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# Chapter 1 Specification

## Introduction

This series of mainboards features an integration of the powerful processor Intel Pentium 4 and the single-chip North Bridge Intel 865PE. The Intel P4 processor is a rapid execution engine providing 800/533/400MHz system bus, while North Bridge Intel 865PE is a high performance integrated chipset providing Dual Channel DDR 400/333/266 SDRAM memory interface, Hub interface as well as AGP interface.

Integrated with Intel 865PE, South Bridge Intel ICH5 supports the LPC I/O, upstream Hub interface, PCI interface, IDE interface, Serial ATA interface, USB 2.0 interface, AC'97 2.2 (6-channel) Audio interface and the interrupt control. This chapter is to introduce to users every advanced function of this high performance integration.

**Topics included in this chapter are:**

**1-1 Mainboard Layout**

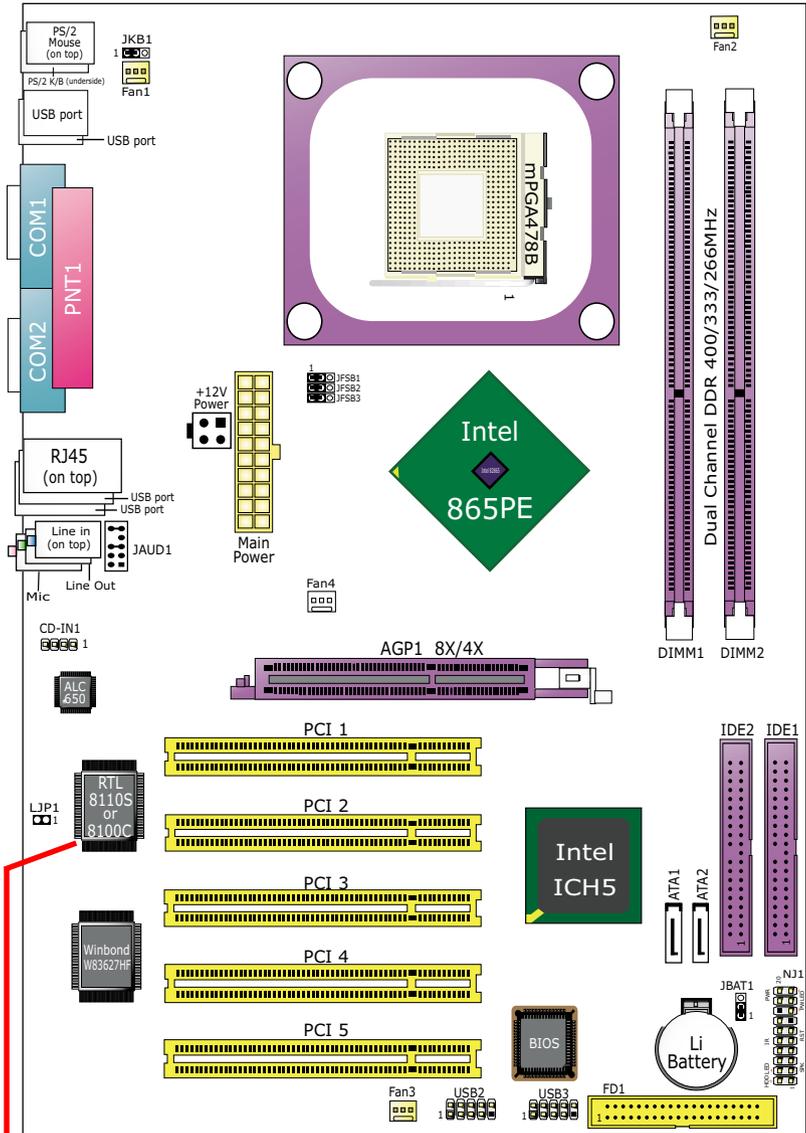
**1-2 Chipset Diagram**

**1-3 Mainboard Specification Table**

**1-4 Mainboard Specifications\*\***

**\*\* If any difference is found between the mainboard description and the Mainboard you are using, please look up the Errata/Update Slip enclosed inside for the correction or updated information, or else contact the mainboard Dealer or visit our Web Site for the latest manual update.**

# 1-1 Mainboard Layout



{ RTL8100C 10/100 LAN for SL-86SPE4-L  
 { RTL8110S Gigabit LAN for SL-86SPE4-G

## 1-2 Mainboard Specification Table

<b>Series 86SPE4-(LG) Specifications and Features</b>			
CPU	Socket 478B for P4 CPU (HT CPU and Prescott CPU included)		
North Bridge	Intel 865PE, supporting 800/533/400MHz FSB		
South Bridge	Intel ICH5		
BIOS	AMI BIOS		
Memory	Supporting Dual-channel DDR 400/333/266 SDRAM, up to 2GB in 2 DIMM slots		
I/O Chip	W83627HF, with Hardware Monitor		
AGP interface	AGP8X/4X Mode only; 1 AGP Slot on board		
Audio	AC'97 Audio 2.2 compliant, 6 channel audio		
IDE Interface	2 UATA 66/100 IDE ports		
SATA Interface	2 Serial ATA connectors		
PCI Slots	5 PCI Master slots on board		
I/O Connectors	8 USB V2.0, 1 FDD port, 2 COM ports, 1 LPT, 1 IrDA, 1 PS/2 K/B, 1 PS/2 Mouse		
Networking	10/100 Mbps Ethernet Controller RTL8100C / Gigabit Ethernet Controller RTL8110S		
Other common features	PS/2 Keyboard/Mouse Wake Up		
Optional Features	86SPE4	86SPE4-L	86SPE4-G
LAN Controller on board	No	RTL8100C	RTL8110S

## **1-3 Mainboard Specifications**

### **1-3.1 CPU Socket**

CPU Socket 478B on board, supporting Intel® Pentium 4 processors (including Intel Hyper Threading CPUs and Prescott CPUs) in 478-pin package for :

- 800/533/400MHz System Bus
- 512KB L2 Advanced Transfer Cache
- Hyper-pipelined technology
- Advanced dynamic execution;
- Rapid Execution Engine
- Streaming SIMD Extensions 2
- 128 Bit Enhanced Floating Point Unit
- Execution Trace Cache

### **1-3.2 System Chipsets**

North Bridge Intel 865PE:

- A high performance integrated chipset providing processor interface (including Hyper-Threading Technology), Dual channel DDR 400/333/266 SDRAM memory interface, Hub interface, AGP interface.
- Showing Hyper Threading Logo when booting with a Hyper-threading CPU.

South Bridge Intel ICH5:

- Supporting the LPC I/O, upstream Hub interface, PCI interface, IDE interface, Serial ATA interface, USB 2.0 interface, AC'97 2.2 (6-channel) Audio interface and the interrupt control.

### **1-3.3 Memory**

2 DDR DIMM 184-pin slots on board :

- Supporting unregistered, non-ECC Dual-channel DDR 400/333/266 SDRAM up to 2GBs
- DIMMs to be populated in identical pairs for Dual-channel operation
- SPD (Serial Presence Detect) Scheme for DIMM Detection supported

### **1-3.4 AMI BIOS**

Flash Memory for easy upgrade, supporting BIOS Writing Protection, Year 2000 compliant, and supporting various hardware configuration during booting system (See Chapter 4 BIOS Setup):

- Standard BIOS Features(Times, Date, System Information etc.)
- Advanced BIOS Features (CPU,IDE, Floppy, Super I/O, Hardware Health, ACPI, USB, and Frequency/Voltage Control)
- Advanced Chipset Features (NorthBridge, SouthBridge Configuration)
- PCI/PNP Resource Management (IRQ Settings, Latency Timers etc.)
- Boot Configuration Setup (Boot Settings, Boot Device Priority etc.)
- BIOS Security Features (Supervisor Password, User Password)

### **1-3.5 Accelerated Graphics Port (AGP) Interface**

AGP Controller embedded on board, supporting:

- 1.5V (4x/8x) power mode only
- 8x 66MHz AD and SBA signalling, AGP pipelined split-transection longburst transfers up to 2GB/sec
- AGP 8X/4X supported, AGP V3.0 compliant

### **1-3.6 Advanced System Power Management**

- ACPI 1.0B compliant (Advanced Configuration and Power Interface), including ACPI suspend mode support (See ACPI Configuration of Advanced BIOS Features in BIOS Setup)
- APM V1.2 compliant (Legacy Power Management)
- Supporting Wake On LAN
- Real Time Clock (RTC) with date alarm, month alarm, and century field

### **1-3.7 Multi-I/O Functions :**

- Serial ATA Controller integrated in ICH5, supporting:
  - 2x Serial ATA connectors supporting up to 150MByte/s transfer rate
- PCI EIDE Controller, supporting:
  - 2x UATA100/66/33 IDE connectors supporting up to 4 IDE devices
- Dedicated IR Functions:
  - Third serial port dedicated to IR function either through the two complete serial ports or the third dedicated port Infrared-IrDA (HPSIR) and ASK (Amplitude Shift Keyed) IR
- Multi-mode Parallel Data Transfer:
  - Standard mode, high speed mode ECP and enhanced mode EPP
- Floppy Disk Connector:
  - One FDD connector supporting 2 floppy drives with drive swap support
- Universal Serial Bus Transfer Mode:
  - USB V2.0 compliant; 480Mb/s USB Bus, supporting Windows 2000 or later operating system (no support for Windows 9X/ME)
  - 4 built-in USB connectors and 2 USB Headers which require 2 additional USB cables to provide 4 more optional USB ports
- PS/2 Keyboard and PS/2 Mouse
- UARTs (Universal Asynchronous Receiver / Transmitter):
  - Two serial ports (COM1 & COM2) on board

### **1-3.8 Expansion Slots**

- 5 PCI Bus Master slots
- 1 AGP slot
- 2 DDR SDRAM DIMM slots

### **1-3.9 Gigabit Ethernet Controller on board for 86SPE4-G**

PCI local bus single-chip Gigabit Ethernet Controller RTL8110S on board SL-86SPE4-G:

- Supporting 10/100/1000Mb data transfer
- Supporting Wake On LAN function through the on-board RJ45 LAN Connector
- LAN Driver enclosed in Support CD for user's installation.

### **1-3.10 10/100Mbps Ethernet Controller for 86SPE4-L**

PCI local bus single-chip 10/100Mbps Ethernet Controller RTL8100C on board SL-86SPE4-L:

- Supporting 10/100Mb data transfer
- Supporting Wake On LAN function through the on-board RJ45 LAN Connector
- LAN Driver enclosed in Support CD for user's installation.

### **1-3.11 Hardware Monitor on board**

- Hardware Monitor supported by W83627HF, providing monitoring and alarm for flexible desktop management of hardware voltage, temperatures and fan speeds.
- Utility Software Soltek Hardware Monitor for displaying system status is enclosed in Support CD for user's installation.

### **1-3.12 AC'97 Audio Codec on board**

AC'97 Audio Codec 2.2 compliant on board

- Supporting 6-channel display of PCM audio output
- 6 channel audio consists of Front Left, Front Right, Back Left, Back Right, Center and Subwoofer for complete surround sound effect
- AC'97 Audio Codec Driver enclosed in Support CD for user's installation.

### **1-3.13 Form Factor**

- ATX Form Factor, ATX Power Supply, version 2.03 compliant, supported by one Main Power Connector, one +12V Power Connector.
- Mainboard size: 305mm x 210mm

# Chapter 2 Hardware Setup

## To Get Things Ready for Hardware Setup !

1. We recommend to install your CPU before any other components. For detailed installation instructions of processor, you can also refer to the pamphlet enclosed in your CPU package.
2. Installing a cooling fan with a good heat sink is a must for proper heat dissipation for your CPU. Get ready an appropriate fan with heat sink for proper installation. Improper fan and installation will damage your CPU.
3. In case CPU Vcore, CPU clock or Frequency Ratio is adjustable on board, please follow the instructions described in the User's manual for proper setup. Incorrect setting will cause damage to your CPU.

