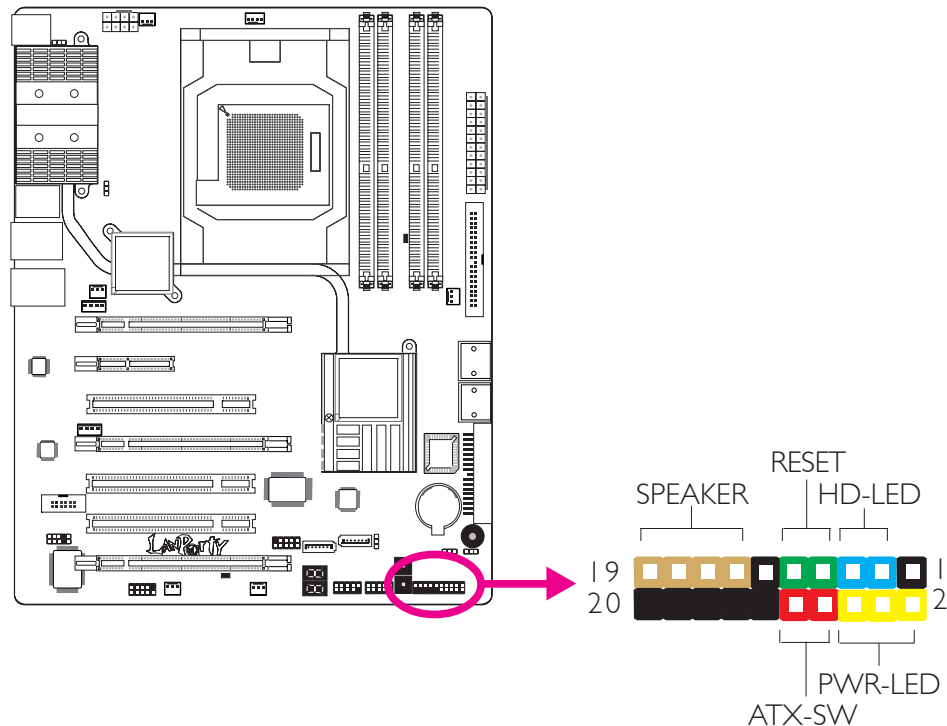
If for some reasons you need to totally cut off the power supplied to the PC, switch off the power supply or unplug the power cord. Take note though that if you intend to restart it at once, please strictly follow the steps below.

1. The time where power is totally discharged varies among power supplies. It's discharge time is highly dependent on the system's configuration such as the wattage of the power supply, the sequence of the supplied power as well as the number of peripheral devices connected to the system. Due to this reason, we strongly recommend that you wait for the Standby Power LED (refer to the "LEDs" section in this chapter for the location of the Standby Power LED) to lit off.
2. After the Standby Power LED has lit off, wait for 6 seconds before powering on the PC.

If the system board is already enclosed in a chassis which apparently will not make the Standby Power LED visible, wait for 15 seconds before you restore power connections. 15 seconds is approximately the time that will take the LED to lit off and the time needed before restoring power.

The above will ensure protection and prevent damage to the motherboard and components.

## Front Panel Connectors



### HD-LED: Primary/Secondary IDE LED

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

### RESET: Reset Switch

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

### SPEAKER: Speaker Connector

This connects to the speaker installed in the system chassis.

### ATX-SW: ATX Power Switch

Depending on the setting in the BIOS setup, this switch is a “dual function power button” that will allow your system to enter the Soft-Off or Suspend mode.

**PWR-LED: Power/Standby LED**

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

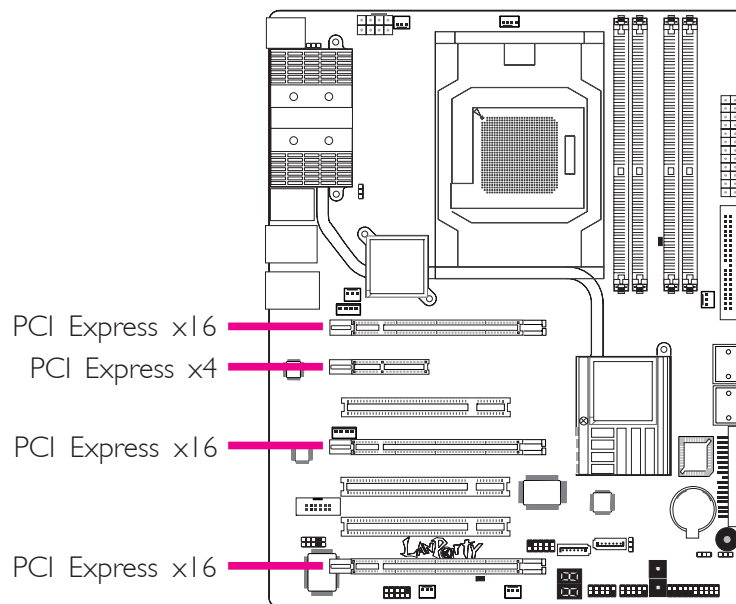
**Note:**

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

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



## PCI Express Slots



### PCI Express x16

Install PCI Express x16 graphics card, that comply to the PCI Express specifications, into the PCI Express x16 slot. To install a graphics card into the x16 slot, align the graphics card above the slot then press it down firmly until it is completely seated in the slot. The retaining clip of the slot will automatically hold the graphics card in place. Refer to the CrossFire chapter for more information.

### PCI Express Slots Configuration

Graphics Mode	Bandwidth			
	PCIE 1	PCIE 2	PCIE 3	PCIE 4
Single Graphics Mode	x16	x2 or x4*	x16	N.C.
	x16	x2 or x4*	x8	x8
2-way or 4-way CrossFire	x16	---	x16	N.C.
3-way CrossFire	x16	---	x8	x8
2-way CrossFire + Physics	x16	---	x8	x8

\* If PCIE 2 is set to x4 (in the BIOS), the system will not support Marvell 88E8053.

### PCI Express x4

Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x4 slot.

# Award BIOS Setup Utility

## Standard CMOS Features

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

Phoenix - AwardBIOS CMOS Setup Utility		
Standard CMOS Features		
Date <mm:dd:yy>	Mon, <b>Oct</b> 29 2007	Item Help Menu Level ▶ Change the day, month, year and century
Time <hh:mm:ss>	20 : 20 : 30	
▶ Primary IDE Master	None	
▶ Primary IDE Slave	ATAPI DVD D DH16D	
Drive A	1.44M, 3.5 in.	
Halt On	All, But Keyboard	
Base Memory	640K	
Extended Memory	1047552K	
Total Memory	1048576K	

↑↓→←: 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 1994 to 2079.

### 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.

## Primary IDE Master and Primary IDE Slave

To configure IDE drives, move the cursor to a field then press <Enter>. The following screen will appear:

Phoenix - AwardBIOS CMOS Setup Utility		
Primary IDE Master		
IDE HDD Auto-Detection	<b>Press Enter</b>	Item Help
Primary IDE Master	Auto	Menu Level ►►
Access Mode	Auto	To auto-detect the HDD's size, head... on this channel
Capacity	0 MB	
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.

## Primary IDE Master and Primary IDE Slave

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

## Access Mode

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

### Capacity

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

### Cylinder

This field displays the number of cylinders.

### Head

This field displays the number of read/write heads.

### Precomp

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

### Landing Zone

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

### Sector

This field displays the number sectors per track.

### Drive A

This field identifies the type of floppy disk drive installed.

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

### Halt On

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

<i>No Errors</i>	The system boot will not stop for any errors detected.
<i>All Errors</i>	The system boot will stop whenever the BIOS detects a non-fatal error.
<i>All, But Keyboard</i>	The system boot will not stop for a keyboard error; it will stop for all other errors.
<i>All, But Diskette</i>	The system boot will not stop for a disk error; it will stop for all other errors.
<i>All, But Disk/Key</i>	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

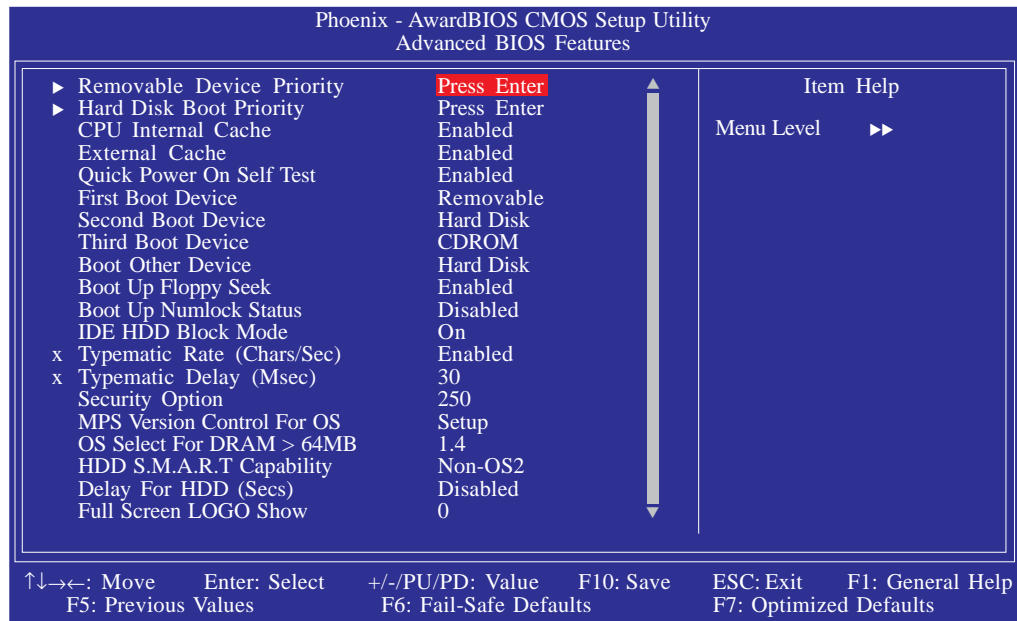
Displays the amount of extended memory detected during boot-up.

### 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.



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.

### Removable Device Priority

### Hard Disk Boot Priority

Refer to the following pages for more information on these submenus

### CPU Internal Cache and External Cache

These fields speed up the memory access. The default is Enabled, which provides better performance by enabling cache.

### Quick Power On Self Test

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

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

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

### 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.

### 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.

### 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.

## MPS Version Control for OS

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

## OS Select for DRAM > 64MB

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

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

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

### Delay For HDD (Secs)

This field is used to select the time that would delay the HDD controller's initial time. This is specially useful for some HDDs which will not be ready at first boot when you power-on the system.

### Full Screen Logo Show

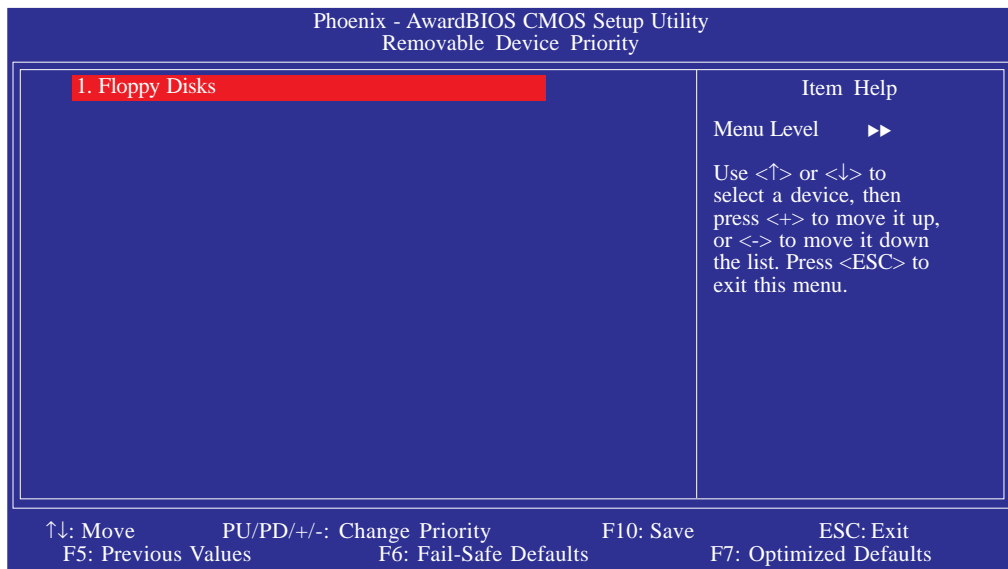
This field is applicable only if you want a particular logo to appear during system boot-up.

*Enabled* The logo will appear in full screen during system boot-up.

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

## Removable Device Priority

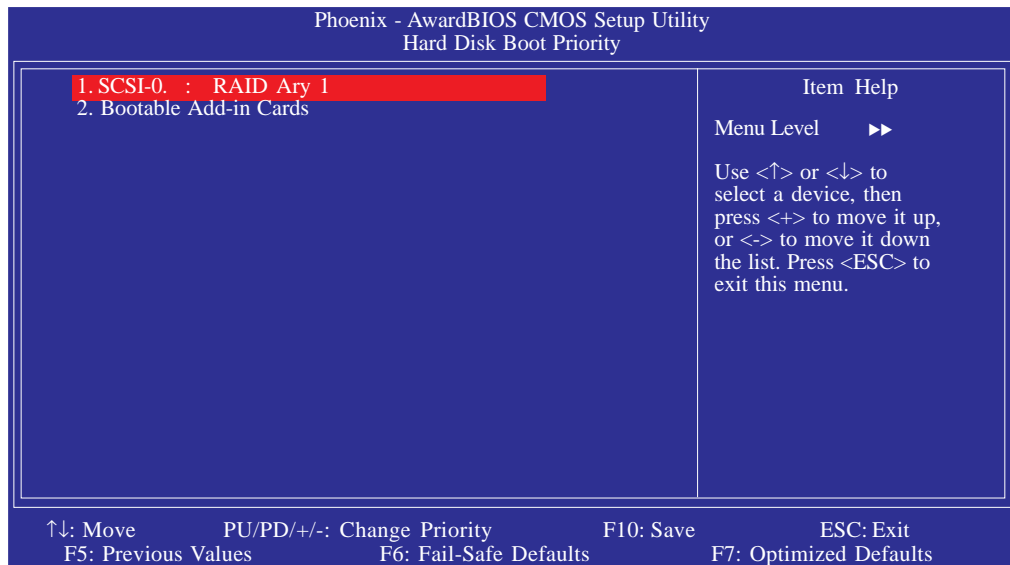
This field is used to select the boot sequence of the removable devices. Move the cursor to this field then press <Enter>. Use the Up or Down arrow keys to select a device then press <+> to move it up or <-> to move it down the list.



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

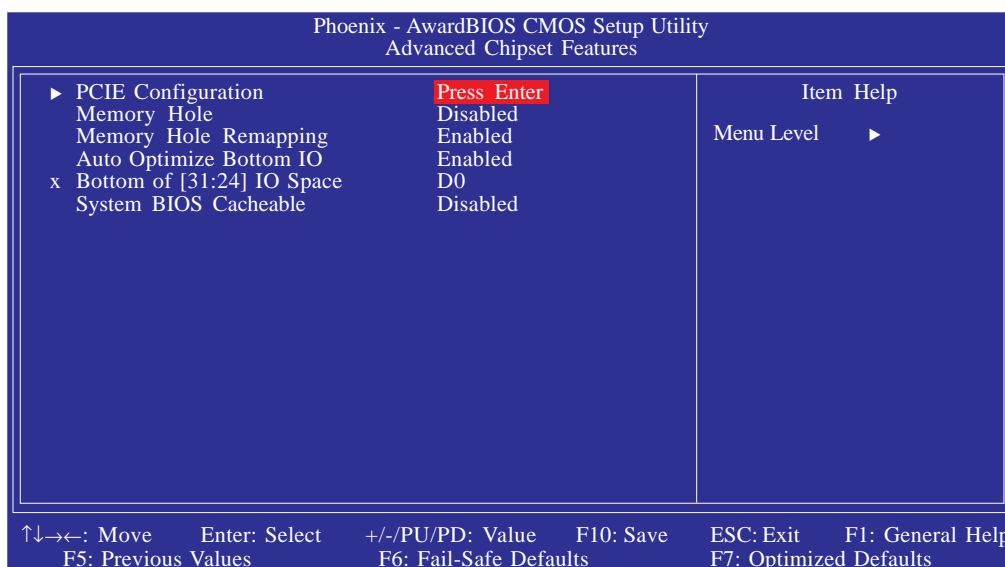
### Hard Disk Boot Priority

This field is used to select the boot sequence of the hard drives. Move the cursor to this field then press <Enter>. Use the Up or Down arrow keys to select a device then press <+> to move it up or <-> to move it down the list.



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

## Advanced Chipset Features



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.

### PCIE Configuration

Refer to the following pages for more information on this submenu.

### Memory Hole

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.

### Memory Hole Remapping

The options are Enabled and Disabled.

### Auto Optimize Bottom IO

When Enabled, the system automatically optimizes the maximum DRAM size after the kernel has assigned PCI resources.

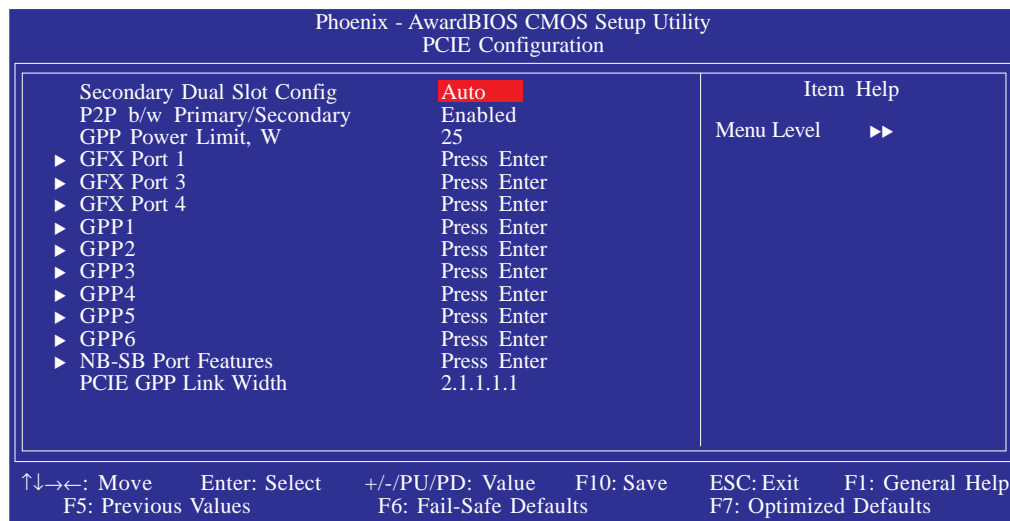
### Bottom of [31:24] IO Space

This field is used to enter the memory that will be remapped to another address. The minimum is 0000 and the maximum is 00FF.

### 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.

## PCIE Configuration



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

### Secondary Dual Slot Config

The options are Auto, Enabled and Disabled.

### P2P b/w Primary/Secondary

The options are Enabled and Disabled.

### GPP Power Limit, W

This field is used to enter the GPP's power limit. The minimum is 0 and the maximum is 255.

