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## CHAPTER 1: INTRODUCTION

### 1.1 MOTHERBOARD FEATURES

#### A. Hardware

##### CPU

- λ Supports LGA 775.
- λ Supports Intel Pentium 4 processor.
- λ Front Side Bus at the following frequency ranges:
  - 533MT/s (133MHz Core Clock)
  - 800MT/s (200MHz Core Clock)
  - 1066MT/s (266MHz Core Clock)
- λ Supports Hyper-Threading Technology. (HT)
- λ Supports Execute Disable Bit Technology (XD).
- λ Supports Enhanced Intel SpeedStep® Technology (EIST).
- λ Supports Intel Extended Memory 64 Technology (Intel EM64T).

##### Chipset

- λ North Bridge: NF4-SLI-SPP.
- λ South Bridge: NF4-SLI-MCP.

##### Dimensions

- λ ATX Form Factor: 30.48cm (L) x 24.38cm (W)

##### Operating System Supporting

- λ Supports Windows 2000, and Windows XP.

##### System Memory

- λ Supports dual channel DDR2 up to 8 banks.
- λ Supports un-buffered non-ECC DIMMs.
- λ Supports DDR2 400 (200MHz) / 533 (266MHz) / 667 (333MHz) for a theoretical maximum bandwidth of 10.6 GB/s.
- λ Maximum DRAM space is up to 16GB.

DIMM Socket Location	DDR Module	Total Memory Size
DDR2_A1	256MB/512MB/1GB/2GB/4GB*1	Max is 16GB.
DDR2_A2	256MB/512MB/1GB/2GB/4GB*1	
DDR2_B1	256MB/512MB/1GB/2GB/4GB*1	
DDR2_B2	256MB/512MB/1GB/2GB/4GB*1	

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### **Expansion Slots**

- λ Three 32bit PCI bus master slots.
- λ **Normal Mode PCI-Express slots:**
  - One PCI-Express x16 slot: PCI\_EX16-1.
  - Two PCI-Express x1 slots: PCI-EX1-1 and PCI-EX1-2.
- λ **SLI Mode PCI-Express slots:**
  - Two PCI-Express x8 slots: PCI-EX16-1 and PCI-EX16-2.
  - Two PCI-Express x1 slots: PCI-EX1-1 and PCI-EX1-2.

**Notice:**

Normal Mode and SLI Mode are switched by SLI-NF4T selector card.  
(Please read Chapter 5 for detail information.)

### **Gigabit Ethernet LAN**

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

### **On Board AC'97 Sound Codec**

- λ Chip: ALC850.
- λ Supports 8 channels.
- λ Supports SPDIF-Out and SPDIF-In (optional) functions.
- λ Compliant with AC'97 version 2.3 specification.

### **Super I/O**

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

### **IEEE 1394 Chip (optional)**

- λ Chip: VIA VT6307.
- λ Supports two 1394A Firewire ports up to 400Mb/s individually.

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### **Serial ATA II**

- λ Controller integrated in NF4-SLI-MCP.
- λ Supports RAID functions.
- λ Supports Serial ATA 2.0 specification.
- λ Supports 4 Serial ATA (SATA) devices.
- λ Data transfer rate up to 1.5GB/s or 3GB/s.

### **RAID Controller**

- λ Controller integrated in NF4-SLI-MCP.
  - λ NVIDIA RAID Technology:
    - RAID 0 disk striping for highest system and application performance
    - RAID 1 disk mirroring support for fault tolerance
- Support for both SATA and ATA-133 disk controller standards

### **On Board IDE**

- λ Two on-board connectors support 4 devices.
- λ Supports Ultra DMA Modes 6~0 (Ultra DMA –133/100/60/33).
- λ Supports standard PIO Modes 4~0.

### **Internal On-board I/O Connectors and Headers**

- λ 1 front panel header supports front panel facilities.
- λ 1 CD-in connector supports 1 CD-ROM audio-in device.
- λ 1 front audio header supports front panel audio-out function.
- λ 1 chassis open header supports PC case-opened warning function.
- λ 1 S/PDIF-out connector supports digital audio-out function
- λ 1 S/PDIF-in connector supports digital audio-in function (optional).
- λ 1 1394A header supports 1 1394A Firewire port at front panel (optional).
- λ 1 Floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes.
- λ 2 IDE connectors support 4 hard disk devices.
- λ 3 USB headers support 6 USB 2.0 ports.
- λ 4 serial ATA II connectors support 4 SATA I/II devices.