**The following topics are included in this chapter:**

**2-1 CPU Installation with Socket 478B**

**2-2 Pentium 4 CPU Fan Installation**

**2-3 Memory Installation**

**2-4 AGP 8X/4X Slot Installation**

**2-5 IDE Connectors Installation**

**2-6 Serial ATA Connectors Installation**

**2-7 Floppy Drive Connector Installation**

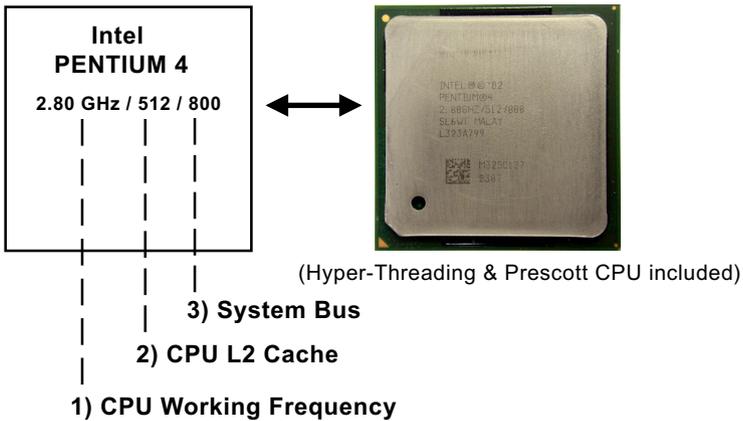
**2-8 ATX V2.03 Power Supply Installation**

**2-9 Jumper Settings**

**2-10 Other Connectors Configuration**

## 2-1 CPU Installation with Socket 478B

### 2-1.1 To Identify a Pentium 4 CPU



On the heatsink side of a Pentium 4 CPU, there printed a line of figures to identify its specifications. The line consists of 4 parts:

1. CPU Working Frequency: this part depicts the working frequency of the CPU. The Intel P4 processor with three different System Bus mode provides a variety of speeds ranging from 2A Ghz to 3.2Ghz.  
 400MHz System Bus: 2.60, 2.50, 2.40, 2.20, 2A GHz  
 533MHz System Bus: 3.06, 2.80, 2.66, 2.53, 2.40, 2.26 GHz  
 800MHz System Bus: 3.20, 3, 2.80C, 2.60C, 2.40C GHz
2. CPU L2 Cache: this part depicts the L2 Cache size. For example, 512 stands for 512 KB L2 Cache; 256 stands for 256 KB L2 Cache
3. System Bus: this part depicts the System Bus (Front Side Bus) is provided by CPU clock x 4. For example,  
 800MHz = 200MHz(CPU clock) x 4; 533MHz = 133MHz x 4  
 400MHz = 100MHz x 4

Note: System Bus vs CPU Clock

P4 CPU is a quad-pumped CPU. The system bus is provided by the CPU clock x 4. Therefore, users can figure out the P4 CPU clock by the System Bus divided by 4.

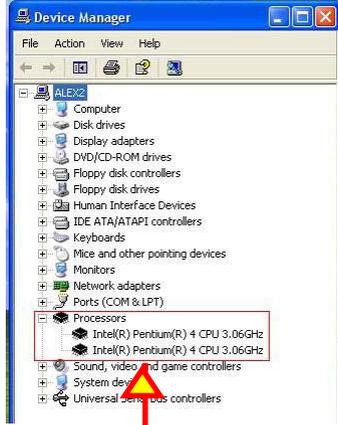
Pentium 4 with Hyper Threading Technology :

- (1) P4 processors at 2.40C, 2.60C, 2.80C, 3, 3.20GHz with an advanced 800MHz system bus
- (2) P4 processor at 3.06Ghz with 533MHz system bus

### 2-1.2 CPU Installation with Socket 478B

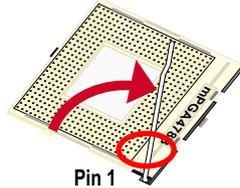
This mainboard is built with CPU Socket 478B ( 478-pin) supporting the Intel Pentium 4 CPU:

- Follow the steps described in this section to install the 478-pin Pentium 4 CPU into the on board Socket 478.
- After installation of Pentium 4 CPU, you must also install the specific Pentium 4 CPU fan designed in tandem with this CPU. This CPU Fan installation is described in next section.
- This mainboard supports Hyper-threading dual-in-one CPU, the function of which can be enabled by Windows XP. (See illustration on the right.)

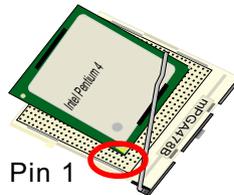


( If Hyper-threading CPU is installed successfully with O/S Win XP, the O/S will enable the dual-in-one CPU function.)

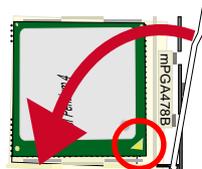
1. First pull sideways the lever of Socket 478, and then turn it up 90° so as to raise the upper layer of the socket from the lower platform.



2. Configure Pin 1 of CPU to Pin 1 of the Socket, just as the way shown in the diagram on the right. Adjust the position of CPU until you can feel all CPU pins get into the socket with ease.

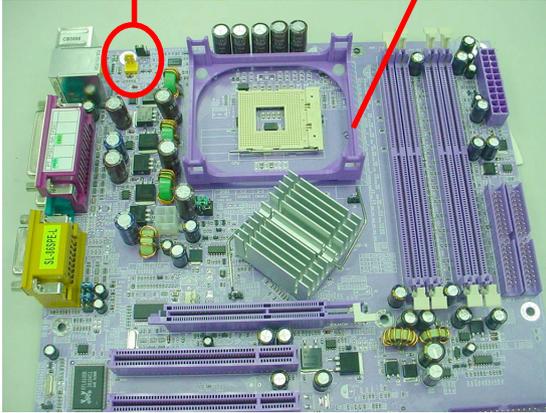


3. Make sure that all CPU pins have completely entered the socket and then lower down the lever to lock up CPU to socket.

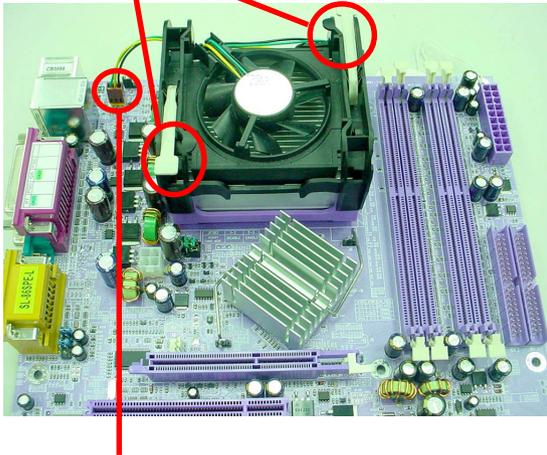


**2-2 Pentium 4 CPU Fan Installation:**

CPU Fan Connector      Pentium 4 Fanbase



Press down 2 Spring Locks to lock fan to fanbase



Connect Fan Connector to CPU FAN connector

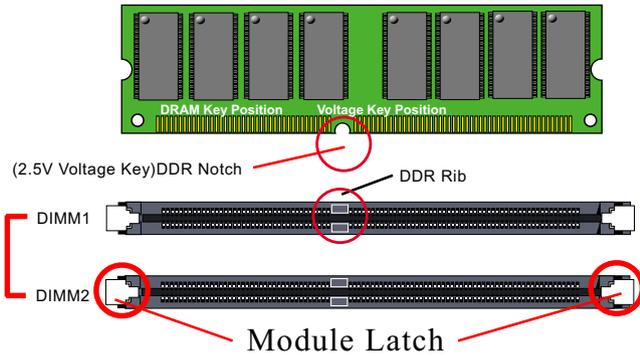
The above pictures are taken from sample mainboards as installation illustration. The layout in the pictures may be different from your mainboard.

## 2-3 Memory Installation

### 2-3.1 To Install DDR SDRAM Module

- To enable Dual-channel memory function, users should insert totally identical (size and frequency) DDR module pair into the bank-pair.
- DDR DIMM slot has 184 pins and one notch. Insert a DDR SDRAM vertically into the 184-pin slot with the notch-to-rib matching.

184-Pin DIMM Notch Key Definition



DIMM1+DIMM2 = Dual Channel Memory  
(Dual-channel is not valid on single DIMM)

### 2.3.2 Dual Channel Memory Features

- Dual Channel Memory Configuration is formed by couple of identical DDR SDRAMs.
- Dual Channel memory configuration provides higher performance than Single Channel configurations.
- Matched DIMMs need to have identical density, DRAM technology, DRAM bus width, and equal number of memory banks.
- This series supports up to 2GB unbuffered Dual-channel DDR 400/333/266 SDRAM, with 2 DDR DIMM slots on board. Do not insert other type of modules into these slots.
- The dual memory controller can double the DDR memory bandwidth up to 6.4GB/s with couple of DDR400, 5.4GB/s with couple of DDR333 and 4.2GB/s with couple of DDR266.

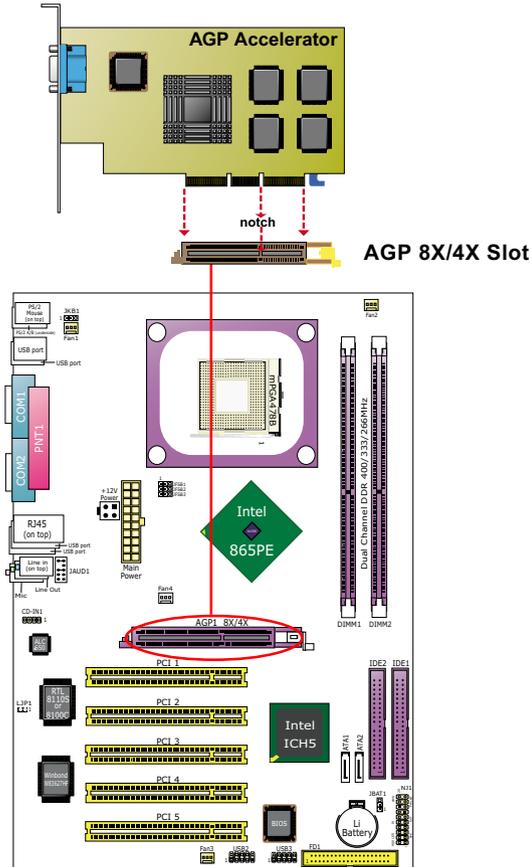
### 2-3.3 To Remove a DIMM

Power off the system first, and then press down the holding latches on both sides of slot to release the module from the DIMM slot.

## 2-4 AGP 8X/4X Slot Installation

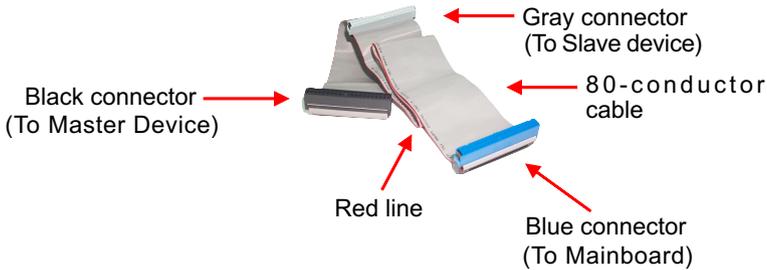
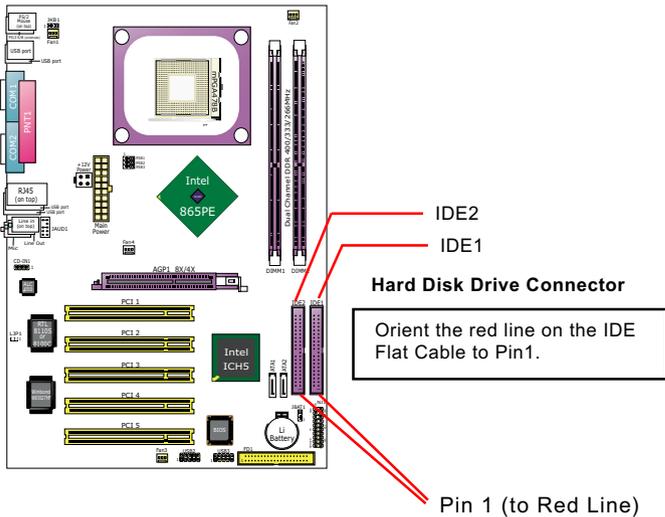
The AGP slot on board supports 1.5V AGP 8X/4X card only. A Rib is specifically added to the 8X/4X slot so as to match the AGP 8X/4X card. To insert a 3.3V AGP 2X card into the AGP 4X slot will damage the system chip and burn the 1.5V circuitry.

An AGP 8X card will support a data transfer rate up to 2GB/sec, while an AGP 4X card will provide 1GB/sec transfer rate.



## 2-5 IDE Connectors Installation

To install IDE Connector, you may connect the blue connector of IDE cable to the primary (IDE1) or secondary (IDE2) connector on board, and then connect the gray connector to your slave device and the black connector to your master device. If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers correctly. Please refer to your hard disk documentation for the jumper settings.

