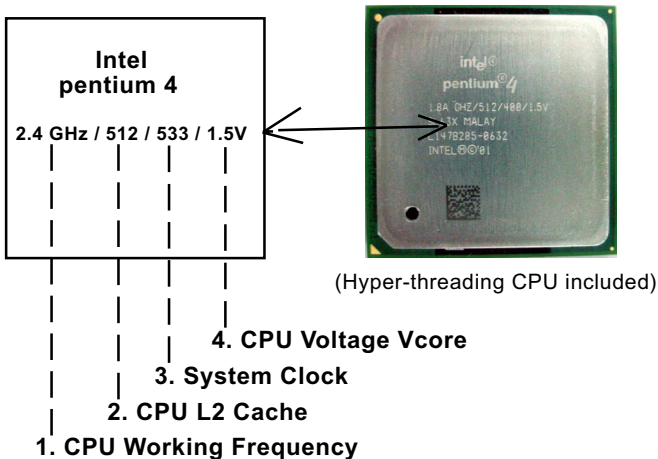# Chapter 2 Hardware Setup

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 heatsink is a must for proper heat dissipation for your CPU. Get ready an appropriate fan with heatsink 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 Manual for proper setup. Incorrect setting will cause damage to your CPU.

The following topics are included in this chapter:

2-1 Pentium 4 CPU Identification


```
┌─────────────────────────────┐
│         Intel               │
│       pentium 4             │
│                             │
│  2.4 GHz / 512 / 533 / 1.5V │ ←
│    │    │    │    │          │
│    │    │    │    │          │
│    │    │    │    │          │
└────│────│────│────│──────────┘
     │    │    │    │
     │    │    │    │        (Hyper-threading CPU included)
     │    │    │    │
     │    │    │   4. CPU Voltage Vcore
     │    │   3. System Clock
     │   2. CPU L2 Cache
    1. CPU Working Frequency
```

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. For example,

   2.4 GHz depicts that this CPU is locked to 2.4 GHz working frequency (18 x 133MHz CPU clock);

   2A GHz depicts that this CPU is an A version, locked to 2.0 GHz working frequency (20 x 100MHz CPU clock)

   3.06GHz depicts that this is a 3.06GHz hyper-threading CPU

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 Clock: this part depicts the System Clock (Front Side Bus) provided by the CPU. For example,

   533 stands for a 533MHz system clock provided by a 133MHz CPU times 4;

   400 stands for a 400 system clock provided by a 100 MHz CPU x 4.

4. CPU Voltage Vcore: this part depicts the CPU Voltage. For example,
   1.5V stands for a CPU of 1.5V Vcore.

Note: System Clock vs CPU Clock
P4 CPU is a quadpumped CPU. The system bus is provided by the CPU clock x 4. Therefore, users can figure out the P4 CPU clock by the System Clock divided by 4.

## 2-2 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 Hyperthreading dual-in-one CPU, the function of which can be enabled by Windows XP. (See illustration on the right.)
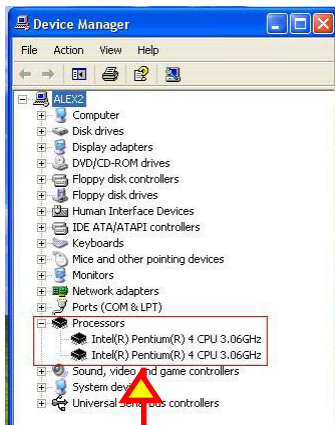

(If Hyper-threading CPU is installed successfully with O/S Win XP, the O/S will enable the dual-in-one CPU function.)

1. First pull sideways the lever of Socket 478, and then turn it up 90^0 so as to raise the upper layer of the socket from the lower platform.
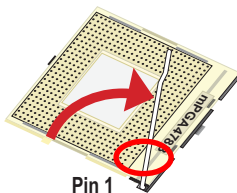
Pin 1