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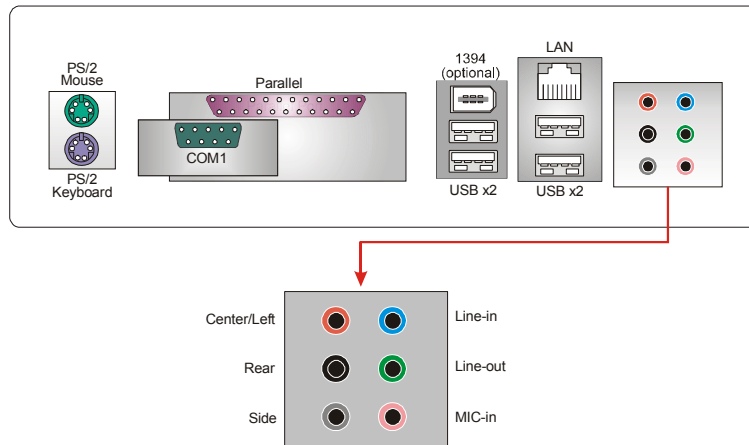
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### Back Panel I/O Connectors

- λ 1 Serial port.
- λ 1 Parallel port.
- λ 1RJ-45 LAN jack.
- λ 1 PS/2 Mouse port.
- λ 1 PS/2 Keyboard port.
- λ 1 1394A Firewire port (optional).
- λ 4 USB 2.0 ports.
- λ 6 audio ports support 8 channels audio-out facilities.



### B. BIOS & Software

#### BIOS

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

#### Software

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

***1.2 PACKAGE CHECKLIST***

- λ FDD Cable x 1
- λ HDD Cable x 1
- λ User's Manual x 1
- λ Serial ATA Cable x 1
- λ BRI-2 SLI Bridge x 1
- λ Fully Setup Driver CD x 1
- λ Rear I/O Panel for ATX Case x 1
- λ SLI-NF4T Selector Card x 1 (pre-installed)
- λ SPDIF Cable x 1 (optional)
- λ USB 2.0 Cable x 1 (optional)
- λ Retention Bracket x 1 (optional)
- λ IEEE 1394A Cable x 1 (optional)
- λ Serial ATA Power Switch Cable x 1 (optional)



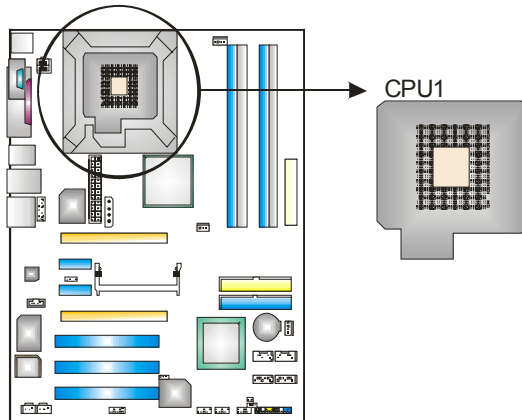


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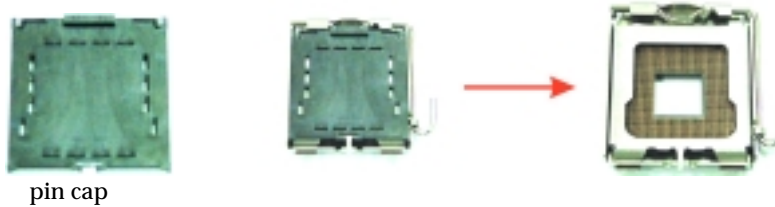
## CHAPTER 2: HARDWARE INSTALLATION

### 2.1 INSTALLING CENTRAL PROCESSING UNIT (CPU)

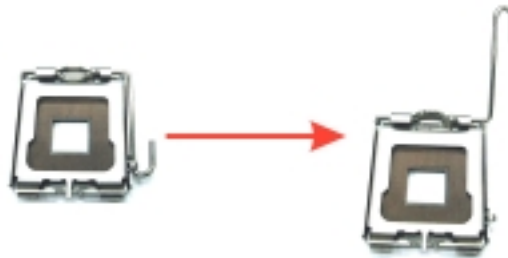


**Special Notice:**

*Remove Pin Cap before installation, and make good preservation for future use. When the CPU is removed, cover the Pin Cap on the empty socket to ensure pin legs won't be damaged.*



**Step 1:** Pull the lever sideways away from the socket and then raise the lever up to a 90-degree angle.



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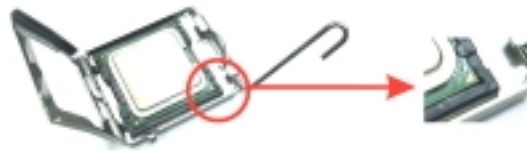
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**Step 2:** Look for the black cut edge on socket, and the white dot on CPU should point forwards this black cut edge. The CPU will fit only in the correct orientation.

*Step 2-1:*



*Step 2-2:*



**Step 3:** Hold the CPU down firmly, and then close the lever to complete the installation.

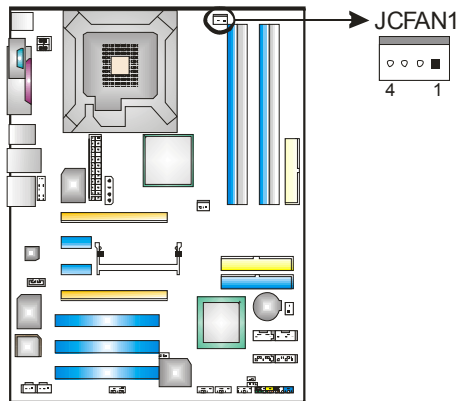


**Step 4:** Put the CPU Fan on the CPU and buckle it. Connect the CPU FAN power cable to the JCFAN1. This completes the installation.

