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CHAPTER 1: INTRODUCTION

1.1 MOTHERBOARD FEATURES

A. Hardware

CPU

- Supports Socket 939.
- Supports AMD Athlon 64 FX / Athlon 64 processor.
- HyperTransport™ technology up to 2000MHz Full duplex
- AMD 64 architecture enables simultaneous 32 and 64 bit computing.
- Supports HyperTransport™ and AMD Cool'n'Quiet™ Technology

Chipset

- **NVIDIA nForce4 CK8-04 SLI:**
 - Supports NVIDIA Firewall.
 - Supports Gigabit Ethernet.
 - Supports 10 USB 2.0 ports.
 - Supports NVIDIA nTune Utility.
 - Supports NVIDIA Secure Networking Processor.
 - Supports 2 PCI-Express x16 interface graphics cards.
 - Supports 4 SATA 2.0 ports, each channel up to 3Gb/s.
 - Supports NVIDIA RAID functions, including RAID 0, RAID 1 and RAID 0+1.
 - Supports 4 IDE disk drives with PIO Mode 5, Bridge Mode and Ultra DMA 33/66/100/133 Bus Master Mode.
 - Compliant with AC'97 version 2.3 specification.
 - Compliant with PCI-Express Version 1.a specification.

Operating Systems

- Supports Windows 2000 and Windows XP.
Note: Do not support Windows 98SE and Windows ME.

Dimensions

- ATX Form Factor: 29.4cm (L) x 24.35cm (W)

On-board IDE

- 2 on-board connectors support 4 IDE disk drives.
- Supports PIO mode 5, Block Mode and Ultra DMA 33/66/100/133 bus master mode.

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System Memory

- Supports Dual Channel DDR.
- Supports 8 banks in total.
- Supports DDR333 and DDR400.
- Maximum memory size is 4GB.

DIMM Socket Location	DDR Module	Total Memory Size (MB)
DIMM1	128MB/256MB/512MB/1GB *1	Max is 4 GB.
DIMM2	128MB/256MB/512MB/1GB *1	
DIMM3	128MB/256MB/512MB/1GB *1	
DIMM4	128MB/256MB/512MB/1GB *1	

Expansion Slots

- Three 32bit PCI bus master slots.
- **Normal Mode PCI-Express slots:**
 - One PCI-Express x16 slot: PEX16-1.
 - Three PCI-Express x1 slots: PEX16-2, PEX1-1 and PEX1-2 slots
- **SLI Mode PCI-Express slots:**
 - Two PCI-Express x8 slots: PEX16-1 and PEX16-2.
 - Two PCI-Express x1 slots. PEX1-1 and PEX1-2.

Notice:

Normal Mode and SLI Mode are switched by SLI-NF4 selector card.
(Please read Chapter 5 for detail information.)

Gigabit Ethernet LAN

- NVIDIA Gigabit MAC + VITESSE Gigabit PHY VSC8201.
- Supports 10Mb/s, 100Mb/s and 1GB/s auto-negotiation.
- Half/Full duplex capability.
- Supports personal Firewall setup.
- Supports ACPI power management.

On-board AC'97 Audio Sound Codec

- Chip: ALC850:
- Compliant with AC'97 version2.3 specification.
- Supports 8 channels audio output.

IEEE 1394A Chip (optional)

- Chip: VIA VT6307.
- Supports 2 ports with transfer up to 400Mb/s.

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Super I/O

- Chip: ITE IT8712F.
- Low Pin Count Interface.
- Provides the most commonly used legacy Super I/O functionality.
- Environment Control initiatives,
 - H/W Monitor
 - Fan Speed Controller
 - ITE's "Smart Guardian" function

Serial ATA

- 4 on-board Serial ATA connectors support 4 serial ATA (SATA) ports.
- Supports data transfer rates 1.5Gb/s or 3Gb/s.
- Compliant with SATA2.0 specification.

RAID Controller

- Integrated in nForce4 CK8-04 SLI:
- NVIDIA RAID Technology:
 - RAID 0 disk striping for highest system and application performance
 - RAID 1 disk mirroring support for fault toleranceSupport for both SATA and ATA-133 disk controller standards
 - RAID 0+1 disk striping and mirroring for highest performance with fault tolerance

Security

- NVIDIA Network Management:
 - Remote access, configuration, monitoring
 - Command line interface (CLI)
 - WMI scripts.
- NVIDIA Firewall technology:
 - Native firewall solution, protects the PC from intruders by filtering unauthorized traffic.

Internal On-board Connectors and Headers

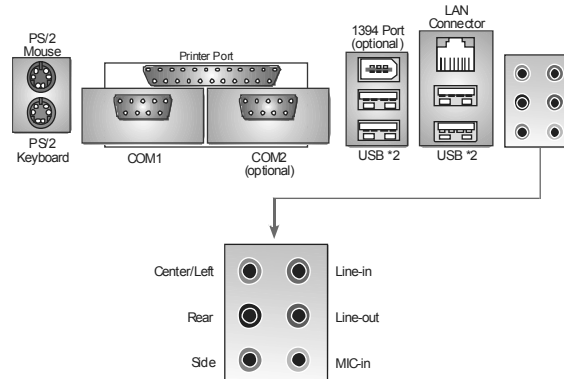
- 1 audio-out header supports audio-out facilities.
 - 1 front panel header supports front panel facilities.
 - 1 CD-in connector supports CD-ROM audio-in function.
 - 1 SPDIF-out connector supports digital audio-out function.
 - 1 IEEE1394A header supports 1 1394A Firewire port (optional).
-

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- 1 SPDIF-in connector supports digital audio-in function (optional).
- 1 floppy connector supports 2 FDD devices with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes.
- 2 IDE connectors support 4 IDE disk drives.
- 3 USB headers support 6 USB 2.0 ports at front panel.
- 4 Serial ATA connectors support 4 SATA 2.0 devices.

Rear (Back Panel) Side Connectors

- 1 Printer Port.
- 1 PS/2 Mouse Port.
- 1 PS/2 Keyboard Port.
- 1 Serial Port. (COM2 is optional.)
- 1 1394A Firewire Port (optional).
- 1 RJ-45 LAN jack.
- 4 USB 2.0 Ports.
- 6 audio ports support 8 channels audio-out facilities.



B. BIOS & Software

BIOS

- Award legal BIOS.
- Supports APM1.2.
- Supports ACPI.
- Supports USB Function.

Bundled Software

- Supports 9th Touch™, WINFLASHER™ and FLASHER™.

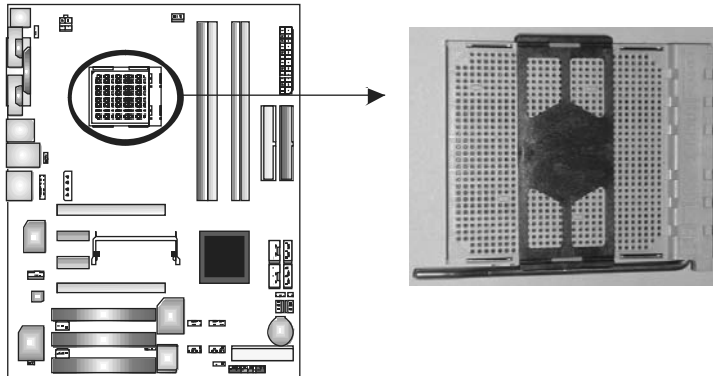
1.2 PACKAGE CHECKLIST

- ✦ FDD Cable x 1
- ✦ HDD Cable x 1
- ✦ User's Manual x 1
- ✦ Serial ATA Cable x 1
- ✦ BRI-2 SLI Bridge x 1
- ✦ Fully Setup Driver CD x 1
- ✦ Rear I/O Panel for ATX Case x 1
- ✦ SLI-NF4 Selector Card x 1 (pre-installed)
- ✦ SPDIF Cable x 1 (optional)
- ✦ USB 2.0 Cable x 1 (optional)
- ✦ Retention Bracket x 1 (optional)
- ✦ IEEE 1394A Cable x 1 (optional)
- ✦ Serial ATA Power Switch Cable x 1 (optional)

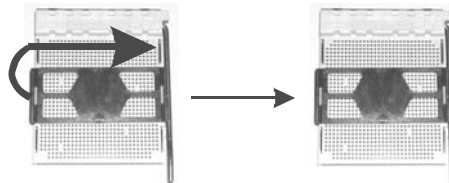


CHAPTER 2: HARDWARE INSTALLATION

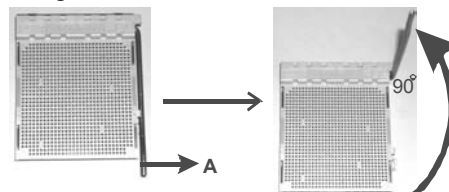
2.1 CENTRAL PROCESSING UNIT (CPU)



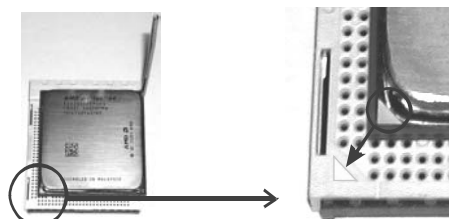
Step 1: Remove the socket protection cap.



Step 2: Pull the lever toward direction A from the socket and then raise the lever up to a 90-degree angle.

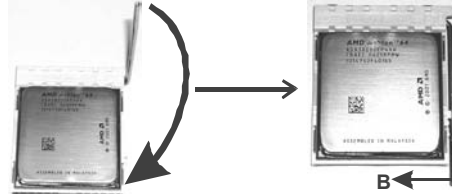


Step 3: Look for the white triangle on socket, and the gold triangle on CPU should point forwards this white triangle. The CPU will fit only in the correct orientation.



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Step 4: Hold the CPU down firmly, and then close the lever toward direct B to complete the installation.



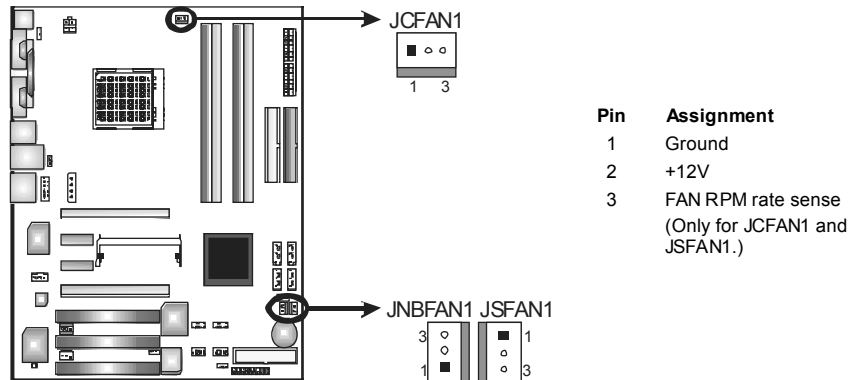
Step 5: Put the CPU Fan on the CPU and buckle it. Connect the CPU FAN power cable to the JCFAN1. This completes the installation.

2.2 FAN HEADERS

JCFAN1: CPU FAN Power Header

JSFAN1: System Fan Power Header (optional)

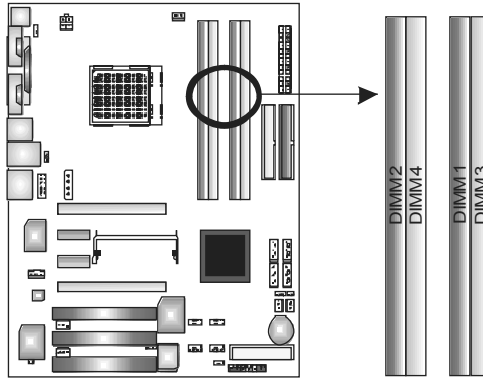
JNBFAN1: Northbridge Fan Power Header



Note:

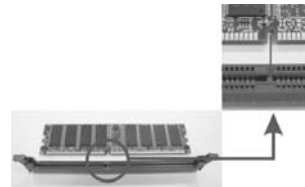
The JCFAN1 and JSFAN1 support system cooling fan with Smart Fan Control utility. It supports 3 pin head connector. When connecting with wires onto connectors, please note that the red wire is the positive and should be connected to pin#2, and the black wire is Ground and should be connected to GND.