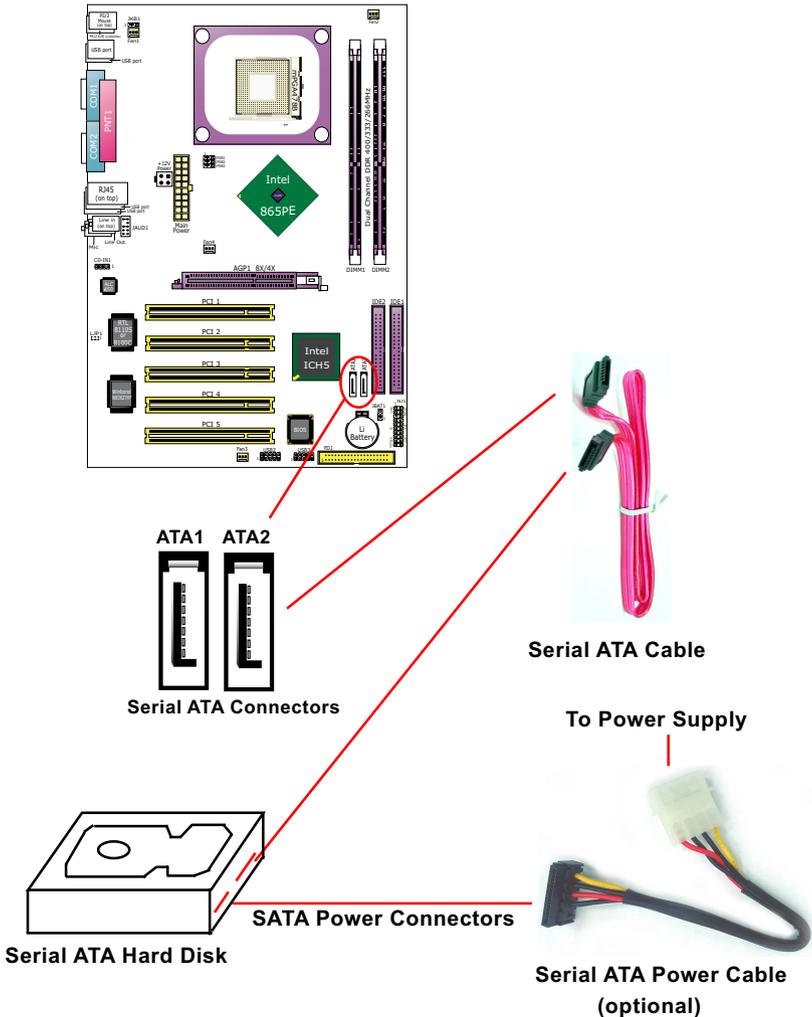


### IDE Flat Cable

## 2-6 Serial ATA Connectors Installation

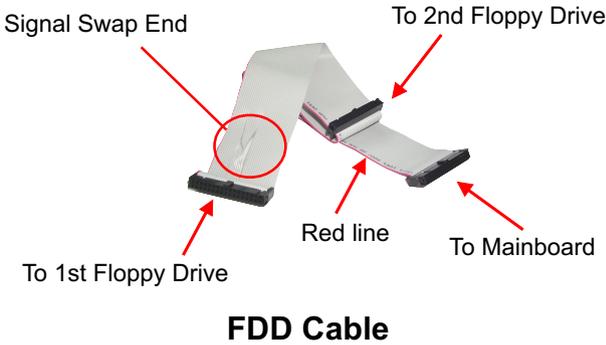
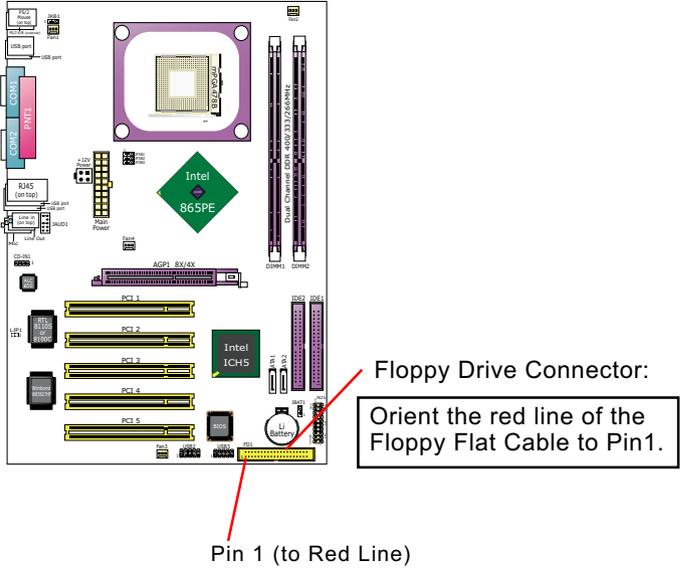
The Serial ATA is designed to improve the Parallel ATA with the capability of Hot Plug and offer a data bandwidth of 150Mbytes/second. It also reduce voltage and pin count and can be implemented with thin cables which improve the inner ventilation of PC cases.

2 Serial ATA connectors are built on board, supported by the SATA Controller for SATA Hard Disk Drives.

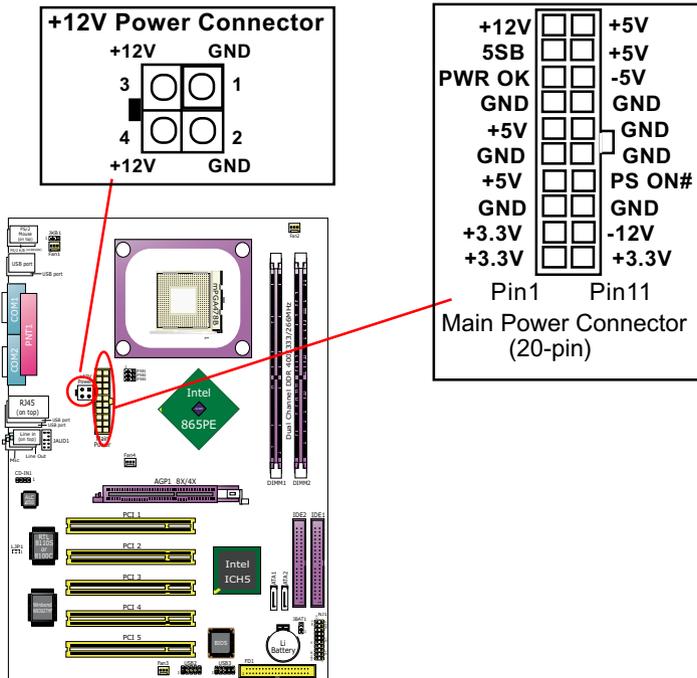


## 2-7 Floppy Drive Connector Installation

To install FDC, you should connect the end of FDC cable with single connector to the board, and connect the other end with two connectors to the floppy drives.



## 2-8 ATX V2.03 Power Supply Installation



ATX V2.03 Power Supply is strongly recommended for mainboard running with 2GHz or higher CPU.

To set up Power Supply on this mainboard:

1. Connect the on-board Main Power Connector (20-pin) to the Main Power Connector (20-pin) of an ATX Power Supply which can be of the latest version 2.03 model, and then connect the square-shaped +12V Power Connector on board to the square-shaped +12V Power Connector of the Power Supply.

Warning: Both the Main Power Connector and the +12V Power Connector should be connected to Power Supply; otherwise, the system may either not start or damaged.

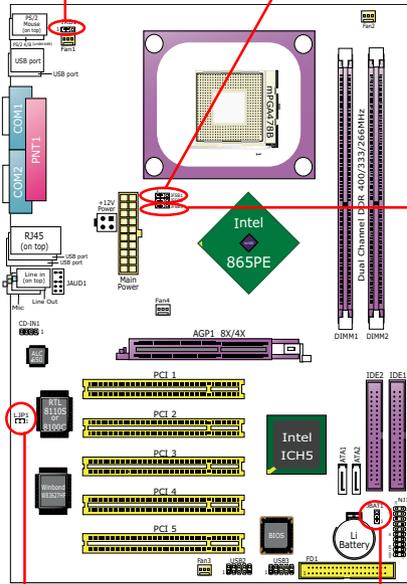
2. This ATX Power Supply should be able to provide at least 720mA/ +5V standby power for Wake On Lan function.

## 2-9 Jumper Settings

The following diagrams show the locations and settings of jumper blocks on the mainboard.

<b>JKB1: Keyboard / Mouse Wake Up</b>	
 1	<b>1-2 closed (default)</b> Disabled
 1	<b>2-3 closed</b> Enabled

<b>JFSB1&amp;JFSB2: CPU Frequency Select</b>			
(default) <b>CPU Auto- Detection</b>	<b>100MHz (FSB400)</b>	<b>133MHz (FSB533)</b>	<b>200MHz (FSB800)</b>
<b>JFSB1</b> 1	 1	 1	 1
<b>JFSB2</b> 1	 1	 1	 1

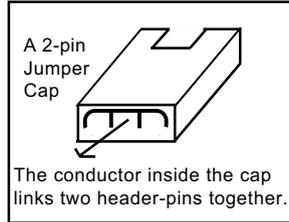
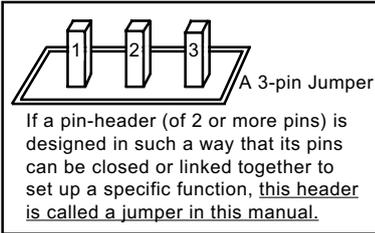


<b>JFSB3 Memory Turbo Mode</b>	
 1	<b>1-2 closed (default)</b> Turbo Mode Disabled
 1	<b>2-3 closed</b> Turbo Mode Enabled

<b>LJP1: LAN Controller Select for 86SPE4-L &amp; 86SPE4-G</b>	
 1	<b>1-2 open (default)</b> LAN controller Enabled
 1	<b>2-3 closed</b> LAN controller Disabled

<b>JBAT1 Clear CMOS</b>	
 1	<b>1-2 closed (default)</b> To hold data
 1	<b>2-3 closed</b> To clear CMOS

**How to tackle the Jumpers:**



- A Jumper is usually but not necessarily given a “JpX” legend.
- In the Jumper setting diagram, the jumper pins covered with black marks stand for closed pins with jumper cap.



- Do not remove any jumper cap when power is on. Always make sure the power is off before changing any jumper settings. Otherwise, the mainboard will be damaged.

**2-9.1 JFSB1 & JFSB2: CPU Frequency Select**

JFSB1 and JFSB2 are designed on board for CPU frequency select.

1. Setting JFSB1 1-2 closed and JFSB2 to 1-2 closed will allow CPU on board to Auto Detect its own frequency and apply it to the System Bus.
2. Setting JFSB1 2-3 closed and JFSB2 2-3 closed is for 100 MHz CPU.
3. Setting JFSB1 opened and JFSB2 2-3 closed is for 133 MHz CPU.
4. Setting JFSB1 2-3 closed and JFSB2 opened is to select a CPU clock at 200 MHz for your CPU. If 200MHz is an overclock for your CPU, it may or may not boot your system. If an overclock fails to boot system, you should restore the default setting and then clear CMOS to reboot your system. (See Clear CMOS in next paragraph.)

JFSB1&JFSB2: CPU Frequency Select			
(default) CPU Auto-Detection	100MHz (FSB400)	133MHz (FSB533)	200MHz (FSB800)
JFSB1	JFSB1	JFSB1	JFSB1
1 	1 	1 	1 
JFSB2	JFSB2	JFSB2	JFSB2
1 	1 	1 	1 

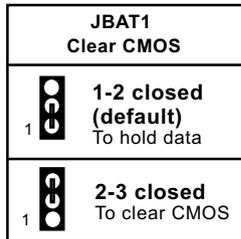
Further Notes on CPU Overclocking:

1. If you have successfully booted system, with or without CPU overclock, you still can try another CPU overclock in BIOS Setup. Please enter BIOS Setup, choose “Frequency/Voltage Control” of Advanced BIOS Features, and configure the “CPU Clock” item to raise your CPU clock.
2. CPU overclocking should take all components on board into account. If you fail in BIOS overclocking, you will not be able to restart system. In such case, Power off system and clear CMOS by JBAT1 and then restart your system. And remember to reconfigure whatever should be reconfigured.
3. If your system is already fixed in a cabinet or case, you may not like to take the trouble to clear CMOS. Then power on your system with the power button on the PC case and simultaneously press down the “Insert” key on the keyboard until you see the initial bootup screen appear. And remember you should also enter CMOS BIOS Setup instantly and choose “Load Optimized Defaults” to restore default BIOS .

**2-9.2 JBAT1: Clear CMOS**

When you have problem with rebooting your system, you can clear CMOS data and restore it to default value. To clear CMOS with Jumper JBAT1, please follow the steps below:

1. Power off system.
2. Set JBAT1 to Pin 2-3 closed.
3. After 2 or 3 seconds, restore the JBAT1 setting to Pin1-2 closed.
4. CMOS data are restored to default now. Remember never clear CMOS when system power is on.



### 2-9.3 JFSB3: Memory Turbo Mode

JFSB3 is designed on board for improving Memory performance. If you want to obtain better system performance, you can set JFSB3 2-3 closed to enable the Memory Turbo Mode. Otherwise, you can set JFSB3 1-2 closed to disable the Memory Turbo Mode.

JFSB3 Memory Turbo Mode	
	1-2 closed (default) <sup>1</sup> Turbo Mode Disabled
	2-3 closed <sup>1</sup> Turbo Mode Enabled

### 2-9.4 LJP1: LAN Controller Select

LJP1 is a 2-pin jumper for enabling or disabling the on-board LAN Controller. Users can set LJP1 open to enable the on-board LAN Controller so as to set up the LAN driver, or to set LJP1 closed to disable the on-board LAN Controller. Whether LJP1 is enabled or not, users are still free to use an add-on PCI LAN card for networking.