## 2.2 FAN HEADERS

These fan headers support cooling-fans built in the computer. The fan wiring and plug may be different according to the fan manufacturer. Connect the fan cable to the connector while matching the black wire to pin#1.

### JCFAN1: CPU Fan Power Header



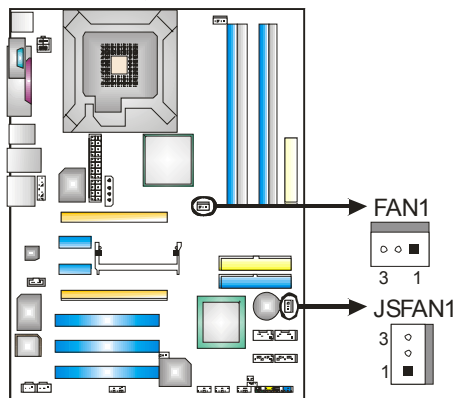
Pin	Assignment
1	Ground
2	+12V
3	FAN RPM rate sense
4	Smart Fan Control

#### Note:

The JCFAN1 supports system cooling fan with Smart Fan Control utility. It supports 4 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.

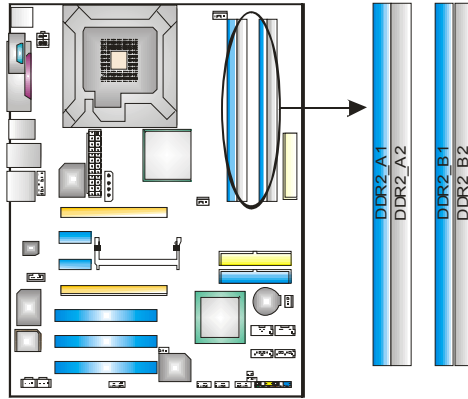
### FAN1: North Bridge Fan Power Header

### JSFAN1: System Fan Power Header

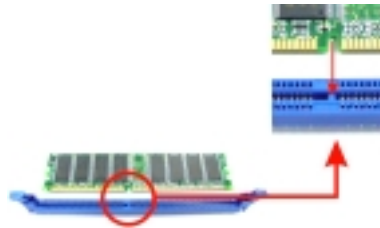


Pin	Assignment
1	Ground
2	+12V
3	FAN RPM rate sense (optional)

**2.3 INSTALLING SYSTEM MEMORY**



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.



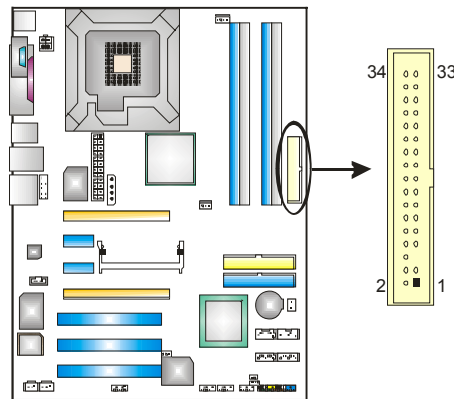
2. Insert the DIMM vertically and firmly into the slot until the retaining chip snap back in place and the DIMM is properly seated.



2.4 CONNECTORS AND SLOTS

**FDD1: Floppy Disk Connector**

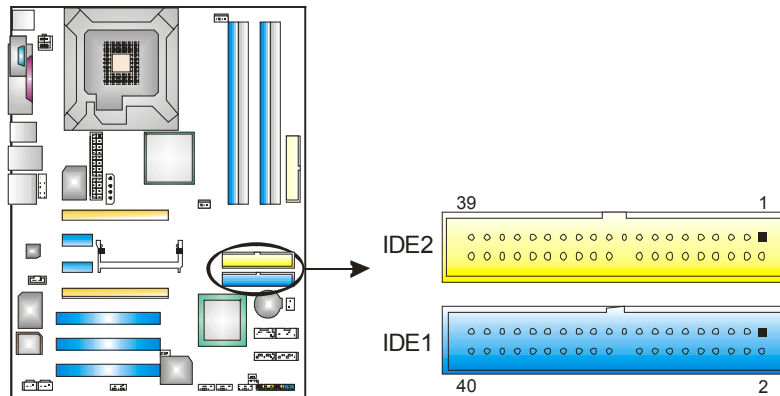
The motherboard provides a standard floppy disk connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. This connector supports the provided floppy drive ribbon cables.