2.3 MEMORY MODULES INSTALLATION

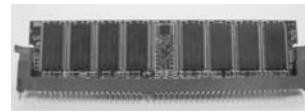


2.2.1 DDR Module installation

1. Unlock a DIMM slot by pressing the retaining clips outward. Align a DIMM on the slot such that the notch on the DIMM matches the break on the Slot.



2. Insert the DIMM vertically and firmly into the slot until the retaining chip snap back in place and the DIMM is properly seated.



2.2.2 DDR Installation Notice

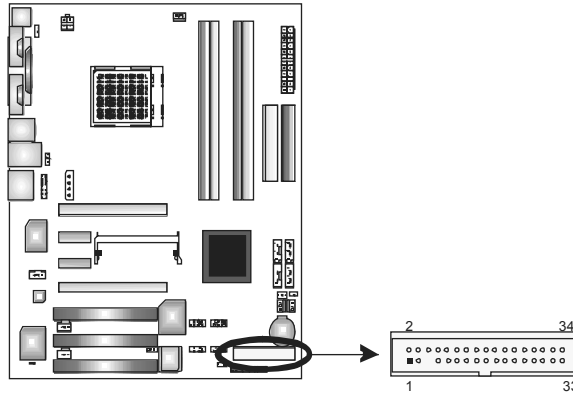
- Please follow the table below to install your DDR memory module, or the system may not boot up or may not function properly.
- “SS” represents Single Side DDR memory module.
- “DS” represents Double Side DDR memory module.
- Star sign “*” represents leave the DIMM socket empty.

DIMM1	SS/DS	*	SS/DS	*	SS/DS
DIMM2	*	*	SS/DS	*	SS/DS
DIMM3	*	SS/DS	*	SS/DS	SS/DS
DIMM4	*	*	*	SS/DS	SS/DS

2.4 CONNECTORS & SLOTS

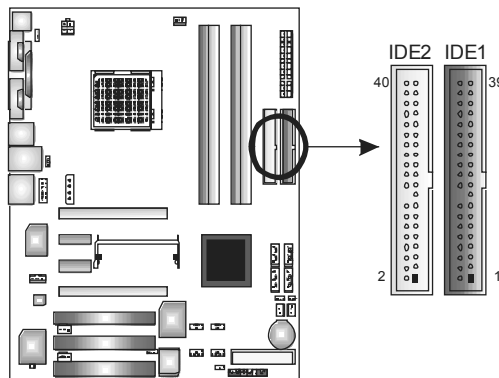
FDD1: Floppy Disk Connector

The motherboard provides a standard floppy disk connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. This connector supports the provided floppy drive ribbon cables.



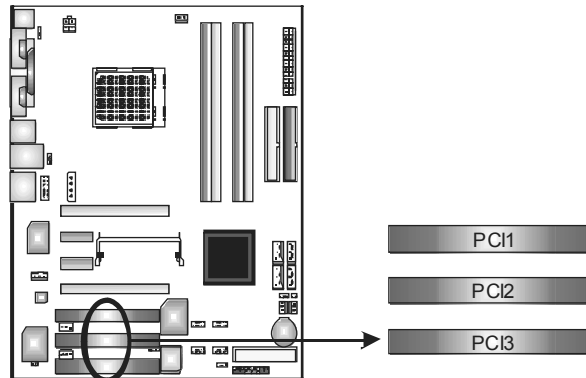
IDE1/IDE2: Hard Disk Connectors

The motherboard has two 32-bit Enhanced PCI IDE Controller that provides PIO Mode 0~5, Bus Master, and Ultra DMA 33/66/100/133 functionality. It has two HDD connectors IDE1 (primary) and IDE2 (secondary). The IDE connectors can connect a master and a slave drive, so you can connect up to four hard disk drives. The first hard drive should always be connected to IDE1.



PCI1~PCI3: Peripheral Component Interconnect Slots

This motherboard is equipped with 3 standard PCI slot. PCI stands for Peripheral Component Interconnect, and it is a bus standard for expansion cards. This PCI slot is designated as 32 bits.

**PEX16-1/PEX16-2/PEX1-1/PEX1-2:PCI-Express Slots****PEX16-1 (Normal Mode):**

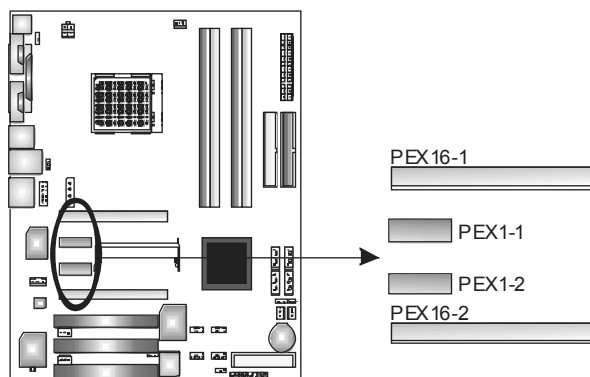
- PCI Express 1.0a compliant.
- Maximum bandwidth is up to 4GB/s per direction.

PEX16-1/PEX1-1/PEX1-2 (Normal Mode):

- PCI Express 1.0a compliant.
- Maximum bandwidth is up to 250MB/s per direction.

PEX16-1/PEX16-2 (SLI Mode):

- PCI Express 1.0a compliant.
- Maximum bandwidth is up to 2GB/s per direction.



CHAPTER 3: HEADERS & JUMPERS SETUP

3.1 HOW TO SETUP JUMPERS

The illustration shows how to set up jumpers. When the jumper cap is placed on pins, the jumper is “close”, if not, that means the jumper is “open”.



Pin opened



Pin closed

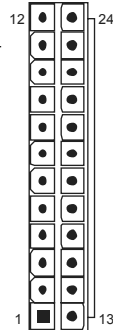
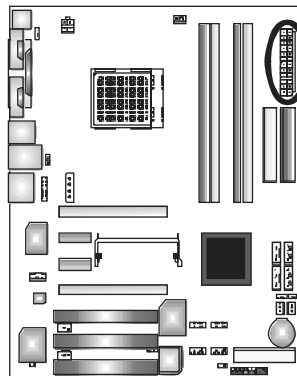


Pin1-2 closed

3.2 DETAIL SETTINGS

JATXPWR1/JATXPWR2: ATX Power Source Connectors

This connector allows user to connect 24-pin power connector on the ATX power supply.

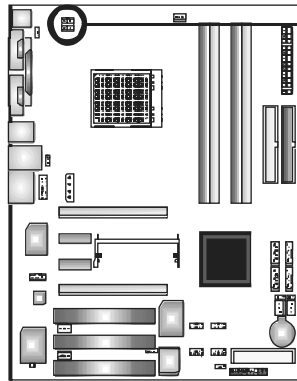


Pin	Assignment
1	+3.3V
2	+3.3V
3	Ground
4	+5V
5	Ground
6	+5V
7	Ground
8	PW_OK
9	Standby Voltage+5V
10	+12V
11	+12V
12	Detect
13	+3.3V
14	-12V
15	Ground
16	PS_ON
17	Ground
18	Ground
19	Ground
20	-5V
21	+5V
22	+5V
23	+5V
24	Ground

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JATXPWR2: ATX Power Source Connector

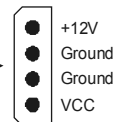
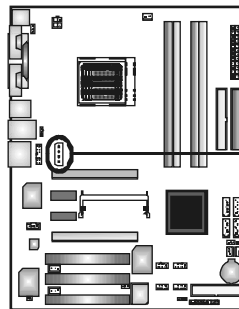
By connecting this connector, it will provide +12V to CPU power circuit.



Pin	Assignment
1	+12V
2	+12V
3	Ground
4	Ground

JPEXPWR1: PCI-Express x16 Slot Power Source Connector

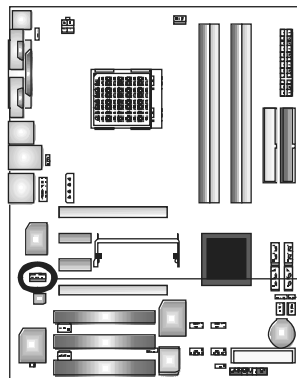
When SLI mode is enabled, please plug in this PEX power source connector to make sure the system is working under a stable environment. Please read Chapter 5 for detail information.



+12V
Ground
Ground
VCC

JCDIN1: CD-ROM Audio-in Connector

This connector allows user to connect the audio source from the variety devices, like CD-ROM, DVD-ROM, PCI sound card, PCI TV turner card etc..



Pin	Assignment
1	Left channel input
2	Ground
3	Ground
4	Right channel input

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J1394_USB1/JUSBV1: Power Source Headers for USB Ports

Pin 1-2 Close:

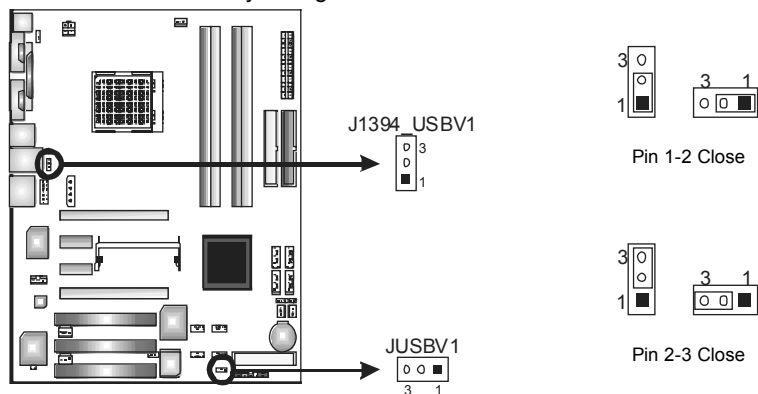
J1394_USB1: +5V for USB ports at J1394_USB1 and JUSBLAN1.

JUSBV1: +5V for front USB headers (JUSB1/JUSB2/JUSB3).

Pin 2-3 Close:

J1394_USB1: USB ports at J1394_USB1 and JUSBLAN1 are powered with +5V standby voltage.

JUSBV1: Front USB headers (JUSB1/JUSB2/JUSB3) are powered with +5V standby voltage.

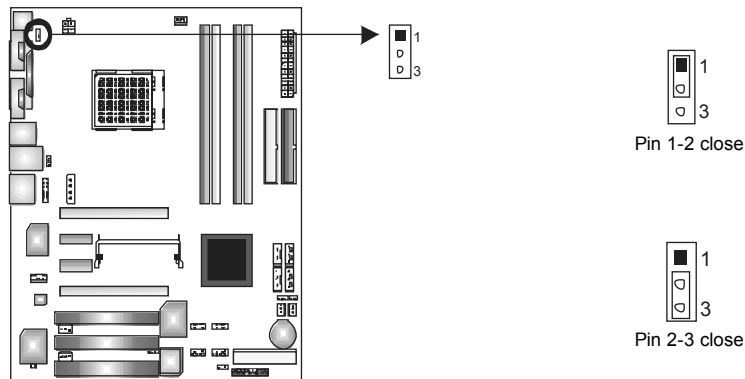


Note: In order to support this function “Power-on system via USB device,” “J1394_USB1/JUSBV1” jumper cap should be placed on Pin 2-3 individually.

JKBMSV1: Power Source Header for PS/2 Keyboard/Mouse

Pin 1-2 Close: +5V for PS/2 keyboard and mouse..

Pin 2-3 Close: PS/2 keyboard and mouse are powered with +5V standby voltage.

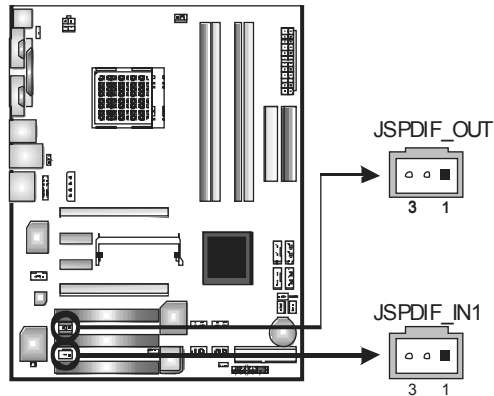


Note: In order to support this function “Power-on system via keyboard and mouse”, “JKBMSV1” jumper cap should be placed on Pin 2-3.