### GFX Port 1 to GFX Port 4

### GPPI to GPP 6

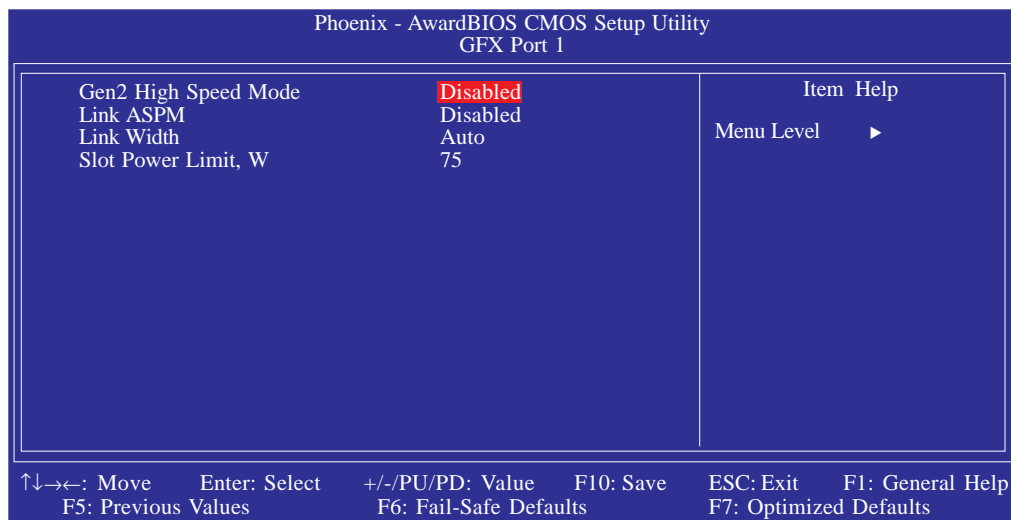
### NB-SB Port Features

### PCIE GPP Link Width

Refer to the following pages for more information on these submenus.

The options are 4.1.1 and 2.1.1.1.1.

## GFX Port 1 to GFX Port 4



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

## Gen2 High Speed Mode

The options are Disabled, Software Switch and Autonomous Switch.

## Link ASPM

The options are Disabled, L0s, L1, and L0s & L1.

## Link Width

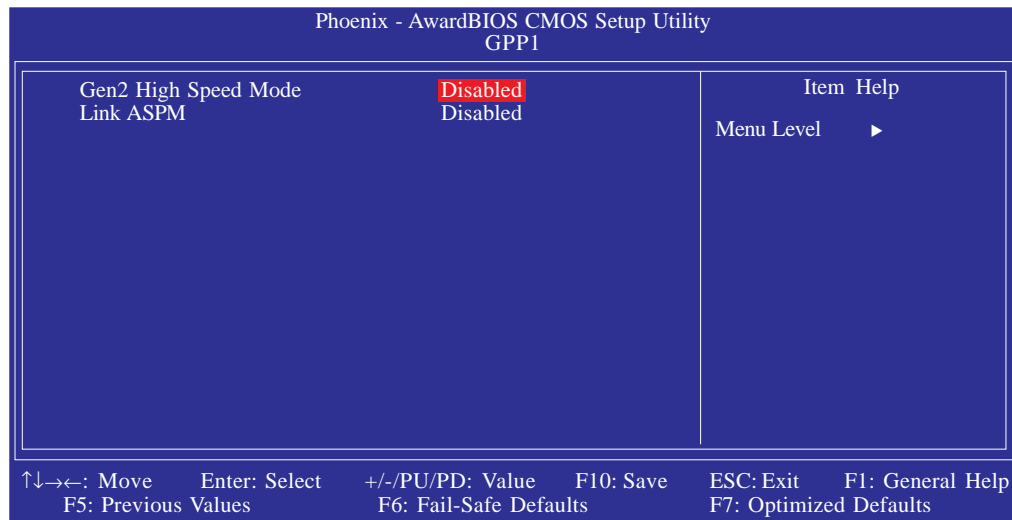
The options are Auto, x1, x2, x4, x8 and x16.

## Slot Power Limit, W

This field is used to enter the slot's power limit. The minimum is 0 and the maximum is 255.



## GPP1 to GPP6



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

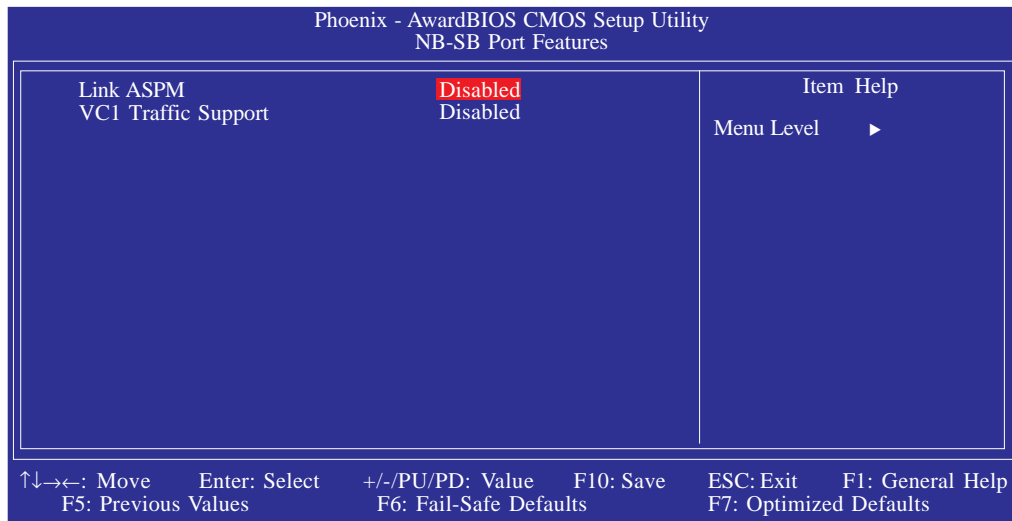
### Gen2 High Speed Mode

The options are Disabled, Software Switch and Autonomous Switch.

### Link ASPM

The options are Disabled, L0s, L1, and L0s & L1.

## NB-SB Port Features



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

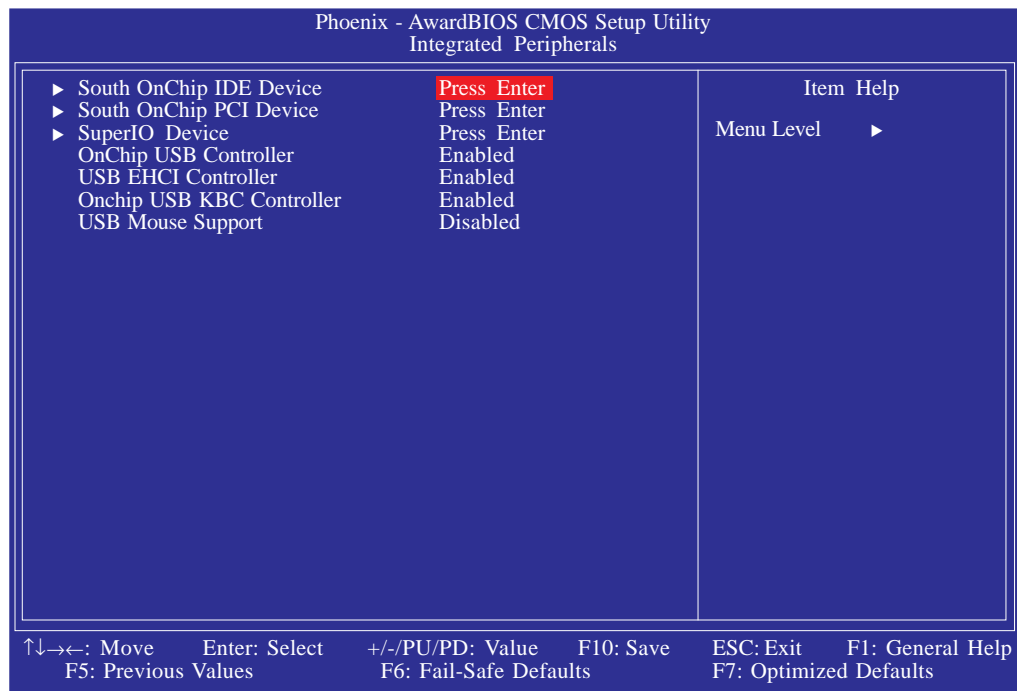
## Link ASPM

The options are Disabled and LI.

## VC1 Traffic Support

The options are Enabled and Disabled.

## Integrated Peripherals



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

South OnChip IDE Device

South OnChip PCI Device

SuperIO Device

OnChip USB Controller

Refer to the following pages for more information on these submenus.

USB EHCI Controller

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

This field is used to enable or disable USB 2.0.

### OnChip USB KBC Controller

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.

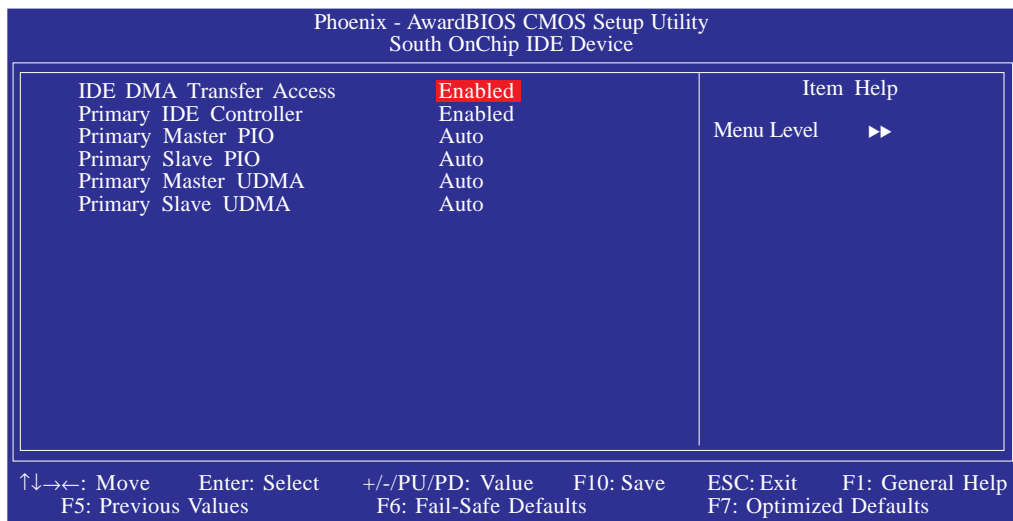
If a PS/2 keyboard is not available and you need to use a USB keyboard to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

### USB Mouse Support

Due to the limited space of the BIOS ROM, the support for legacy USB mouse (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 mouse is not available and you need to use a USB mouse to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

## South OnChip IDE Device



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

### IDE DMA Transfer Access

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

### Primary IDE Controller

This field is used to enable or disable the onboard IDE.

### Primary Master PIO and Primary 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.

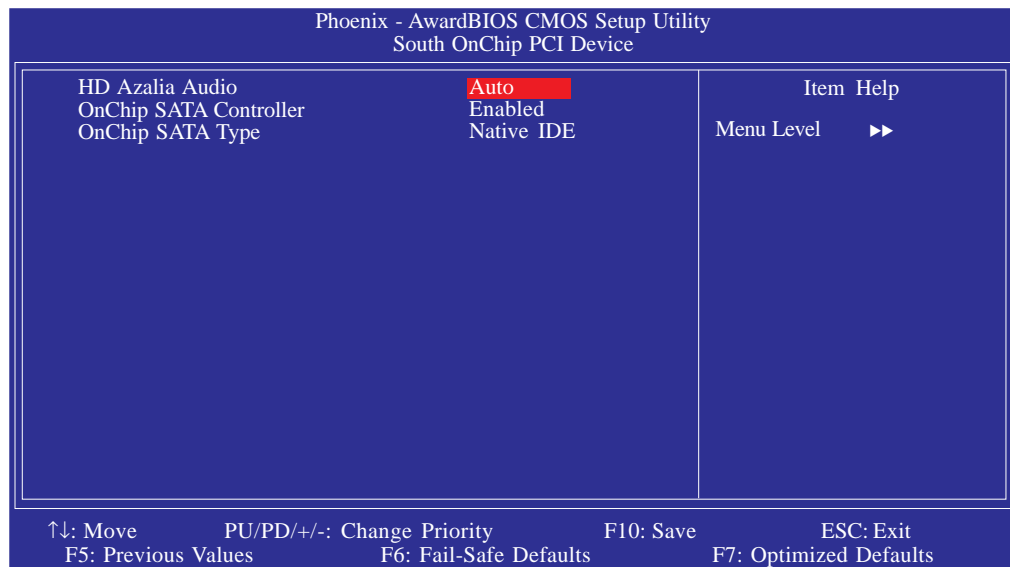
- Auto*      The BIOS will automatically set the system according to your hard disk drive's timing.
- Mode 0-4*      You can select a mode that matches your hard disk drive's timing. Caution: Do not use the wrong setting or you will have drive errors.

### Primary Master UDMA and Primary 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.

<i>Auto</i>	The BIOS will automatically detect the settings for you.
<i>Disabled</i>	The BIOS will not detect these categories.

## South OnChip PCI Device



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

### HD Azalia Audio

This field is used to enable or disable the onboard audio.

### OnChip SATA Controller

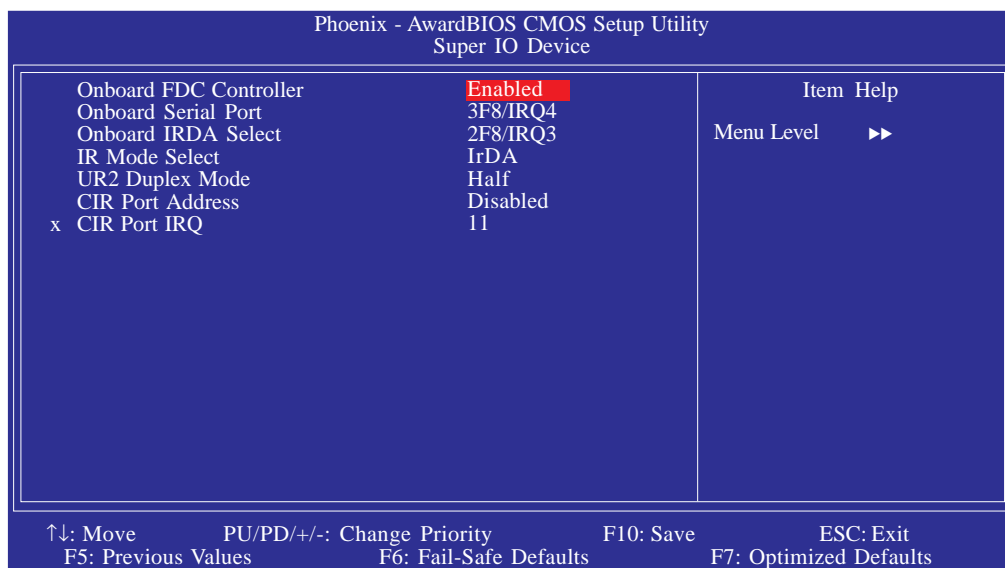
This field is used to enable or disable the onboard SATA supported by the AMD SB600.

### OnChip SATA Type

This field is used to configure the SATA devices supported by the AMD SB600.

- Native IDE* This option configures the Serial ATA drives as Parallel ATA storage devices.
- RAID* This option allows you to create RAID on Serial ATA devices.
- Legacy IDE* This option configures the Serial ATA drives as Legacy IDE storage devices.

## Super IO Device



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

## Onboard FDC Controller

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

## Onboard Serial Port

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

## Onboard IrDA Select

*3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3*    Allows you to manually select an I/O address for the onboard IrDA.  
*Disabled*       Disables the onboard IrDA.



### IR 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.

### UR2 Duplex Mode

<i>Half</i>	Data is completely transmitted before receiving data.
<i>Full</i>	Transmits and receives data simultaneously.

### CIR Port Address

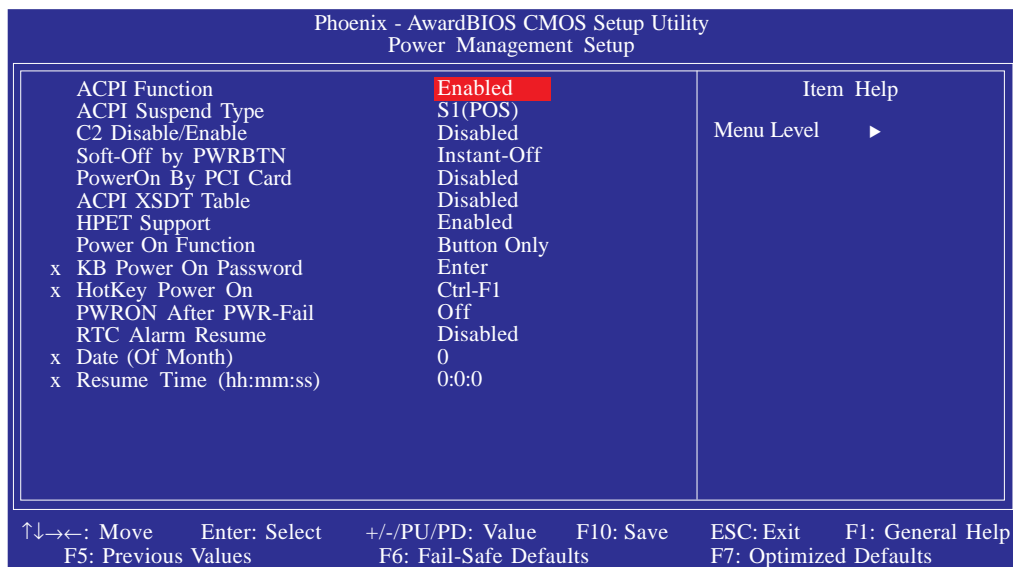
This field is used to select an I/O address for the CIR device.

### CIR Port IRQ

This field is used to select an IRQ for the CIR device.

## Power Management Setup

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



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. If you want to use the Suspend to RAM function, make sure this field is enabled then select "S3(STR)" in the field below.

### 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.

### C2 Disable/Enable

The options are Enabled and Disabled.

### Soft-Off by PWRBTN

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

- |                     |   |
|---------------------|---|
| <i>Delay 4 Sec.</i> | 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. |
| <i>Instant-Off</i>  | Pressing and then releasing the power button at once will immediately power off your system.  |

### PowerOn By PCI Card

- |                 |  |
|-----------------|--|
| <i>Enabled</i>  | 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. |
| <i>Disabled</i> | The system will not wake up despite access to the PCI card.  |

### ACPI XSDT Table

The options are Enabled and Disabled.

### HPET Support

The options are Enabled and Disabled.

### Power On Function

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

<i>Button only</i>	Default setting. Uses the power button to power on the system.
<i>Password</i>	When this option is selected, set the password you would like to use to power-on the system in the “KB Power On Password” field.
<i>Hot Key</i>	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.
<i>MS Move&amp;Click</i>	When this option is selected, move or click the mouse to power-on the system.
<i>Any Key</i>	Press any key to power-on the system.
<i>Keyboard 98</i>	When this option is selected, press the “wake up” key of the Windows® 98 compatible keyboard to power-on the system.

### KB Power On Password

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

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

### Hot Key Power On

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

### PWRON After PWR-Fail

<i>Off</i>	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.
<i>On</i>	When power returns after an AC power failure, the system will automatically power-on.
<i>Former-Sts</i>	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.

### RTC Alarm Resume

<i>Enabled</i>	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)" and "Resume Time" 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.
<i>Disabled</i>	Disables the automatic power-on function. (default).

### Date (of Month)

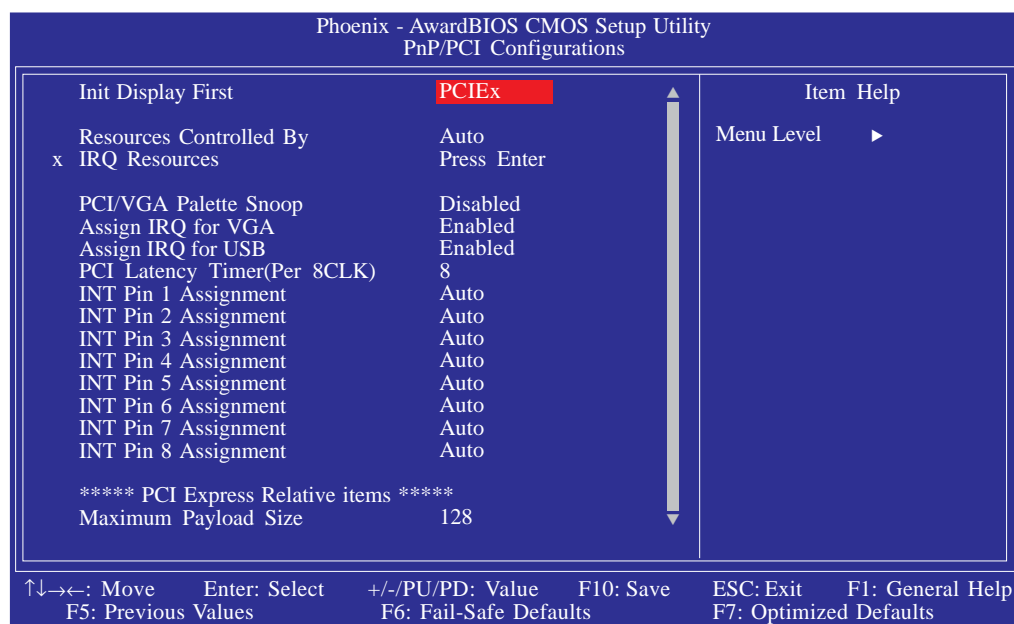
<i>0</i>	The system will power-on everyday according to the time set in the "Time (hh:mm:ss) Alarm" field.
<i>1-31</i>	Select a date you would like the system to power-on. The system will power-on on the set date, and time set in the "Time (hh:mm:ss) Alarm" field.