**IDE1/IDE2: Hard Disk Connector**

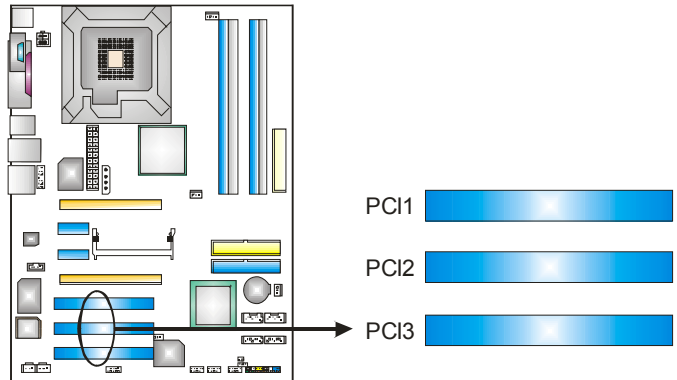
The motherboard has two 32-bit Enhanced PCI IDE Controller that provides PIO Mode 0~5, Bus Master, and Ultra DMA 33/66/100/133 functionality. It has two HDD connectors IDE1 (primary) and IDE2 (secondary).

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 three standard PCI slots. PCI stands for Peripheral Component Interconnect, and it is a bus standard for expansion cards. This PCI slot is designated as 32 bits.



**PCI-EX16-1/PCI-EX16-2/PCI-EX1-1/PCI-EX1-2:  
PCI-Express Slots**

**PCI-EX16-1 (Normal Mode):**

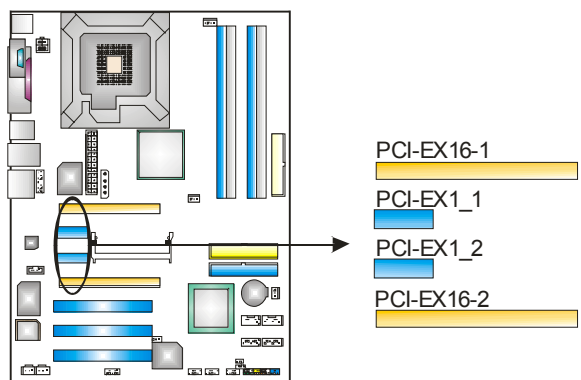
- PCI Express 1.0a compliant.
- Maximum bandwidth is up to 4GB/s per direction.

**PCI-EX1-1/PCI-EX1-2 (Normal Mode):**

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

**PCI-EX16-1/PCI-EX16-2 (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

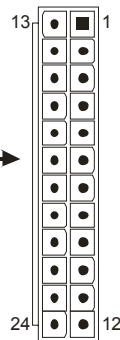
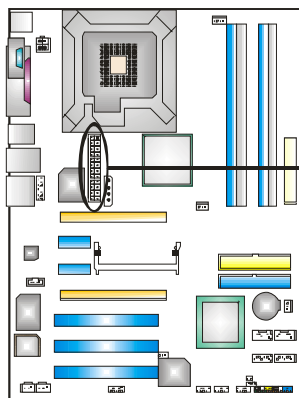


Pin1-2 closed

### 3.2 DETAIL SETTINGS

#### JATXPWR1: ATX Power Connector

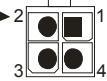
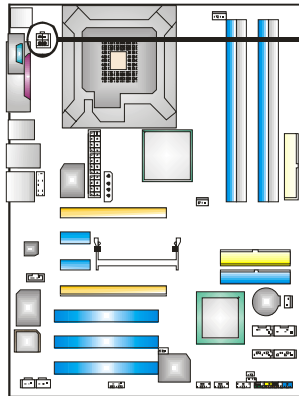
This connector allows user to connect 20-pin power connector on the ATX power supply.



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	+3.3V
13	+3.3V
14	-12V
15	Ground
16	PS_ON
17	Ground
18	Ground
19	Ground
20	NC
21	+5V
22	+5V
23	+5V
24	Ground

**JATXPWR2: ATX Power Source Connector**

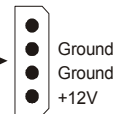
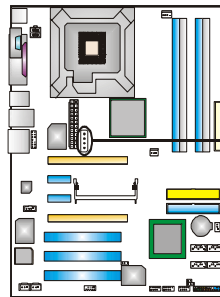
By connecting this connector, it will provide +12V to CPU power circuit.



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

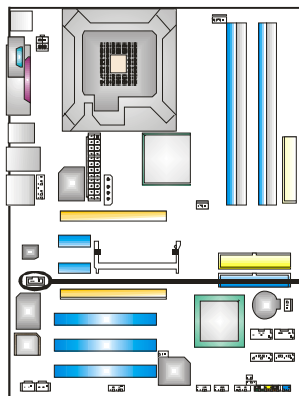
**JAUXPWR1: PCI-Express x16 Slot Power Source Connector**

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.