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.
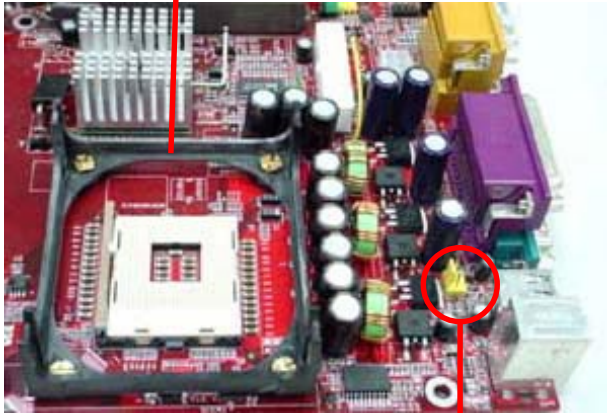

Pin 1
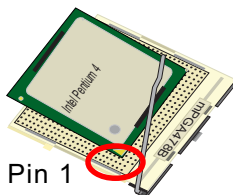
3. Make sure that all CPU pins have completely entered the socket and then lower down the lever to lock up CPU to socket.
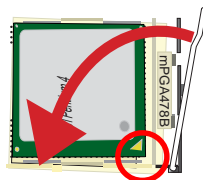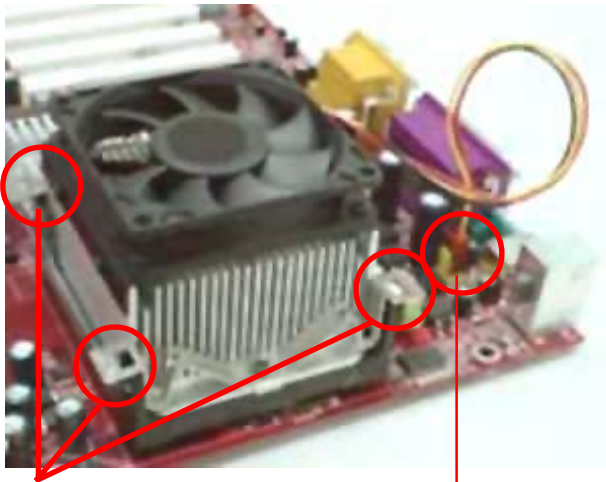
2-3 Pentium 4 CPU Fan Installation

Pentium 4 Fanbase

Pentium 4 Fan Connector

Press down 4 latches to lock fan to Fan Base

**Connect Fan Cable to CPU Fan Connector**

2-4 Memory Installation

How to tackle with the memory Modules:
• Make sure to unplug your power supply before adding or removing memory module. Failure to do so may cause severe damage to both your mainboard and the memory module.
• Pay attention to the orientation of the DIMM slots. Forcing a DIMM into a slot improperly will damage the memory module and slot itself.
• Make sure you have the right type of memory module for your mainboard.

2-4.1 To Install DDR SDRAM Module for this Mainboard

• This Mainboard only supports up to 2GB unbuffered DDR 266/200 SDRAM, with 2 DDR DIMM slots on board. Do not insert other type of modules into these slots.

• 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. Press the Module down in a gradual way until it surely reaches the bottom and clicks straight up the two latches on the left and right of the slot. If any one of the latches has not turned up completely, you should unplug the module and press it down a bit more firmly.

184-Pin DIMM Notch Key Definitions
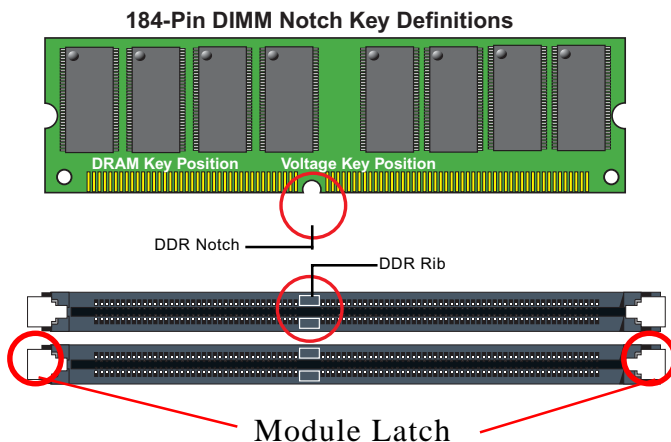
2-4.2 To Remove a DIMM