### Resume Time (hh:mm:ss)

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) " field, the time set in this field must be later than the time of the RTC set in the Standard CMOS Features submenu.

## PnP/PCI Configurations

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



The screen above list all the fields available in the PnP/PCI Configurations 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.

### Init Display First

- PCIEx*      When the system boots, it will first initialize PCI Express.  
*PCI Slot*    When the system boots, it will first initialize PCI.

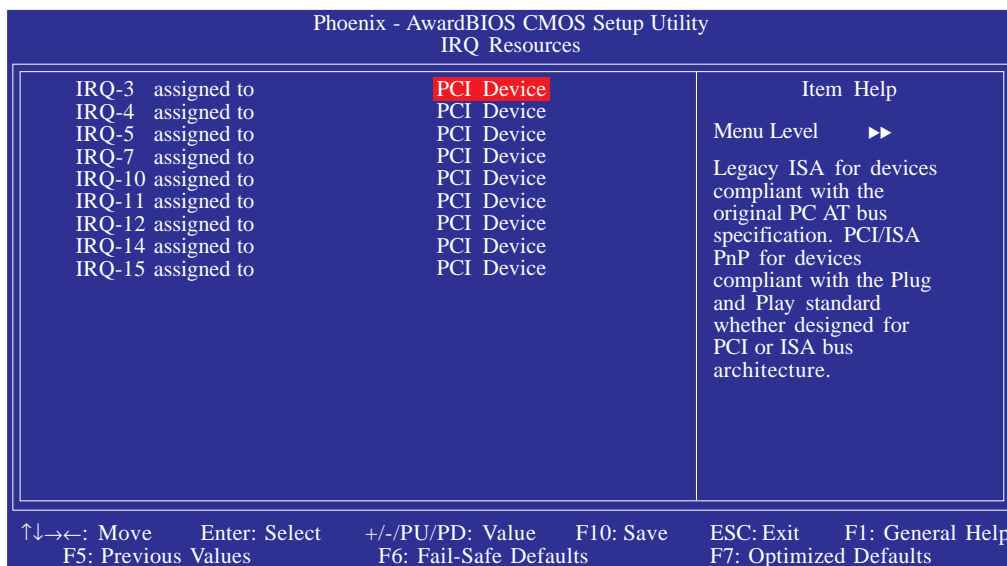
### Resources Controlled By

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 in the "IRQ Resources" field.

## IRQ Resources

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



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.

## Assign IRQ for VGA

When Enabled, the system automatically assigns an IRQ for the VGA card installed. Your VGA card will need an IRQ only when using the video capture function of the card. If you are not using this function and a new device requires an IRQ, you can set this field to Disabled. The IRQ (previously occupied by the VGA card) will be available for your new device.

### Assign IRQ for USB

When Enabled, the system automatically assigns an IRQ for the USB device connected to your system. However, if you are not using USB devices and an ISA slot requires an IRQ, set this field to Disabled. The IRQ previously occupied by the USB device will be available for the ISA slot.

### PCI Latency Timer (Per 8CLK)

This feature is used to select the length of time each PCI device will control the bus before another takes over. The larger the value, the longer the PCI device can retain control of the bus. Since each access to the bus comes with an initial delay before any transaction can be made, low values for the PCI Latency Timer will reduce the effectiveness of the PCI bandwidth while higher values will improve it.

### INT Pin 1 Assignment to INT Pin 8 Assignment

By default, a device is automatically assigned to each INT. You can also manually assign an INT for each device.

### Maximum Payload Size

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



Phoenix - AwardBIOS CMOS Setup Utility		
PC Health Status		
Shutdown Temperature	85°C/185°F	
CPUFan Fully ON If CPUTemp	> 50°C	
CPUFan Turn OFF If CPUTemp	< 25°C	
SYSFan Fully ON If SYSTemp	> 35°C	
SYSFan Turn OFF If SYSTemp	< 25°C	
NB Fan Fully ON If NB Temp	> 55°C	
NB Fan Turn OFF If NB Temp	< 25°C	
CPU Core Voltage	1.20V	
DRAM Voltage	1.79V	
VCC SB Voltage	1.20V	
VTT +1.2V Voltage	1.18V	
ATX +3.3V Voltage	3.28V	
ATX +12V Voltage	11.90V	
+5V Dual Voltage	4.97V	
Battery Voltage	3.36V	
CPU Core Temperature	39°C	
PWM Area Temperature	33°C	
CHIPSET Temperature	34°C	
CPU Fan Fan Speed	2872 RPM	
CHS Fan Speed	0 RPM	
CHIPSET Fan Speed	0 RPM	

Item

Help

Menu Level

↑↓←→: Move

Enter: Select

F5: Previous Values

+/-/PU/PD: Value

F10: Save

F6: Fail-Safe Defaults

ESC: Exit

F1: General Help

F7: Optimized Defaults

The screen above lists all the fields available in the PC Health Status 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.

You can prevent the system from overheating by selecting a temperature at which the system will shutdown. If the system detected that its temperature exceeded the one set in this field, it will automatically shutdown.

This field is used to select the CPU's temperature at which the CPU fan will rotate at full speed.

This field is used to select the CPU's temperature at which the CPU fan will rotate at a start speed which is the slowest speed.



Note:

- I. If the CPU temperature runs between the highest (set in the “CPUFan Fully On If CPUTemp” field) and lowest (set in the “CPUFan Turn Off If CPUTemp” field) temperature, the system will automatically adjust the CPU fan’s speed according to the temperature.

2. If you want to reduce the CPU fan's noise or prevent CPU overheat, select a lower temperature in the "CPUFan Fully On If CPUTemp" field to allow the CPU fan to rotate full speed at the selected lower temperature.

### SYSFan Fully On If SYSTemp

This field is used to select the system's temperature at which the chassis fan will rotate at full speed.

### SYSFan Turn Off If SYSTemp

This field is used to select the system's temperature at which the chassis fan will rotate at a start speed which is the slowest speed.



**Note:**

*If the system's temperature runs between the highest (set in the "SYSFan Fully On If SYSTemp" field) and lowest (set in the "SYSFan Turn Off If SYSTemp" field) temperature, the system will automatically adjust the chassis fan's speed according to the temperature.*

### NB Fan Fully On If NB Temp

This field is used to select the Northbridge chip's temperature at which the chip's fan will rotate at full speed.

### NB Fan Turn Off If NB Temp

This field is used to select the Northbridge chip's temperature at which the chip's fan will rotate at a start speed which is the slowest speed.



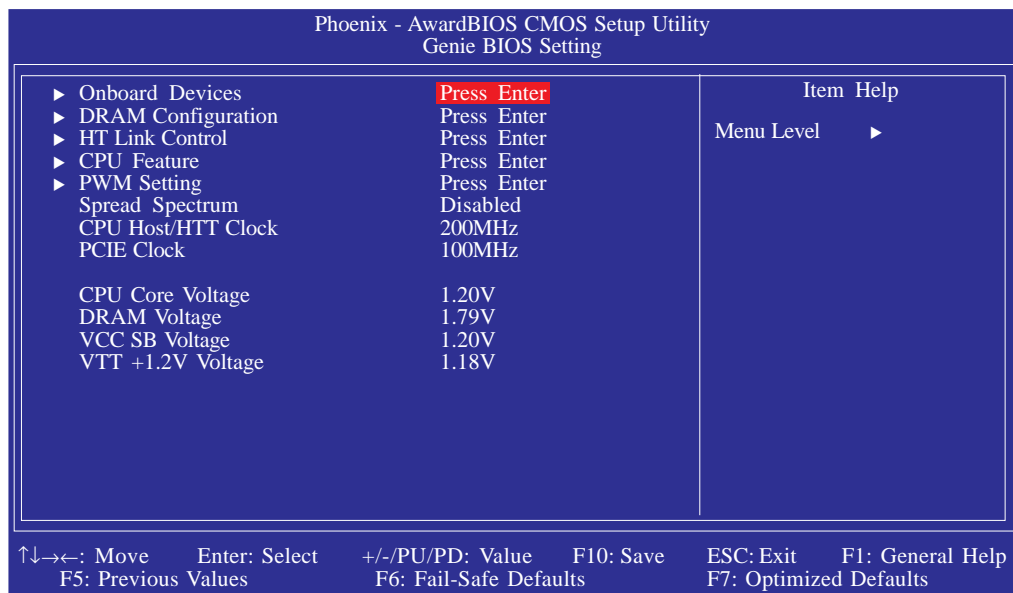
**Note:**

*If the Northbridge chip's temperature runs between the highest (set in the "NB Fan Fully On If NB Temp" field) and lowest (set in the "NB Fan Turn Off If NB Temp" field) temperature, the system will automatically adjust the fan speed of the Northbridge chip according to the temperature.*

### CPU Core Voltage to CHIPSET Fan Speed

These fields will show the output voltage, temperature and fan speed of the monitored devices or components.

## Genie BIOS Setting



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

### Onboard Devices

### DRAM Configuration

### HT Link Control

### CPU Feature

### PWM Setting

### Spread Spectrum

Refer to the following pages for more information on these submenus.

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

### CPU Host/HTT Clock

This field is used to enter a CPU Host/HTT Clock value. The minimum is 200 and the maximum is 700.

### PCIE Clock

This field is used to enter the PCIE clock. The minimum is 100 and the maximum is 250.

### CPU Core Voltage

This field will show the CPU's current voltage.

### DRAM Voltage

This field will show the DRAM's current voltage.

### VCC SB Voltage

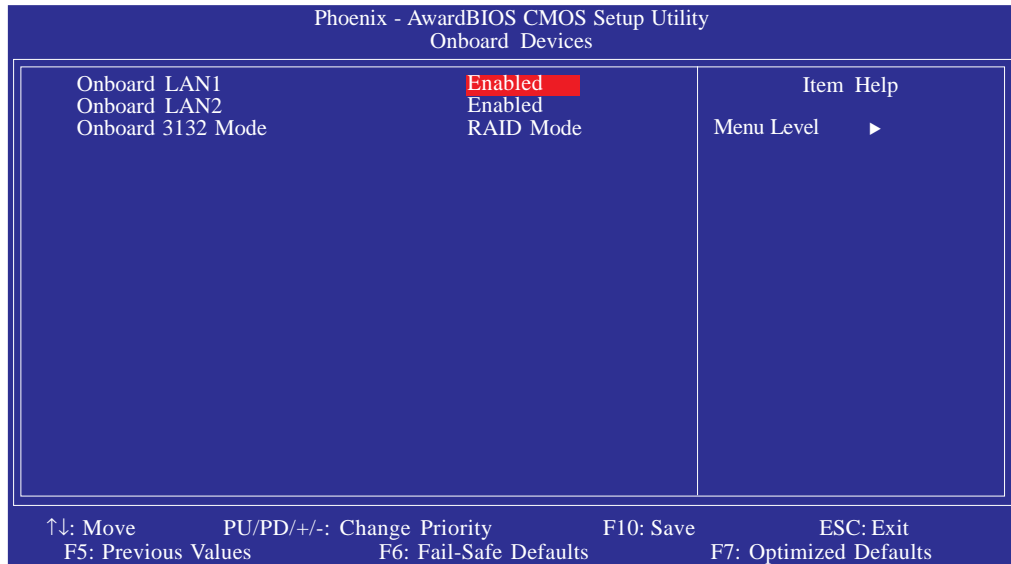
This field will show the Southbridge's current voltage.

### VTT 1.2 Voltage

This field will show the VTT's current voltage.

## Onboard Devices

Move the cursor to this field and press <Enter>, the following screen will appear:



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

## Onboard LAN 1 and Onboard LAN 2

*Enabled*      The system automatically detects the onboard LAN ports.

*Disabled*     Disables the onboard LAN ports.

## Onboard 3132 Mode

This field is used to configure the SATA devices supported by the Silicon Image Sil3132.

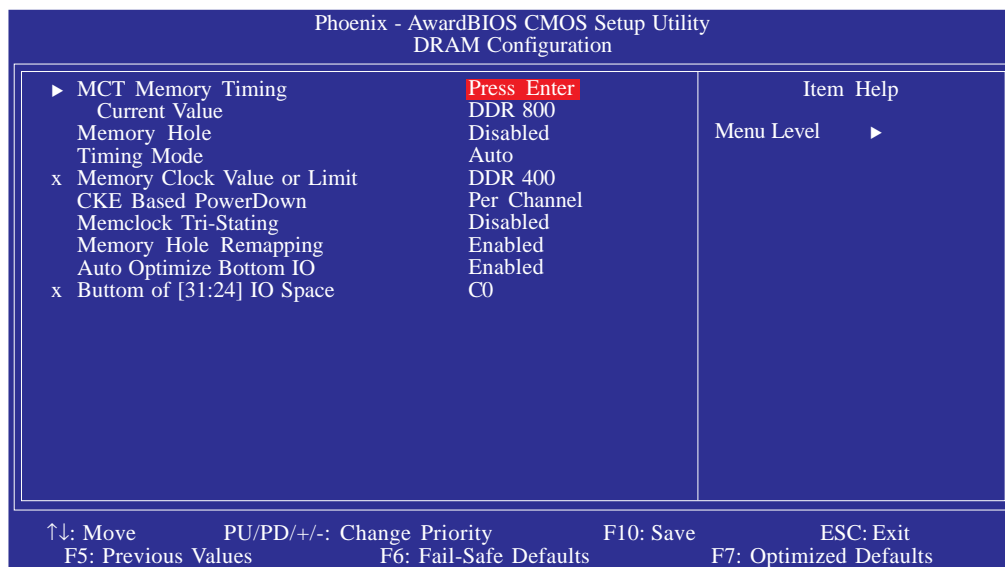
*Mass Storage*    This option configures the Serial ATA drives as Parallel ATA storage devices.

*RAID Mode*      This option allows you to create RAID on Serial ATA devices.

*Disabled*        Disables the Sil3132's SATA function.

## DRAM Configuration

Move the cursor to this field and press <Enter>, the following screen will appear:



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

## MCT Memory Timing

Refer to the following pages for more information on this submenu.

## Memory Hole

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.

15M - 16M	The CPU assumes the 15-16MB memory range is allocated to the hidden ISA address range instead of the actual system DRAM.
Disabled	The CPU assumes the 15-16MB address range actually contains DRAM memory. If more than 16MB of system memory is installed, this option must be selected to provide contiguous system memory.

### Timing Mode

<i>Auto</i>	The BIOS will automatically detect all DRAM timing.
<i>Max CLK</i>	This option uses the maximum DRAM clock.
<i>Manual</i>	This option allows you to manually select the DRAM's clock speed.

### Memory Clock Value or Limit

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

### CKE Based PowerDown

The options are Per Channel and Per CS.

### Memclock Tri-stating

The options are Enabled and Disabled.

### Memory Hole Remapping

The options are Enabled and Disabled.

### Auto Optimize Bottom IO

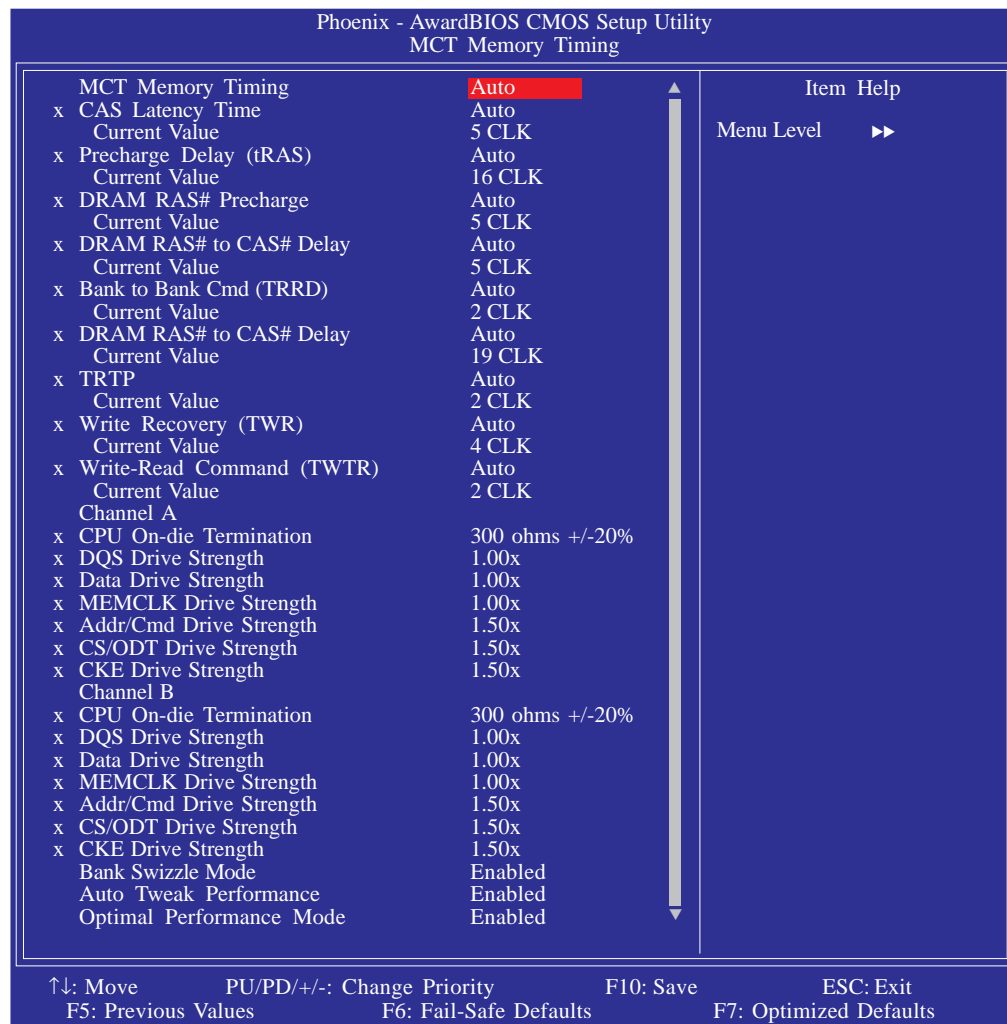
The options are Enabled and Disabled.

### Bottom of [31:24] IO Space

This field is used to select the memory that will be remapped to another address higher than 00E0.

## MCT Memory Timing

Move the cursor to this field and press <Enter>, the following screen will appear:



The screen above list all the fields available in the MCT Memory Timing 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.

## MCT Memory Timing

- Auto*      The BIOS will automatically detect all the MCT memory timing.
- Manual*      This option allows you to manually configure the MCT memory timing on the following fields.



### CAS Latency Time

This field is used to select the clock cycles for the CAS latency.

### Precharge Delay (tRAS)

The options are Auto, Vt16, Vt17, Vt18 and 4 to 15.

### DRAM RAS# Precharge

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

### DRAM RAS# to CAS# Delay

This field is used to select the latency between the DRAM active command and the read/write command. The options are 2 and 3.

### Bank to Bank Cmd (TRRD)

The options are Auto, 1 to 15.

### DRAM RAS# to CAS# Delay

This field is used to select the latency between the DRAM active command and the read/write command. The options are 2 and 3.