**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..

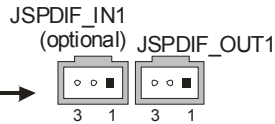
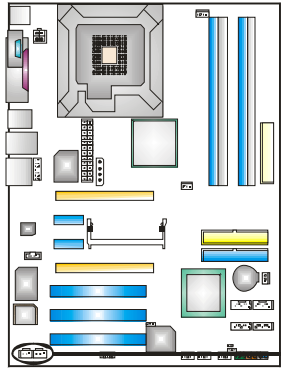


Pin	Assignment
1	Left channel input
2	Ground
3	Ground
4	Right channel input



**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.

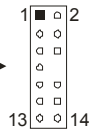
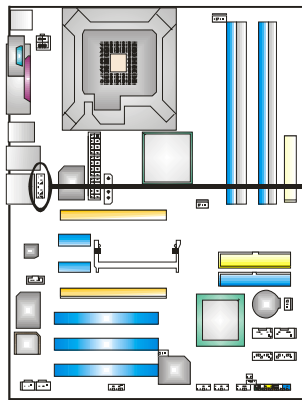


JSPDIF\_OUT:  
**Pin Assignment**  
1 +5V  
2 SPDIF OUT  
3 Ground

JSPDIF\_IN1 (optional):  
**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  
12 Right line-in  
13 Left line-in  
14 Left line-in

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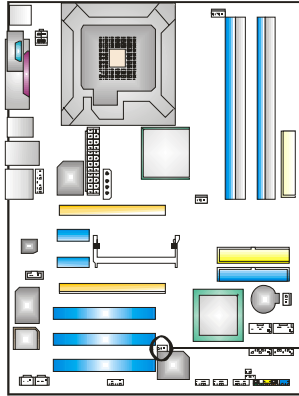
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### J1394PWR1 (optional): Power Source Header for 1394 Chip



**Pin 1-2 Close:**

+3.3V for 1394 chipset (default).

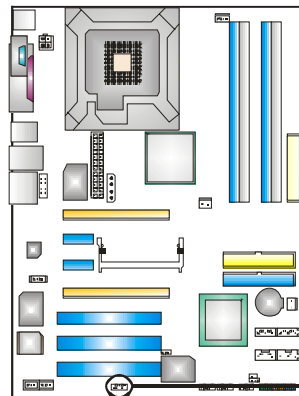


**Pin 2-3 Close:**

+3.3V SB for 1394 chipset.

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

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

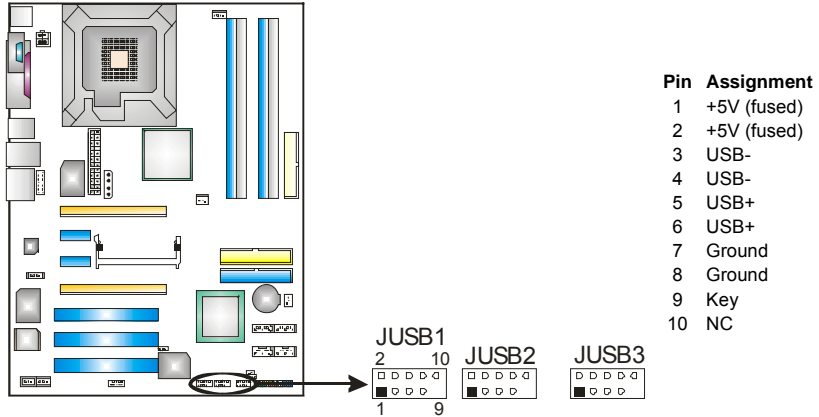


Pin Assignment

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

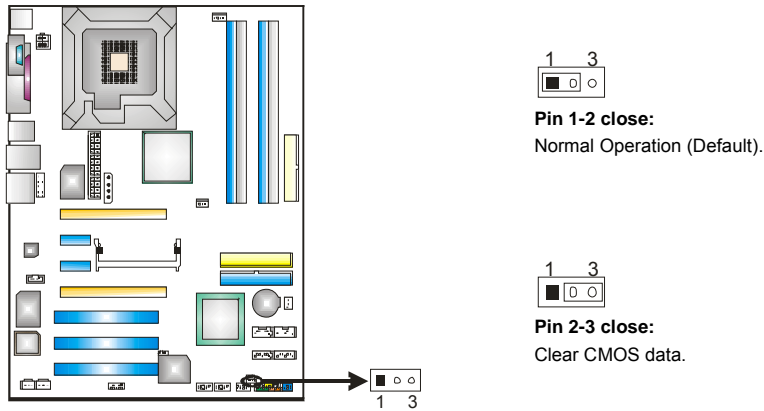
**JUSB1~JUSB3: Headers for USB Ports at Front Panel**

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.



**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.

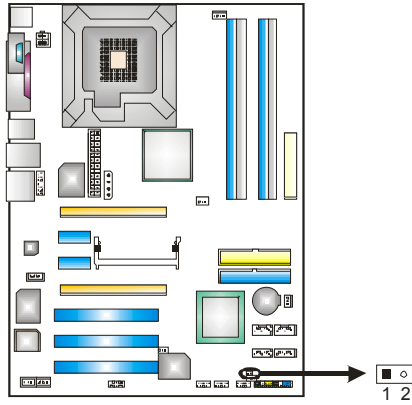


**※ Clear CMOS Procedures:**

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 the desired password or clear the CMOS data.