Press down the holding latches on both sides of slot to release the module from the DIMM slot.
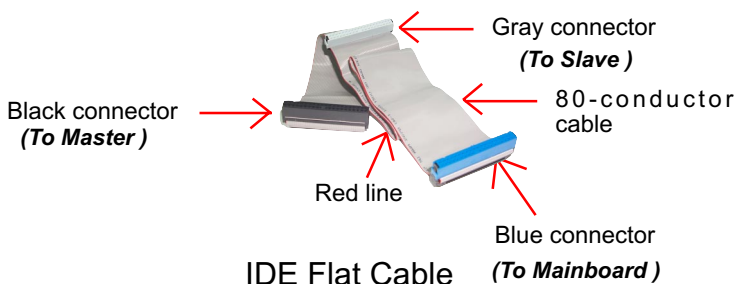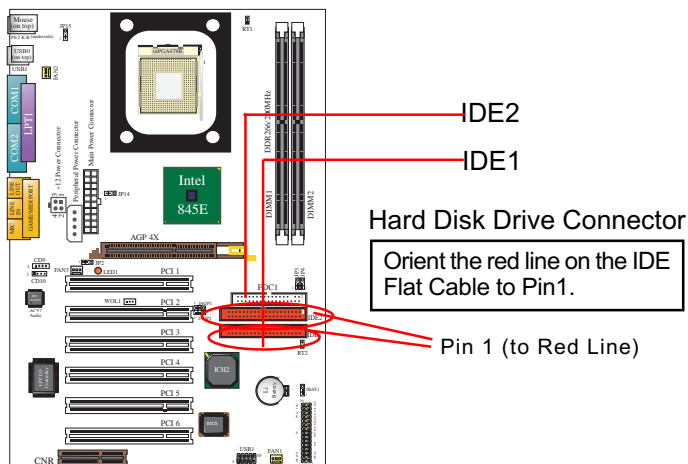
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2-5 AGP 4X Installed with Jumper and LED Safeguard

1. The AGP slot on board supports 1.5V AGP 4X card only. A Rib is specifically added to the 4X AGP slot so as to match the AGP 4X card. To insert a 3.3V AGP 2X card into the AGP 4X slot will damage the system chip as well as burn the 1.5V circuitry.
   Jp2 is designed on board to check the voltage of the AGP card inserted in the AGP slot. <u>When Jp2 is set to 1-2 closed, safeguard is enabled to allow only 1.5V AGP4X card to boot system</u>. If a 3.3V AGP2X card is mistakenly inserted to AGP slot, it will not boot system.

2. <u>In case you have to use a PCI VGA card for the display, you must first set Jp2 to 2-3 closed to disable the safeguard.</u> If a 3.3V AGP2X card is mistakenly inserted to AGP slot under no safeguard, the 3.3V power will burn the 1.5V circuitry. So, take care never to apply 3.3V AGP card to this mainboard.(See Jumper Setting Section for detailed jumper setting description).

3. LED1 is a Warning LED. Whenever an AGP card is not inserted to the AGP slot, or if the card is not a correct one, LED1 will keep lighting up until a proper installation is done.

Jp2
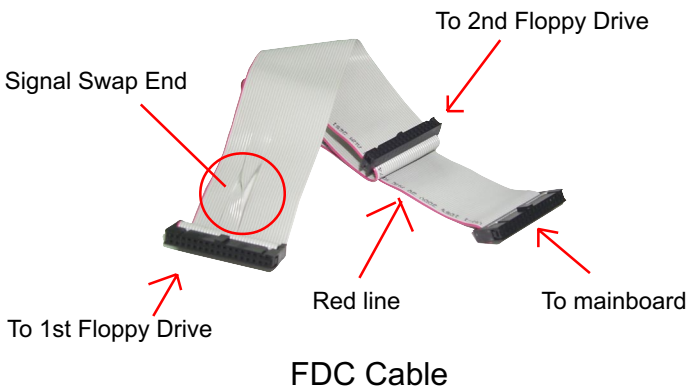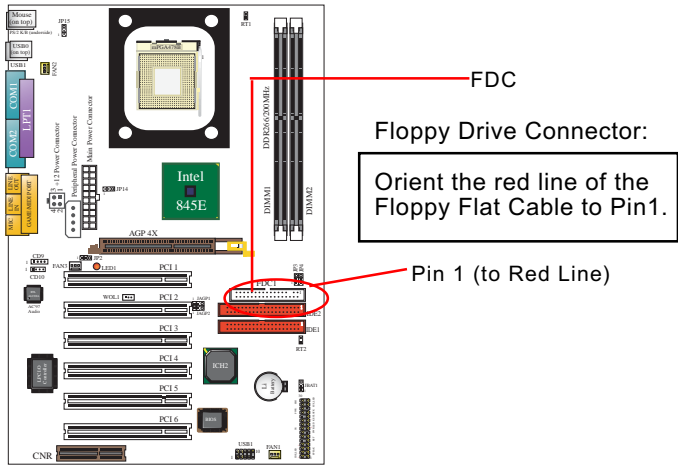1.5V AGP4x Safeguard