### TRTP

The options are Auto, and 1 to 15.

### Write Recovery (TWR)

This field is used to select the write recovery time when the DRAM safely registers the last write data. This is the time from the last write data to precharge.

### Write-Read Command (TWTR)

The options are Auto, 1 to 15.

### CPU On-die Termination

The options are 300 ohms +/-20%, 150 ohms +/-20% and 70 ohms +/-20%.

### DQS Drive Strength

The options are 0.75x, 1.00x, 1.25x and 1.50x.

### Data Drive Strength

The options are 0.75x, 1.00x, 1.25x and 1.50x.

### MEMCLK Drive Strength

The options are 0.75x, 1.00x, 1.25x and 1.50x.

### Addr/Cmd Drive Strength

The options are 0.75x, 1.00x, 1.25x and 1.50x.

### CS/ODT Drive Strength

The options are 0.75x, 1.00x, 1.25x and 1.50x.

### CKE Drive Strength

The options are 0.75x, 1.00x, 1.25x and 1.50x.

### Bank Swizzle Mode

The options are Enabled and Disabled.

### Auto Tweak Performance

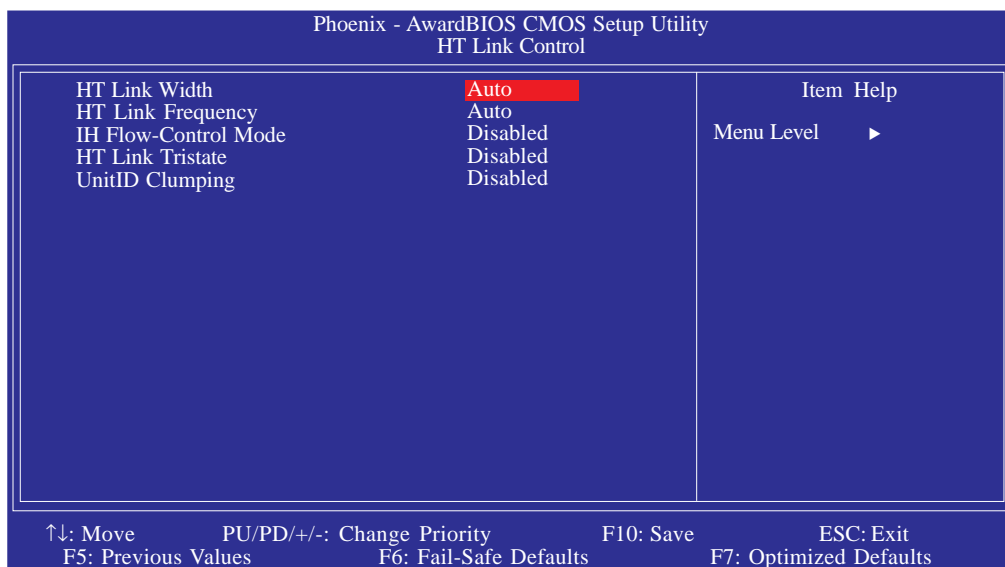
The field enables or disables the performance tweaks of all high speed DIMMs.

### Optimal Performance Mode

This field enables or disables the performance mode of DIMMs with SPD function.

## HT Link Control

Move the cursor to this field and press <Enter>, the following screen will appear:



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

## HT Link Width

The options are Auto, 8 bit and 16 bit.

## HT Link Frequency

The options are Auto, 200MHz, 400MHz, 600MHz, 800MHz and 1 GHz.

## IH Flow-Control Mode

This field enables or disables the isochronous flow control mode.

## HT Link Tristate

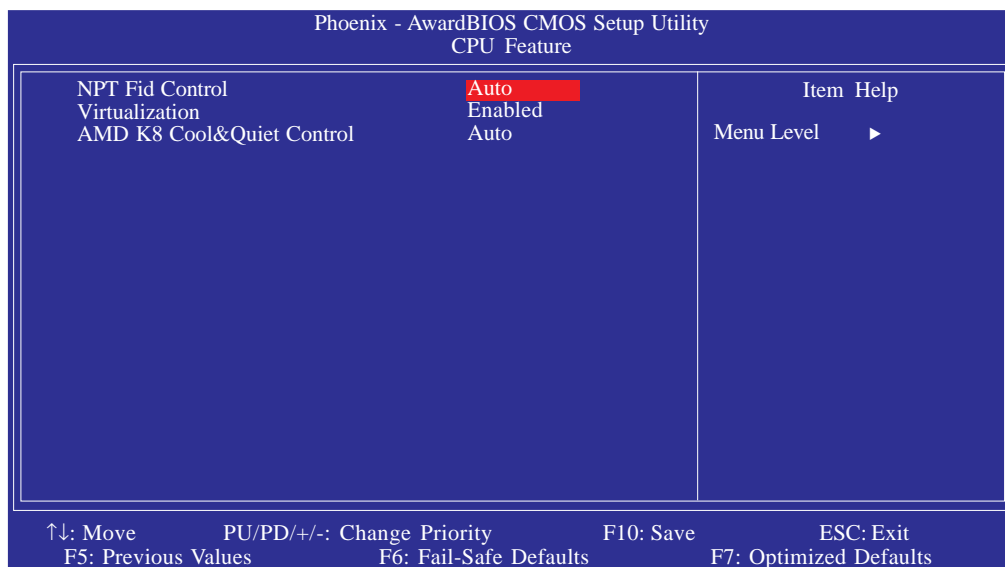
The options are Disabled, CAD/CTL and CAD/CTL/CLK.

## UnitID Clumping

The options are Disabled, UnitID 2/3, UnitID B/C and UnitID 2/3&B/C.

## CPU Feature

Move the cursor to this field and press <Enter>, the following screen will appear:



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

## NPT Fid Control

The options are Auto, x4 to x13.5.

## Virtualization

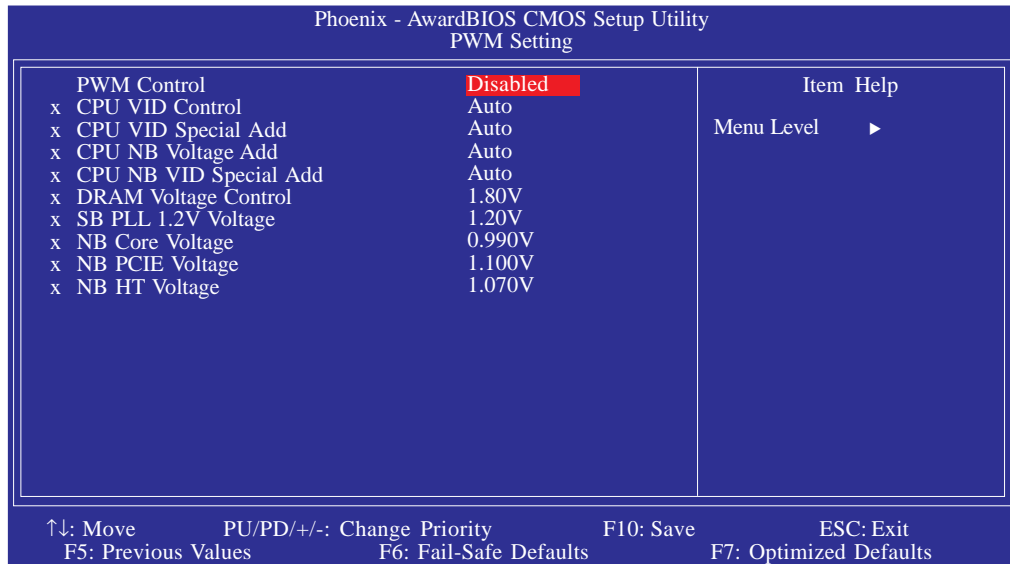
When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

## AMD K8 Cool&amp;Quiet Control

<i>Auto</i>	Enables AMD's Cool'n'Quiet technology. This function allows the system to detect the CPU's tasks and utilization status. When the CPU's task slows down, the system effectively lowers power consumption by changing its CPU speed and voltage, subsequently decreasing its noise level.
<i>Disabled</i>	Disables AMD's Cool'n'Quiet technology.

## PWM Setting

Move the cursor to this field and press <Enter>, the following screen will appear:



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

## PWM Control

The options are Enabled and Disabled.

## CPU VID Control

This field allows you to manually adjust to a higher core voltage that is supplied to the CPU. If you want to use the CPU's default core voltage, leave this field in its default setting. The CPU's Vcore will be generated according to the CPUVID configuration.



### Important:

*Although this function is supported, we do not recommend that you use a higher voltage because unstable current may be supplied to the system board causing damage.*

## CPU VID Special Add

This field provides more options to further adjust the voltage of the CPU.

### CPU NB Voltage Control

This field allows you to manually adjust to a higher core voltage that is supplied to the Northbridge. If you want to use the Northbridge's default core voltage, leave this field in its default setting.

### CPU NB VID Special Add

This field provides more options to further adjust the voltage of the Northbridge.

### DRAM Voltage Control

This field allows you to manually select higher voltage supplied to the DRAM.

### SB PLL 1.2V Voltage

This field allows you to manually select the Southbridge's core voltage.

### NB Core Voltage

This field allows you to manually select the Northbridge's core voltage.

### NB PCIE Voltage

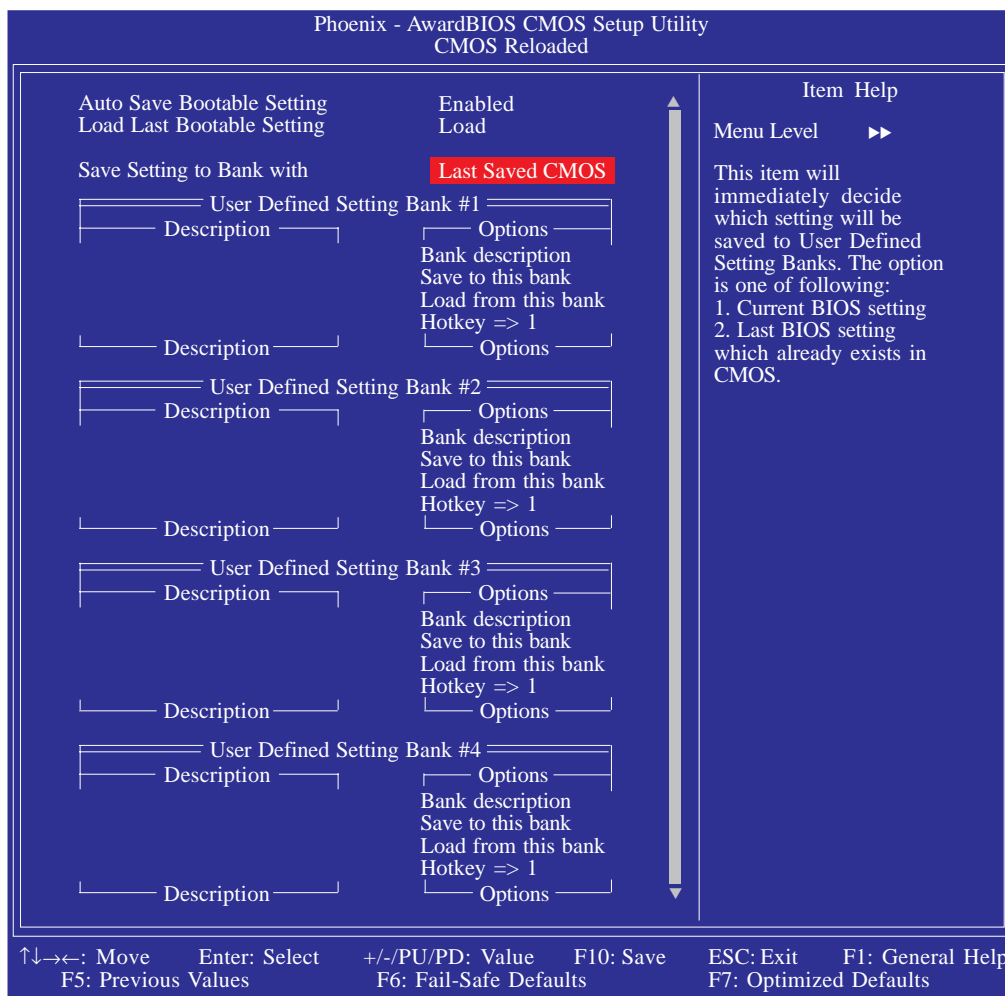
The options are 0.990V to 1.210V.

### NB HT Voltage

The options are 1.070V to 1.380V.

## CMOS Reloaded

The CMOS Reloaded submenu allows you to save different configurations and when needed, allows you to conveniently restore one of these previously saved configurations. Highlight CMOS Reloaded in the main menu then press <Enter>.



The screen above list all the fields available in the CMOS Reloaded 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.

CMOS Reloaded is especially helpful to overclockers who often go through the tiresome trial and error process of repeatedly changing the BIOS settings to come up with the most ideal overclocked setting. By being able to save and load the settings, it eliminates the tedious job of remembering several settings and/or repeatedly resetting settings during the trial process. The settings are stored in the SEEPROM. SEEPROM is divided into 5 banks - the backup bank and the 4 user defined banks.

### Auto Save Bootable Setting

This field is used to automatically save the last bootable setting from CMOS to an area in the EEPROM referred to as the backup bank. To use this function:

1. Set this field to Enabled.
2. Select "Save & Exit Setup" in the main menu then press <Enter>.
3. Type <Y> then press <Enter>.

If the changes to the setting allowed the system to boot, the setting will be stored in the EEPROM. In other words, if the system did not boot up, the setting will not be stored. You may then follow the steps in the next section to load the last bootable setting.

### Load Last Bootable Setting

If, during the trial and error process, the setting resulted to the system's instability or worse yet, not being able to boot up the system, please follow the steps below to use the Load function.



**Note:**

*You can use the Load function only if you have set the "Auto Save Bootable Setting" to Enabled.*

1. If the system did not boot up properly but you were able to enter the BIOS utility:
  - a. Select "CMOS Reloaded" in the main menu then press <Enter>.
  - b. Move the cursor to "Load Last Bootable Setting" then press "Load".
  - c. Press <Y> to load the last bootable setting that was stored in the backup bank.
2. If you cannot enter the BIOS utility:
  - a. Use the Clear CMOS jumper to clear the CMOS. Refer to chapter 2 for more information about clearing CMOS.
  - b. Enter the BIOS utility then perform steps 1a to 1c.



## Saving, Loading and Naming BIOS Settings

For overclockers who require different sets of settings for various system environments or operating systems, CMOS Reloaded allows you to save, load and name up to four sets of BIOS settings - in the “User Defined Setting Bank #1” to “User Defined Setting Bank #4” fields.

### Save Setting to Bank With

This field is used to select the type of setting you would like saved to a User Defined Setting Bank when you use the “Save to this Bank” function of that bank.

<i>Current BIOS Setting</i>	This option will save the current BIOS setting to the User Defined Setting Bank.
<i>Last BIOS Setting</i>	This option will save the last saved BIOS setting to the User Defined Setting Bank.

### User Defined Setting Bank #1/2/3/4

#### *Bank Description*

To name the BIOS setting, move the cursor to “Bank Description” then press <Enter>. You can enter up to 60 characters. Providing a name to the BIOS setting will allow you to easily remember the settings in the bank.

#### *Save to this Bank*

To save the BIOS setting, move the cursor to “Save to this Bank” then press <Enter>. Type <Y> then press <Enter>. This will save the current setting or the last saved setting to this bank; depending on the option selected in the “Save Setting to Bank With” field.

If you want to immediately reboot to use the new settings, make sure to save before you exit the BIOS setup utility by selecting “Y” in the “Save & Exit Setup” submenu.

***Load from this Bank***

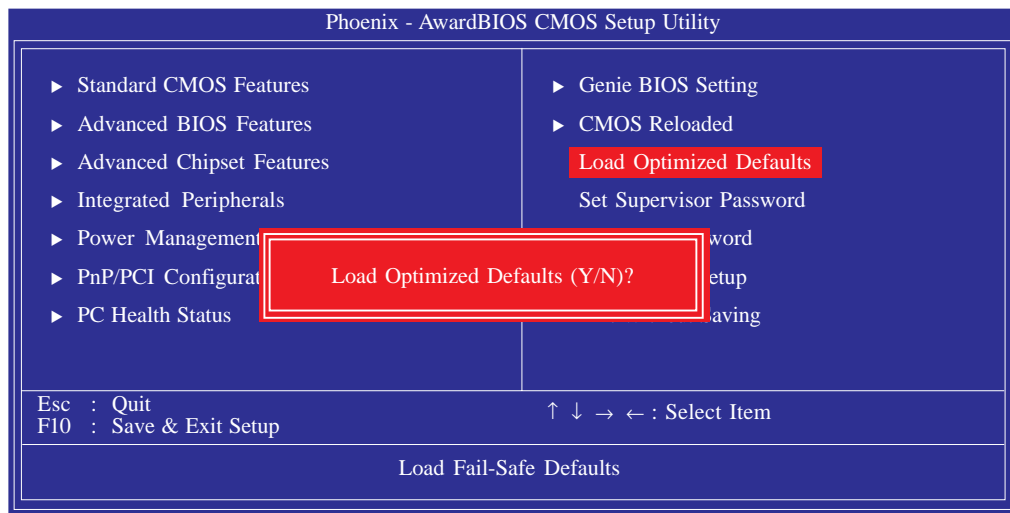
To load the setting saved in the bank, move the cursor to “Load from this Bank” then press <Enter>. The setting in this bank will replace the current setting. Make sure to save before you exit the BIOS setup utility by selecting “Y” in the “Save & Exit Setup” submenu.

***Hotkey***

You can now load a BIOS setting during system boot up; bypassing the lengthy process of entering the BIOS utility to load a setting. Move the cursor to “Hotkey” then press <Enter>. Select the key you would like to use to load the settings from the bank. When the system boots up, press the key to load the setting.

## 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>.

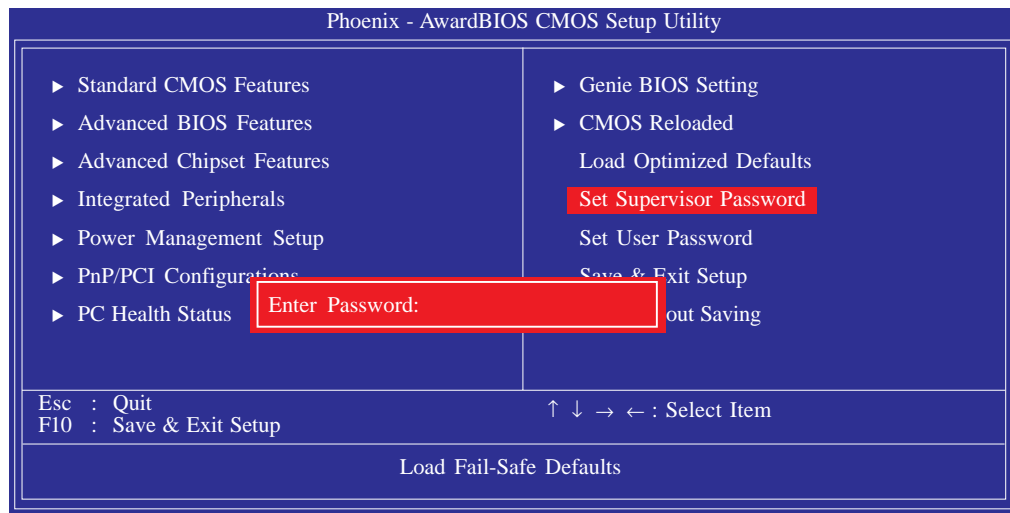


Type <Y> and press <Enter> to load the Setup default values.