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JSPDIF_OUT/JSPDIF_IN1: Digital Audio-out Connectors (JSPDIF_IN1 is optional.)

These connectors allow user to connect the PCI bracket SPDIF output or input header.



JSPDIF_OUT:

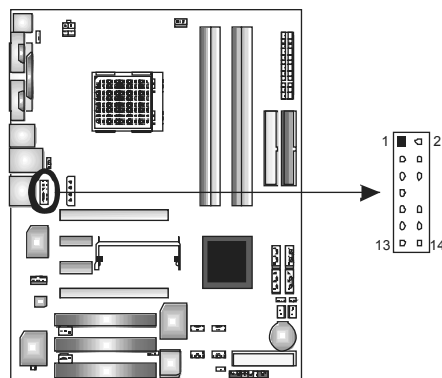
Pin	Assignment
1	+5V
2	SPDIF OUT
3	Ground

JSPDIF_IN1:

Pin	Assignment
1	+5V
2	SPDIF IN
3	Ground

JAUDIO2: Front Panel Audio-out Header

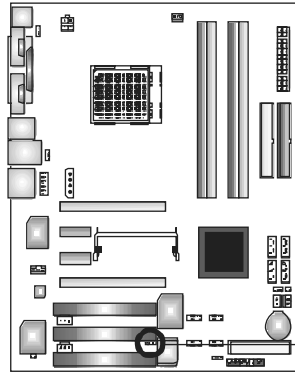
This connector will allow user to connect with the front audio out put headers on the PC case. It will disable the output on back panel audio connectors.



Pin	Assignment
1	MIC-in/ Stereo MIC-in R
2	Ground
3	Stereo MIC-in L
4	Audio power
5	Right line-out/ Speaker-out Right.
6	Right line-out/ Speaker-out Right
7	Reserved
8	Key
9	Left line-out/ Speaker-out Left
10	Left line-out/ Speaker-out Left
11	Right line-in (optional)
12	Right line-in (optional)
13	Left line-in (optional)
14	Left line-in (optional)

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J1394PWR1 (optional): Power Source Header for 1394 Chip



Pin 1-2 Close:

+3.3V for 1394 chipset (default).

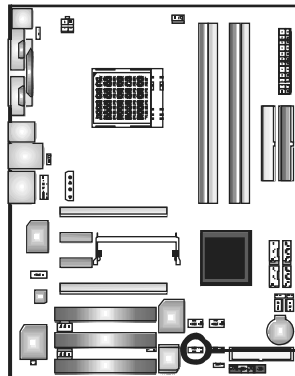


Pin 2-3 Close:

+3.3V SB for 1394 chipset.

J1394A1 (optional): Header for 1394A Firewire Port at Front Panel

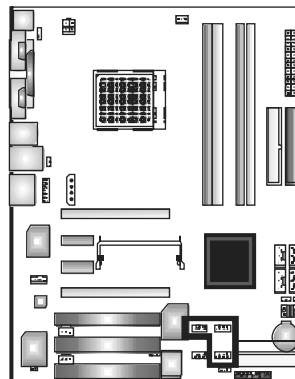
This header allows user to connect the front 1394 port for digital image devices.



Pin	Assignment
1	A+
2	A-
3	Ground
4	Ground
5	B+
6	B-
7	+12v
8	+12V
9	Key
10	Ground

JUSB1~JUSB3: Headers for USB Ports at Front Panel

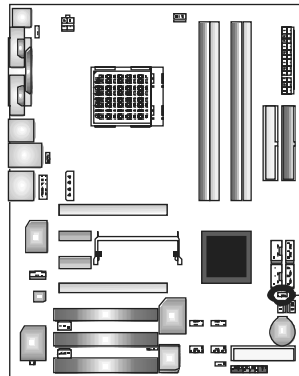
This connector allows user to connect additional USB cables at PC front panel, and also can be connected with internal USB devices, like USB card reader.



Pin	Assignment
1	+5V (fused)
2	+5V (fused)
3	USB-
4	USB-
5	USB+
6	USB+
7	Ground
8	Ground
9	Key
10	NC

JCMOS1: Clear CMOS Header

By placing the jumper on pin2-3, it allows user to restore the BIOS safe setting and the CMOS data, please carefully follow the procedures to avoid damaging the motherboard.



Pin 1-2 close:
Normal Operation (Default).



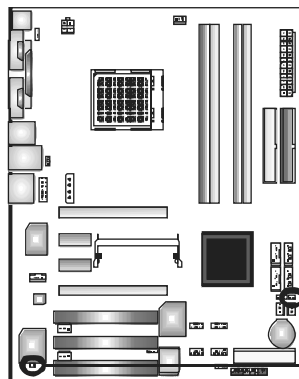
Pin 2-3 close:
Clear CMOS data.

※ Clear CMOS Procedures:

1. Remove AC power line.
2. Set the jumper to “Pin 2-3 close”.
3. Wait for five seconds.
4. Set the jumper to “Pin 1-2 close”.
5. Power on the AC.
6. Reset your desired password or clear the CMOS data.

JCI1/JCI2: Case Open Headers (JCI2 is optional.)

This connector allows system to monitor PC case open status. If the signal has been triggered, it will record to the CMOS and show the message on next boot-up.

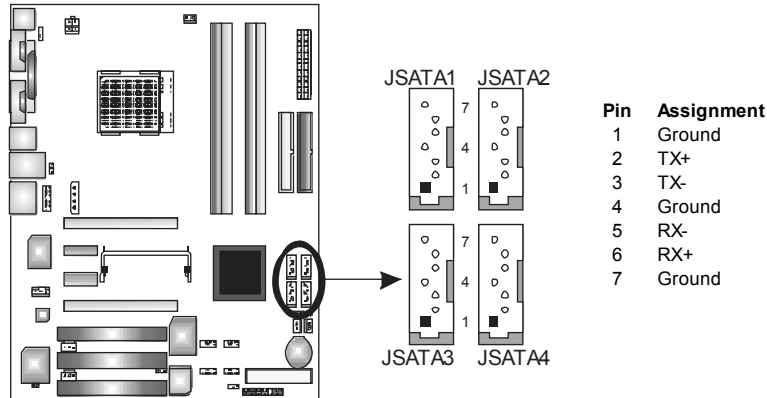


Pin	Assignment
1	Case open signal
2	Ground

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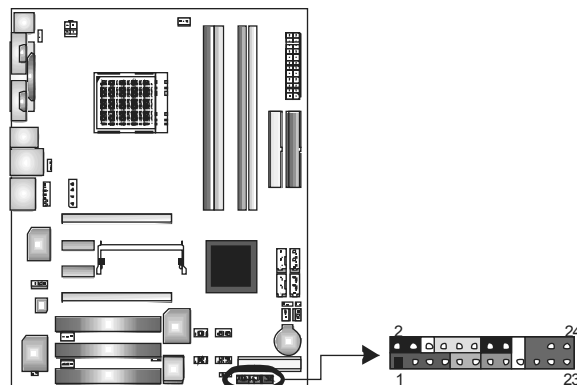
JSATA1~JSATA4: Serial ATA Connectors

The motherboard has a SATA Controller in nForce4 CK8-04 SLI with 4 channels SATA interface, it satisfies the SATA 2.0 spec and with transfer rate of 3.0Gb/s.



JPANEL1: Header for Front Panel Facilities

This 24-pin connector includes Power-on, Reset, HDD LED, Power LED, Sleep button, speaker and IrDA Connection. It allows user to connect the PC case's front panel switch functions.



Pin	Assignment	Function	Pin	Assignment	Function
1	+5V	Speaker Connector	2	Sleep control	Sleep button
3	N/A		4	Ground	
5	N/A		6	N/A	N/A
7	Speaker	Hard drive LED	8	Power LED (+)	Power LED
9	HDD LED (+)		10	Power LED (+)	
11	HDD LED (-)		12	Power LED (-)	
13	Ground	Reset button	14	Power button	Power-on button
15	Reset control		16	Ground	
17	N/A		18	Key	
19	N/A	IrDA Connector	20	Key	IrDA Connector
21	+5V		22	Ground	
23	IRTX		24	IRRX	

CHAPTER 4: USEFUL HELP

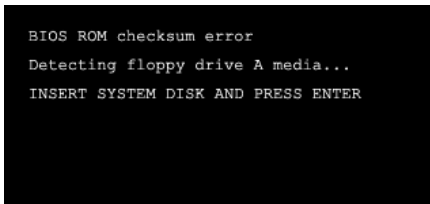
4.1 AWARD BIOS BEEP CODE

Beep Sound	Meaning
One long beep followed by two short beeps	Video card not found or video card memory bad
High-low siren sound	CPU overheated System will shut down automatically
One Short beep when system boot-up	No error found during POST
Long beeps every other second	No DRAM detected or install

4.2 EXTRA INFORMATION

A. BIOS Update

After you fail to update BIOS or BIOS is invaded by virus, the Boot-Block function will help to restore BIOS. If the following message is shown after boot-up the system, it means the BIOS contents are corrupted.

A screenshot of a black screen with white text. The text reads: "BIOS ROM checksum error", "Detecting floppy drive A media...", and "INSERT SYSTEM DISK AND PRESS ENTER".

```
BIOS ROM checksum error
Detecting floppy drive A media...
INSERT SYSTEM DISK AND PRESS ENTER
```

In this Case, please follow the procedure below to restore the BIOS:

1. Make a bootable floppy disk.
2. Download the Flash Utility "AWDFLASH.exe" from the Biostar website: www.biostar.com.tw
3. Confirm motherboard model and download the respectively BIOS from Biostar website.
4. Copy "AWDFLASH.exe" and respectively BIOS into floppy disk.
5. Insert the bootable disk into floppy drive and press Enter.
6. System will boot-up to DOS prompt.
7. Type "Awdflash xxxx.bf/sn/py/r" in DOS prompt.
8. System will update BIOS automatically and restart.
9. The BIOS has been recovered and will work properly.

B. CPU Overheated

If the system shutdown automatically after power on system for seconds, that means the CPU protection function has been activated.

When the CPU is over heated, the motherboard will shutdown automatically to avoid a damage of the CPU, and the system may not power on again.

In this case, please double check:

1. The CPU cooler surface is placed evenly with the CPU surface.
2. CPU fan is rotated normally.
3. CPU fan speed is fulfilling with the CPU speed.

After confirmed, please follow steps below to relief the CPU protection function.

1. Remove the power cord from power supply for seconds.
2. Wait for seconds.
3. Plug in the power cord and boot up the system.

Or you can:

1. Clear the CMOS data.
(See "JCMOS1: Clear CMOS Header" section)
2. Wait for seconds.
3. Power on the system again.

4.3 TROUBLESHOOTING

Probable	Solution
<ol style="list-style-type: none">1. No power to the system at all Power light don't illuminate, fan inside power supply does not turn on.2. Indicator light on keyboard does not turn on.	<ol style="list-style-type: none">1. Make sure power cable is securely plugged in.2. Replace cable.3. Contact technical support.
System inoperative. Keyboard lights are on, power indicator lights are lit, and hard drive is spinning.	Using even pressure on both ends of the DIMM, press down firmly until the module snaps into place.
System does not boot from hard disk drive, can be booted from optical drive.	<ol style="list-style-type: none">1. Check cable running from disk to disk controller board. Make sure both ends are securely plugged in; check the drive type in the standard CMOS setup.2. Backing up the hard drive is extremely important. All hard disks are capable of breaking down at any time.
System only boots from optical drive. Hard disk can be read and applications can be used but booting from hard disk is impossible.	<ol style="list-style-type: none">1. Back up data and applications files.2. Reformat the hard drive. Re-install applications and data using backup disks.
Screen message says "Invalid Configuration" or "CMOS Failure."	Review system's equipment. Make sure correct information is in setup.
Cannot boot system after installing second hard drive.	<ol style="list-style-type: none">1. Set master/slave jumpers correctly.2. Run SETUP program and select correct drive types. Call the drive manufacturers for compatibility with other drives.