LED1: AGP Failure LED
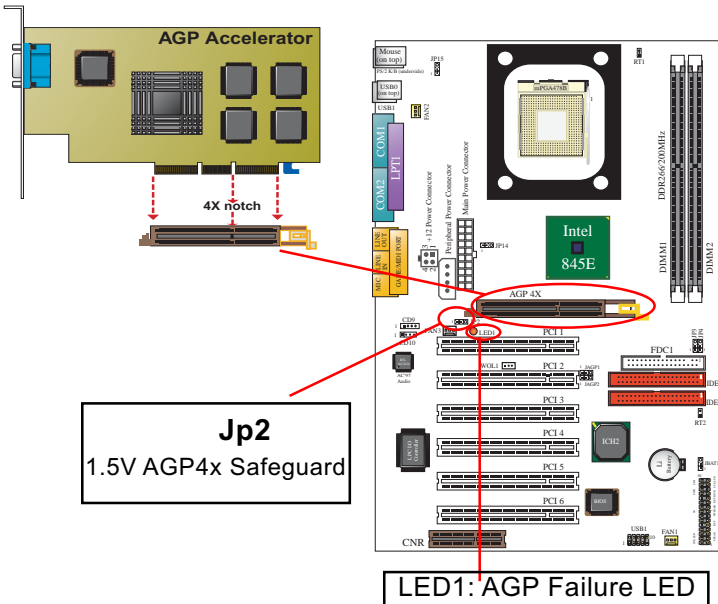
2-6 IDE Connector Installation

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.
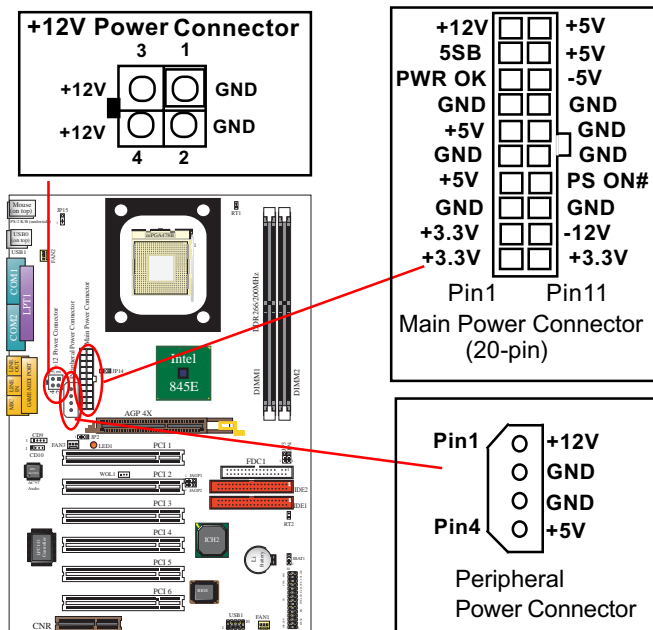
IDE2

IDE1

Hard Disk Drive Connector

Orient the red line on the IDE Flat Cable to Pin1.

Pin 1 (to Red Line)

Gray connector
(To Slave)

80-conductor cable

Black connector
(To Master)

Red line

Blue connector
(To Mainboard)

IDE Flat Cable

2-7 Floppy Drive Connector (FDC) Installation

To install FDC (Floppy Drive Connector), you should connect the end of FDD cable with single connector to the board , and connect the other end with two connectors to the floppy drives.

FDC

Floppy Drive Connector:

Orient the red line of the Floppy Flat Cable to Pin1.