LJP1: LAN Controller Select for 86SPE4-L & 86SPE4-G	
	1-2 open (default) LAN controller Enabled
	2-3 closed LAN controller Disabled

### 2-9.5 JKB1: Keyboard / Mouse Wake Up

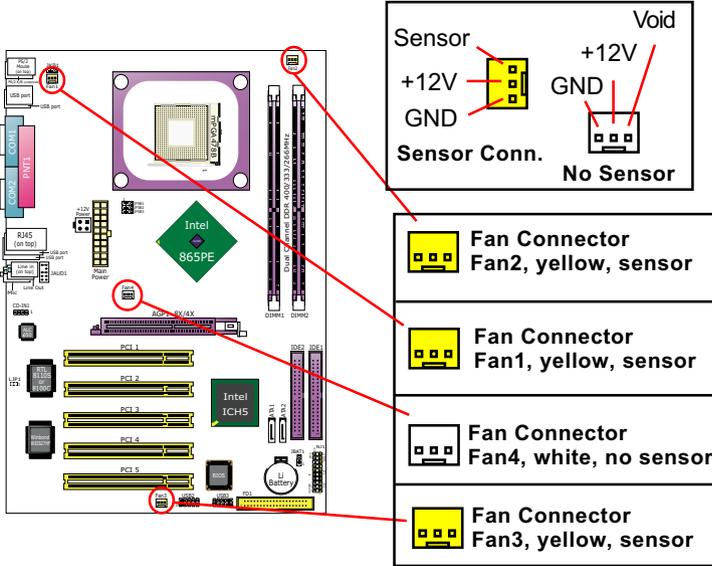
JKB1 is designed on board as a jumper to enable/disable the PS/2 keyboard/mouse Wake Up from suspend mode. USB keyboard/mouse Wake Up function is not supported on this mainboard.

JKB1: Keyboard / Mouse Wake Up	
	1-2 closed (default) Disabled <sup>1</sup>
	2-3 closed Enabled <sup>1</sup>

## 2-10 Other Connectors Configuration

This section lists out all connectors configurations for users' reference.

### 2-10.1 On Board Fan Connectors

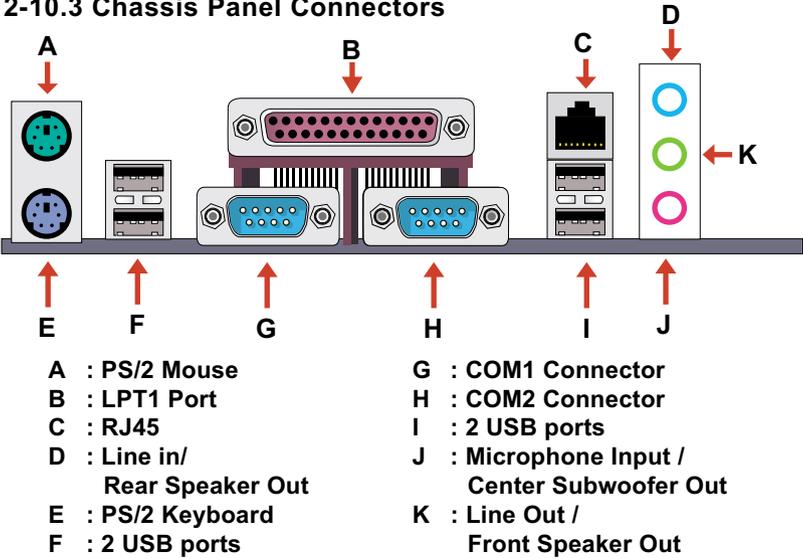


Both Sensor and No-sensor Fan Connectors support CPU/AGP/System/Case cooling fan with +12V mode. A Hardware Monitor chipset is on board, with which users can install a Hardware Monitor Utility and read the fan speed transmitted from the sensor fan. Otherwise, users can read the fan speed from the "Hardware Monitor Status" via BIOS.

A running Fan will send out 2 electric pulses per rotation of its fan blade. A Sensor Fan Connector will count the electric pulses and send the information to the System Hardware Monitor which in turn will work out the fan rotation speed and display it on screen.



### 2-10.3 Chassis Panel Connectors

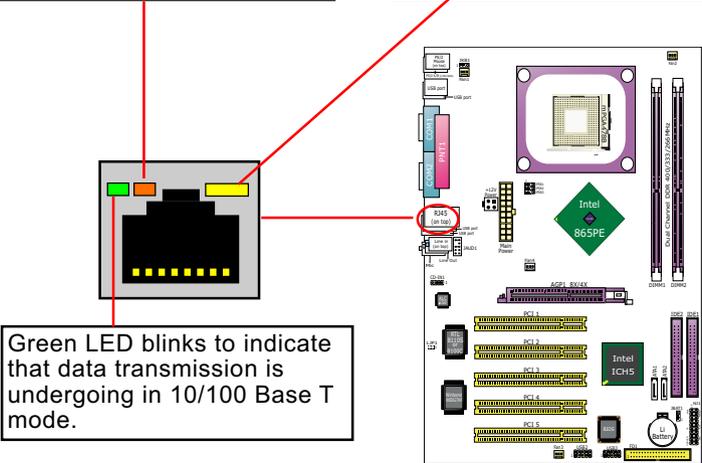


### 2-10.4 LAN Connector

One RJ45 connector is on board for network connection.

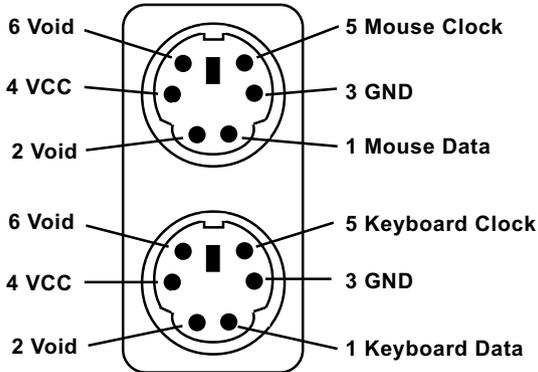
Orange LED blinks to indicate that data transmission is undergoing in 1000 Base T mode.

Yellow LED "On" to indicate Network hub is in connection with the system.



## 2-10.5 PS/2 Mouse And PS/2 Keyboard

(PS/2 Mouse: On top of keyboard connector, green)

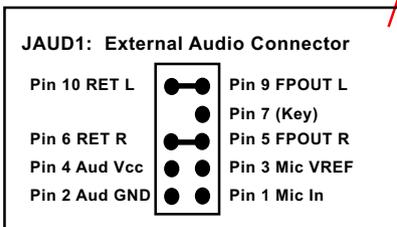
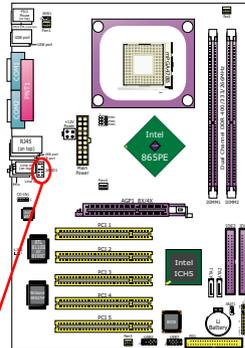


(PS/2 Keyboard Connector: Underside, purple)

## 2-10.6 External Audio Connector

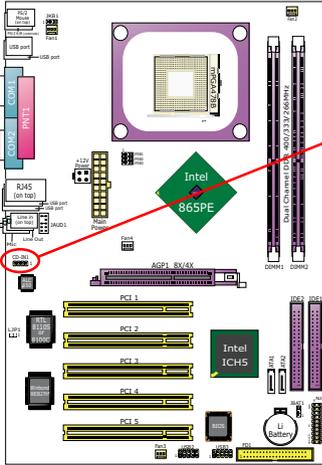
This Mainboard is designed with an External Audio connector “JAUD1” which provides connection to your chassis.

1. When JAUD1 is set to 5-6 closed and 9-10 closed, this default setting disables this connector and leaves the Back Panel Audio enabled.
2. To use this Front Panel Audio Connector, please open all pins of JAUD1 and connect it to your chassis.



**2-10.7 CD-ROM Audio Connectors**

CD-IN1 is an audio connector connecting CD-ROM audio to mainboard.

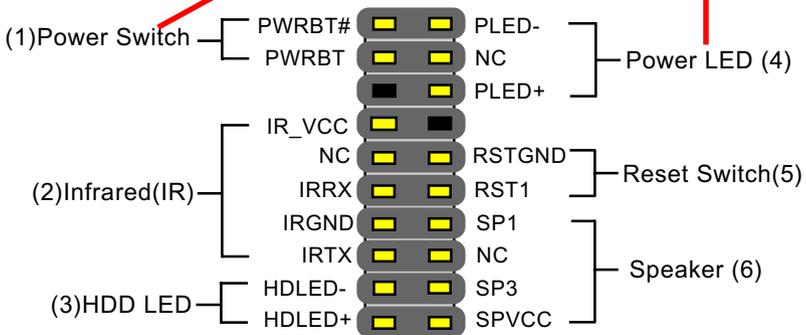
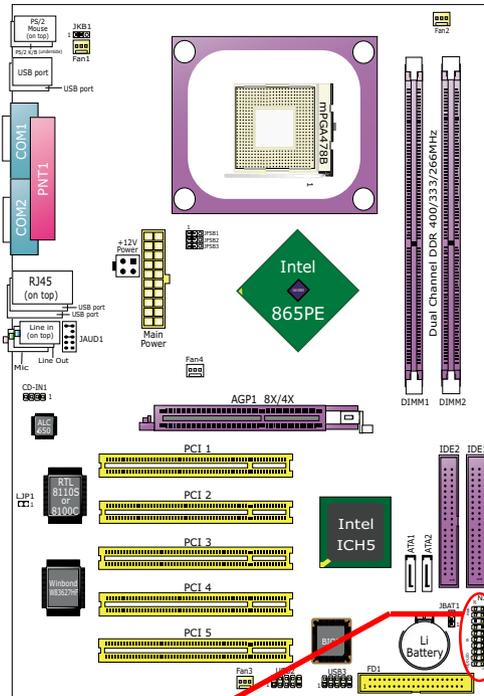


CD-ROM Audio Pin Assignment

CD-IN1	Pin 1	Pin 2	Pin 3	Pin 4
	Left Channel	GND	GND	Right Channel

## 2-10.8 Complex Pin-header

This complex Pin-header consists of the following connectors for various supports. When you have fixed the mainboard to the case, join the connectors of this Complex Pin-header to the case Front Panel.



# Chapter 3 Software Setup

## Drivers, Utilities and Software Installation

- Support CD:

This series of mainboards will be shipped with a Support CD which contains those necessary driver files, Application Softwares and some helpful utilities. It is a user-friendly, auto-run CD which will open itself up in a CD-ROM automatically.

This chapter is devoted to describing the installations of all these essential drivers and utilities on Windows 9X, Windows ME, Windows 2000 and Windows XP. And installation on Windows XP as the general illustration hereby.

If you are using a newer driver version than the illustration used below, the pictures may be different.

The priority of drivers to be installed should also be noted. Users are recommended to take the following installation orders :

**3-1 To Open up the Support CD**

**3-2 To Install Intel Chipset Software Installation Utility**

**3-3 To Install AC'97 Audio Drivers**

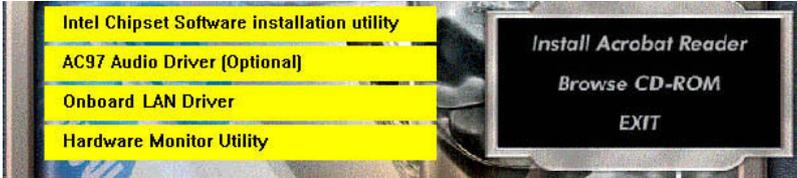
**3-4 To Install Hardware Monitor Utility**

**3-5 To install Ethernet Drivers**

**3-6 To Install Intel USB V2.0 Drivers**

### **3-1 To Open up the Support CD**

1. Please put the Support CD enclosed in your mainboard package into the CD-ROM drive. In a few seconds, the Main Menu will automatically appear, displaying the contents to be installed for this series:

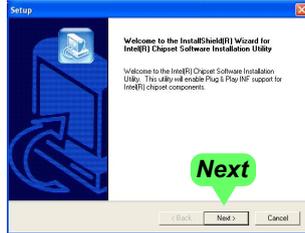


2. In case your system does not open the Support CD automatically, please click to the following path to enter the Main Installation Menu:  
D:\Autorun.exe (assuming that your CD-ROM Drive is Drive D)
3. We recommend that drivers installation should be started from top to bottom of main menu.
4. Drivers may be updated from time to time in our web site. If you are installing a newer driver than the one illustrated in this chapter, please be aware that the illustration pictures might be different.