## 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>.



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

Confirm Password:

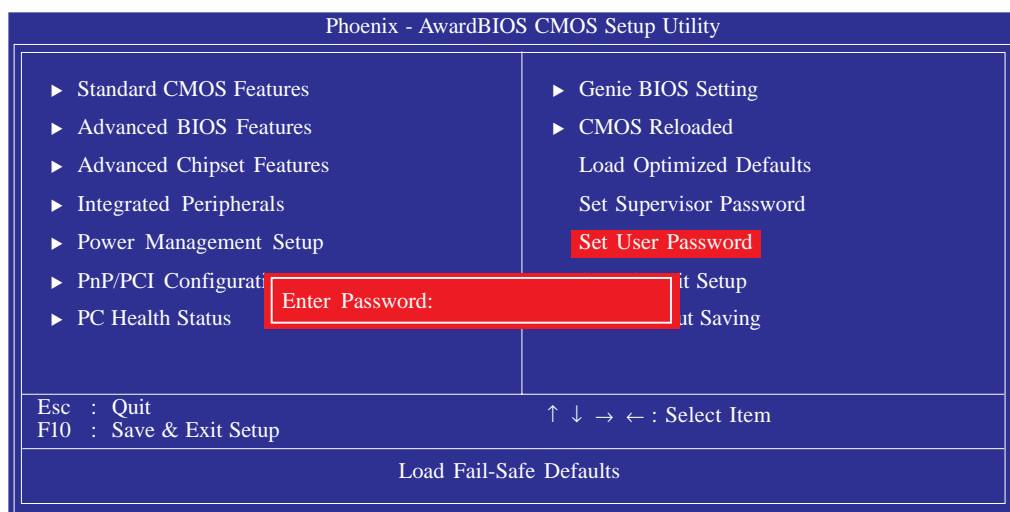
You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set Supervisor Password" and press <Enter>, instead of typing in a new password. Press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



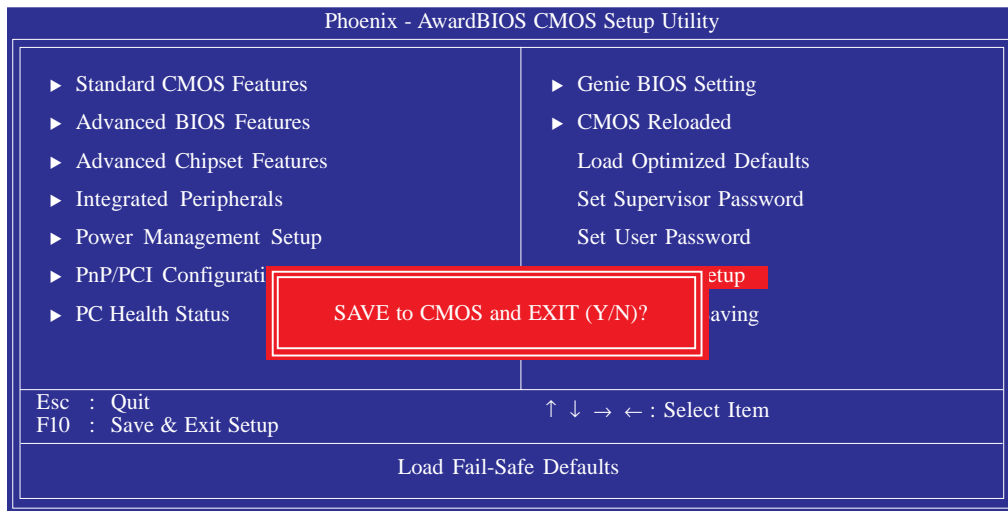
Type in the password. You are limited to eight characters. When done, the message below will appear:

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

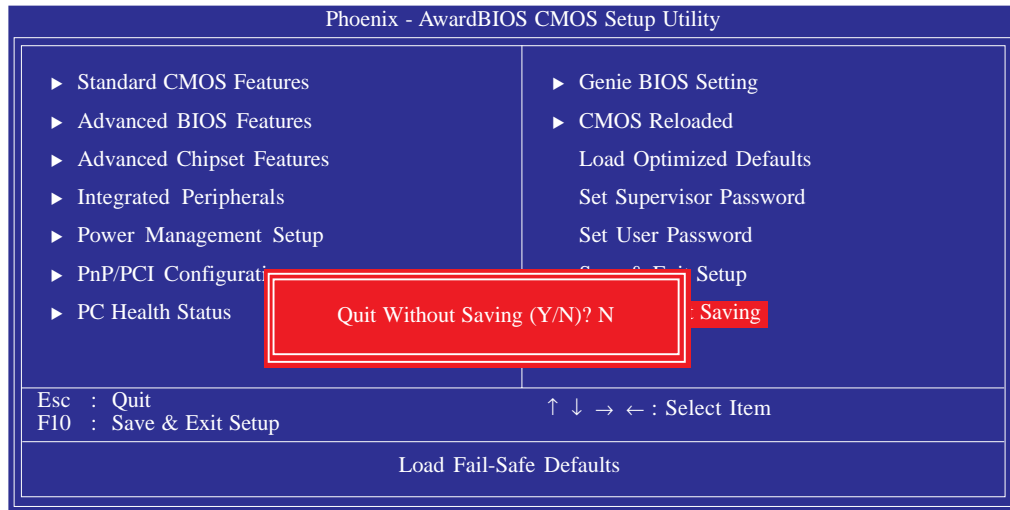
When all the changes have been made, highlight “Save & Exit Setup” and press <Enter>.



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

## Exit Without Saving

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



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

## RAID BIOS

### AMD BIOS

The AMD BIOS utility is used to configure and manage RAID on Serial ATA drives connected to SATA 1 to SATA 4.

After you power up the system and all drives have been detected, the AMD BIOS status message screen will appear. Press the <F4> key to enter the utility. The utility allows you to build a RAID system on Serial ATA drives.

### Sil3132 SataRAID BIOS

The Sil3132 SataRAID BIOS utility, supported by the Silicon Image Sil3132 chip, is used to configure and manage RAID on Serial ATA drives connected to SATA 5 and SATA 6.

After you power up the system and all hard disk drives have been detected, the Sil3132 SataRAID BIOS status message screen will appear. Press the <Ctrl-S> or <F4> key to enter the utility. The utility allows you to build a RAID system on Serial ATA drives.



**Important:**

*Before creating RAID, make sure you have installed the Serial ATA drives and connected the data cables otherwise you won't be able to enter the RAID BIOS utility.*

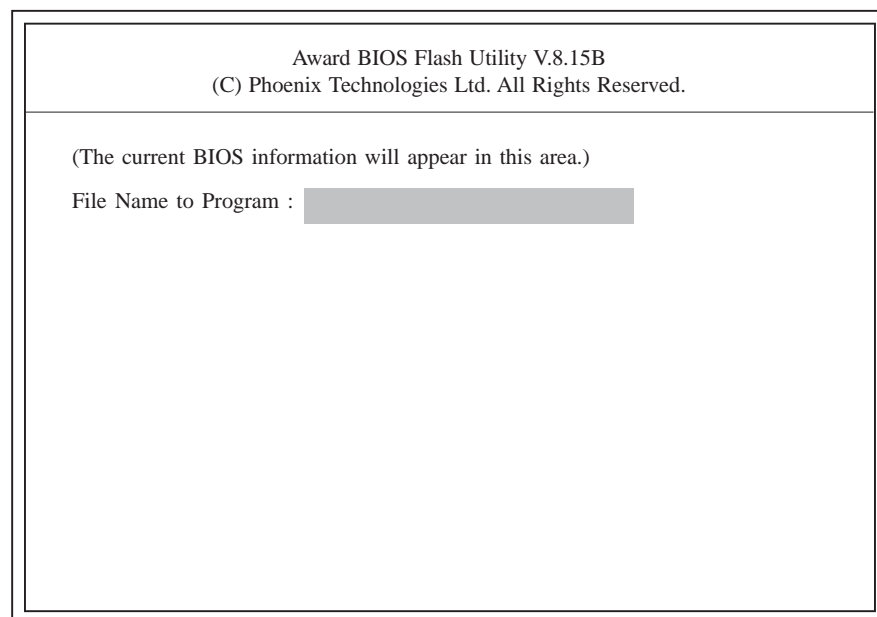
Refer to chapter 5 for steps in configuring RAID.



## Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AWDFLASH.EXE. You can download them from DFI's web site or contact technical support or your sales representative.

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:



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.

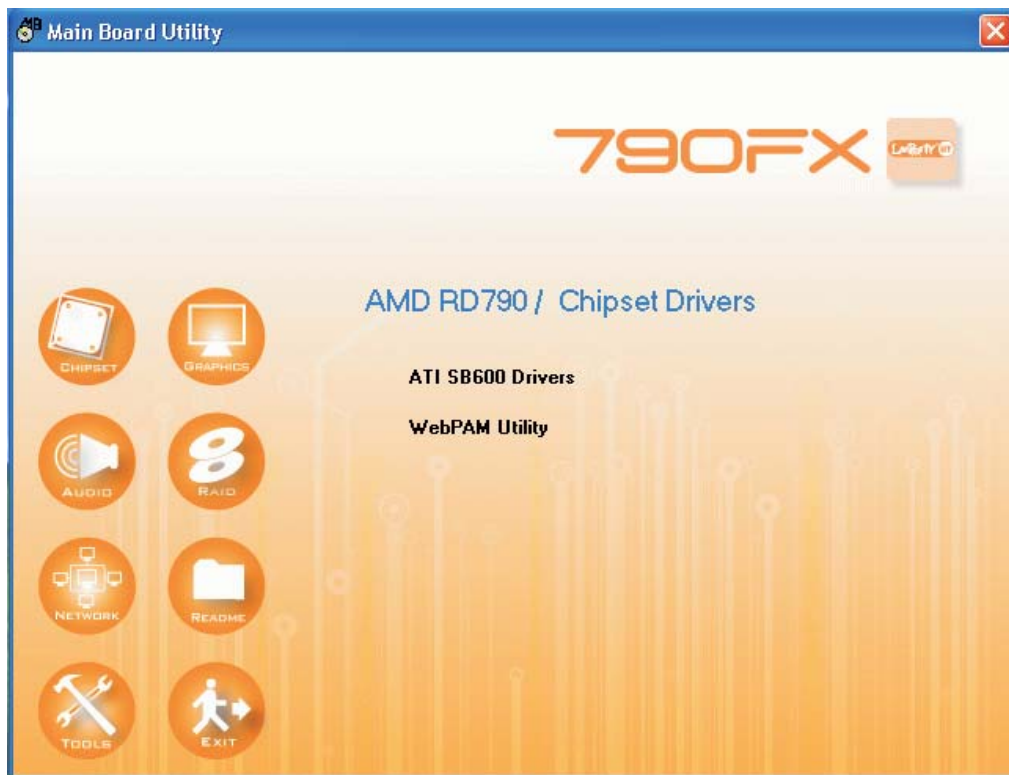
## Chapter 4 - Supported Software

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### 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.

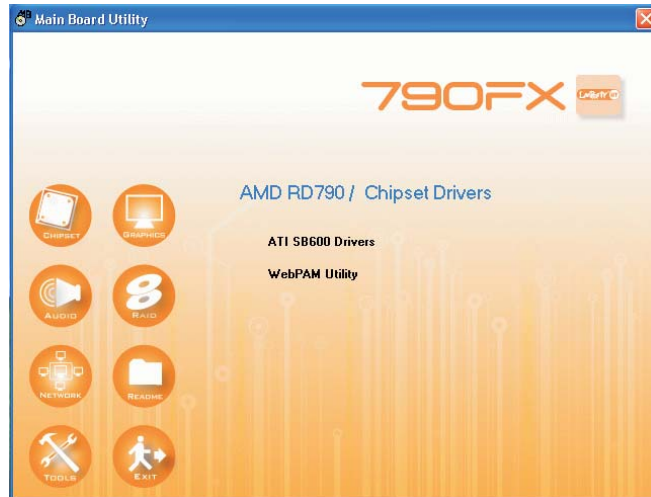
Insert the CD into a CD-ROM drive. The autorun screen will appear. If after inserting the CD, "Autorun" did not automatically start, please go directly to the root directory of the CD and double-click "Setup".



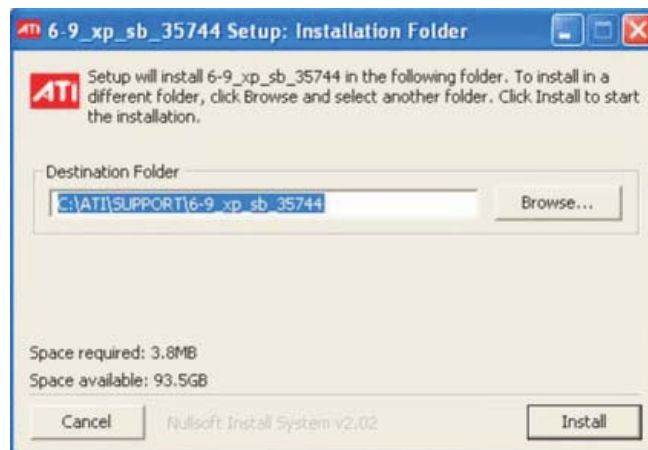
## ATI SB600 Drivers

On the left side of the autorun screen, click the “CHIPSET” icon.

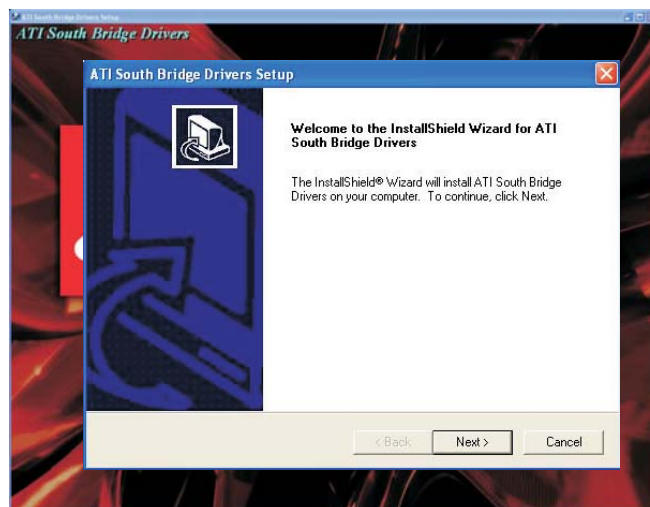
1. Click “ATI SB600 Drivers” on the main menu.



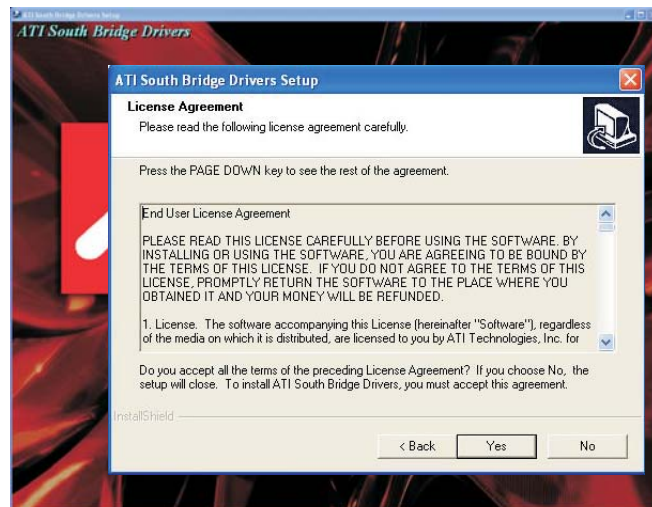
2. Click Install to install to the destination folder or click Browse to select another folder.



3. Setup is now ready to install the driver. Click Next.

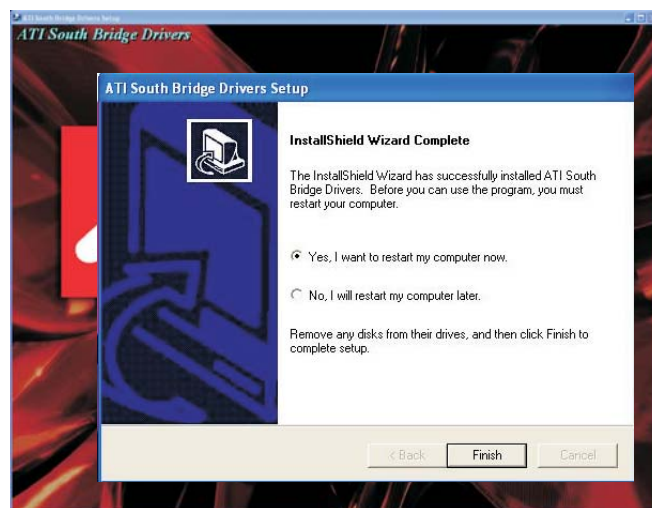


4. Read the license agreement then click Yes.



5. Click "Yes, I want to restart my computer now" then click Finish.

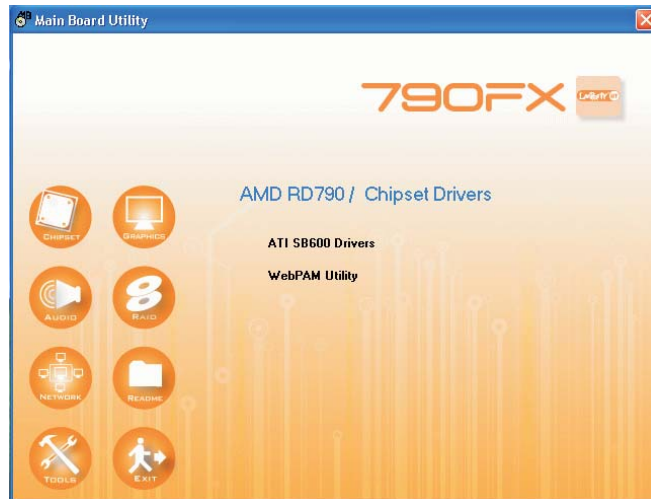
Restarting the system will allow the new driver installation to take effect.



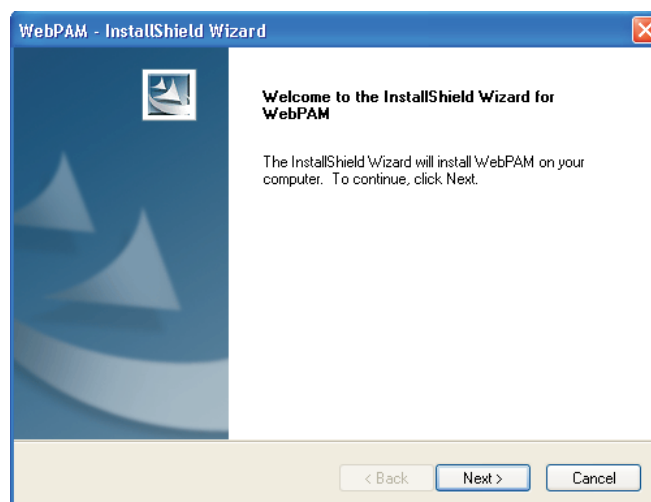
## WebPAM Utility

On the left side of the autorun screen, click the “CHIPSET” icon.

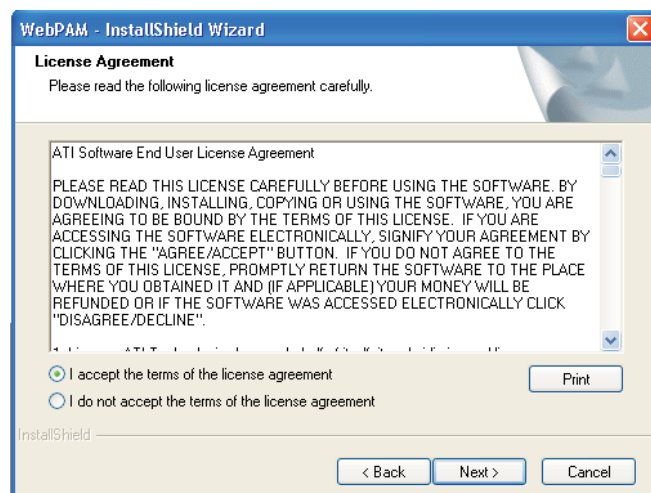
1. Click “WebPAM Utility” on the main menu.