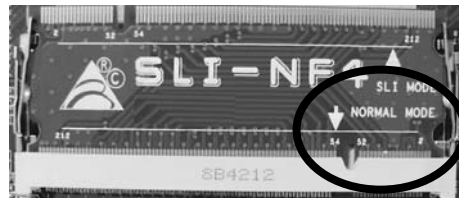
CHAPTER 5: NVIDIA SLI FUNCTION

5.1 REQUIREMENTS

- Only Windows XP supports SLI (Dual Video) function.
- Two identical SLI-ready graphics cards that are NVIDIA certified.
- The graphics card driver should support NVIDIA SLI technology.
- The power supply unit must provide at least the minimum power required by the system, or the system will be unstable.

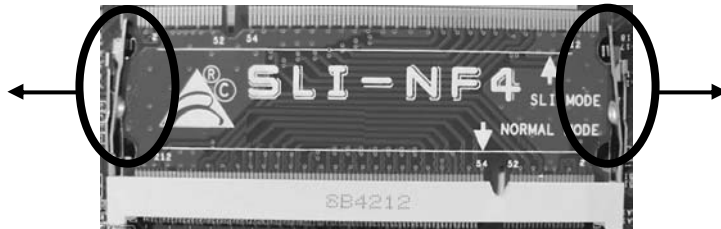
5.2 PLACING THE SLI-NF4 SELECTOR CARD

- There is a pre-installed SLI-NF4 selector card on the motherboard. The default setting is Normal Mode, only supports single graphics card.

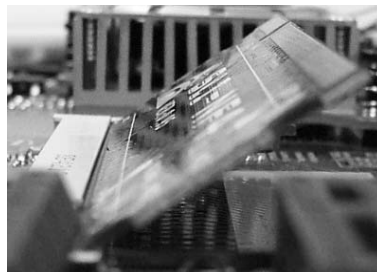


- To use two graphics cards, firstly, you have to set the selector card to SLI Mode, to support dual video cards.

Step 1: Push the retention clips outward to release SLI-NF4 selector card.



Step 2: Pull the selector card out of the slot.

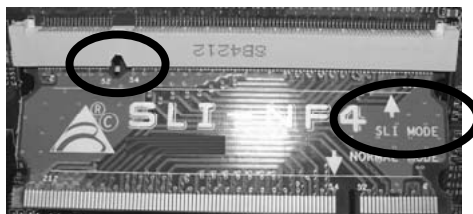


② pull out the selector card

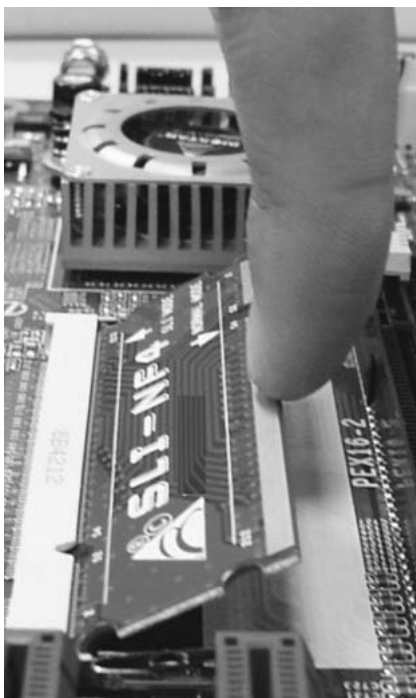
① about 45° degree lift.

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Step 3: Invert the selector card and insert the edge labeled “SLI MODE”.



Step 4: Push down the selector card until the retention clips snap into place.



- ① Insert the card with a degree about 45° .
- ② Push the selector card downward.

Notice: Make sure to insert the card into the slot completely.

5.3 THINGS TO NOTICE

■ Normal Mode:

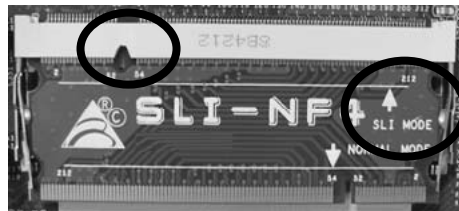
- Only PEX16-1 slot supports PCI-Express x16 interface graphics card function.
- PEX16-2, PEX1-1 and PEX1-2 slots provide PCI-Express x1 interface expansion card function.

■ SLI Mode:

- Use BRI-SLI connector to link two SLI-ready PCI-E x16 interface graphics cards.
- PEX16-1 and PEX16-2 slots provide PCI-E x8 data transfer rate.
- PEX1-1 and PEX1-2 slots provide PCI-Express x1 interface expansion card function.
- Coordinate with graphics card driver to set Dual Video function.

5.4 INSTALLING SLI-READY GRAPHICS CARDS

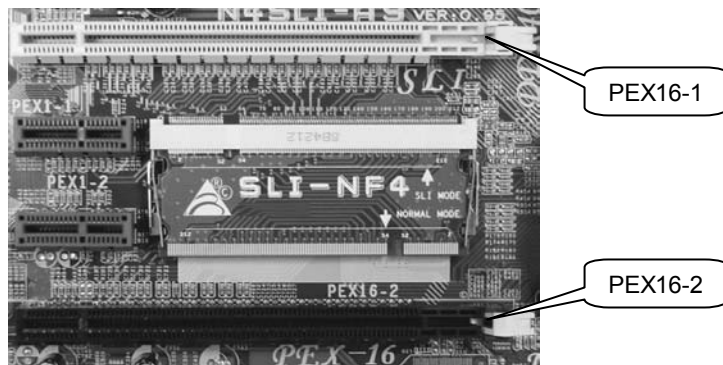
Step 1: Make sure the SLI-NF4 selector card is placed at SLI Mode.



Step 2: Prepare two graphics cards with PCI-E x16 interface.

Step 3: Insert the first one graphics card into the yellow slot (PEX16-1).

Step 4: Insert the second graphics card into the white slot (PEX16-2).



Notice:

Make sure both the graphics cards are seated into slots completely.

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Step 5: Connect a 4-pin ATX power cable to PEX power connector (JPEXPWR1), this will ensure the stabilization of your system.

Notice:

When under SLI mode, please make sure the power supply is at least 500W (and above).



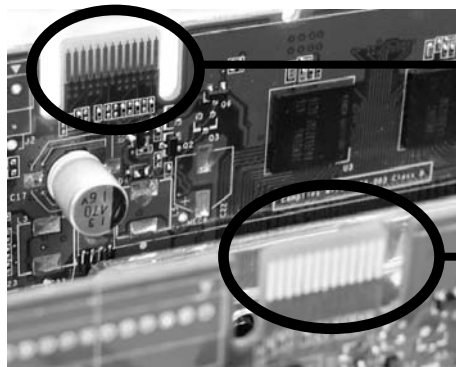
Step 6: Insert the SLI Bridge (BRI-2) connector on the gold-fingers on each graphics card.



Front view



Side view



Gold-fingers on
two graphics

Step 7: To securely fix the connector between two graphics cards, a retention bracket must be installed.

Step 7-1: Remove any of the bracket cover between the two graphics cards.

Step 7-2: Align and insert the retention bracket into the slot and then fix it with a screw.

Notice:

1. Make sure the retention bracket supports the SLI Bridge (BRI-2) firmly.
2. Retention bracket is optional

5.5 *ENABLING MULTI-GPU FEATURE IN WINDOWS*

After the graphics cards are installed, enable the Multi-GPU feature in NVIDIA nView properties.

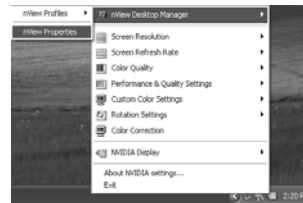
Step 1:

Click NVIDIA Settings icon on the Windows taskbar.



Step 2:

Select nView Properties in nView Desktop Manager pop-up menu.



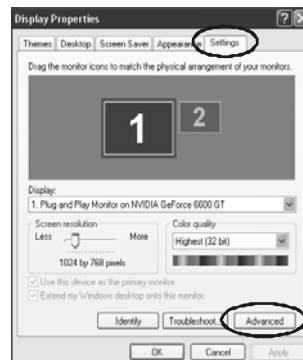
Step 3:

Click Properties icon in Desktop Management tab to display Display Properties dialog box.



Step 4:

Click Advanced icon in Settings tab.



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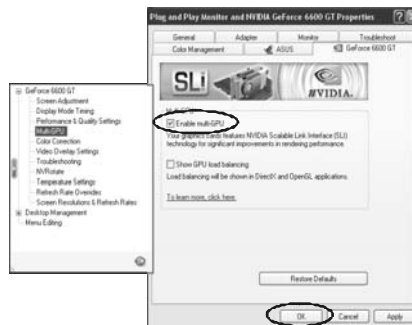
Step 5:

Select NVIDIA GeForce tab, and then click on Multi-GPU item on the left dialog box.



Step 6:

Check before Enable SLI multi-GPU item, and click on OK to complete the setting.



CHAPTER 6: NVIDIA RAID FUNCTIONS

6.1 OPERATION SYSTEM

- Supports Windows XP Home/Professional Edition, and Windows 2000 Professional.

6.2 RAID ARRAYS

NVRAID supports the following types of RAID arrays:

RAID 0: RAID 0 defines a disk striping scheme that improves disk read and writes times for many applications.

RAID 1: RAID 1 defines techniques for mirroring data.

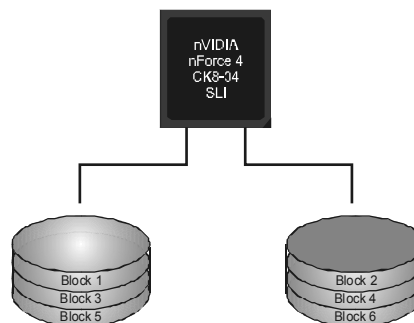
RAID 0+1: RAID 0+1 combines the techniques used in RAID 0 and RAID 1.

Spanning (JBOD): JBOD provides a method for combining drives of different sizes in to one large disk.

6.3 HOW RAID WORKS

RAID 0:

The controller “stripes” data across multiple drives in a RAID 0 array system. It breaks up a large file into smaller blocks and performs disk reads and writes across multiple drives in parallel. The size of each block is determined by the strip size parameter, which you set during the creation of the RAID set based on the system environment. This technique reduces overall disk access time and offers high bandwidth.



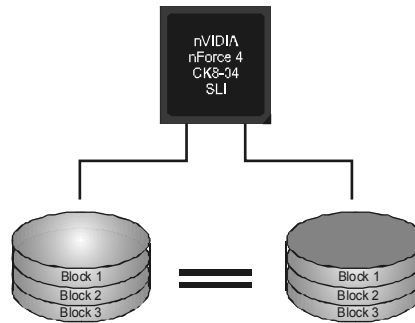
Features and Benefits

- **Drives:** Minimum 1, and maximum is up to 6 or 8. Depending on the platform.
- **Uses:** Intended for non-critical data requiring high data throughput, or any environment that does not require fault tolerance.
- **Benefits:** provides increased data throughput, especially for large files. No capacity loss penalty for parity.
- **Drawbacks:** Does not deliver any fault tolerance. If any drive in the array fails, all data is lost.
- **Fault Tolerance:** No.

RAID 1:

Every read and write is actually carried out in parallel across 2 disk drives in a RAID 1 array system. The mirrored (backup) copy of the data can reside on the same disk or on a second redundant drive in the array. RAID 1 provides a hot-standby copy of data if the active volume or drive is corrupted or becomes unavailable because of a hardware failure.

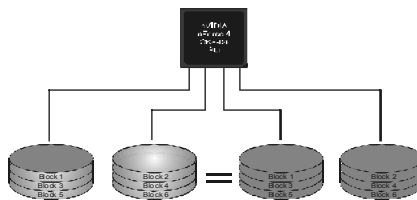
RAID techniques can be applied for high-availability solutions, or as a form of automatic backup that eliminates tedious manual backups to more expensive and less reliable media.

**Features and Benefits**

- **Drives:** Minimum 2, and maximum is 2.
- **Uses:** RAID 1 is ideal for small databases or any other application that requires fault tolerance and minimal capacity.
- **Benefits:** Provides 100% data redundancy. Should one drive fail, the controller switches to the other drive.
- **Drawbacks:** Requires 2 drives for the storage space of one drive. Performance is impaired during drive rebuilds.
- **Fault Tolerance:** Yes.