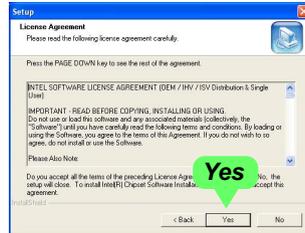
### 3-2 Intel Chipset Software Installation Utility

1. Following the procedures of opening the Support CD, click to “Install Intel Chipset software installation Utility” to proceed.

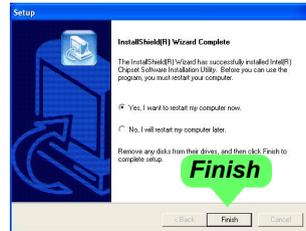
2. The Intel Service Pack InstallShield Wizard will pop up to guide you to the Intel Service pack installation. Press “**Next**” button to continue.



3. “Intel Software License Agreement” screen will appear, please click the “**Yes**” button to agree with the Licence Agreement and continue.



4. After all the setup process is finished, please restart your computer by clicking on “Finish” so as to take the Utility into effect.



### 3-3 AC'97 Audio Driver Installation

Avance AC97 Audio Codec on board, AC'97 2.2 compatible stereo audio code for PC multimedia systems. Avance AC'97 Audio Codec Driver is provided in Support CD for user's installation.

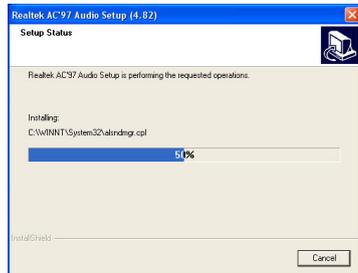
#### 3-3.1 To Install AC'97 6-channel Audio Driver

1. Following the procedures of opening the Support CD, click to “ AC'97 Audio Driver” to proceed.

2. Instantly, the “installShield Wizard” screen appears to guide you through the “Avance AC'97 Audio Setup”.



3. instantly, the Setup program proceeds to install the softwares which include AC'97 driver and AVRack. (If you want to stop setup, click the “Cancel” button.)



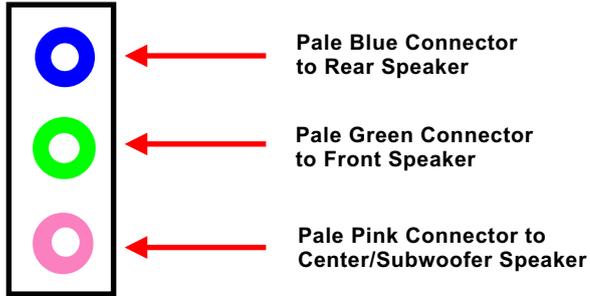
4. After the setup process is finished, please check the radial button “Yes, I want to restart my computer now.” And click “Finish” to restart your system.



### 3-3.2 To Verify 6-channel Audio

After installation of AC'97 6-channel Codec, you must configure the 5.1 Speaker connection to enable the 6-channel audio.

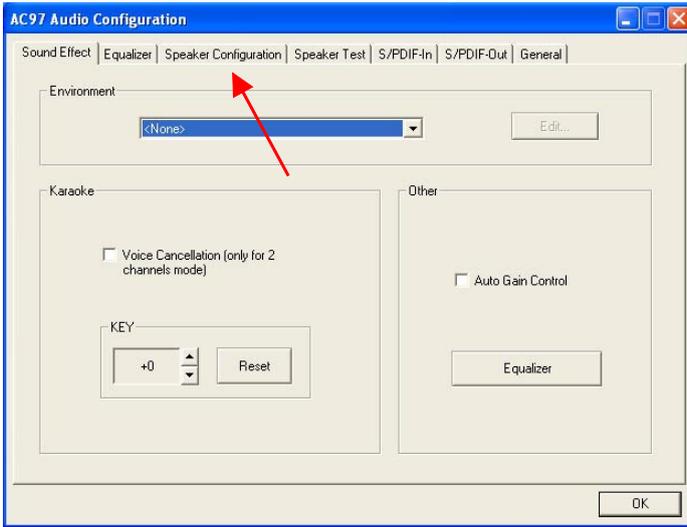
1. Connect your on-board Audio Connector to your 6-channel speakers as depicted below:



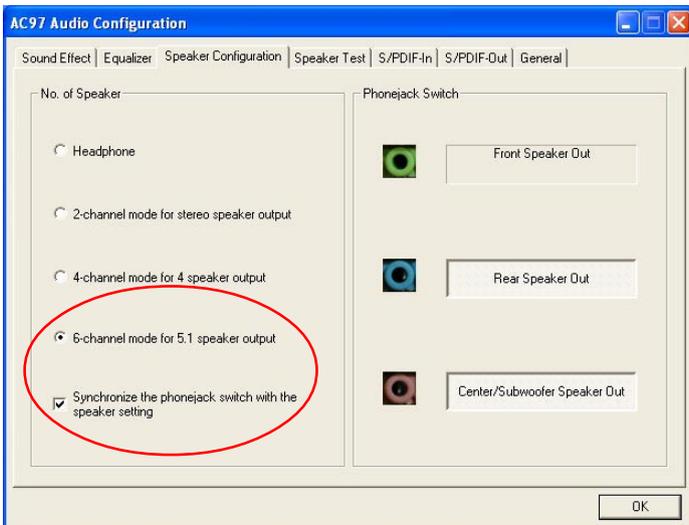
2. After Connection is done, start your Windows system and double click the Avance Sound Effect manager icon to enter 6-channel configuration:



3. The "AC'97 Audio Configuration" screen will pop out. Click the "Speaker Configuration" bar with your mouse.



4. Instantly, the "Speaker Configuration" screen will pop out. Pick the items "6-channel mode for 5.1 speakers output" and "Synchronize the phonejack switch with the speakers settings" and then click "OK" to finish configuration.



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- 5. At finishing the Speakers Configuration, you can also click the “Speaker Test” bar on the screen to test the 6-channel performance. The figure below is the “Speaker Test” screen with testing instructions enclosed on it. Follow the instructions to perform the Speakers Test.



## 3-4 To Install Hardware Monitor Utility

### 3-4.1 Installation

Hardware Monitor is built on this mainboard. Its installation is programmed to a fully automated mode on Windows 9X/Me/NT4/2000/XP. Users can follow the model installation below for its installation on various Windows System.

1. Following the procedures of opening the Support CD, click to “Hardware Monitor Utility” to proceed.

2. The Soltek Hardware Monitor InstallShield Wizard will pop up to guide you to the Intel Service pack installation. Press “**Next**” button to continue.



3. The **InstallShield Wizard** screen will show the current setting, please click the “**Install**” button to continue.

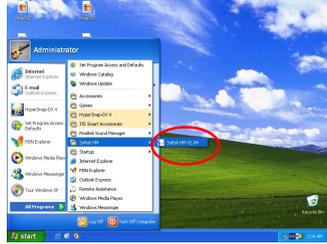


4. After all the setup process is finished, click “Finish” to exit the wizard.



### 3-4.2 Verification

1. After installing Soltek Hardware Monitor, double click “SoltekHM” icon on the desktop to open the main window of the Soltek Hardware Doctor.



2. Then the pop-up screen will show all information about CPU Temperature, Fan Speed and various Voltages.

Showing the Fan Speed(s) that is supported by the mainboard.

Showing the temperature(s), the function of which is supported by the mainboard.

Click on “Soltek” button to display the function menu.

The image shows the Soltek Hardware Monitor software interface. It features a futuristic, metallic-looking design with several data panels. Callout boxes with red lines point to specific elements: 'Showing the Fan Speed(s) that is supported by the mainboard.' points to the 'FAN TACHOMETER' section; 'Showing the temperature(s), the function of which is supported by the mainboard.' points to the 'TEMPERATURE' section; 'Click on “Soltek” button to display the function menu.' points to a 'Soltek' button on the right; 'Showing the Voltage(s) that is supported by the mainboard.' points to the 'VOLTAGE' section; and 'Status Warning LED' points to a green LED indicator at the bottom right.

TEMPERATURE		FAN TACHOMETER	
CPU On	40	Fan 1	not Found
ABS B	47	Fan 2	9750
RT 2	29	Fan 3	not Found

VOLTAGE	
CPU Voltage	1.272
DRAM Voltage	2.822
3.3V	3.296
5V	4.919
12V	12.096
-12V	-11.944
5VSB	4.914
Battery	7.980

\*Note: Not all items or functions showing in the above picture will show up. Only those items or functions that are supported by the mainboard will reveal themselves in the above screen.

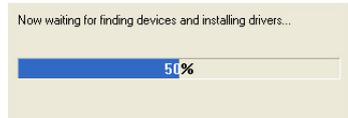
### 3-5 To Install RTL8100C/RTL8110S Ethernet Drivers

RTL8100C or RTL8110S Gigabit LAN driver for Windows 98/ME / 2000 / XP. After restarting system, click on the Onboard LAN Driver to start setup. The following illustration is done with RTL8110S for your reference.

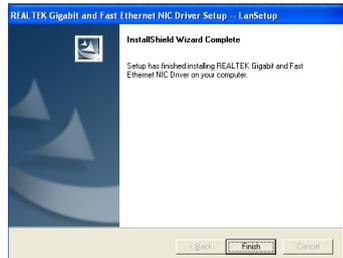
1. Instantly, the InstallShield Wizard pop out. Click Next to continue.



2. Next, the program starts to copy files.



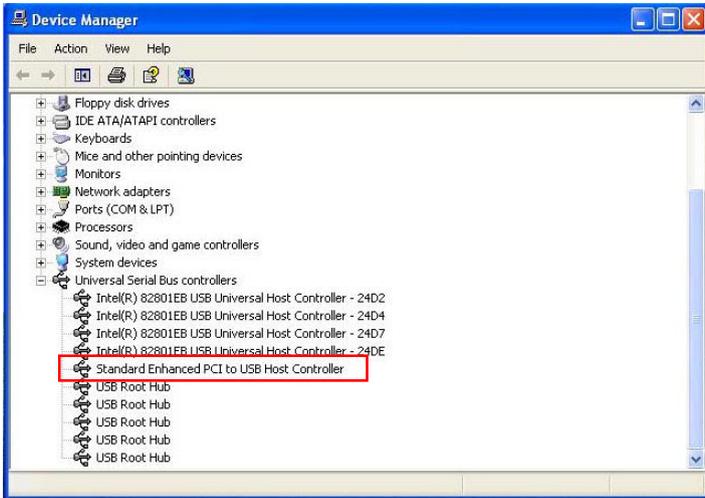
3. In a few seconds, setup completes. Restart system and complete setup.



### 3-6 To Install USB 2.0 Driver for Windows 2000/XP

USB V2.0 with its 480Mb/s transfer rate supports operating system Windows 2000 and Windows XP via the Windows 2000 and Windows XP Service Pack. For achieving Intel USB 2.0 support, users should install the latest Service Pack for Windows 2000 or Windows XP. (intel USB 2.0 does not support Windows 9X/ME.)

1. After installation of Intel Chipset software installation Utility in Windows 2000 or Windows XP, start to install the latest Service Pack version into the operating system. The installation of the latest Service Pack will support USB2.0 in Windows 2000 or Windows XP now.(The latest Service Pack can be found in Microsoft Web Site.)
2. To verify USB2.0 installation, please enter “Device Manager” of “My Computer”. On the “Device Manager” screen, you should be able to see the item “Standard Enhanced PCI to USB Host Controller”, verifying USB2.0 Driver is installed successfully.



# *Memo*

# Chapter 4 AMI BIOS Setup

## THE BIOS

BIOS stands for Basic Input and Output System. It was once called ROM BIOS when it was stored in a Read-Only Memory (ROM) chip. Now manufacturers would like to store BIOS in EEPROM which means Electrically Erasable Programmable Memory. BIOS used in this series of mainboard is stored in EEPROM, and is the first program to run when you turn on your computer.

BIOS performs the following functions:

1. Initializing and testing hardware in your computer (a process called "POST", for Power On Self Test).
2. Loading and running your operating system.
3. Helping your operating system and application programs manage your PC hardware by means of a set of routines called BIOS Run-Time Service.

**This Chapter includes the following topics :**

**4-1 About BIOS Setup**

**4-2 To Run BIOS Setup**

**4-3 About CMOS**

**4-4 The POST (Power On Self Test)**

**4-5 To Update BIOS**

**4-6 BIOS Setup**

### **4-1 About BIOS Setup**

BIOS setup is an interactive BIOS program that you need to run when:

1. Changing the hardware of your system. (For example: installing a new Hard Disk etc.)
2. Modifying the behavior of your computer. (For example: changing the system time or date, or turning special features on or off etc.)
3. Enhancing your computer's behavior. (For example: speeding up performance by turning on shadowing or cache)

### **4-2 To Run BIOS Setup**

First access BIOS setup menu by pressing < DEL > key after "POST" is complete ( before OS is loaded ). BIOS will then display the following message:

DEL: SETUP

### **4-3 About CMOS**

CMOS is the memory maintained by a battery. CMOS is used to store the BIOS settings you have selected in BIOS Setup. CMOS also maintains the internal clock. Every time you turn on your computer, the BIOS Looks into CMOS for the settings you have selected and configures your computer accordingly. If the battery runs out of power, the CMOS data will be lost and POST will issue a "CMOS invalid" or "CMOS checksum invalid" message. If this happens, you have to replace the battery and check and configure the BIOS Setup for the new start.