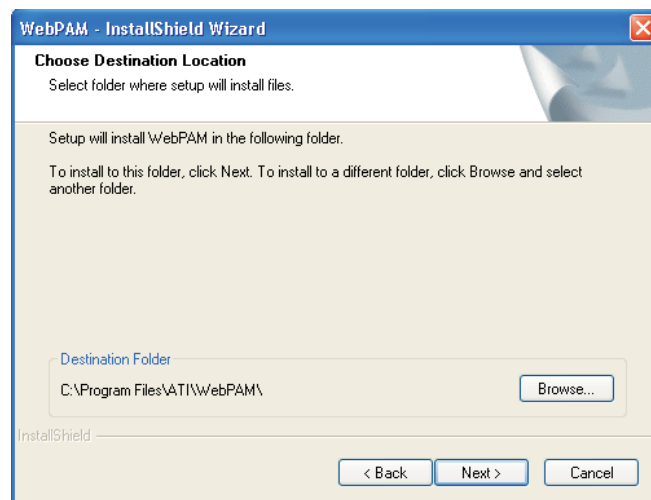
2. You are now ready to install the driver. Click Next.



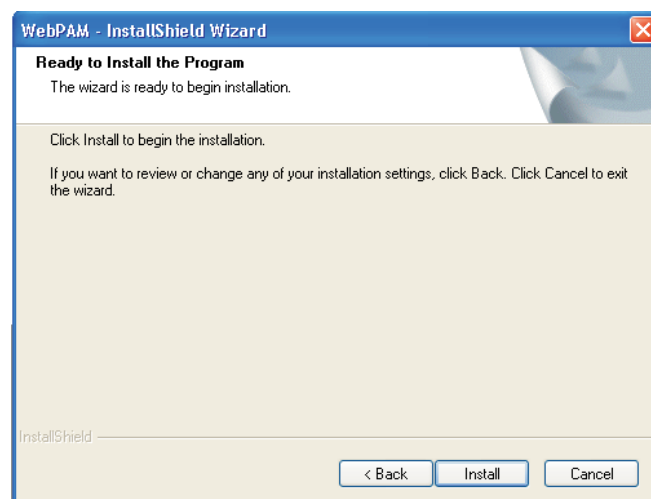
3. Read the license agreement then click “I accept the terms of the license agreement”. Click Next.



- Click Next to install to the destination folder or click Browse to select another folder.



- Click Next to begin installation.



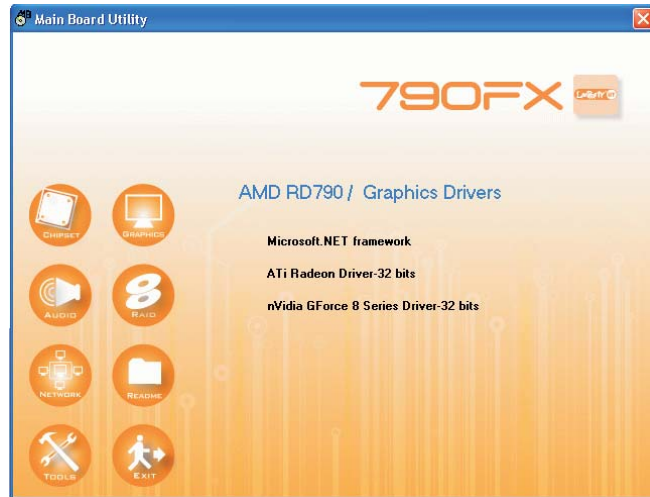
- Click Finish.



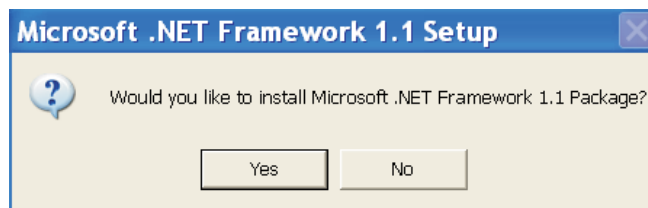
## Microsoft .NET Framework

On the left side of the autorun screen, click the “GRAPHICS” icon.

1. Click “Microsoft .NET Framework” on the main menu.



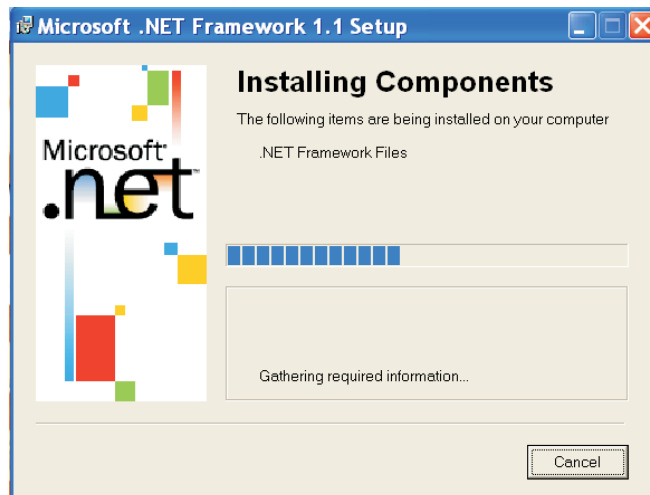
2. Click “Yes” to install the Framework package.



3. Setup is currently installing the files onto your computer:

Follow the prompts on the screen to complete installation.

Restart the system to allow the new driver installation to take effect.

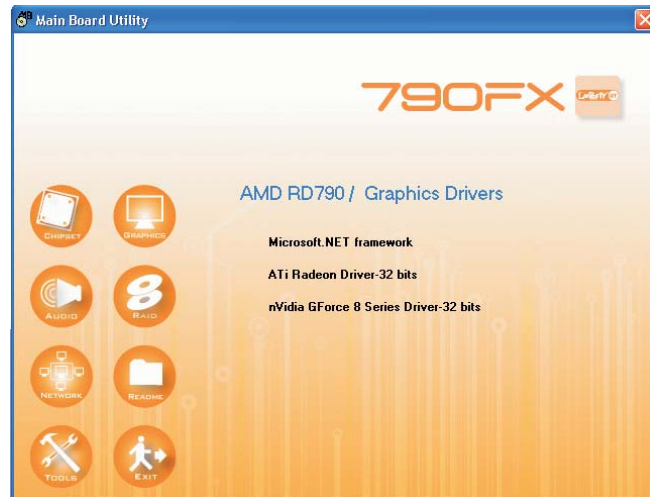




## Graphics Drivers

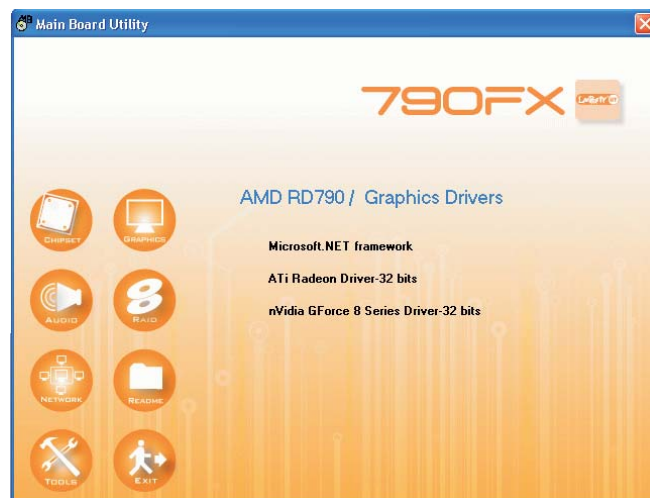
On the left side of the autorun screen, click the “GRAPHICS” icon.

The CD provides both ATI and nVidia drivers. Select the driver according to the graphics card you are using.

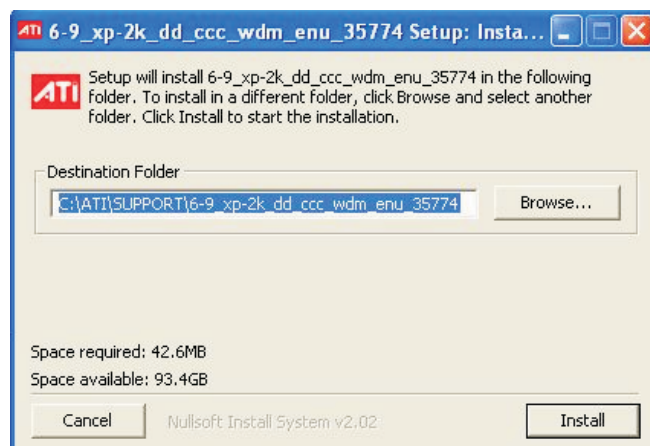


### ATI Radeon Driver

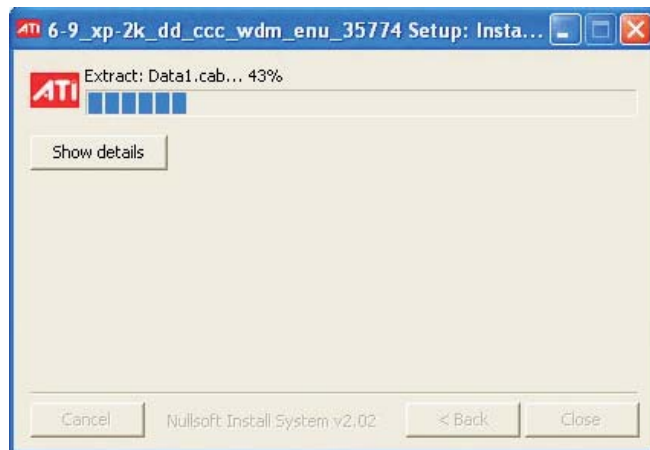
1. Click “ATI Radeon Driver-32 bits” on the main menu.



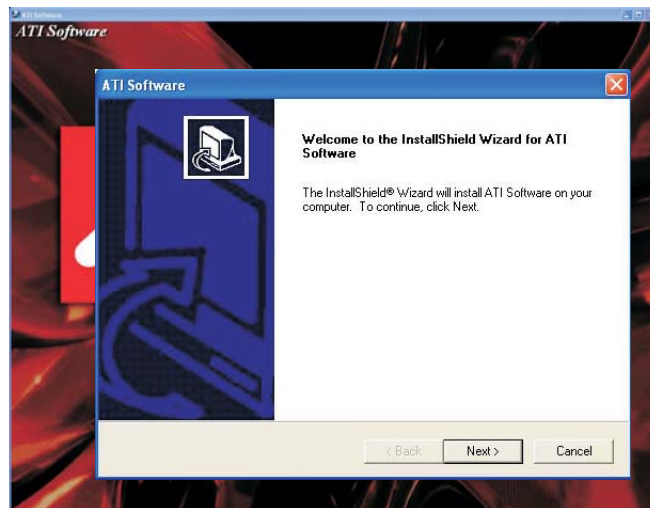
2. Click Install to install to the destination folder or click Browse to select another folder.



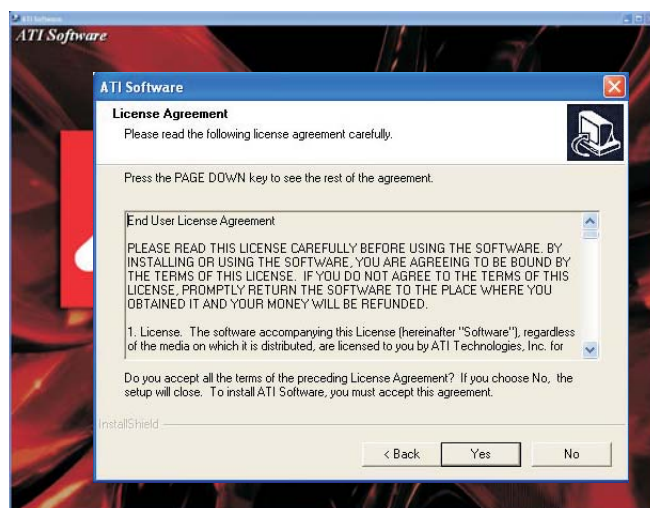
- The installation wizard will extract the files needed to install the driver:



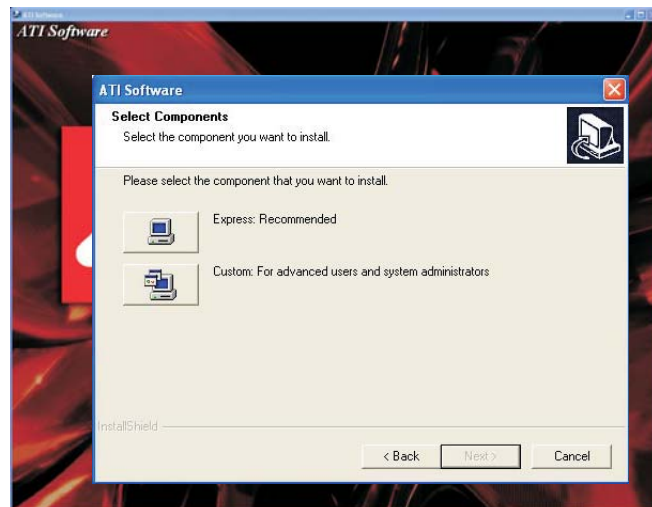
- Setup is now ready to install the driver. Click Next.



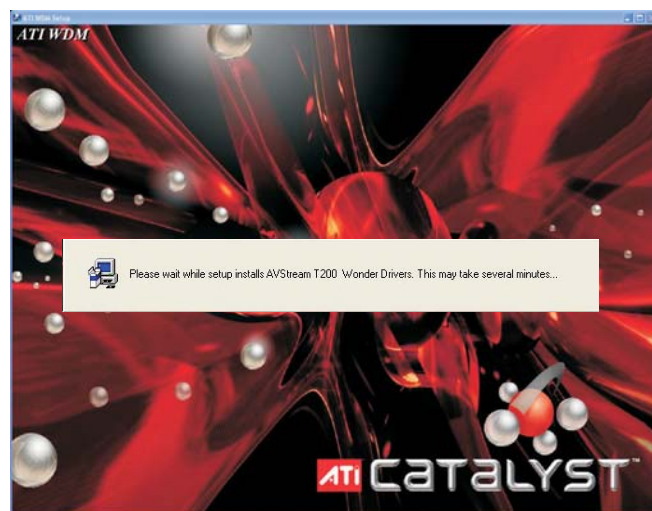
- Read the license agreement then click Yes.



6. Select the component you want to install then click Next.



7. Setup is preparing to install the driver:

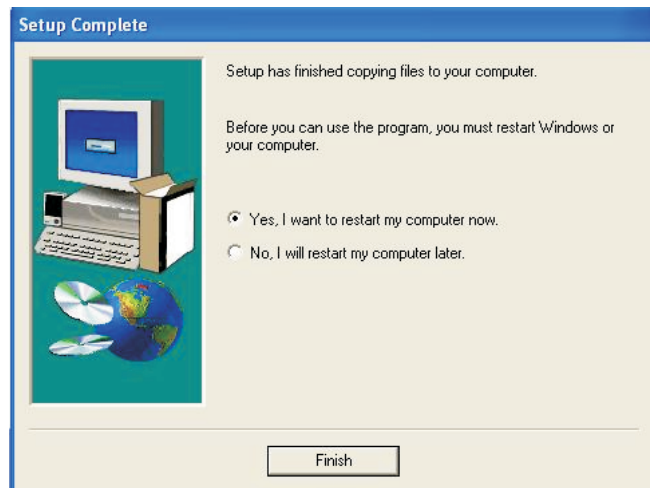


8. Setup is currently installing the driver: Follow the remainder of the steps shown on the screen; clicking “next” each time you finish a step.



- Click “Yes, I want to restart my computer now” then click Finish.

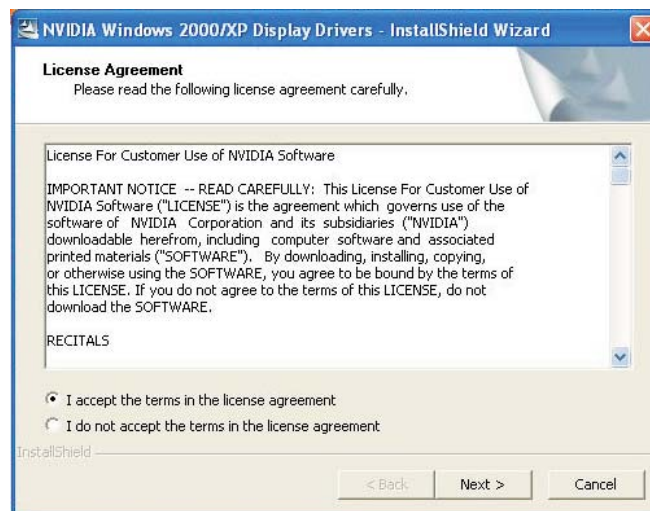
Restarting the system will allow the new driver installation to take effect.



### nVidia GeForce Driver

- Click “nVidia GeForce 8 Series Driver-32 bits” on the main menu.

Read the license agreement then click “I accept the terms in the license agreement”. Click Next.



- The installation wizard will extract the files needed to install the driver. After all files have been extracted, click Next.

- Follow the remainder of the steps shown on the screen; clicking “next” each time you finish a step.

- Reboot the system for the driver to take effect.



## Realtek Audio Driver

On the left side of the autorun screen, click the “AUDIO” icon.

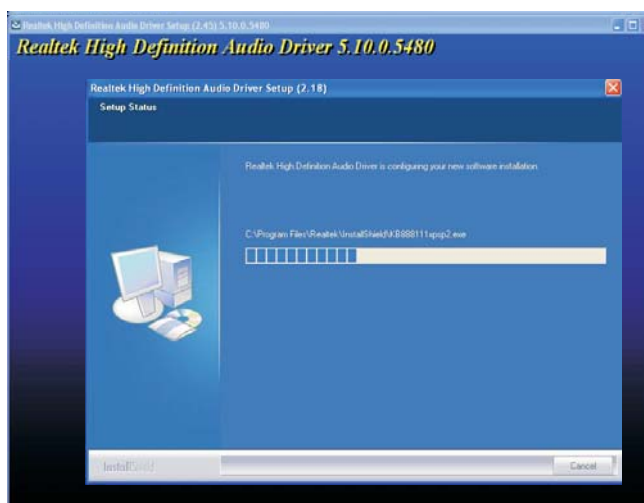
1. Click “Realtek Audio Driver” on the main menu.



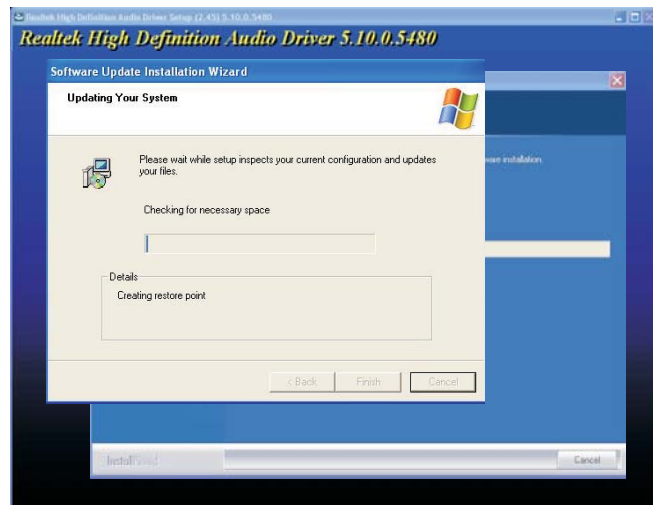
2. Setup is now ready to install the driver. Click Next to continue.



3. Setup is currently installing the driver.



4. Setup is now configuring the new software installation.



5. Click "Yes, I want to restart my computer now" then click Finish.

Restarting the system will allow the new driver installation to take effect.





## RAID Drivers

On the left side of the autorun screen, click the “RAID” icon.