**JCI1: Case Open Headers**

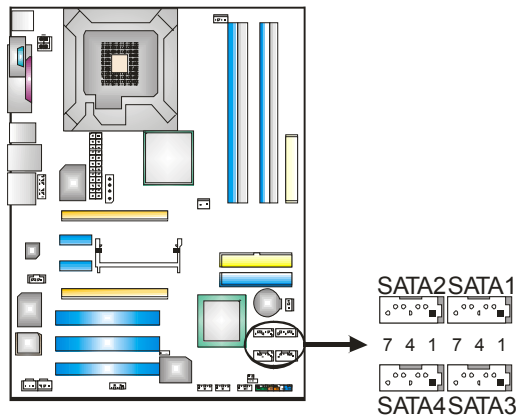
This connector allows system to monitor PC case open status. If the signal has been triggered, it will record to the CMOS and show the message on next boot-up.



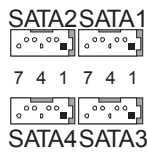
Pin	Assignment
1	Case open signal
2	Ground

**JSATA1~JSATA4: Serial ATA Connectors**

The motherboard has a SATA Controller in NVIDIA Crush19 with 4 channels SATA interface, it satisfies the SATA 2.0 spec and with transfer rate of 3.0Gb/s.



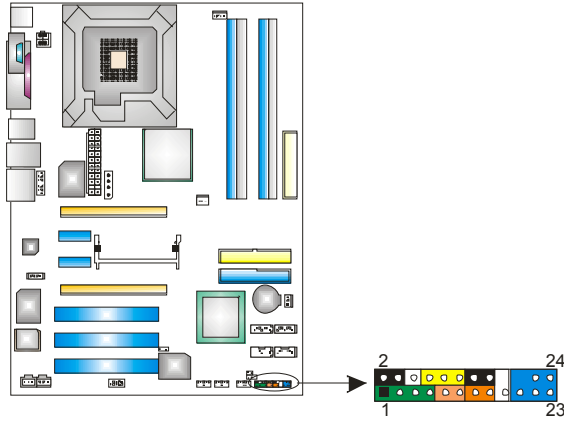
Pin	Assignment
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground



## N4SIE-A7

### 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	

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## CHAPTER 4: USEFUL HELP

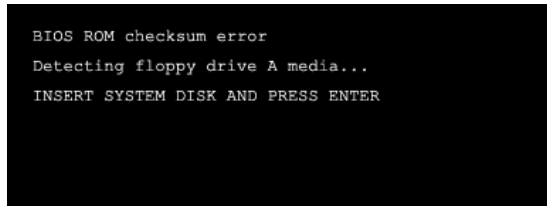
### 4.1 AWARD BIOS BEEP CODE

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.



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](http://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 "Close CMOS Header: JCMOS1" section)
2. Wait for seconds.
3. Power on the system again.

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### **4.3 TROUBLESHOOTING**

<b>Probable</b>	<b>Solution</b>
<ol style="list-style-type: none"><li>1. No power to the system at all Power light don't illuminate, fan inside power supply does not turn on.</li><li>2. Indicator light on keyboard does not turn on.</li></ol>	<ol style="list-style-type: none"><li>1. Make sure power cable is securely plugged in.</li><li>2. Replace cable.</li><li>3. Contact technical support.</li></ol>
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"><li>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.</li><li>2. Backing up the hard drive is extremely important. All hard disks are capable of breaking down at any time.</li></ol>
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"><li>1. Back up data and applications files.</li><li>2. Reformat the hard drive. Re-install applications and data using backup disks.</li></ol>
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"><li>1. Set master/slave jumpers correctly.</li><li>2. Run SETUP program and select correct drive types. Call the drive manufacturers for compatibility with other drives.</li></ol>



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## CHAPTER 5: NVIDIA SLI FUNCTION

### 5.1 REQUIREMENTS

- λ Only Windows XP supports SLI (Dual Video) function.
- λ Two identical SLI-ready graphics cards that are NVIDIA certified.
- λ The graphics card driver should support NVIDIA SLI technology.
- λ 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-NF4T SELECTOR CARD

- λ There is a pre-installed SLI-NF4T selector card on the motherboard. The default setting is Normal Mode, only supports single graphics card.



- λ 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-NF4T 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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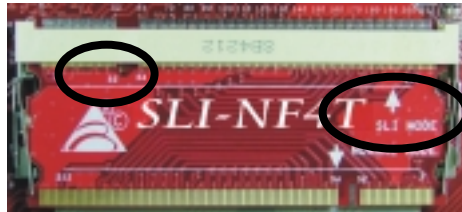
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Step 3: Invert the selector card and insert the edge labeled "SLI MODE".



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**

**λNormal Mode:**

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

**λSLI Mode:**

- Use BRI-2 connector to link two SLI-ready PCI-E x16 interface graphics cards.
- Both 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.