RAID 0+1:

RAID 0 drives can be mirrored using RAID 1 techniques. Resulting in a RAID 0+1 solution for improved performance plus resiliency.

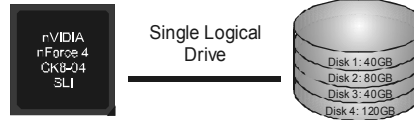
**Features and Benefits**

- **Drives:** Minimum 4, and maximum is 6 or 8, depending on the platform.
- **Benefits:** Optimizes for both fault tolerance and performance, allowing for automatic redundancy. May be simultaneously used with other RAID levels in an array, and allows for spare disks.
- **Drawbacks:** Requires twice the available disk space for data redundancy, the same as RAID level 1.
- **Fault Tolerance:** Yes.

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Spanning (JBOD):

JBOD stands for “Just a Bunch of Disks”. Each drive is accessed as if it were on a standard SCSI host bus adapter. This is useful when a single drive configuration is needed, but it offers no speed improvement or fault tolerance.



Features and Benefits

- **Uses:** JBOD works best if you have odd sized drives and you want to combine them to make one big drive.
- **Benefits:** JBOD provides the ability to combine odd size drives using all of the capacity of the drives.
- **Drawbacks:** Decreases performance because of the difficulty in using drives concurrently.
- **Fault Tolerance:** Yes.

※ For more detailed setup information, please refer to the Driver CD, or go to http://www.nvidia.com/page/pg_20011106217193.html to download NVIDIA nForce Tutorial Flash.

CHAPTER 7: WARPSPEEDER™



7.1 INTRODUCTION

[WarpSpeeder™], a new powerful control utility, features three user-friendly functions including Overclock Manager, Overvoltage Manager, and Hardware Monitor.

With the Overclock Manager, users can easily adjust the frequency they prefer or they can get the best CPU performance with just one click. The Overvoltage Manager, on the other hand, helps to power up CPU core voltage and Memory voltage. The cool Hardware Monitor smartly indicates the temperatures, voltage and CPU fan speed as well as the chipset information. Also, in the About panel, you can get detail descriptions about BIOS model and chipsets. In addition, the frequency status of CPU, memory, AGP and PCI along with the CPU speed are synchronically shown on our main panel.

Moreover, to protect users' computer systems if the setting is not appropriate when testing and results in system fail or hang, [WarpSpeeder™] technology assures the system stability by automatically rebooting the computer and then restart to a speed that is either the original system speed or a suitable one.

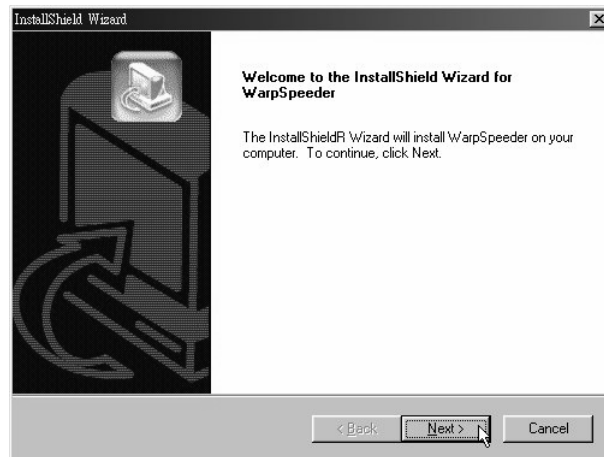
7.2 SYSTEM REQUIREMENT

OS Support: Windows 98 SE, Windows Me, Windows 2000, Windows XP

DirectX: DirectX 8.1 or above. (The Windows XP operating system includes DirectX 8.1. If you use Windows XP, you do not need to install DirectX 8.1.)

7.3 INSTALLATION

1. Execute the setup execution file, and then the following dialog will pop up. Please click “Next” button and follow the default procedure to install.



2. When you see the following dialog in setup procedure, it means setup is completed. If the “Launch the WarpSpeeder Tray Utility” checkbox is checked, the Tray Icon utility and [WarpSpeeder™] utility will be automatically and immediately launched after you click “Finish” button.

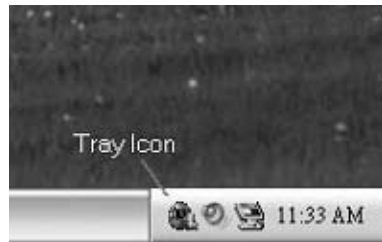


Usage:

The following figures are just only for reference, the screen printed in this user manual will change according to your motherboard on hand.

7.4 [WARPSPEEDER™] INCLUDES 1 TRAY ICON AND 5 PANELS**1. Tray Icon:**

Whenever the Tray Icon utility is launched, it will display a little tray icon on the right side of Windows Taskbar.



This utility is responsible for conveniently invoking [WarpSpeeder™] Utility. You can use the mouse by clicking the left button in order to invoke [WarpSpeeder™] directly from the little tray icon or you can right-click the little tray icon to pop up a popup menu as following figure. The “Launch Utility” item in the popup menu has the same function as mouse left-click on tray icon and “Exit” item will close Tray Icon utility if selected.



2. Main Panel

If you click the tray icon, [WarpSpeeder™] utility will be invoked.
Please refer to the following figure; the utility's first window you will see is Main Panel.

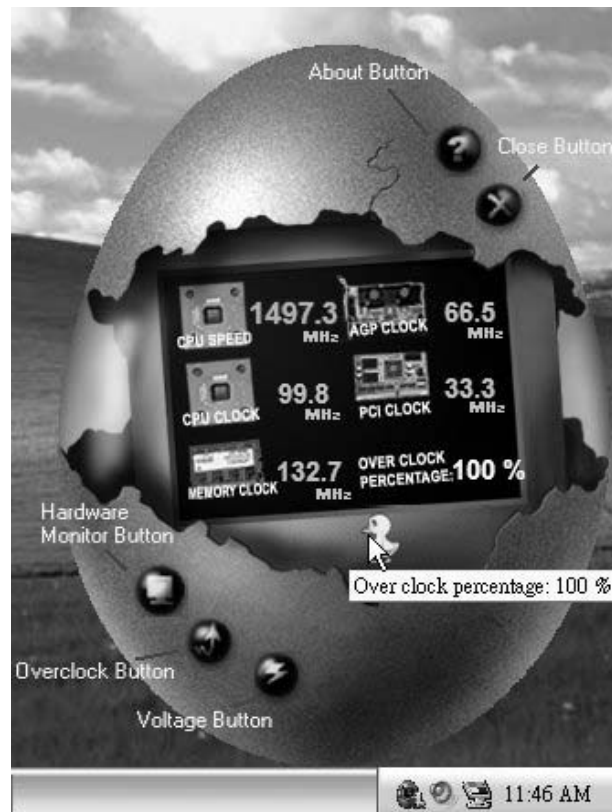
Main Panel contains features as follows:

- a. Display the CPU Speed, CPU external clock, Memory clock, AGP clock, and PCI clock information.
- b. Contains About, Voltage, Overclock, and Hardware Monitor Buttons for invoking respective panels.
- c. With a user-friendly Status Animation, it can represent 3 overclock percentage stages:

Man walking→overclock percentage from 100% ~ 110 %

Panther running→overclock percentage from 110% ~ 120%

Car racing→overclock percentage from 120% ~ above



3. Voltage Panel

Click the Voltage button in Main Panel, the button will be highlighted and the Voltage Panel will slide out to up as the following figure.

In this panel, you can decide to increase CPU core voltage and Memory voltage or not. The default setting is "No". If you want to get the best performance of overclocking, we recommend you click the option "Yes".



4. Overclock Panel

Click the Overclock button in Main Panel, the button will be highlighted and the Overclock Panel will slide out to left as the following figure.



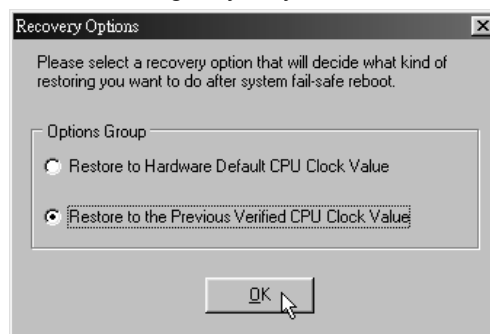
Overclock Panel contains the these features:

- a. “-3MHz button”, “-1MHz button”, “+1MHz button”, and “+3MHz button”: provide user the ability to do real-time overclock adjustment.

Warning:

Manually overclock is potentially dangerous, especially when the overclocking percentage is over 110 %. We strongly recommend you verify every speed you overclock by click the Verify button. Or, you can just click Auto overclock button and let [WarpSpeeder™] automatically gets the best result for you.

- b. “Recovery Dialog button”: Pop up the following dialog. Let user select a restoring way if system need to do a fail-safe reboot.



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- c. “Auto-overclock button”: User can click this button and [WarpSpeeder™] will set the best and stable performance and frequency automatically. [WarpSpeeder™] utility will execute a series of testing until system fail. Then system will do fail-safe reboot by using Watchdog function. After reboot, the [WarpSpeeder™] utility will restore to the hardware default setting or load the verified best and stable frequency according to the Recovery Dialog's setting.
- d. “Verify button”: User can click this button and [WarpSpeeder™] will proceed a testing for current frequency. If the testing is ok, then the current frequency will be saved into system registry. If the testing fail, system will do a fail-safe rebooting. After reboot, the [WarpSpeeder™] utility will restore to the hardware default setting or load the verified best and stable frequency according to the Recovery Dialog's setting.

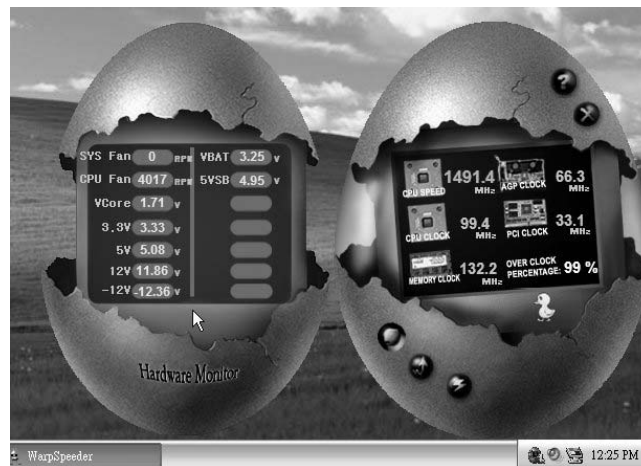
Note:

Because the testing programs, invoked in Auto-overclock and Verify, include DirectDraw, Direct3D and DirectShow tests, the DirectX 8.1 or newer runtime library is required. And please make sure your display card's color depth is High color (16 bit) or True color(24/32 bit) that is required for Direct3D rendering.

5. Hardware Monitor Panel

Click the Hardware Monitor button in Main Panel, the button will be highlighted and the Hardware Monitor panel will slide out to left as the following figure.

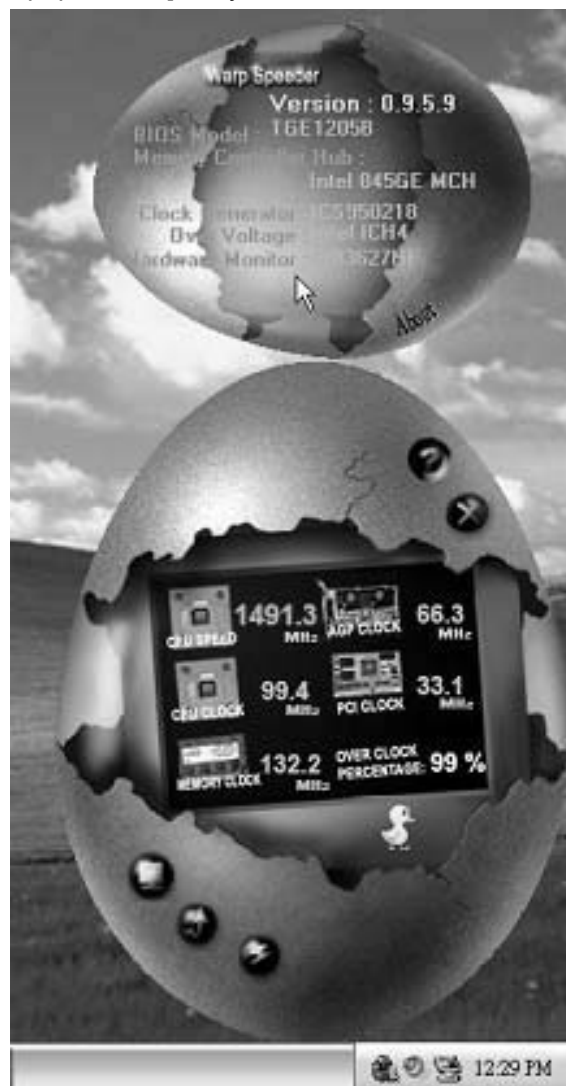
In this panel, you can get the real-time status information of your system. The information will be refreshed every 1 second.