Pin 1 (to Red Line)

To 2nd Floppy Drive

Signal Swap End

Red line

To mainboard

To 1st Floppy Drive

FDC Cable

2-8 ATX V 2.03 Power Supply Installation

+12V Power Connector

```
          3    1
+12V    ( O  O )  GND
+12V    ( O  O )  GND
          4    2
```

```
+12V    [□□]  +5V
5SB     [□□]  +5V
PWR OK  [□□]  -5V
GND     [□□]  GND
+5V     [□□]  GND
GND     [□□]  GND
+5V     [□□]  PS ON#
GND     [□□]  GND
+3.3V   [□□]  -12V
+3.3V   [□□]  +3.3V
```
Pin1   Pin11
Main Power Connector
(20-pin)

```
Pin1  ⟋ O  +12V
      |  O  GND
      |  O  GND
Pin4  ⟍ O  +5V
```
Peripheral
Power Connector

ATX V2.03 power supply is strongly recommended for mainboard running with 2GHz or higher CPU.
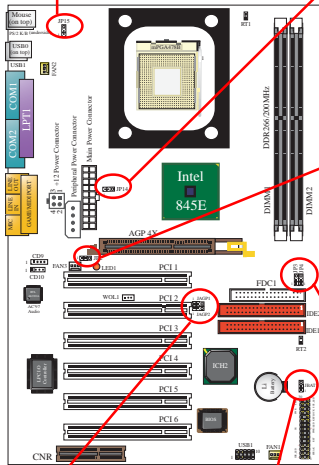
To set up Power Supply on this mainboard:
1. Connect the on-board Main Power Connector (20-pin) to the Main Power Connector (20-pin) of an ATX Power Supply which can be either of the latest version 2.03 or of earlier ATX format.
2. If you use an ATX Power Supply Version 2.03 or later, you can now connect the on-board square-shaped +12V Connector to the square-shaped +12V Connector of your ATX Power Supply. In this case, it is not necessary for you to connect the on-board 4-pin Peripheral Power Connector to your Power Supply.
3. If you use an ATX power Supply of an older version than V2.03, you cannot find a square-shaped +12V Connector with your Power Supply; you must then connect the on-board 4-pin Peripheral Power Connector to the 4-pin Peripheral Power Connector of your Power Supply.

2-9 Jumper Settings

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

Jp15:
PS/2 KB/Mouse Power On

1	**1-2 closed** (default) PS/2 KB/Mouse Power On Disabled
1	**2-3 closed** PS/2 KB/Mouse Power On Enabled

Jp14:
Front Side Bus Select

1	1-2 closed (default) for CPU Auto-select 533/400MHz
1	2-3 closed 533MHz select

Jp2:
1.5V AGP4X Safeguard

1	1-2 closed (default) allowing only 1.5V AGP 4X to boot system ;
1	2-3 closed Safeguard disabled, allowing PCI VGA to boot system; (Warning: 3.3V AGP card will damage the 1.5V AGP circuitry.)

JAGP1&JAGP2:
AGP Voltage Select

1.5V (Default)	JAGP1 JAGP2	
1.6V	JAGP1 JAGP2	
1.7V	JAGP1 JAGP2	

JBAT1:
Clear CMOS

1	1-2 closed (default) To hold data
1	2-3 closed To clear CMOS

Jp3&Jp4
DIMM Voltage Select

DIMM Voltage	Jp3	Jp4
2.5V (Default)		
2.6V		
2.7V		

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2-9.1 How to tackle the Jumpers:

1 | 2 | 3 — A 3-pin Jumper

If a pin-header (of 2 or more pins) is designed in such a way that its pins can be closed or linked together to set up a specific function, <u>this header is called a jumper in this manual.</u>

A 2-pin Jumper Cap

The conductor inside the cap links two header-pins together.
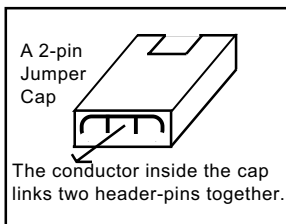
• A Jumper is usually but not necessarily given a "JpX" legend.
• In the Jumper setting diagram, all jumper pins covered with black marks stand for closed pins with jumper cap.