### **4-4 The POST ( Power On Self Test )**

POST is an acronym for Power On Self Test. This program will test all things the BIOS does before the operating system is started. Each of POST routines is assigned a POST code, a unique number which is sent to I/O port 080h before the routine is executed.

## 4-5 To Update BIOS

- System BIOS is incorporated into a Flash memory component. Flash BIOS allows user to upgrade BIOS without the need to replace an EPROM component.
- The Upgrade Utility can be loaded on a floppy diskette for upgrading saving, and verifying the system BIOS. The Update Utility can also be run from a hard disk drive or a network drive.
- Normally, to update BIOS is unnecessary if the system is working fine. Users should only update BIOS when incompatible problems are encountered or new features have to be added to system.

### • Please follow the steps below for updating the system BIOS:

Step 1. Please visit the board maker's website, download the zip files of the latest BIOS and AMI flash utility "**amiflash.exe**" for your mainboard. After unzipping, the BIOS file format will be \*.ROM, of which "\*" stands for the specific BIOS file name.

Step 2. Create a bootable diskette. Then copy the BIOS file and AMI flash utility "**amiflash.exe**" into the diskette.

Step 3. Insert the diskette into drive A, boot your system from the diskette.

Step 4. Under "A " prompt, type "**amiflash \*.ROM** " and then press <Enter> to run BIOS update program. Please note that there should be a space between **amiflash** and **\*.ROM**. (\*.ROM depends on your mainboard model and version code. Instead of typing "\*\*", you should type the specific file name for your specific mainboard). For example, you may type "amiflash MP005.rom".

Step 5. When the message "Flash ROM Update Completed - Pass." appears, please restart your system.

Step 6. You will see a message "CMOS Memory Size Wrong" during booting the system. Press <Del> or <F1> to run CMOS setup utility, then reload "Load Failsafe Defaults" or "**Load Optimal Defaults**" and save this change.

## 4-6 BIOS SETUP --- CMOS Setup Utility

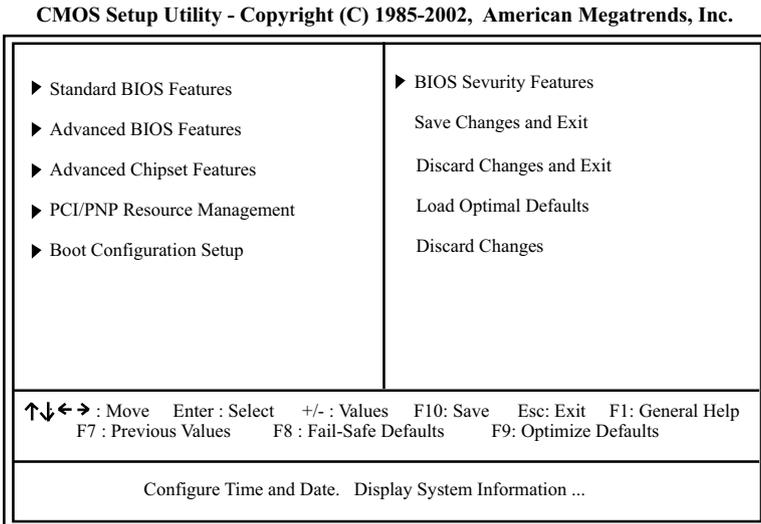
### 4-6.1 CMOS Setup Utility

This mainboard comes with the AMI BIOS from American Megatrends Inc. Enter the CMOS Setup Utility Main Menu by:

1. Turn on or reboot your system. After a series of diagnostic checks, the following message will appear:

**PRESS <Del> TO RUN SETUP**

2. Press the <Del> key and the main program screen will appear as follows.



3. Use the arrow keys on your keyboard to select an option, and press <Enter>. Modify the system parameters to reflect the options installed in your system.
4. You may return to the Main Menu anytime by pressing <Esc>.
5. In the Main Menu, "Save Changes and Exit" saves your changes and reboots the system, and "Discard Changes and Exit" ignores your changes and exits the program.

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6. In entering the Main option of the Main Menu, please use the functions in the Function List to configure the setting:

↑↓←→ : Move    Enter : Select    +/- : Values    F10: Save    Esc: Exit    F1: General Help  
F7 : Previous Values    F8 : Fail-Safe Defaults    F9: Optimized Defaults

Use [Enter], [Tab] or [Shift-Tab] to select a field.

Use [+] or [-] to choose the options.

<F1>: "General Help" provides explanations of the hot-key functions available.

<F7>: "Previous values" allows user to discard previous values or not.

<F8>: "Fail-safe defaults" allows user to load Fail-safe Defaults or not. Save and Exit Setup.

<F9>: "Optimized Defaults" allows user to load Optimal Defaults or not.



### 4-6.3 Advanced BIOS Features

Advanced BIOS Features allows user to configure HDD, Floppy, Serial Port, Parallel Port etc....

Run the Advanced BIOS Features as follows:

Choose “Advanced BIOS Features” from the Main Menu and a screen with a list of options will appear:

**CMOS Setup Utility - Copyright (C) 1985-2002, American Megatrends, Inc.  
Advanced BIOS Features**

Advanced Settings	Help Item
<p><b>Warning: Setting wrong values in below sections may cause system to malfunction.</b></p> <ul style="list-style-type: none"> <li>▶ CPU Configuration <span style="float: right;">Press Enter</span></li> <li>▶ IDE Configuration <span style="float: right;">Press Enter</span></li> <li>▶ Floppy Configuration <span style="float: right;">Press Enter</span></li> <li>▶ SuperIO Configuration <span style="float: right;">Press Enter</span></li> <li>▶ Hardware Health Configuration <span style="float: right;">Press Enter</span></li> <li>▶ ACPI Configuration</li> <li>▶ Clock Generator Configuration <span style="float: right;">Press Enter</span></li> <li>▶ USB Configuration <span style="float: right;">Press Enter</span></li> <li>▶ Voltage Control <span style="float: right;">Press Enter</span></li> <li>▶ Power Management <span style="float: right;">Press Enter</span></li> </ul>	<p>Configure CPU.</p>

↑↓←→ : Move    Enter : Select    +/- : Values    F10: Save    Esc: Exit    F1: General Help  
 F7 : Previous Values    F8 : Fail-Safe Defaults    F9: Optimized Defaults

#### 4-6.3.1 CPU Configuration

Choose “CPU Configuration” in “Advanced BIOS Features” and press <Enter>. The following sub-screen will appear for configuration:

##### CPU Configuration

Configure advanced CPU settings Module Version - C0.03	Help Item
<p>Manufacturer : Intel                      Brand String : Intel(R) Pentium (R) 4 CPU 2.536GHz                      Frequency : 2.54GHzMHz                      PSB Speed : 534MHz                      Cache L1 : 8 KB                      Cache L2 : 512 KB</p> <p>Ratio CMOS Setting : 14                      Max CPUID Value Limit : Disabled:</p> <p>Hyper-threading Technology : Disabled</p>	

**Manufacturer** BIOS shows the current manufacturer of on-board CPU.

**Brand String** BIOS shows the current brand of on-board CPU.

**Frequency** BIOS shows the current on-board CPU frequency.

**Ratio Status** BIOS shows the current ratio (multiplier) status of on-board CPU. For P4 CPUs, the ratio is usually locked.

**Ratio Actual Value** BIOS shows the actual CPU ratio.

**Ratio CMOS Setting** BIOS shows the CPU Ratio in CMOS. If an invalid ratio is set in CMOS, then actual and setpoint values may differ.

**Hyper-threading Function** BIOS shows the current status of Hyper-threading function. If Hyper-threading CPU is running on board, this item will show “Enabled” status. If Hyper-threading CPU is not on-board, this item shows “Disabled”.

### 4-6.3.2 IDE Configuration

Choose “IDE Configuration” in “Advanced BIOS Features” and press <Enter>. The following sub-screen will appear for IDE Devices configuration:

IDE Configuration

IDE Configuration		Help Item
IDE Configuration	P/S-ATA (Auto)	
S-ATA Running Enhanced Mode	Yes	
P-ATA Channel Selection	Both	
S-ATA Ports Definition	P0-3rd./P1-4th	
▶ Primary IDE Master	Hard Disk	
▶ Primary IDE Slave	ATAPI CDROM	
▶ Secondary IDE Master	Not Detected	
▶ Secondary IDE Slave	Not Detected	
▶ Third IDE Master	Not Detected	
▶ Fourth IDE Master	Not Detected	
Hard Disk Write Protect	Disabled	
IDE Detect Time Out (Sec)	35	
ATA(P1) 80Pin Cable Detection	Host & Device	

4-6.3.2-1 IDE Configuration

<p><b>IDE Configuration</b> Allows you to configurare IDE device mode. Choices: P/S-ATA(Auto): Parallel/Serial ATA combined mode; S-ATA Only: For S-ATA running on board only; P/S-ATA(Win98/Me): P/S-ATA on Win98/Me only Disabled: IDE Configuration disabled</p> <hr/>
<p><b>IDE Configuration</b> — Choosing “P/S-ATA(Auto)” to configure the following:</p> <p><b>S-ATA Running Enhanced Mode</b> If P/S-ATA (Auto) is chosen, use this item to choose S-ATA Running Enhanced Mode. <b>(Combined Mode Option)</b> Choices: <input checked="" type="checkbox"/> <b>Yes</b>: Choose from the following option: P-ATA (parallel ATA) Channel Selection: Choices: Primary; Secondary; Both S-ATA Ports Definition: Choices: P0-3rd./P1-4th.; P0-4th./P1-3rd.</p> <p><input type="checkbox"/> <b>No</b>: Choose from the following options: P-ATA (parallel ATA) Channel Selection: Choices: Primary; Secondary; Both</p>
<p><b>IDE Configuration</b> — Choosing “S-ATA Only” to configure the following:</p> <p><b>S-ATA Ports Definition</b> Allows you to assign the S-ATA port locations. Choices: P0-3rd./P1-4th.; P0-4th./P1-3rd.;</p>
<p><b>IDE Configuration</b> — Choosing “P/S-ATA(Win98/Me)” to configure the following:</p> <p><b>Combined Mode Option</b> Choices: P-ATA 1st Channel; S-ATA 1st Channel;</p> <p><b>S-ATA Ports Definition</b> Choices: P0-Master/P1-Slave; P0-Slave/P1-Master;</p>

4-6.3.2-2 Primary/Secondary IDE Master/Slave and Third/Fourth IDE Master

▶ Primary IDE Master	Hard Disk
▶ Primary IDE Slave	ATAPI CDROM
▶ Secondary IDE Master	Not Detected
▶ Secondary IDE Slave	Not Detected
▶ Third IDE Master	Not Detected
▶ Fourth IDE Master	Not Detected

**Primary/Secondary IDE Master/Slave** Press <Enter> To show the detected information of Primary / Secondary IDE Master/Slave device(s).