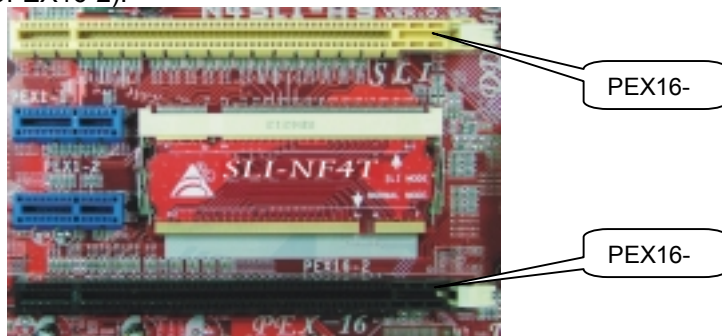
**5.4 INSTALLING SLI-READY GRAPHICS CARDS**

Step 1: Make sure the SLI-NF4T 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 (PCI-EX16-1). And then insert the second graphics card into the white slot (PCI-EX16-2).



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

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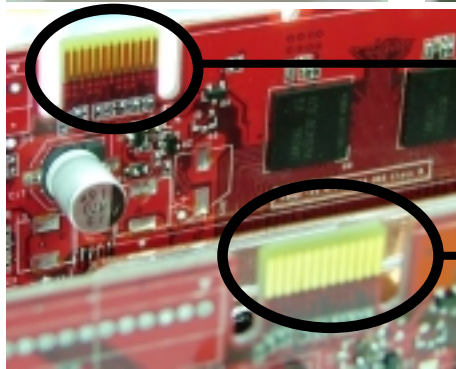
Step 5: Connect a 4-pin ATX power cable to AUX power connector (JAUXPWR1), this will ensure the stabilization of your system.

**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 of each graphics card.



Gold-fingers on two graphics

**Notice:**

Please make good preservation of this bridge for future use.

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:**

Make sure the retention bracket supports the SLI Bridge (BRI-2) firmly.

### 5.5 ENABLING MULTI-GPU FEATURE IN WINDOWS

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

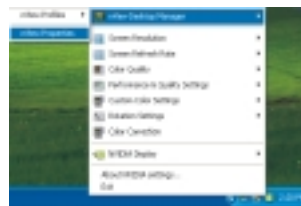
Step 1:

Click NVIDIA Settings icon on the Windows taskbar.



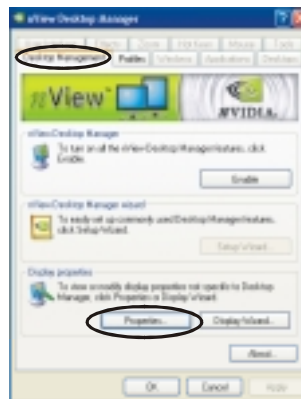
Step 2:

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



Step 3:

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



Step 4:

Click "Advanced" icon in Settings tab.



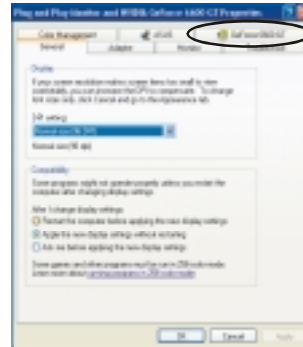
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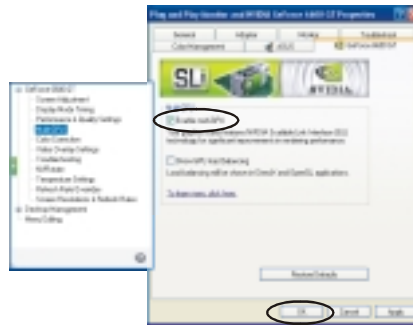
Step 5:

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.



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## CHAPTER 6: NVIDIA RAID FUNCTIONS

### 6.1 OPERATION SYSTEM

λ 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.

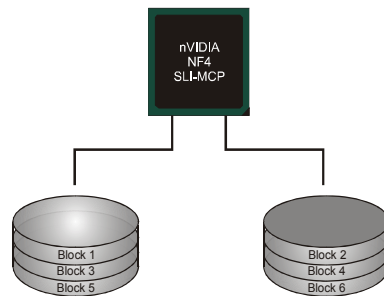
**RAID 0+1:** RAID 0+1 combines the techniques used in RAID 0 and RAID 1.

**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.



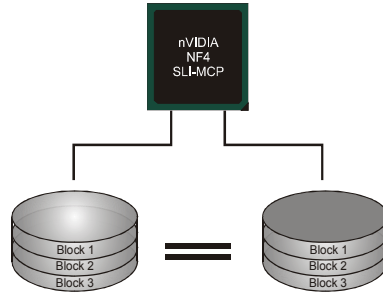
#### Features and Benefits

- **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.

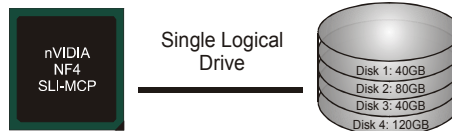


**Features and Benefits**

- **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.