Jp X   1 **[OC-O]** 3   1 **[OOO]** 3   1 **[C-OO]** 3

Jumper with   **Jumper with**   **Jumper with**
Pin 2-3 closed   **all pins open**   **Pin 1-2 closed**

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

2-9.2 Jp14: CPU Front Side Bus Select

This Mainboards is shipped to users with a Jp14 FSB (Front Side Bus) Frequency Select design, with which user can select the FSB Frequency to match with the Pentium 4 processor selected on board. Yet users are not recommended to take Jp14 as a tool for overclocking. It is saver and more advisible for users to select the default (CPU auto-select) clock on board.

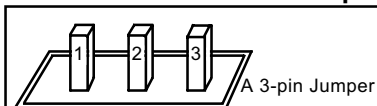| Jp14: Front Side Bus Select |
|---|
| 1-2 closed (default) for CPU Auto-select 533/400MHz |
| 2-3 closed 533MHz select |

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" menu, then 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 .

2-9.3 Jp1: PS/2 KB/Mouse Power On

Jp1 is designed to enable / disable PS/2 Keyboard/Mouse Power on function. Setting Jp1 to 1-2 closed will disable this function. Setting Jp1 to 2-3 closed will enable this function. Yet user still has to enter BIOS Setup for choosing the KB/ Mouse Power-on mode. (See Integrated Peripherals" in BIOS Setup.)

Jp15: PS/2 KB/Mouse Power On
1-2 closed (default) PS/2 KB/Mouse Power On Disabled
2-3 closed PS/2 KB/Mouse Power On Enabled

2-9.4 Jp2: 1.5V AGP4X Safeguard

1. Jp2 is designed on board to check the voltage of the AGP card inserted in the AGP slot. <u>When Jp2 is set to 1-2 closed, safeguard is enabled to allow only 1.5V AGP4X card to boot system</u>. If a 3.3V AGP2X card is mistakenly inserted to AGP slot, it will not boot system.

Jp2: 1.5V AGP4X Safeguard
1 [◖◗◗]   1-2 closed (default) allowing only 1.5V AGP 4X to boot system ;
1 [◗◖◗]   2-3 closed Safeguard disabled, allowing PCI VGA to boot system; (Warning: 3.3V AGP card will damage the 1.5V AGP circuitry.)

2. <u>In case you have to use a PCI VGA card for the display, you must first set Jp2 to 2-3 closed to disable the safeguard.</u> If a 3.3V AGP2X card is mistakenly inserted to AGP slot under no safeguard, the 3. 3V power will burn the 1.5V circuitry. So, take care never to apply 3.3V AGP card to this mainboard.

2-9.5 Jp3 & Jp4: DIMM Voltage Select:

The default voltage 2.5V at DIMM sockets is for normal operation of the supported DDR SDRAM. In some case, when you try to do CPU overclocking, you then may also need to raise the transfer rate of the memory interface. Jp3 & Jp4 are designed on board to provide settings for selecting a higher DIMM voltage so as to raise the speed of the memory interface.

Warning: In selecting a higher voltage than the default , you are risking the stability of your system.

Jp3&Jp4 DIMM Voltage Select		
DIMM Voltage	Jp3	Jp4
2.5V (Default)	1 [⊟]	1 [⊟]
2.6V	1 [⊟]	1 [⊟]
2.7V	1 [⊟]	1 [⊟]

2-9.6 JBAT1: Clear CMOS

When you have problem with rebooting you system, you can clear CMOS data and restore it to default value. To clear CMOS with Jumper Jp10, please follow the steps below:
1. Power off system;
2. Set JBAT1 to Pin 2-3 closed.
3. After 2 or 3 seconds, return the JBAT1 setting to Pin1-2 closed.
4. CMOS data are restored to default. Remember never clear CMOS when system power is on.

JBAT1: Clear CMOS
1-2 closed (default) To hold data
2-3 closed To clear CMOS

2-9.7 JAGP1 & JAGP2: AGP Voltage Select

JAGP1 & JAGP2 is a design for selecting a higher AGP voltage than the default 1.5V . Just as adjusting the DIMM voltage to cope with CPU overclocking, a higher AGP voltage will also raise the chance of CPU overclocking. However, it is important to bear in mind that CPU over-clocking will risk the stability of your PC system.