**Third/Fourth IDE Master** Press <Enter> to show the detected information of third/fourth IDE Master device(s).

If any IDE device is detected in any one of the above items press <Enter> to reveal the IDE information:

**Primary/(Secondary/Third/Fourth) IDE Master/(Slave)**

Primary/(Secondary/Third/Fourth) IDE Master/(Slave)	Help Item
Device : Hard Disk Vendor : WDC WD400BB-00DEA0 Size : 40.0GB LBA Mode : Supported Block Mode : 16Sectors PIO Mode : 4 Async DMA : MultiWord DMA-2 Ultra DMA : Ultra DMA-5 S.M.A.R.T. : Supported	Select the type of device connected to the system.
Type : Auto LBA/Large mode : Auto Block (Multi-Sector Transfer) : Auto PIO Mode : Auto S.M.A.R.T. : Auto 32Bit Data Transfer : Disabled	

**Type** To select the types of the IDE devices:  
 Not Installed; Auto: Setting type automatically  
 CD-ROM: ATAPI (Packet Interface) CD-ROM drive  
 ARMD: ATAPI Removable Media Device

**LBA/Large mode** To auto-select (default) or disable LBA/Large mode.

**Block (Multi-Sector Transfer)** To auto-select (default) or disable Block Mode.

**PIO Mode** To auto-select (default) or disable PIO Mode.  
 Choices: Disabled; 1, 2, 3, 4

**S.M.A.R.T** Allows you to enable / disable the Self Monitoring Analysis and Reporting Technology for the hard disk.

**32Bit Data Transfer** To auto-select (default) or disable 32Bit Data Transfer.

### 4-6.3.4 Super IO Configuration

Choose “SuperIO Configuration” in “Advanced BIOS Features” and press <Enter>. The following sub-screen will appear for configuration:

**SuperIO Configuration**

Configure Win627THF Super IO Chipset	Help Item																
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">OnBoard Floppy Controller</td> <td style="width: 50%;">Enabled</td> </tr> <tr> <td>Serial Port1 Address</td> <td>3F8/IRQ4</td> </tr> <tr> <td>Serial port2 Address</td> <td>2F8/IRQ3</td> </tr> <tr> <td>Serial port2 Mode</td> <td>Normal</td> </tr> <tr> <td>OnBoard CIR Port</td> <td>Disabled</td> </tr> <tr> <td>Parallel Port Address</td> <td>378</td> </tr> <tr> <td>Parallel Port Mode</td> <td>Normal</td> </tr> <tr> <td>Parallel Port IRQ</td> <td>IRQ7</td> </tr> </table>	OnBoard Floppy Controller	Enabled	Serial Port1 Address	3F8/IRQ4	Serial port2 Address	2F8/IRQ3	Serial port2 Mode	Normal	OnBoard CIR Port	Disabled	Parallel Port Address	378	Parallel Port Mode	Normal	Parallel Port IRQ	IRQ7	Allows BIOS to Enable or Disable Floppy Controller.
OnBoard Floppy Controller	Enabled																
Serial Port1 Address	3F8/IRQ4																
Serial port2 Address	2F8/IRQ3																
Serial port2 Mode	Normal																
OnBoard CIR Port	Disabled																
Parallel Port Address	378																
Parallel Port Mode	Normal																
Parallel Port IRQ	IRQ7																

**OnBoard Floppy Controller** Allows you to enable / disable the Onboard Floppy Controller.

Choices: Enabled; Disabled

**Serial Port1 Address** Allows you to set the Onboard Serial Port1 Address.  
Choices: Disabled; 3F8/IRQ4; 3E8/IRQ4; 2E8/IRQ3;

**Serial Port2 Address** Allows you to set the Onboard Serial Port2 Address.  
Choices: Disabled; 2F8/IRQ3; 3E8/IRQ4; 2E8/IRQ3;

**Serial Port 2 Mode** If Serial Port2 Address is not disabled, it allows you to set the Serial Port 2 Mode. Choices:

- Normal;
- IrDA: Providing 2 items for configuration:
  - IR I/O Pin Select: SINB/SOUTB; IRRX/IRTX
  - IR Duplex Mode: Half Duplex; Full Duplex
- ASK IR: Providing 2 items for configuration:
  - IR I/O Pin Select: SINB/SOUTB; IRRX/IRTX
  - IR Duplex Mode: Half Duplex; Full Duplex

**OnBoard CIR Port** Allows you to set the onboard CIR Port.  
Choices: Disabled; 2E0; 3E0

**Parallel Port Address** Allows you to configure Parallel Port Address.  
Choices: Disabled; 378; 278; 3BC;

- Disabled: To disable this function;
- 378: 2 items to configure for address 378:
  - Parallel Port Mode:
    - Normal;
    - Bi-Directional;
    - EPP:
      - EPP Version: 1.9; 1.7
    - ECP:
      - ECP Mode DMA Channel: DMA0; DMA1; DMA3
  - Parallel Port IRQ: IRQ5; IRQ7

### 4-6.3.5 Hardware Health Configuration

1. Choose “Hardware Health Configuration” in “Advanced BIOS Features” and press <Enter>. The following sub-screen will appear for configuration:

Hardware Health Configuration		Help Item
System Temperature	: 34°C/93°F	Enables Hardware Health Monitoring Device.
CPU Temperature	: 45°C/113°F	
Fan1 Speed	: 3125 RPM	
Fan2 Speed	: 3169 RPM	
Fan3 Speed	: N/A	
CPU Core	: 1.500 V	
AGP	: 1.516 V	
+3.30V	: 3.258 V	
+5.00V	: 5.094V	
+12.0V	: 12.074 V	
-12.0V	: -12.048 V	
Battery	: 3.444 V	

↑↓←→ : Move    Enter : Select    +/- : Values    F10: Save    Esc: Exit    F1: General Help  
 F7 : Previous Values    F8 : Fail-Safe Defaults    F9: Optimize Defaults

**System Temperature** Shows current system temperature.

**CPU Temperature** Shows current CPU internal temperature.

**Fan1/2/3 Speed** Displaying the current speed of Chassis/CPU/Power Fan.

**CPU Core** Showing CPU core actual voltage value.

**AGP/3.3V/+12V/+5.00V/ Battery** Showing current voltage against the 1.5V/3.3V/ +12V/+5V/5VSB/Battery power supply.

### 4-6.3.6 ACPI Configuration

- Choose “ACPI Configuration” in “Advanced BIOS Features” and press <Enter>. The following sub-screen will appear for ACPI configuration:

ACPI Settings	Help Item
▶ General ACPI Configuration	Press Enter
▶ Advanced ACPI Configuration	Press Enter

### General ACPI Configuration:

To press < Enter > on General ACPI Configuration will reveal the following item(s).

**Suspend mode** This item shows that the mainboard support S1 (POS) suspend mode only.

### ▶ Advanced ACPI Configuration:

To press < Enter > on Advanced ACPI Configuration will reveal the following item(s).

**ACPI 2.0 Support** Allows you to enable / disable ACPI (Advanced Configuration and Power Interface) 2.0 Support function.  
Choices: Yes; No

**ACPI APIC Support** Allows you to enable / disable ACPI APIC (Advanced Programmable Interrupt Controller) Support function.

**ACPI APIC SCI IRQ** If ACPI APIC Support is enabled (Yes), it allows you to enable / disable ACPI APIC SCI IRQ function.

**BIOS-->AML ACPI table** Allows you to enable / disable BIOS-->AML ACPI table function.

**Headless mode** Allows you to enable / disable Headless operation mode through ACPI.

### 4-6.3.7 Clock Generator Configuration

1. Choose “Clock Generator Configuration” in “Advanced BIOS Features” and press <Enter>. The following sub-screen will appear for configuration:

**Clock Generator Configuration**

Configure ICS ICS952603 Clock Generator		Help Item
CPU Frequency Setting	133	Enable USB host controllers.
AGP/PCI Frequency Setting	66.66/33.33 Fixed	
Spread Spectrum	Disabled	
Auto PCI Clock	Enabled	

↑↓←→ : Move    Enter : Select    +/- : Values    F10: Save    Esc: Exit    F1: General Help  
 F7 : Previous Values    F8 : Fail-Safe Defaults    F9: Optimized Defaults

**CPU Frequency Setting** Allows BIOS to select CPO overclock.

**AGP/PCI Frequency Setting** To set AGP/PCI frequency.  
 Choices: 66.66/33.33 foxed; 72.73/36.36 fixed; 80.00/40.00 fixed; Disabled

**Spread Spectrum** Allows BIOS to set Clock Spread Spectrum for EMI Control.  
 Choices: Disabled; 0.35%; 0.50%; 0.75%; 1.00%

**Auto PCI Clock** Allows BIOS to enable/disable the PCI Clock auto.  
 Choices: Disabled; Enabled

### 4-6.3.8 USB Configuration

1. Choose “USB Configuration” in “Advanced BIOS Features” and press <Enter>. The following sub-screen will appear for configuration:

**USB Configuration**

USB Configuration	Help Item
Module Version - 2.22.5-7.4 USB Devices Enabled : None  USB Function                               8 USB Ports Legacy USB Support                        Enabled USB 2.0 Controller                        Enabled USB 2.0 Controller Mode                 FullSpeed ▶ USB Mass Storage Device Config Press Enter	Enable USB host controllers.

↑↓←→ : Move   Enter : Select   +/- : Values   F10: Save   Esc: Exit   F1: General Help  
 F7 : Previous Values   F8 : Fail-Safe Defaults   F9: Optimized Defaults

**USB Function** Allows you to set the USB Function on the USB port.  
 Choices: 8 USB Ports (default); 6 USB Ports ; 4 USB Ports; 2 USB Ports; Disabled

**Legacy USB Support** Allows you to enable(default) / disable the Legacy USB support.  
 Choices: Enabled(default); Disabled; Auto

**USB 2.0 Controller** Allows you to enable(default)/ disable the USB 2.0 Controller.

**USB 2.0 Controller Mode** Allows you to configure the USB 2.0 Controller Mode.  
 Choices: FullSpeed; HiSpeed.

<p>▶ <b>USB Mass Storage Device Config</b></p> <p><b>USB Mass Storage Reset Delay</b></p> <p><b>No USB Mass Storage Device detected</b></p>	<p>If USB Mass Storage device is installed, press “Enter” to view its submenu :</p> <p>To select number of seconds POST waits for the USB mass storage device after start unit command.                      Choices: 10 Sec; 20 Sec; 30 Sec; 40 Sec</p> <p>If no USB Mass Storage device is detected, this line will appear on screen.</p>
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### 4-6.3.9 Voltage Control

1. Choose “Frequency/Voltage Control” in “Advanced BIOS Features” and press <Enter>. The following sub-screen will appear for configuration:

#### Frequency/Voltage Control

Voltage Configuration		Help Item
AGP Voltage Control	1.5V	Press “+”/“-” to select.
DIMM Voltage Control	2.6V	
CPU Voltage Control	Auto	

↑↓←→ : Move    Enter : Select    +/- : Values    F10: Save    Esc: Exit    F1: General Help  
F7 : Previous Values    F8 : Fail-Safe Defaults    F9: Optimized Defaults

**AGP Voltage Control** Allows you to configure the AGP Voltage.  
Choices: 1.5V; 1.6V; 1.7V; 1.8V

**DIMM Voltage Control** Allows you to configure the DIMM Voltage.  
Choices: 2.5V; 2.6V; 2.7V; 2.8V; 2.9V

**CPU Voltage Control** Allows you to configure the CPU Voltage. Usually, to raise CPU voltage will raise the chance of CPU overclocking and yet risk damage of CPU.  
Choices: Auto; 0.8375V ~1.8000V in 0.0125V stepping

### 4-6.3.10 Power Management

Choose "Power Management" in "Advanced BIOS Features" and press <Enter>. The following sub-screen will appear for configuration:

Power Management		Help Item
APM Configuration		
Power Management/APM	Enabled	Enable or disable APM.
Video Power Down Mode	Suspend	
Hard Disk Power Down Mode	Suspend	
Standby Time Out	Disabled	
Suspend Time Out	Disabled	
Power Button mode	On/Off	
Restore on AC Power Loss	Power Off	
Resume On Ring	Disabled	
Resume On LAN/PME#	Disabled	
Resume On RTC Alarm	Disabled	

↑↓←→ : Move    Enter : Select    +/- : Values    F10: Save    Esc: Exit    F1: General Help  
 F7 : Previous Values    F8 : Fail-Safe Defaults    F9: Optimized Defaults

**Power Management/ APM** Allows you to enable (default)/ disable the Power management / Advanced Power Management function.

**Video Power Down Mode** Allows you to select the Video Power Down Mode. Choices: Disabled; Standby; Suspend

**Hard Disk Power Down Mode** Allows you to select the Hard Disk Power Down Mode. Choices: Disabled; Standby; Suspend

**Standby Time Out (Minute)** To set the duration of Standby Time Out. Choices: Disabled; 1; 2; 4; 8; 10; 20; 30; 40; 50; 60

**Suspend Time Out (Minute)** To set the duration of Suspend Time Out. Choices: Disabled; 1; 2; 4; 8; 10; 20; 30; 40; 50; 60

**Power Button Function** Allows you to set power Button function. Choices: On/Off (default); Suspend

**Restore on AC/Power Loss** Allows you to set the restore state from AC/Power Loss. Choices: Last State; Power Off (default); Power On



### 4-6.4.1 NorthBridge Configuration

Choose "NorthBridge Configuration" in "Advanced Chipset Features" and press <Enter>. The following sub-screen will appear for configuration:

**NorthBridge Configuration**

DRAM Frequency	Auto	<b>Help Item</b>
Configure DRAM Timing by SPD	Enabled	
Memory Hole	Disabled	
Init. Graphic Adapter Priority	AGP/PCI	
Graphics Aperture Size	64MB	

**DRAM Frequency** Allows you to set the current SDRAM frequency.  
 Choices: Auto; 266MHz; 333MHz; 400MHz

**Configure SDRAM Timing by SPD** SPD (Serial presence detect) is a device in memory module for storing the module information such as DRAM timing and chip parameters. If this option is enabled, BIOS will access SPD automatically to configure module timing. If disabled, DRAM timing can be configured manually.  
 Default: Enabled

<b>DRAM CAS# Latency</b>	With SDRAM Timing by SPD disabled, you can select the SDRAM CAS# (Column Address Strode)latency manually. Choices: 2 Clocks; 2.5 Clocks; 3 Clocks
<b>DRAM RAS# Precharge</b>	With SDRAM Timing by SPD disabled, you can select the SDRAM RAS# (Row Address Strode) Precharge cycle manually. Choices: 2 Clocks; 3 Clocks; 4 Clocks
<b>DRAM RAS# to CAS# Delay</b>	With SDRAM Timing by SPD disabled, you can select the SDRAM RAS# to CAS# delay cycle manually. Choices: 2 Clocks; 3 Clocks; 4 Clocks
<b>DRAM Precharge Delay</b>	Allows you to set the SDRAM Precharge Delay cycle. Choices: 5 Clocks; 6 Clocks; 7 Clocks; 8 Clocks
<b>DRAM Burst Length</b>	With SDRAM Timing by SPD disabled, you can select the SDRAM Burst length manually. Choices: 8; 4

**Memory Hole** Allows you to enable / disable (default) the support of Memory Hole which is reserved for ISA card.  
Choices: Disabled; 15MB-16MB

**Init. Graphics Adapter Priority** Allows you to select the initial Graphics Adapter.  
Choices: AGP/PCI(default); PCI/AGP;

**AGP Aperture Size** Series of options are available: 4, 8, 16, 32, 64, 128, 256MB. Memory mapped and graphics data structures can reside in a Graphics Aperture. This area is like a linear buffer. BIOS will automatically report the starting address of this buffer to the O.S. The default setting is 64MB.