6. About Panel

Click the “about” button in Main Panel, the button will be highlighted and the About Panel will slide out to up as the following figure.

In this panel, you can get model name and detail information in hints of all the chipset that are related to overclocking. You can also get the mainboard’s BIOS model and the Version number of [WarpSpeeder™] utility.



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Note:

Because the overclock, overvoltage, and hardware monitor features are controlled by several separate chipset, [WarpSpeeder™] divide these features to separate panels. If one chipset is not on board, the correlative button in Main panel will be disabled, but will not interfere other panels' functions. This property can make [WarpSpeeder™] utility more robust.

N4SLI-A9 BIOS Setup

BIOS Setup.....	1
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2 Standard CMOS Features.....	6
3 Advanced BIOS Features	9
4 Advanced Chipset Features.....	12
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8 PC Health Status	26
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BIOS Setup

Introduction

This manual discussed Award™ Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The Award BIOS™ installed in your computer system's ROM (Read Only Memory) is a custom version of an industry standard BIOS. This means that it supports Nvidia CK8 processor input/output system. The BIOS provides critical low-level support for standard devices such as disk drives and serial and parallel ports.

Adding important has customized the Award BIOS™, but nonstandard, features such as virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

The rest of this manual is intended to guide you through the process of configuring your system using Setup.

Plug and Play Support

These AWARD BIOS supports the Plug and Play Version 1.0A specification. ESCD (Extended System Configuration Data) write is supported.

EPA Green PC Support

This AWARD BIOS supports Version 1.03 of the EPA Green PC specification.

APM Support

These AWARD BIOS supports Version 1.1&1.2 of the Advanced Power Management (APM) specification. Power management features are implemented via the System Management Interrupt (SMI). Sleep and Suspend power management modes are supported. Power to the hard disk drives and video monitors can be managed by this AWARD BIOS.

ACPI Support

Award ACPI BIOS support Version 1.0 of Advanced Configuration and Power interface specification (ACPI). It provides ASL code for power management and device configuration capabilities as defined in the ACPI specification, developed by Microsoft, Intel and Toshiba.

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PCI Bus Support

This AWARD BIOS also supports Version 2.1 of the Intel PCI (Peripheral Component Interconnect) local bus specification.

DRAM Support

DDR SDRAM (Double Data Rate Synchronous DRAM) are supported.

Supported CPUs

This AWARD BIOS supports the AMD CPU.

Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the <PgUp> and <PgDn> keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program by using the keyboard.

Keystroke	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left (menu bar)
Right arrow	Move to the item on the right (menu bar)
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ Key	Increase the numeric value or make changes
- Key	Decrease the numeric value or make changes
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu – Exit Current page and return to Main Menu
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

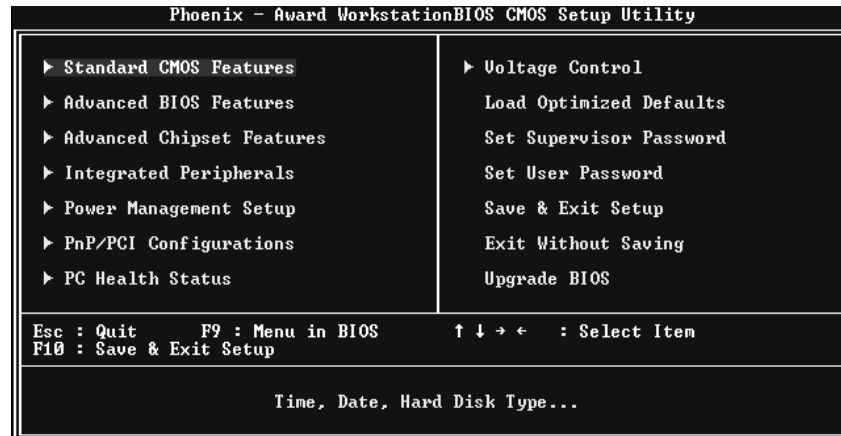
1 Main Menu

Once you enter Award BIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

!! WARNING !!

The information about BIOS defaults on manual (**Figure 1,2,3,4,5,6,7,8,9**) is just for reference, please refer to the BIOS installed on board, for update information.

■ **Figure 1. Main Menu**



Standard CMOS Features

This submenu contains industry standard configurable options.

Advanced BIOS Features

This submenu allows you to configure enhanced features of the BIOS.

Advanced Chipset Features

This submenu allows you to configure special chipset features.

Integrated Peripherals

This submenu allows you to configure certain IDE hard drive options and Programmed Input/ Output features.

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Power Management Setup

This submenu allows you to configure the power management features.

PnP/PCI Configurations

This submenu allows you to configure certain “Plug and Play” and PCI options.

PC Health Status

This submenu allows you to monitor the hardware of your system.

Voltage Control

This submenu allows you to change CPU Vcore Voltage and CPU/PCI clock. **(However, this function is strongly recommended not to use. Not properly change the voltage and clock may cause the CPU or M/B damage!)**

Load Optimized Defaults

This selection allows you to reload the BIOS when the system is having problems particularly with the boot sequence. These configurations are factory settings optimized for this system. A confirmation message will be displayed before defaults are set.



Load Optimized Defaults (Y/N)? N

Set Supervisor Password

Setting the supervisor password will prohibit everyone except the supervisor from making changes using the CMOS Setup Utility. You will be prompted with to enter a password.



Enter Password:

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Set User Password

If the Supervisor Password is not set, then the User Password will function in the same way as the Supervisor Password. If the Supervisor Password is set and the User Password is set, the “User” will only be able to view configurations but will not be able to change them.

Enter Password:

Save & Exit Setup

Save all configuration changes to CMOS (memory) and exit setup. Confirmation message will be displayed before proceeding.

SAVE to CMOS and EXIT (Y/N)? Y

Exit Without Saving

Abandon all changes made during the current session and exit setup. Confirmation message will be displayed before proceeding.

Quit Without Saving (Y/N)? N

Upgrade BIOS

This submenu allows you to upgrade bios.

BIOS UPDATE UTILITY (Y/N)? N

2 Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

■ Figure 2. Standard CMOS Setup

Phoenix - Award WorkstationBIOS CMOS Setup Utility	
Standard CMOS Features	
Date <mm:dd:yy>	Mon, Jun 21 1999
Time <hh:mm:ss>	15 : 7 : 18
▶ IDE Channel 0 Master	
▶ IDE Channel 0 Slave	
▶ IDE Channel 1 Master	
▶ IDE Channel 1 Slave	
Drive A	[1.44M, 3.5 in.]
Drive B	[None]
Video	[EGA/UGA]
Halt On	[All , But Keyboard]
Base Memory	640K
Extended Memory	65472K
Total Memory	1024K
Item Help	
Menu Level ▶	
Change the day, month, year and century	

↑↓←→:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F2: Optimized Defaults

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Main Menu Selections

This table shows the selections that you can make on the Main Menu.

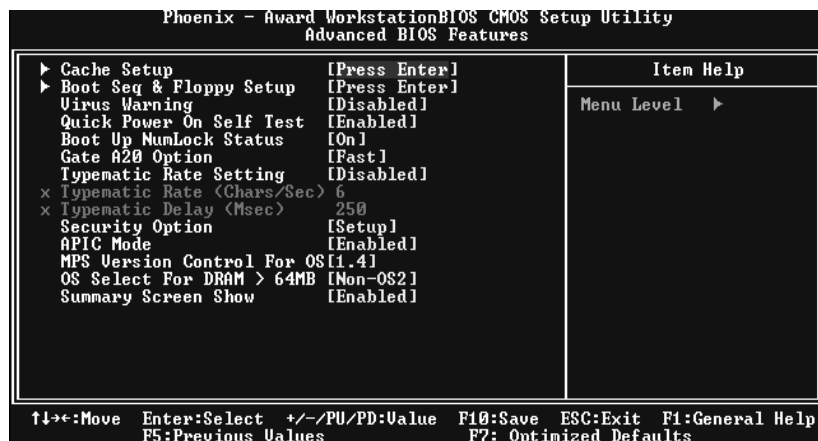
Item	Options	Description
Date	mm : dd : yy	Set the system date. Note that the 'Day' automatically changes when you set the date.
Time	hh : mm : ss	Set the system internal clock.
IDE Primary Master	Options are in its sub menu.	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu.	Press <Enter> to enter the sub menu of detailed options.
IDE Secondary Master	Options are in its sub menu.	Press <Enter> to enter the sub menu of detailed options.
IDE Secondary Slave	Options are in its sub menu.	Press <Enter> to enter the sub menu of detailed options.
Drive A Drive B	360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in None	Select the type of floppy disk drive installed in your system.
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device.

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Item	Options	Description
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/ Key	Select the situation in which you want the BIOS to stop the POST process and notify you.
Base Memory	N/A	Displays the amount of conventional memory detected during boot up.
Extended Memory	N/A	Displays the amount of extended memory detected during boot up.
Total Memory	N/A	Displays the total memory available in the system.

3 Advanced BIOS Features

■ Figure 3. Advanced BIOS Setup



Cache Setup

These BIOS attempt to load the operating system from the device in the sequence selected in these items.

CPU Internal Cache

Depending on the CPU/chipset in use, you may be able to increase memory access time with this option.

Enabled (default) Enable cache.
Disabled Disable cache.

External Cache

This option enables or disables "Level 2" secondary cache on the CPU, which may improve performance.

Enabled (default) Enable cache.
Disabled Disable cache.

Boot Seq & Floppy Setup

Hard Disk Boot Priority

These BIOS attempt to load the operating system from the device in the sequence selected in these items.

The Choices: Pri. Master, Pri. Slave, Sec. Master, Sec. Slave, USBHDD0, USB HDD1, USB HDD2, and Bootable Add-in Cards.

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First/ Second/ Third/ Boot Other Device

These BIOS attempt to load the operating system from the devices in the sequence selected in these items.

The Choices: Floppy, LS120, HDD-0, SCSI, CDROM, HDD-1, HDD-2, HDD-3, ZIP100, LAN, Disabled.

Swap Floppy Drive

For systems with two floppy drives, this option allows you to swap logical drive assignments.

The Choices: Disabled (default), Enabled.

Boot Up Floppy Seek

Enabling this option will test the floppy drives to determine if they have 40 or 80 tracks. Disabling this option reduces the time it takes to boot-up.

The Choices: Enabled (default), Disabled.

Virus Warning

This option allows you to choose the Virus Warning feature that is used to protect the IDE Hard Disk boot sector. If this function is enabled and an attempt is made to write to the boot sector, BIOS will display a warning message on the screen and sound an alarm beep.

Disabled (default)	Virus protection is disabled.
Enabled	Virus protection is activated.

Quick Power On Self Test

Enabling this option will cause an abridged version of the Power On Self-Test (POST) to execute after you power up the computer.

Enabled (default)	Enable quick POST.
Disabled	Normal POST.

Boot Up NumLock Status

Selects the NumLock. State after power on.

On (default)	Numpad is number keys.
Off	Numpad is arrow keys.

Gate A20 Option

Select if chipset or keyboard controller should control Gate A20.

Normal	A pin in the keyboard controller controls Gate A20.
Fast (default)	Lets chipset control Gate A20.

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Typematic Rate Setting

When a key is held down, the keystroke will repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be configured.

Disabled (default)

Enabled

Typematic Rate (Chars/Sec)

Sets the rate at which a keystroke is repeated when you hold the key down.

The Choices: 6 (default), 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (Msec)

Sets the delay time after the key is held down before it begins to repeat the keystroke.