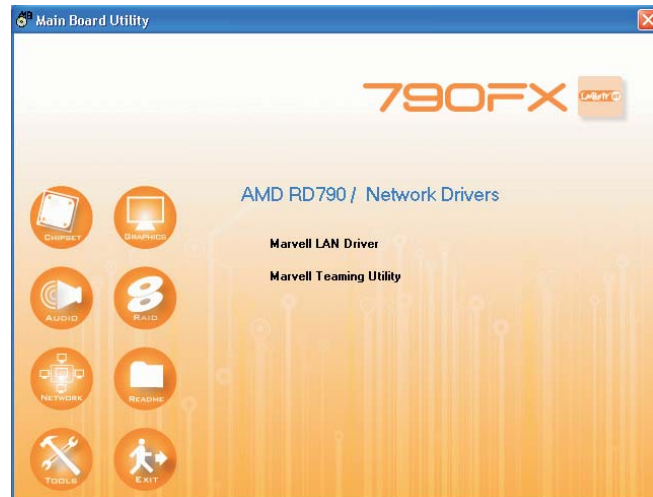
The RAID Drivers menu includes drivers and utility that must be installed when using RAID configured Serial ATA devices that are supported by the Silicon Image Sil3132 controller:



## Marvell LAN Driver

On the left side of the autorun screen, click the “NETWORK” icon.

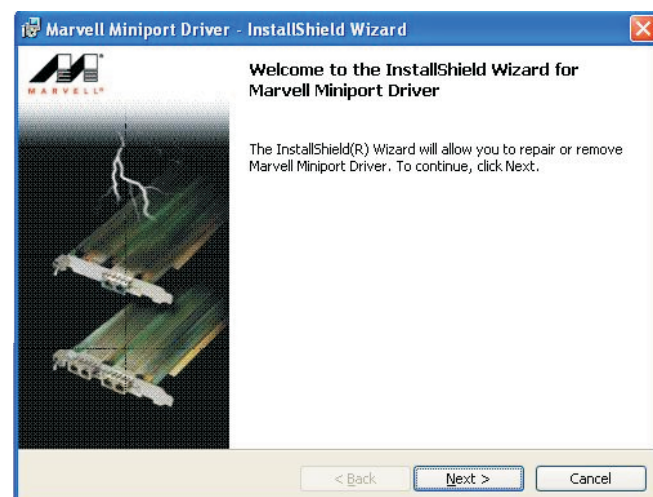
1. Click “Marvell LAN Driver” on the main menu.



2. Setup is preparing the installation wizard.

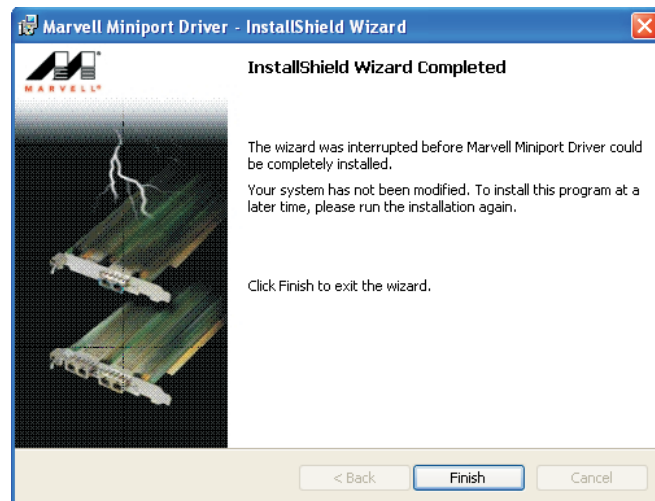


3. Setup will now install the driver. Click Next.





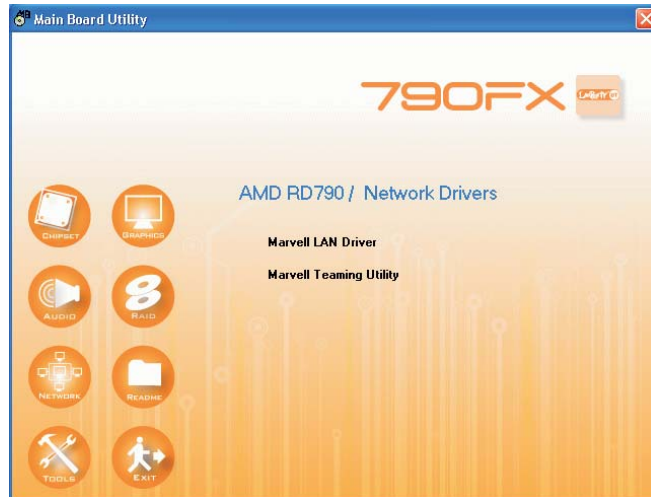
4. Click Finish.
5. Reboot the system for the driver to take effect.



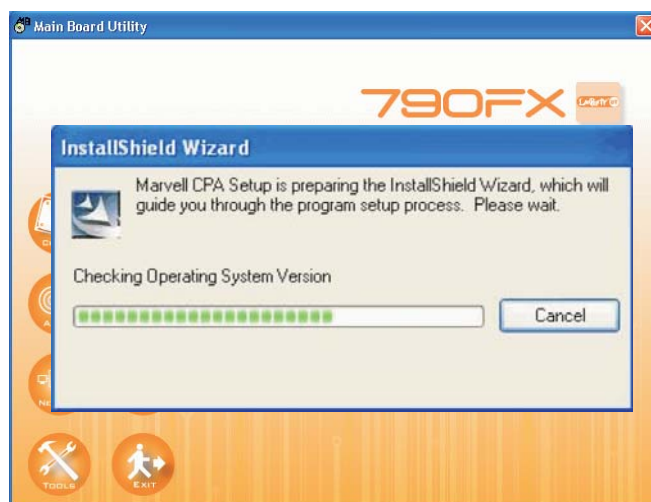
## Marvell Teaming Utility

On the left side of the autorun screen, click the “NETWORK” icon.

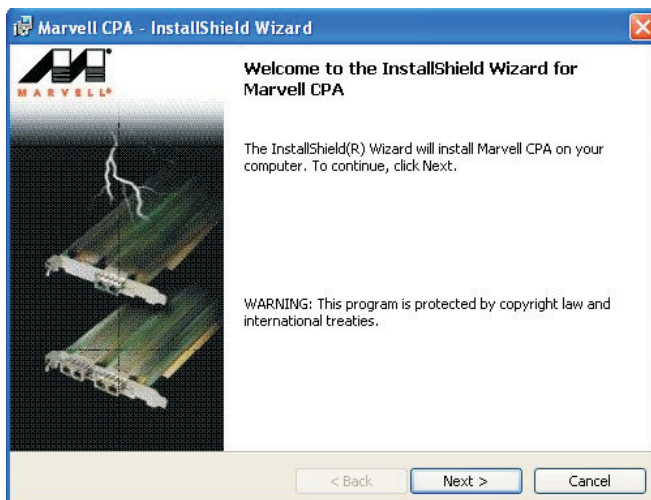
1. Click “Marvell Teaming Utility” on the main menu.



2. Setup is preparing the installation wizard.



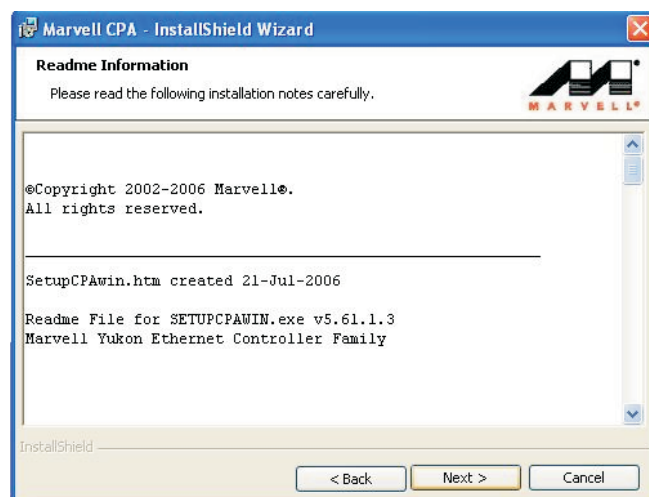
3. Setup is now ready to install the driver. Click Next.



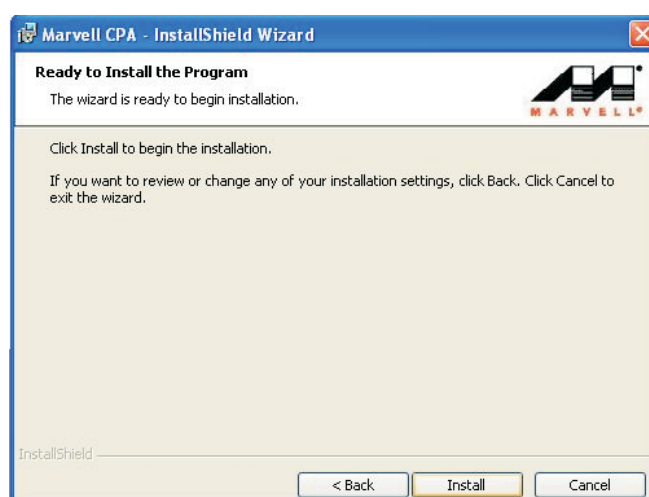
4. Read the license agreement then click "I accept the terms in the license agreement". Click Next.



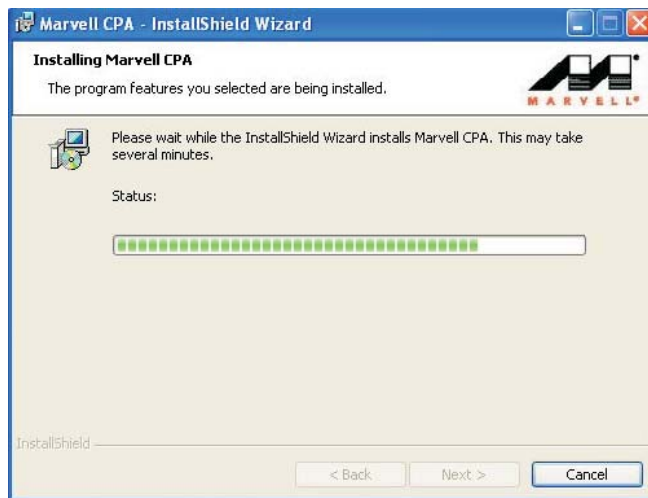
5. The Readme Information contains important installation notes. Before you proceed, please read it carefully then click Next.



6. Click Install to begin installation.



7. Setup is currently installing the driver.



8. Click Finish.
9. Reboot the system for the driver to take effect.



## ITE Smart Guardian

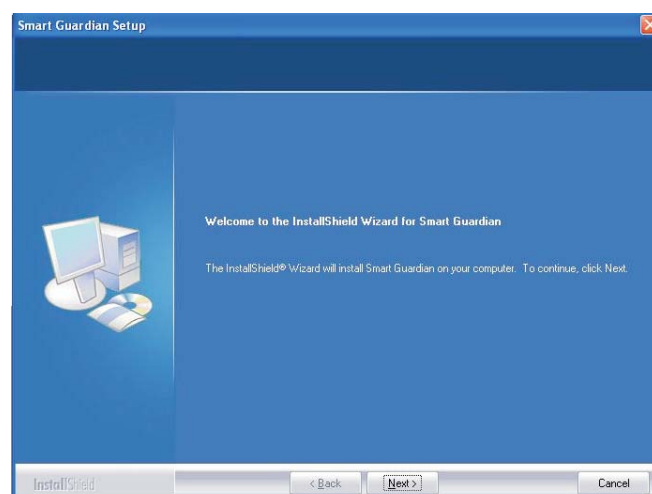
The ITE Smart Guardian utility is capable of monitoring the system's temperature, fan speed, voltage, etc. and allows you to manually set a range (Highest and Lowest Limit) to the items being monitored. If the settings/values are over or under the set range, a warning message will pop-up. The utility 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.

On the left side of the autorun screen, click the "TOOLS" icon.

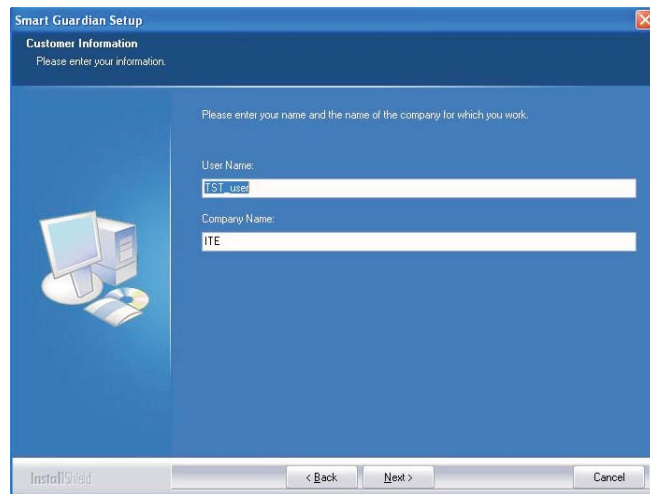
1. Click "ITE Smart Guardian" on the main menu.



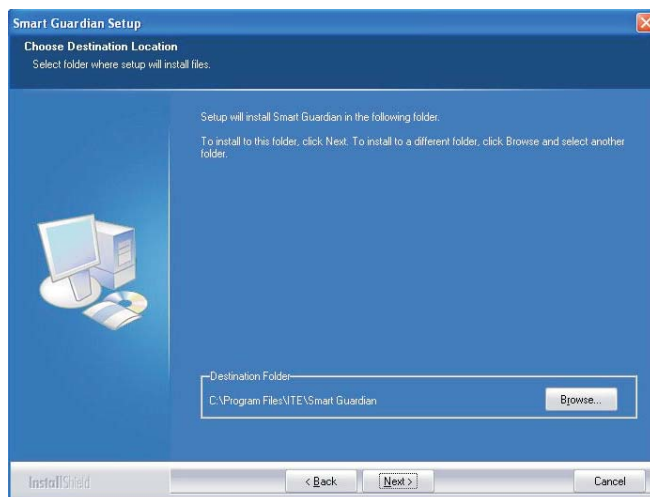
2. Setup is now ready to install the utility. Click Next.



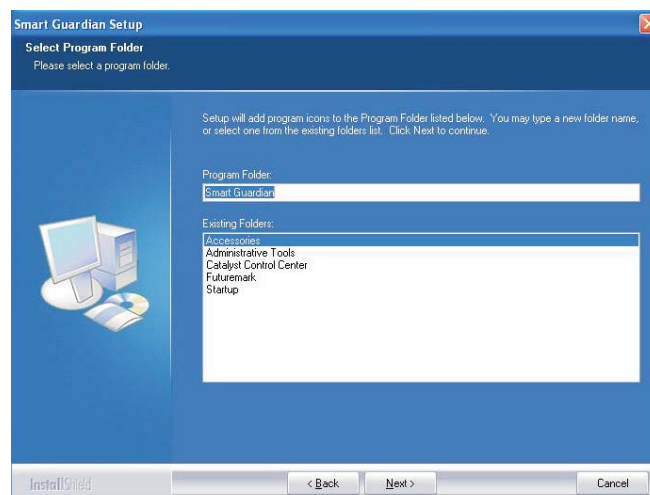
3. Enter the necessary information then click Next.



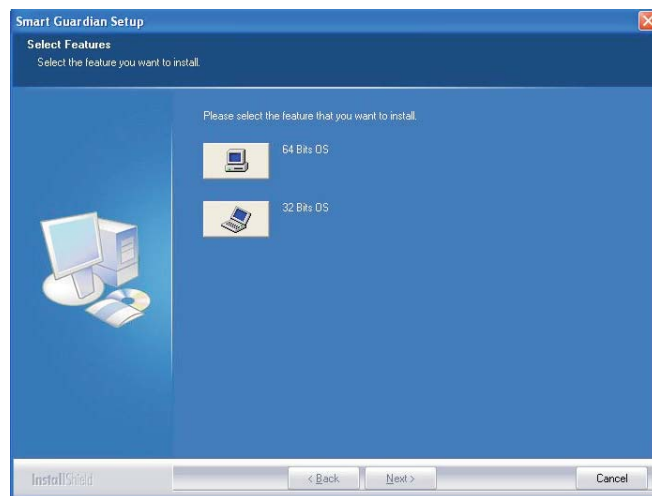
4. Click Next to install to the designated folder or click Browse to select another folder:



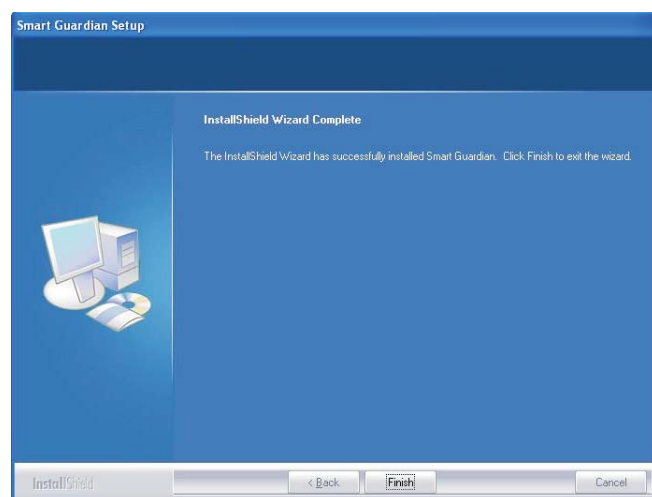
5. Click Next to add the program icon to the Program Folder:



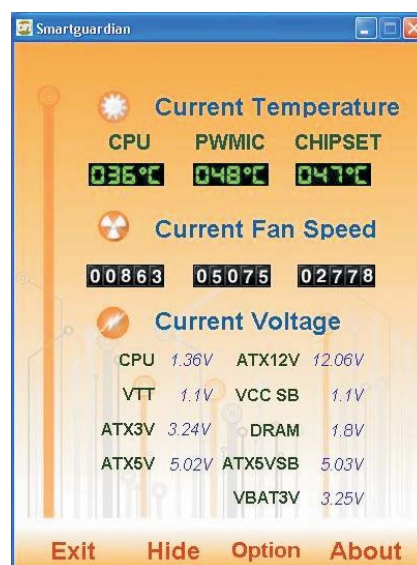
6. Select the option in accordance to the operating system that you are using then click Next.



7. Click Finish. Reboot the system for the driver to take effect.



- 8.. After rebooting the system, you will find the Smart Guardian icon displayed on the screen. Double-click the icon the run the utility.





## USB 2.0 Drivers

### 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® 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 occasionally updated. Please go to DFI's web site at "<http://www.dfi.com/support1/download2.asp>" for the latest version of the drivers or software applications.



## Chapter 5 - RAID

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The AMD SB600 chip allows configuring RAID on 4 Serial ATA drives. It supports RAID 0, RAID 1 and RAID 0+1. The Silicon Image Si3132 chip allows configuring RAID on another 2 Serial ATA drives. It supports RAID 0, RAID 1 and RAID 0+1.

### RAID Levels

#### RAID 0 (Striped Disk Array without Fault Tolerance)

RAID 0 uses two new identical hard disk drives to read and write data in parallel, interleaved stacks. Data is divided into stripes and each stripe is written alternately between two disk drives. This improves the I/O performance of the drives at different channel; however it is not fault tolerant. A failed disk will result in data loss in the disk array.

#### RAID 1 (Mirroring Disk Array with Fault Tolerance)

RAID 1 copies and maintains an identical image of the data from one drive to the other drive. If a drive fails to function, the disk array management software directs all applications to the other drive since it contains a complete copy of the drive's data. This enhances data protection and increases fault tolerance to the entire system. Use two new drives or an existing drive and a new drive but the size of the new drive must be the same or larger than the existing drive.

#### RAID 0+1 (Striping and Mirroring)

RAID 0+1 is a combination of data striping and data mirroring providing the benefits of both RAID 0 and RAID 1. Use four new drives or an existing drive and three new drives for this configuration.

### Settings

To enable the RAID function, the following settings are required.

1. Connect the Serial ATA drives.
2. Configure Serial ATA in the Award BIOS.
3. Configure RAID in the RAID BIOS.
4. Install the RAID driver during OS installation.

## Step 1: Connect the Serial ATA Drives

Refer to chapter 2 for details on connecting the Serial ATA drives.