**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](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.

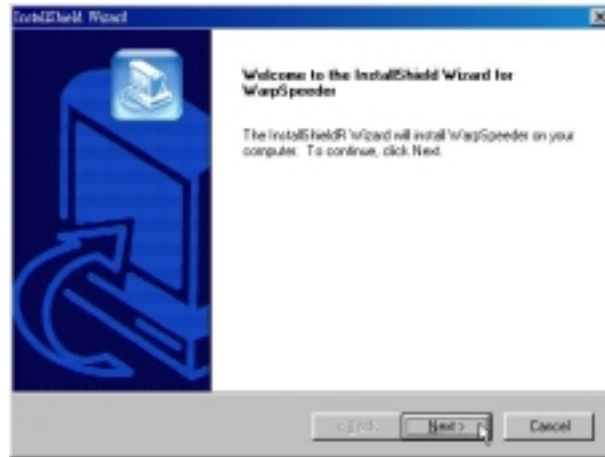
Moreover, to protect users' computer systems if the setting is not appropriate when testing and results in system fail or hang, [WarpSpeeder™] technology assures the system stability by automatically rebooting the computer and then restart to a speed that is either the original system speed or a suitable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

### **7.2 SYSTEM REQUIREMENT**

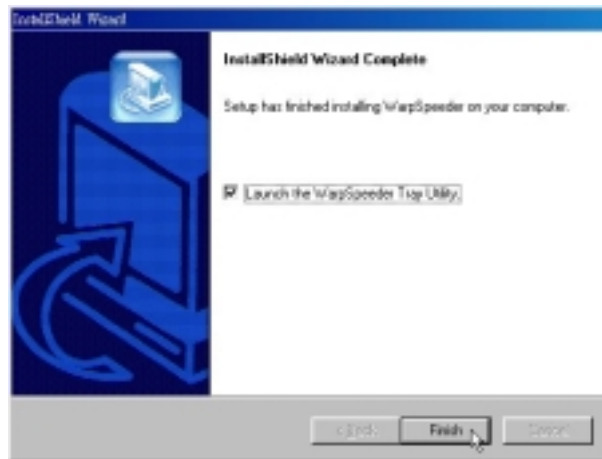
OS Support: Windows 98 SE, Windows Me, Windows 2000, Windows XP  
DirectX: DirectX 8.1 or above. (The Windows XP operating system includes DirectX 8.1. If you use Windows XP, you do not need to install DirectX 8.1.)

**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.

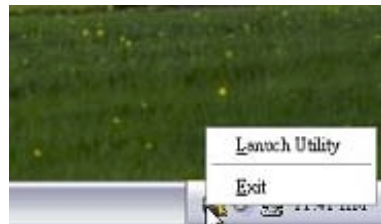
**7.4 [WARPSPEEDER™] INCLUDES 1 TRAY ICON AND 5 PANELS**

**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.

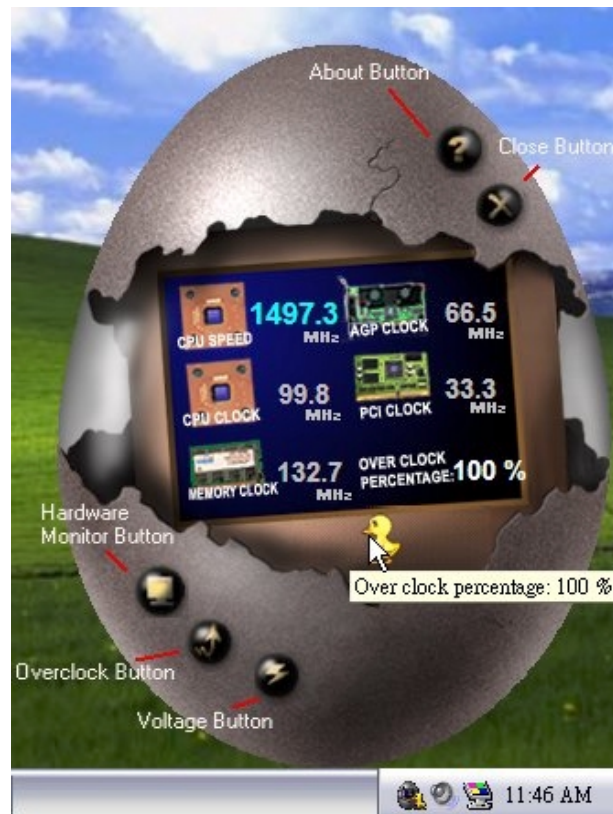
### Main Panel contains features as follows:

- Display the CPU Speed, CPU external clock, Memory clock, AGP clock, and PCI clock information.
- Contains About, Voltage, Overclock, and Hardware Monitor Buttons for invoking respective panels.
- 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.



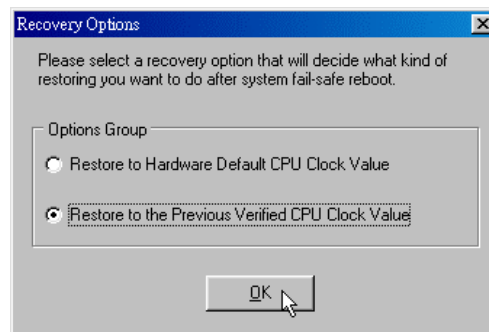
**Overclock Panel contains the these features:**

- 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.

04/21, 2005