The Choices: 250 (default), 500, 750, 1000.

Security Option

This option will enable only individuals with passwords to bring the system online and/or to use the CMOS Setup Utility.

System

A password is required for the system to boot and is also required to access the Setup Utility.

Setup (default)

A password is required to access the Setup Utility only.

This will only apply if passwords are set from the Setup main menu.

APIC MODE

Selecting Enabled enables APIC device mode reporting from the BIOS to the operating system.

The Choices: **Enabled** (default), Disabled.

MPS Version Control For OS

The BIOS supports version 1.1 and 1.4 of the Intel multiprocessor specification.

Select version supported by the operation system running on this computer.

The Choices: 1.4 (default), 1.1.

OS Select For DRAM > 64MB

A choice other than Non-OS2 is only used for OS2 systems with memory exceeding 64MB.

The Choices: **Non-OS2** (default), OS2.

Summary Screen Show

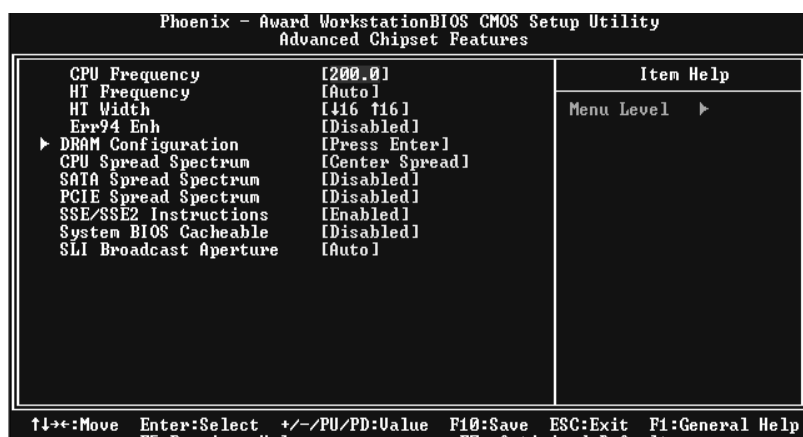
This item allows you to enable/ disable display the Summary Screen Show.

The Choices: Disabled, **Enabled** (default).

4 Advanced Chipset Features

This submenu allows you to configure the specific features of the chipset installed on your system. This chipset manage bus speeds and access to system memory resources, such as DRAM. It also coordinates communications with the PCI bus. The default settings that came with your system have been optimized and therefore should not be changed unless you are suspicious that the settings have been changed incorrectly.

■ Figure 4. Advanced Chipset Setup



CPU Frequency

This item allows you to select the CPU Frequency.

The Choices: 200.0 (default).

HT Frequency

This item allows you to select the HT Frequency.

The Choices: Auto (default).

HT Width

This item allows you to control the utilized width of the outgoing side of the HyperTransport link.

Err94 Enh

This item allows you to enable/disable the “sequential Prefetch Feature” of K8 CPU.

The choices: **Disabled** (default), enable.

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DRAM Configuration

Phoenix - Award WorkstationBIOS CMOS Setup Utility		
DRAM Configuration		
Timing Mode	[Auto]	Item Help
x Memclock index value <Mhz>	200Mhz	Menu Level ►►
x CAS# latency <Tcl>	2.5	
x Min RAS# active time<Tras>	8T	
x RAS# to CAS# delay <Trcd>	4T	
x Row precharge Time <Trp>	2T	
↑↓←→:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help		
F5:Previous Values F7: Optimized Defaults		

CAS# Latency

This field specifies the cas# latency, i.e. cas# to read data valid.

The Choices: CL=2.5 (default), CL=3.0, CL=2.0

Min RAS# active time (tRAS)

This field specifies the minimum RAS# active time. Typically -45-60 Nsec.

The Choices: 6 BUS CLOCKS (default), 13 BUS CLOCKS, 14 BUS CLOCKS, 15 BUS CLOCKS.

RAS# to CAS# Delay (tRCD)

This field specifies the RAS# to CAS# Delay to read/ write command to the same bank. Typically -20 Nsec.

The Choices: 3 BUS CLOCKS (default), 2 BUS CLOCKS, 4 BUS CLOCKS, 5 BUS CLOCKS, 6 BUS CLOCKS, 7 BUS CLOCKS

Row precharge Time (tRP)

This field specifies the Row precharge Time. Precharge to Active or Auto-Refresh of the same bank. Typically 20-24 Nsec.

The Choices: 3 BUS CLOCKS (default), 2 BUS CLOCKS, 4 BUS CLOCKS, 5 BUS CLOCKS, 6 BUS CLOCKS.

CPU Spread Spectrum

The Choices: Center Spread (default).

SATA Spread Spectrum

This item allows you to disable \ enable the SATA spread spectrum function.

The Choices: Disabled (default), Enabled.

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PCIE Spread Spectrum

This item allows you to disable \ enable the SATA spread spectrum function.

The Choices: Disabled (default), Enabled.

SSE/SSE2 Instructions

The Choices: Enabled (default), Disabled.

System BIOS Cacheable

Selecting the “Disabled ” option allows caching of the system BIOS ROM at F0000h-FFFFFh which can improve system performance. However, any programs writing to this area of memory will cause conflicts and result in system errors.

The Choices: Disabled (default), Enabled.

SLI Broadcast Aperture

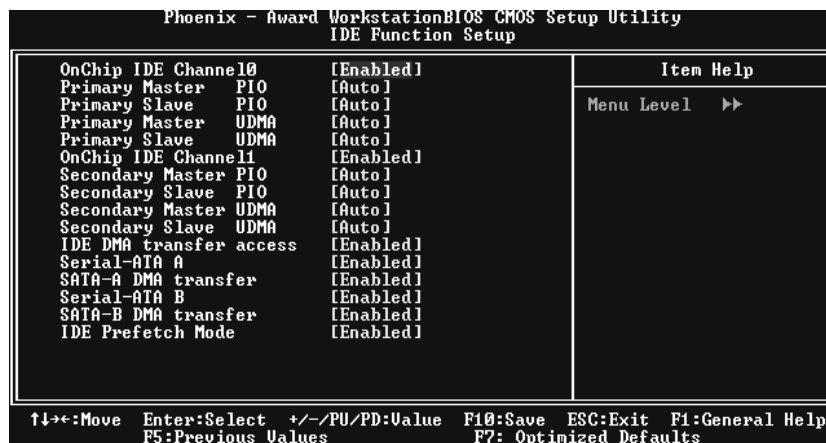
The choices: Auto (default).

5 Integrated Peripherals

■ Figure 5. Integrated Peripherals



IDE Function Setup



If you highlight the literal “Press Enter” next to the “IDE Function Setup” label and then press the enter key, it will take you a submenu with the following options:

OnChip IDE Channel 0/1

The motherboard chipset contains a PCI IDE interface with support for two IDE channels. Select “Enabled” to activate the first and/or second IDE interface. Select “Disabled” to deactivate an interface if you are going to install a primary and/or secondary add-in IDE interface.

The Choices: Enabled (default), Disabled.

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Primary / Secondary / Master / Slave PIO

The IDE PIO (Programmed Input / Output) fields let you set a PIO mode (0-4) for each of the IDE devices that the onboard IDE interface supports. Modes 0 to 4 will increase performance progressively. In Auto mode, the system automatically determines the best mode for each device.

The Choices: Auto (default), Mode0, Mode1, Mode2, Mode3, Mode4.

Primary / Secondary / Master / Slave UDMA

Ultra DMA/100 functionality can be implemented if it is supported by the IDE hard drives in your system. As well, your operating environment requires a DMA driver (Windows 95 OSR2 or a third party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/100, select Auto to enable BIOS support.

The Choices: Auto (default), Disabled.

IDE DMA Transfer Access

The Choices: Enabled (default), Disabled.

Serial-ATA A

Enables support for Serial-ATA A.

The Choices: Enabled (default), Disabled

SATA DMA transfer

The Choices: Enabled (default), Disabled.

Serial-ATA B

Enables support for Serial-ATA B.

The Choices: Enabled (default), Disabled

SATA2 DMA transfer

The Choices: Enabled (default), Disabled.

IDE Prefetch Mode

The Choices: Enabled (default), Disabled.

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RAID Configuration

Phoenix - Award WorkstationBIOS CMOS Setup Utility			
RAID Config			
RAID Enable [Disabled]			Item Help
x IDE Primary Master	RAID	Disabled	Menu Level >>
x IDE Primary Slave	RAID	Disabled	
x IDE Secndry Master	RAID	Disabled	
x IDE Secndry Slave	RAID	Disabled	
x SATA A Primary	RAID	Disabled	
x SATA A Secondary	RAID	Disabled	
x SATA B Primary	RAID	Disabled	
x SATA B Secondary	RAID	Disabled	
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F7: Optimized Defaults			

RAID Enable

The choices: Disabled (default), enable.

ONBOARD DEVICE

Phoenix - Award WorkstationBIOS CMOS Setup Utility		
Onboard Device		
OnChip USB	[U1.1+V2.0]	Item Help
USB Keyboard Support	[Disabled]	Menu Level >>
USB Mouse Support	[Disabled]	
AC97 Audio	[Auto]	
MAC Lan	[Auto]	
Onboard Lan Boot ROM	[Disabled]	
MAC Media Interface	[Pin Strap]	
Onboard 1394	[Enabled]	
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help F5:Previous Values F7: Optimized Defaults		

OnChip USB

This option should be enabled if your system has a USB installed on the system board. You will need to disable this feature if you add a higher performance controller.

The Choices: V1. 1+V2. 0 (default), Disabled, V1.1

USB keyboard Support

Enables support for USB attached keyboard.

The Choices: Disabled (default), Enabled

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USB Mouse Support

Enables support for USB attached mouse.

The Choices: Disabled (default), Enabled

AC97 Audio

This option allows you to control the onboard AC97 audio.

The Choices: Auto (default), Disabled.

MAC LAN

This option allows you to change the state of the onboard MAC LAN.

The Choices: Auto (default), Disabled.

Onboard LAN Boot ROM

This item allows you to enable or disable Onboard LAN Boot ROM.

The Choices: Disabled (default), Enabled.

MAC Media Interface

The Choices: Pin Strap (default).

Onboard 1394

This item allows you to enable or disable the Onboard 1394 Controller.

The Choices: Enabled (default), Disabled.

ONBOARD IO/Address

Phoenix - Award WorkstationBIOS CMOS Setup Utility		
Onboard IO/Address		
Onboard FDC Controller	[Enabled]	Item Help
Onboard Serial Port 1	[3F8/IRQ4]	Menu Level >>
Onboard IR Function	[Disabled]	
UART Mode Select	[IrDA]	
UR2 Duplex Mode	[Half]	
Onboard Parallel Port	[378/IRQ7]	
Parallel Port Mode	[SPP]	
ECP Mode Use DMA	[3]	

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

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If install and FDC or the system has no floppy drive, select Disabled in this field.

The Choices: Enabled (default), Disabled.

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Onboard Serial Port 1

Select an address and corresponding interrupt for the first and second serial ports.

The Choices: Disabled, **3F8/IRQ4** (default), 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto.

Onboard IR Function

The Choices: Disabled (default), Enabled.

UART Mode Select

This item allows you to determine which Infra Red (IR) function of onboard I/O chip.

The Choices: Normal, AS KIR, **IrDA** (default).

UR2 Duplex Mode

Select the value required by the IR device connected to the IR port.

Full-duplex mode permits simultaneous two-direction transmission.

Half-duplex mode permits transmission in one direction only at a time.

The Choices: Half (default), Full.

Onboard Parallel Port

This item allows you to determine access onboard parallel port controller with which I/O Address.

The Choices: **378/IRQ7** (default), 278/IRQ5, 3BC/IRQ7, Disabled.

Parallel Port Mode

The default value is SPP.

The Choices:

SPP (default)	Using Parallel port as Standard Printer Port.
EPP	Using Parallel Port as Enhanced Parallel Port.
ECP	Using Parallel port as Extended Capabilities Port.
ECP+EPP	Using Parallel port as ECP & EPP mode.

ECP Mode Use DMA

Select a DMA Channel for the port.

The Choices: **3** (default), 1.