#### **4-6.4.2 SouthBridge Configuration**

1. Choose "SouthBridge Configuration" in "Advanced Chipset Features" and press <Enter>. The following sub-screen will appear for configuration:

##### **SouthBridge Configuration**

OnBoard AC'97 Audio	Auto	<b>Help Item</b>

↑↓←→ : Move    Enter : Select    +/- : Values    F10: Save    Esc: Exit    F1: General Help  
F7 : Previous Values    F8 : Fail-Safe Defaults    F9: Optimized Defaults

**Onboard AC'97 Audio** Allows you to disable AC' 97 Audio.  
Choices: Auto (default); Disabled

### 4-6.5 PCI/PNP Resource Management

PCI/PNP Resource Management allows you to modify the system's power saving functions.

1. Choose "PCI/PNP Resource Management" from the Main Menu and a screen with a list of options will appear:

CMOS Setup Utility - Copyright (C) 1985-2002, American Megatrends, Inc.  
**PCI/PNP Resource Management**

Advanced PCI/PNP Settings	Help Item
<b>Warning: Setting wrong values in below sections may cause system to malfunction.</b>	
Plug & Play O/S	No
PCI Latency Timer	32
Allocate IRQ to PCI VGA	Yes
Palette Snooping	Disabled
PCI IDE BusMaster	Disabled
OffBoard PCI/ISA IDE Card	Auto
IRQ3	Available
IRQ4	Available
IRQ5	Available
IRQ7	Available
IRQ9	Available
IRQ10	Available
IRQ11	Available
IRQ14	Available
IRQ15	Available
DMA Channel 0	Available
DMA Channel 1	Available
DMA Channel 3	Available
DMA Channel 5	Available
DMA Channel 6	Available
DMA Channel 7	Available
Reserved Memory Size	Disabled

No: lets the BIOS configure all the devices in the system.  
 Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.

↑↓←→ : Move    Enter : Select    +/- : Values    F10: Save    Esc: Exit    F1: General Help  
 F7 : Previous Values    F8 : Fail-Safe Defaults    F9: Optimized Defaults

**Plug & Play O/S** Allows you to configure the PNP devices by BIOS or O/S.

Choices: No(by BIOS) (default); Yes(by O/S)

**PCI Latency Timer (PCI** Allows you to set the PCI Latency Time.

**Clocks)** Choices: 32(default); 64; 96; 192; 128; 160; 192; 224; 248;

**Allocate IRQ to PCI** Allows you to assign IRQ to PCI VGA card if card

**VGA** requests IRQ.

Choices: Yes(default); No

- Palette Snooping** This option allows the BIOS to preview VGA status, and to modify the information delivered from the feature Connector of the VGA card to MPEG card. This option can solve the display inversion to black after you have used a MPEG card.
  
- PCI IDE BusMaster** Allows you to enable / disable(default) the PCI IDE Bus Master function.
  
- OffBoard PCI/ISA IDE Card** Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card.  
 Choices: Auto; PCI Slot1; PCI Slot2; PCI Slot3; PCI Slot4; PCI Slot5;
  
- IRQ 3/4/5/7/9/10/11/14/15** Allows you to specify available IRQs to be used by PCI/PNP devices.  
 Choices: Available(default); Reserved
  
- DMA 0/1/3/5/6/7** Allows you to specify available DMAs to be used by PCI/PNP devices.  
 Choices: Available(default); Reserved
  
- Reserved Memory Size** Allows you to specify memory size to reserve for legacy ISA devices.  
 Choices: Disabled(default); 16K; 32K; 64K

**4-6.6 Boot Configuration Setup**

Boot Configuration Setup allows you to modify the system's boot settings.

Choose "Boot Configuration Setup" from the Main Menu and a screen with a list of options will appear:

**CMOS Setup Utility - Copyright (C) 1985-2002, American Megatrends, Inc.  
 Boot Configuration Setup**

Boot Settings	Help Item
▶ Boot Setting Configuration                      Press Enter	Configure Settings during System Boot.
▶ Boot Device Priority                                      Press Enter	

↑↓←→ : Move    Enter : Select    +/- : Values    F10: Save    Esc: Exit    F1: General Help  
 F7 : Previous Values    F8 : Fail-Safe Defaults    F9: Optimized Defaults

### 4-6.6.1 Boot Settings Configuration

Choose “Boot Settings Configuration” in “Boot Configuration Setup” and press <Enter>. The following items will appear for onfiguration:

**Boot Configuration Setup**

Boot Settings	Help Item
Quick Boot AddOn ROM Display Mode Bootup Num-Lock PS/2 Mouse Support Wait For 'F1' If Error Hit 'DEL' Message Display Interrupt 19 Capture	Enabled Force BIOS On Auto Enabled Enabled Disabled  Configure Settings during System Boot.

**Quick Boot** Allows you to enable (default)/ disable quick boot of your system. If enabled, BIOS will skip certain tests while booting. This will decrease the time needed to boot the system.

**AddOn ROM Display Mode** If “Force BIOS” (default) is chosen, the vendor’s logo screen will be followed by the “AddOn ROM” initial screen (the screen showing the add-on card BIOS message). If “Keep Current” is chosen, no “Add-On ROM” screen is followed.

**Bootup Num-lock** Allows you to toggle between On (default) or Off to control the state of the NumLock keys when the system boots. If On, the numeric keypad is in numeric mode. If off, the numeric keypad is in cursor control mode.

**PS/2 Mouse Support** Enabled (default), PS/2 mouse is supported. Disabled, PS/2 Mouse is not supported. If “Auto” is set, the system will auto detect the PS/2 Mouse.

**Wait For ‘F1’ If Error** Allows you to hit F1 key when errors occur.  
 Choices: Enabled(default); Disabled

**Hit ‘DEL’ Message Display** The system will show “Press DEL key to run Setup when enabled.  
 Choices: Enabled(default); Disabled

**Interrupt 19 Capture** Allows option ROMs to trap interrupt 19.  
 Choices: Enabled; Disabled(default)

### 4-6.6.2 Boot Device Priority

Choose “Boot Device Priority” in “Boot Configuration Setup” and press <Enter>. The bootable devices installed on board will appear and are allowed to assign the Boot Priority.

**Boot Device Priority**

Boot Device Priority		Help Item
1st Boot Device	1st FLOPPY DRIVE	Configure Settings during System Boot.
2nd Boot Device	PM-WDC WD400BB-00	

**1st/2nd/3rd Boot Device** Allows you to set (by pressing <Enter>) floppy or IDE devices already installed to be the 1st/2nd/3rd boot device.  
 Choices: Disabled; Device(s) installed

## 4-6.7 Boot Security Features

Boot Security Features allows you to modify the system's boot security settings.

Choose "Boot Security Features" from the Main Menu and a screen with a list of options will appear:

**CMOS Setup Utility - Copyright (C) 1985-2002, American Megatrends, Inc.  
Boot Security Features**

Security Settings	Help Item
Supervisor Password : Not Installed User Password : Not Installed	Install or Change the password.
Change Supervisor Password      Press Enter	
User Access Level                      Full Access	
Change User Password                Press Enter	
Clear User Password                  Press Enter	
Password Check                        Setup	
Boot Sector Virus Protection        Disabled	

↑↓←→ : Move    Enter : Select    +/- : Values    F10: Save    Esc: Exit    F1: General Help  
F7 : Previous Values    F8 : Fail-Safe Defaults    F9: Optimized Defaults

### 4-6.7.1 Supervisor Password

To show the status of Supervisor Password. "Installed" is displayed when supervisor password is set up. Otherwise, "Not Installed" is displayed.

### 4-6.7.2 User Password

To show the status of User Password. "Installed" is displayed when supervisor password is set up. Otherwise, "Not Installed" is displayed.

### 4-6.7.3 Change Supervisor Password

This option allows you to set a new Supervisor password for the system:

1. Choose "Change Supervisor Password" in the "BIOS Security Features" and press <Enter>. Then the following message appears:

[ Enter new supervisor password ]

2. The first time you run this option, enter your password up to 6 characters and press <Enter>. (The screen does not display the entered characters.)
3. After you enter the password, the following message appears, prompting you to confirm the password:

[ Confirm New Password ]

4. Enter the same password "exactly" the same as you have just typed to confirm the password and press <Enter>.
5. The following message appears to confirm the new password setup.

[ Password installed ]
[OK]

6. Then press any key to continue your CMOS Setup. To save the password setup, you should press "Save Changes and Exit" and choose "OK" to exit and save setup.
7. If you enter a new password into the box, you will be using this new password after you have finished and saved this new setup. Instead, if you press <Enter> before you enter any new password into the instruction box, another message box appears, telling you that you have disabled the Supervisor Password. That means, no password is set for either entering BIOS Setup or system:

[ Password uninstalled ]
[OK]

**User Access Level** Allows you to set four different Access Levels when Supervisor Password has been set.  
Choices: Full Access; Limited; View Only; No Access

Note: "User Access Level" and "Password Check" will appear when "Supervisor Password" has been set.

### 4-6.7.4 Change User Password

This option allows you to set a new User password for the system:

1. Choose "Change User Password" in the "BIOS Security Features" and press <Enter>. Then the following message appears:

[ Enter New Password ]

2. The first time you run this option, enter your password up to 6 characters and press <Enter>. (The screen does not display the entered characters.)
3. After you enter the password, the following message appears, prompting you to confirm the password:

[ Confirm New Password ]

4. Enter the same password "exactly" the same as you have just typed to confirm the password and press <Enter>.
5. The following message appears to confirm the new password setup.

[ Password installed ]
[OK]

6. Then press any key to continue your CMOS Setup. To save the password setup, you should press "Save Changes and Exit" and choose "OK" to exit and save setup.

### 4-6.7.5 Clear User Password

1. To remove the current user password, choose "Clear User Password" and press <Enter>. An instruction box appears on the screen, assuring to clear User Password:

Clear User Password?
[OK]      [Cancel]

2. Then choose [OK] and press <Enter>. The User Password is successfully removed.

**Password Check** Allows you to set BIOS to check up password with a password prompt at BIOS Setup or whenever re-starting system. This option will appear when you have set Supervisor Password or User Password. Choices: Setup (default); Always

#### 4-6.7.6 Boot Sector Virus Protection

**Boot Sector Virus Protection** When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an antivirus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

NOTE: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you disable the virus warning.

#### 4-6.8 Load Optimal Defaults

When you press <Enter> on this item, you will get a confirmation dialog box with a message similar to:

[ Load Optimal Defaults ?]	
[OK]	[Cancel]

Press <Enter> now to load Optimal values for all the Setup options.

### 4-6.9 Disca Changes

Discard Changes option allows you to cancel the modifications that you have specified in the Setup Utility. Highlight this option on the Main Menu and press <Enter> and the following message appears:

[ Discard Changes?]	
[OK]	[Cancel]

Follow the message and press <Enter> key to cancel the modifications that you have specified.

### 4-6.10 Save Changes and Exit

Save Changes and Exit allows you to save all modifications you have specified into the CMOS memory. Highlight this option on the Main Menu and press <Enter>. The following message appears:

[ Saving configuration changes and exit setup? ]	
[OK]	[Cancel]

Press <Enter> key to save the configuration changes and exit CMOS Setup to restart your system.

### 4-6.11 Discard Changes and Exit

Discard Changes option allows you to exit (or not exit) the Setup Utility without saving the modifications that you have specified. Highlight this option on the Main Menu and press <Enter> and the following message appears:

[ Discard Changes (and exit setup?)]	
[OK]	[Cancel]

Follow the message and press <Enter> key to exit CMOS Setup and restart system.