### Important:

1. *Make sure you have installed the Serial ATA drives and connected the data cables otherwise you won't be able to enter the RAID BIOS utility.*
2. *Treat the cables with extreme caution especially while creating RAID. A damaged cable will ruin the entire installation process and operating system. The system will not boot and you will lost all data in the hard drives. Please give special attention to this warning because there is no way of recovering back the data.*

## Step 2: Configure Serial ATA in the Award BIOS

1. Power-on the system then press <Del> to enter the main menu of the Award BIOS.
2. Configure Serial ATA in the appropriate fields.
3. Press <Esc> to return to the main menu of the BIOS setup utility. Select "Save & Exit Setup" then press <Enter>.
4. Type <Y> and press <Enter>.
5. Reboot the system.

## Step 3: Configure RAID in the RAID BIOS

### Configure RAID in the AMD RAID BIOS

When the system powers-up and all drives have been detected, the AMD BIOS status message screen will appear. Press the <F4> key to enter the utility. The utility allows you to build a RAID system on Serial ATA drives.

### Configure RAID in the Sil3132 SATA RAID BIOS

When the system powers-up and all drives have been detected, the Silicon Image BIOS status message screen will appear. Press the <Ctrl-S> or <F4> key to enter the utility. The utility allows you to build a RAID system on Serial ATA drives.

#### Step 4: Install the RAID Driver During OS Installation

The RAID driver must be installed during the Windows® XP or Windows® 2000 installation using the F6 installation method. This is required in order to install the operating system onto a hard drive or RAID volume when in RAID mode or onto a hard drive when in AHCI mode.

1. Start Windows Setup by booting from the installation CD.
2. Press <F6> when prompted in the status line with the 'Press F6 if you need to install a third party SCSI or RAID driver' message.
3. Press <S> to "Specify Additional Device".
4. At this point you will be prompted to insert a floppy disk containing the RAID driver. Insert the provided RAID driver diskette.
5. Locate for the drive where you inserted the diskette then select RAID or AHCI controller that corresponds to your BIOS setup. Press <Enter> to confirm.

You have successfully installed the driver. However you must continue installing the OS. Leave the floppy disk in the floppy drive until the system reboots itself because Windows setup will need to copy the files again from the floppy disk to the Windows installation folders. After Windows setup has copied these files again, remove the floppy diskette so that Windows setup can reboot as needed.

## Chapter 6 - ATI CrossFire Technology

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ATI's CrossFire technology drives your PC to a new peak of performance. By connecting a Radeon CrossFire Edition graphics card and a standard PCI Express graphics card, the power of these multiple GPUs (Graphics Processing Units) within the system will accelerate your gaming performance and improve image quality.

Aside from dual GPU for 3D rendering, CrossFire's new feature - asymmetric processing technology, allows adding another dedicated GPU for physics processing. The 3 GPUs simultaneously handle Data Parallel Processing (DPP) computing tasks such as game rendering and physics in a single system. This provides more realistic cutting edge 3D graphics to run at high resolutions.

### How CrossFire Works

CrossFire's key objective is to maximize the speed of a multi-GPU system. This is achieved by dividing the rendering workload to each of the two GPUs. When each GPU has completed its assigned tasks for a given frame, the Compositing Engine on the CrossFire Edition graphics card combines the results from each GPU (according to the selected operating mode) then sends the final frames out to the display device. The result will be a complete frame rendered at up to twice the performance of a single graphics card.

3D games are made up of a number of different tasks such as input processing, game state updating, artificial intelligence, physics, rendering, networking, audio, etc. The Data Parallel Processing (DPP) computing tasks simultaneously executes a common set of instructions across a large set of input data. Besides rendering, the detailed physics simulations allow these GPUs to take on an expanded role in game computing. Multiple GPUs can enhance a game by providing generous amounts of additional computing power for certain specific tasks.

## Features

Regardless of the type of operating mode used, the completed frames from both GPUs are sent to the Compositing Engine on the CrossFire Edition graphics card, which then sends them on to the display device.

- **Supertile Mode**

Supertiling divides your screen image into subsections like “tiles” in alternating tile pattern such that half of the tiles are assigned to each of the two GPUs.

- **Scissor Mode**

In Scissor mode, each frame is split into two sections, either horizontal or vertical, with each section being processed by one GPU.

- **Alternate Frame Rendering (AFR)**

In AFR mode, all even frames are rendered on one GPU, while all odd frames are rendered on the other.

- **Super AA (Anti-Aliasing)**

The Super AA mode provides even higher quality anti-aliasing on multi-GPU systems. It works by having each GPU render the same frame with anti-aliasing enabled but using different sample locations for each. When both versions of the frame are completed, they are blended in the CrossFire Compositing engine. The resulting image is twice the number of samples, so 4x and 6x AA become 8x and 12x Super AA respectively.

## Graphics Cards Requirements

1. One Radeon® X850 / Radeon® X800 CrossFire Edition graphics card.
2. One standard PCI Express Radeon® X850 or Radeon® X800 graphics card.

The Radeon® X850 CrossFire Edition card works with any standard PCI Express Radeon X850 graphics card (Radeon X850 PRO, Radeon X850 XT or Radeon X850 XT Platinum Edition) from ATI or any of its partners including cards previously sold.

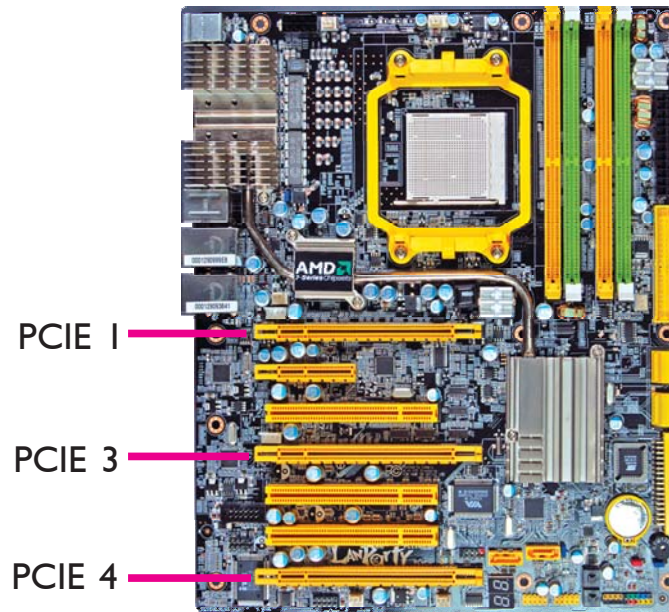
The Radeon® X800 CrossFire Edition card works with any standard PCI Express Radeon X800 graphics card (Radeon X800, Radeon X800 PRO, Radeon X800 XL, Radeon X800 XT or Radeon X800 XT Platinum Edition) from ATI or any of its partners.



**Note:**

*If the clock speed of the CrossFire Edition graphics card and standard PCI Express graphics card are different, both cards will operate at their individual clock speeds.*

## The PCI Express x16 Slots

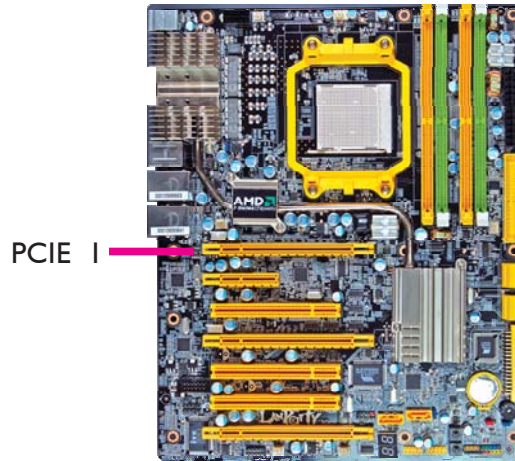


### Configurations

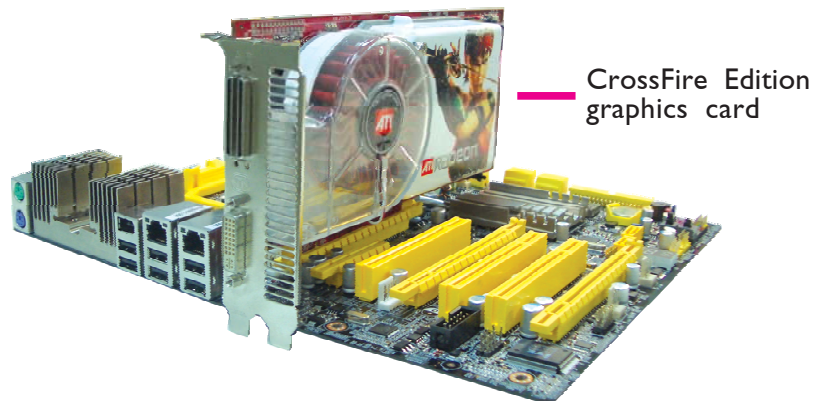
- 2-way or 4-way CrossFire at x16/x16/NC bandwidth
- 3-way CrossFire at x16/x8/x8 bandwidth
- 2-way CrossFire + Physics at x16/x8/x8 bandwidth

## CrossFire Setup

1. Power-off the system and monitor then unplug the power cord.
2. Remove the screw of the bracket that is opposite the PCIE 1 slot then remove the bracket.



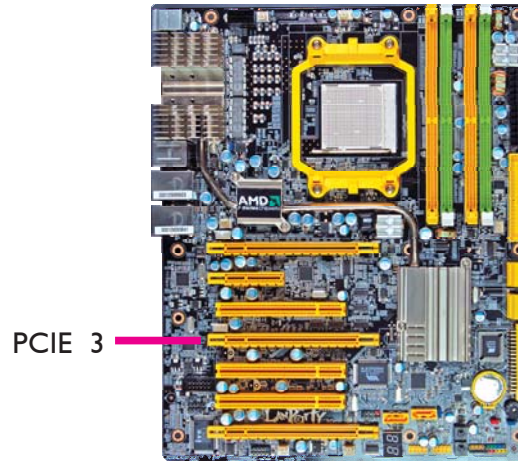
3. Align the CrossFire Edition graphics card (Master) above the PCIE 1 slot then press it down firmly until it is completely seated in the slot.



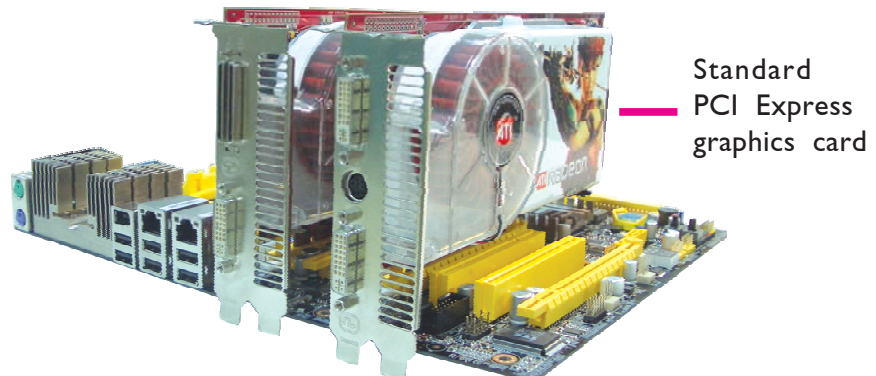
4. Secure the graphics card with the screw you removed in step 2.



5. Remove the screw of the bracket that is opposite the PCIE 3 slot then remove the bracket.

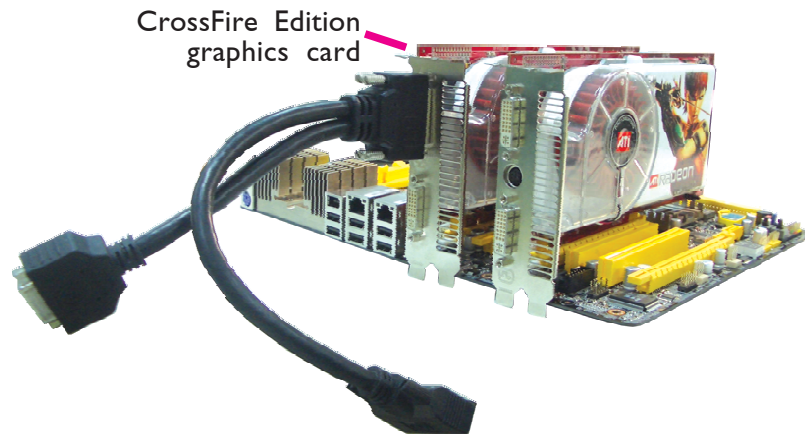


6. Align the standard PCI Express graphics card (Slave) above the PCIE 3 slot then press it down firmly until it is completely seated in the slot.

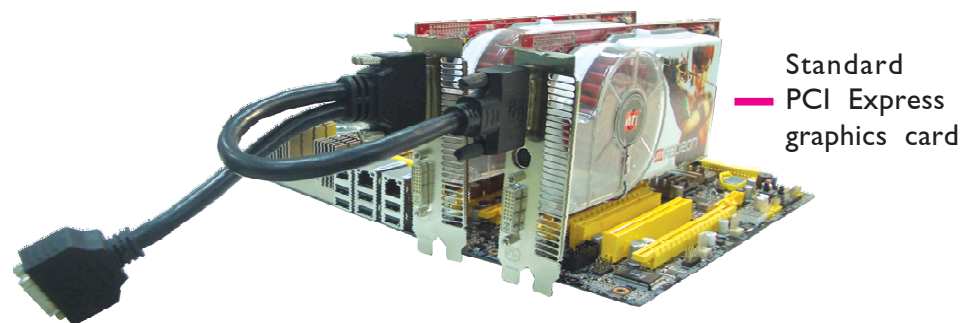


7. Secure the graphics card with the screw you removed in step 5.

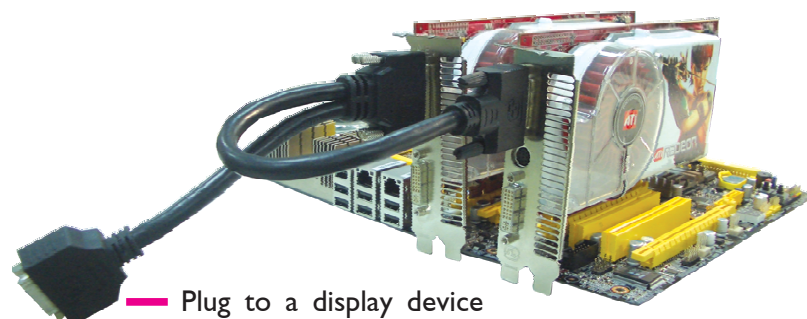
8. The CrossFire Edition graphics card comes with an external cable. Plug one end of the external cable to a connector on the CrossFire Edition graphics card as shown below.



9. Now plug the other end of the external cable to the DVI-I connector on the standard PCI Express graphics card.



10. Connect the loose end of the external cable to a display device.



11. Connect auxiliary power source from the power supply unit to the graphics cards.
12. Install the graphics cards' drivers then restart the system for the drivers to take effect.
13. When you enter the operating system, you will notice the ATI Catalyst Control Center icon added onto your desktop. Double-click this icon.



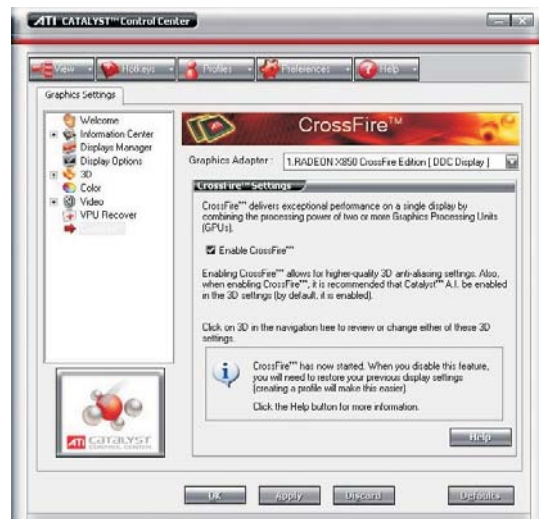
14. Click the View tab then select Custom View.



15. In the Graphics Settings menu (left side of screen), click CrossFire. The CrossFire Settings screen will appear on the main window. Click "Enable CrossFire" then click "Yes" to continue.



16. The screen on the right indicates that CrossFire has been enabled. Make sure to restart the PC for CrossFire to take effect.



## Chapter 7 - Cool'n'Quiet Technology

### Cool'n'Quiet Technology

The AMD Cool'n'Quiet™ technology allows the system to detect the CPU's tasks and utilization status. When the CPU's task slows down, the system effectively lowers power consumption by lowering its CPU speed and voltage, subsequently decreasing its noise level.

To enable the Cool'n'Quiet™ technology, the following settings are required.

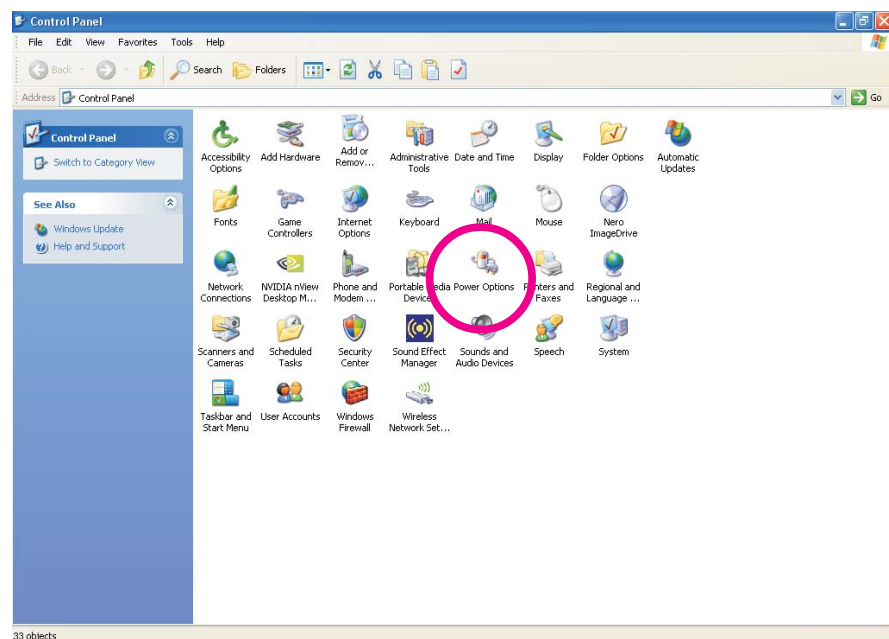
1. Install the Cool'n'Quiet™ driver.
2. Configure Power Management in Windows.

#### Step 1: Install the Cool'n'Quiet™ Driver

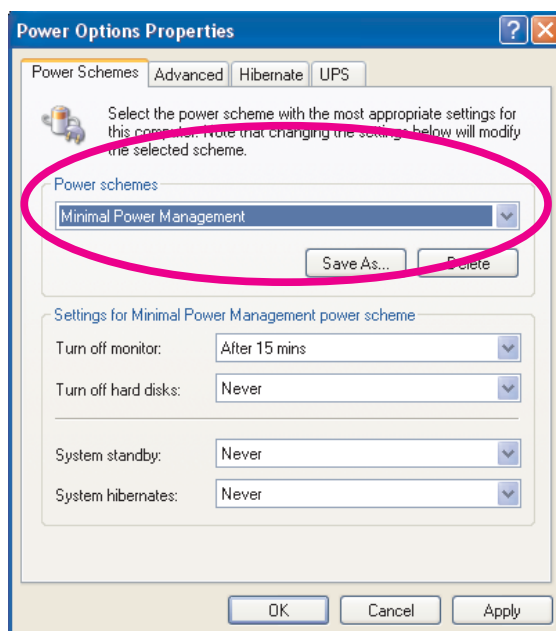
AMD's website provides free download of the Cool'n'Quiet™ driver. Make sure to install the appropriate driver for the CPU that you are using.

#### Step 2: Configure Power Management in Windows

1. On the Windows desktop, click Start then select Control Panel.
2. In Control Panel, double-click the Power Options icon.



3. In the Power Schemes tab, select Minimal Power Management under the Power schemes section then click OK.



## Appendix A - System Error Message

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

### POST Beep

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

### 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-FFFFFFH is bad.

**Memory test fail**

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



## Appendix B - Troubleshooting

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### 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.

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.