IDE HDD Block Mode

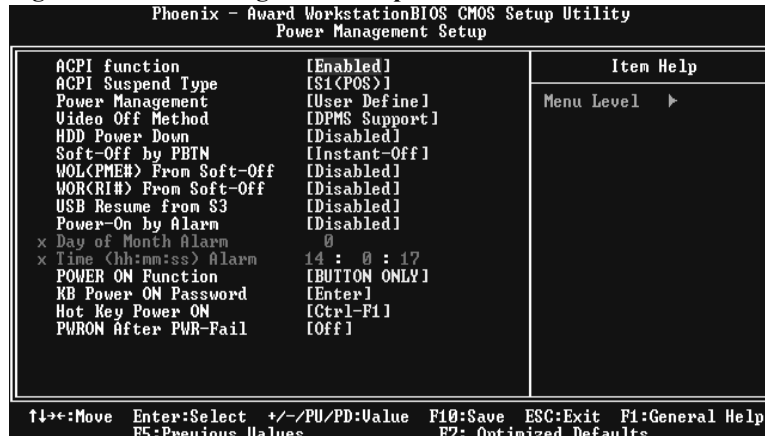
Block mode is also called block transfer, multiple commands, or multiple sector read / write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read / write per sector where the drive can support.

The Choices: Enabled (default), Disabled.

6 Power Management Setup

The Power Management Setup Menu allows you to configure your system to utilize energy conservation and power up/power down features.

■ Figure 6. Power Management Setup



ACPI function

This item displays the status of the Advanced Configuration and Power Management (ACPI).

The Choices: Enabled (default), Disabled.

ACPI Suspend Type

The item allows you to select the suspend type under the ACPI operating system.

The Choices: S1 (POS) (default) Power on Suspend
 S3 (STR) Suspend to RAM
 S1+S3 POS+STR

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

- 1.HDD Power Down.
- 2.Suspend Mode.

There are four options of Power Management, three of which have fixed mode settings

Min. Power Saving

Minimum power management.

Suspend Mode = 1 hr.

HDD Power Down = 15 min

Max. Power Saving

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Maximum power management only available for sl CPU's.

Suspend Mode = 1 min.

HDD Power Down = 1 min.

User Define (default)

Allows you to set each mode individually.

When not disabled, each of the ranges is from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

Video Off Method

This option determines the manner in which the monitor is goes blank.

V/H SYNC+Blank

This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.

Blank Screen

This option only writes blanks to the video buffer.

DPMS (default)

Initial display power management signaling

The Choices: Stop Grant, PwrOn Suspend

HDD Power Down

When enabled, the hard disk drive will power down and after a set time of system inactivity.

All other devices remain active.

The Choices: Disabled (default), 1 Min, 2 Min, 3 Min, 4 Min, 5 Min, 6 Min, 7 Min, 8 Min, 9 Min, 10 Min, 11 Min, 12 Min, 13 Min, 14 Min, 15Min.

Soft-Off by PWR-BTTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung."

The Choices: Delay 4 Sec, **Instant-Off** (default).

WOL (PME#) From Soft-Off

The Choices: Disabled (default), Enabled.

WOR (RI#) From Soft-Off

The Choices: Disabled (default), Enabled.

USB Resume from S3

The Choices: Disabled (default), Enabled.

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Power-On by Alarm

When you select Enabled, an alarm returns the system to Full ON state.

The Choices: Disabled (default), Enabled.

Power on Function

This option allows you to choose the different function to power on the computer.

The Choices: Button Only (default), Hot Key, Password, Mouse Move, Mouse Click, Any Key, Keyboard 98.

KB Power ON Password

Input password and press Enter to set the Keyboard power on password.

Hot Key Power on

This option allows you to choose a hot key to power on.

The Choices: Ctrl-F1 (default), Ctrl-F2, Ctrl-F3, Ctrl-F4, Ctrl-F5, Ctrl-F6, Ctrl-F7, Ctrl-F8

POWER After PWR-Fail

This setting specifies whether your system will reboot after a power fail or interrupts occurs.

Off Leaves the computer in the power off state.

On Reboots the computer.

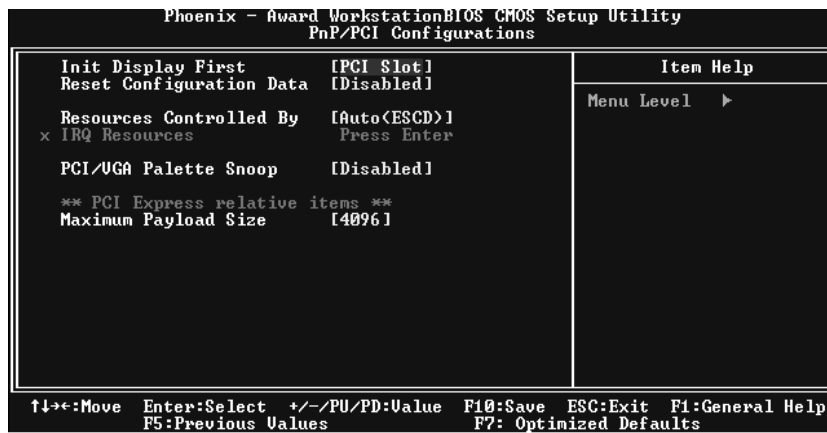
Former-Sts Restores the system to the status before power failure or interrupt occurs.

The Choices: Off (default), On, Former-Sts.

7 PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed of the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

■ **Figure 7. PnP/PCI Configurations**



Init Display First

With systems that have multiple video cards, this option determines whether the primary display uses a PCI Slot or an AGP Slot.

The Choices: PCI Slot (default), AGP.

Reset Configuration Data

The system BIOS supports the PnP feature which requires the system to record which resources are assigned and protects resources from conflict. Every peripheral device has a node, which is called ESCD. This node records which resources are assigned to it. The system needs to record and update ESCD to the memory locations. These locations (4K) are reserved in the system BIOS. If the Disabled (default) option is chosen, the system's ESCD will update only when the new configuration varies from the last one. If the Enabled option is chosen, the system is forced to update ESCDs and then is automatically set to the "Disabled" mode. The above settings will be shown on the screen only if "Manual" is chosen for the resources controlled by function. Legacy is the term, which signifies that a resource is assigned to the ISA Bus and provides non-PnP ISA add-on cards. PCI / ISA PnP signifies that a resource is assigned to the PCI Bus or provides for ISA PnP add-on cards and peripherals.

The Choices: Disabled (default), Enabled.

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Resources Controlled By

By Choosing “**Auto(ESCD)**” (default), the system BIOS will detect the system resources and automatically assign the relative IRQ and DMA channel for each peripheral. By Choosing “Manual”, the user will need to assign IRQ & DMA for add-on cards. Be sure that there are no IRQ/DMA and I/O port conflicts.

IRQ Resources

This submenu will allow you to assign each system interrupt a type, depending on the type of device using the interrupt. When you press the “Press Enter” tag, you will be directed to a submenu that will allow you to configure the system interrupts. This is only configurable when “Resources Controlled By” is set to “Manual”.

IRQ-3	assigned to	PCI Device
IRQ-4	assigned to	PCI Device
IRQ-5	assigned to	PCI Device
IRQ-7	assigned to	PCI Device
IRQ-9	assigned to	PCI Device
IRQ-10	assigned to	PCI Device
IRQ-11	assigned to	PCI Device
IRQ-12	assigned to	PCI Device
IRQ-14	assigned to	PCI Device
IRQ-15	assigned to	PCI Device

PCI / VGA Palette Snoop

Choose Disabled or Enabled. Some graphic controllers which are not VGA compatible take the output from a VGA controller and map it to their display as a way to provide boot information and VGA compatibility.

However, the color information coming from the VGA controller is drawn from the palette table inside the VGA controller to generate the proper colors, and the graphic controller needs to know what is in the palette of the VGA controller. To do this, the non-VGA graphic controller watches for the Write access to the VGA palette and registers the snoop data. In PCI based systems, where the VGA controller is on the PCI bus and a non-VGA graphic controller is on an ISA bus, the Write Access to the palette will not show up on the ISA bus if the PCI VGA controller responds to the Write.

In this case, the PCI VGA controller should not respond to the Write, it should only snoop the data and permit the access to be forwarded to the ISA bus. The non-VGA ISA graphic controller can then snoop the data on the ISA bus. Unless you have the above situation, you should disable this option.

Disabled (default)	Disables the function.
Enabled	Enables the function.

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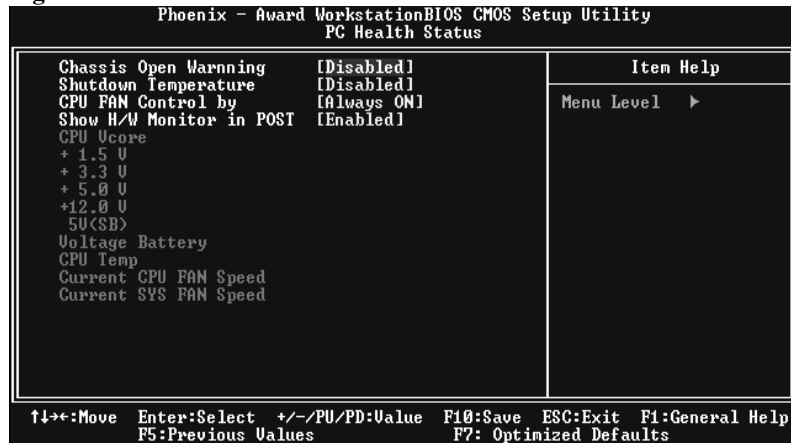
Maximum Payload Size

Set the maximum payload size for Transaction packets (TLP).

The Choice: 4096 (default.)

8 PC Health Status

■ Figure 8. PC Health Status



Chassis Open Warning

This item allows you to enable or disable Chassis Open Warning beep.

The Choices: Disabled (default), Enabled.

Shutdown Temperature

This item allows you to set up the CPU shutdown Temperature. This item only effective under Windows 98 ACPI mode.

The Choices: Disabled (default), 60°C /140F, 65°C /149F, 70°C /158F, 75°C /167F.

CPU FAN Control

The Choice “smart” can make your CPU FAN to reduce noise.

The Choices: Always On (default), Smart.

Show H/W Monitor in POST

If your computer contains a monitoring system, it will show PC health status during POST stage. The item offers several delay time for you to choose.

The Choices: Enabled (default), Disabled.

CPU Vcore/ +1.5V+3.3V/ +5.0V/ +12.0V/5V<SB>/ Voltage Battery

Detect the system's voltage status automatically.

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CPU Temperature

This field displays the current temperature of the CPU.

Current CPU FAN Speed

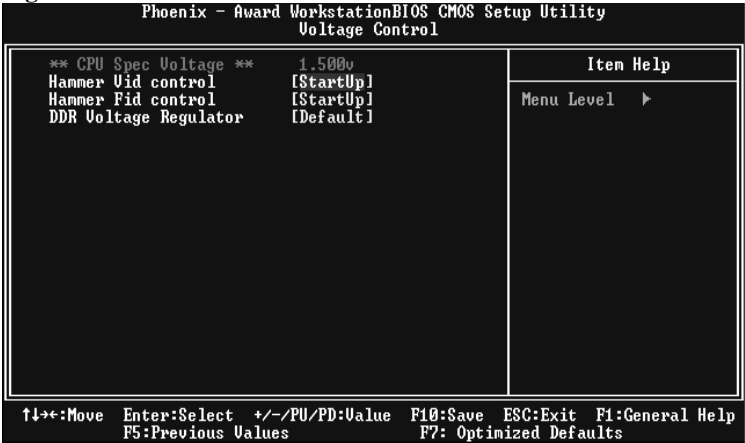
This field displays the current speed of CPU fan.

Current SYS FAN Speed

This field displays the current speed SYSTEM fan.

9 Voltage Control

■ Figure 8. PC Health Status



Hammer Vid Control

This item allows you to set different CPU frequency.

The Choices: **StartUp** (default), and other choices from 800Mhz to 5000Mhz.

Hammer Fid Control

This item allows you to set different CPU voltage.

The Choices: **StartUp** (default), and other choices from 1.625V to 0.8V.

DDR Voltage Regulator

This item allows you to set different DDR voltage.

The Choices: **Default** (default)