JAGP1&JAGP2: AGP Voltage Select		
1.5V (Default)	JAGP1 JAGP2	
1.6V	JAGP1 JAGP2	
1.7V	JAGP1 JAGP2	

2-10 Other Connectors Configuration

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

2-10.1 On Board FAN Connectors
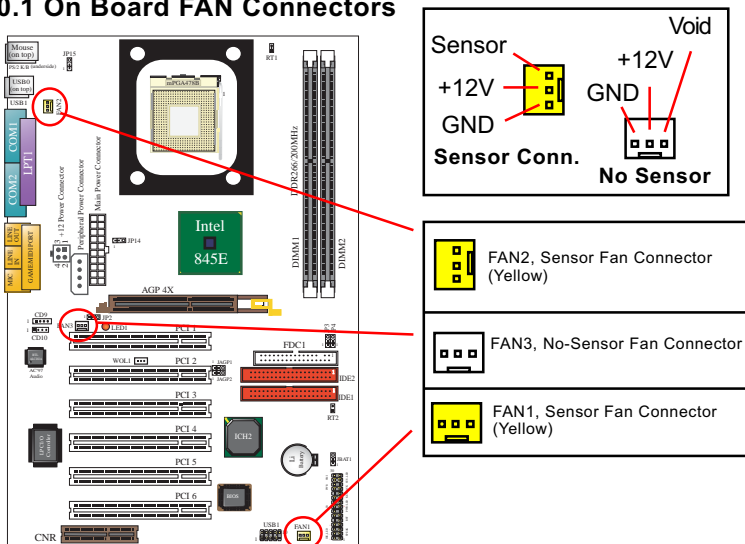
Both Sensor and No-sensor Fan Connectors support CPU/AGP/System/Case cooling fan with +12V mode. When connecting the wire to any Fan Connector, user should make sure that the red wire is for the positive current and should be connected to pin +12V, and the black wire is Ground and should be connected to pin GND. A Hardware Monitor chipset is on board, with which user can install a Hardware Monitor Utility and read the fan speed transmitted from the sensor fan connector. Otherwise, user can read the fan speed from the "Hardware Monitor Status" in CMOS BIOS.

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

2-10.2 Connector WOL1: Wake On LAN

1. This connector connects to a LAN card with a Ring signal output. The connector powers up the system when it receives a wake-up packet or signal through the LAN card.
2. This feature requires that Resume On Ring feature is enabled in the BIOS setting "Power Management Setup" and that your system must be on ATX power supply with at least 720mA / +5V standby power.

WOL1

+5V
Standby
GND
Ring

Connect the Wake On LAN signal from LAN card to WOL1
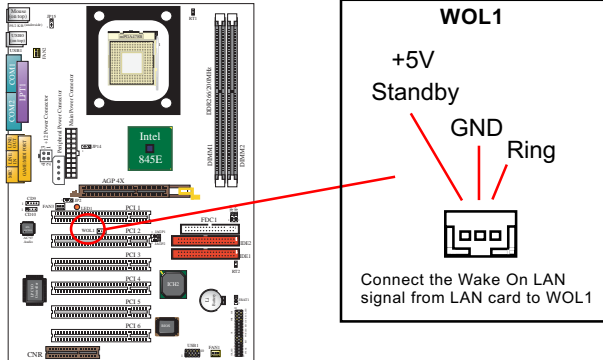
2-10.3 CD-ROM Audio Connectors (CD-In1/CD-In2)

Both CD-In1 and CD-In2 are audio connectors connecting CD-ROM audio to mainboard. Take notice that Connector CD-In2 is of narrower pin pitch.
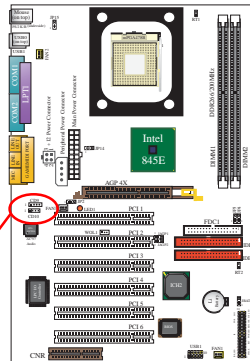
CD-ROM Audio Pin Assignment

	Pin 1	Pin 2	Pin 3	Pin 4
1 ●●●● CD 9	Left Channel	GND	GND	Right Channel
1 ●●●● CD 10	GND	Left Channel	GND	Right Channel

2-10.4 Slot CNR: Communication And Networking Riser Slot

This slot allows you to use network, modem or audio riser cards.

1. If modem CNR is installed, the modem CNR must be set as primary.
2. The audio CNR must be set as secondary if on-chip AC '97 is enabled at the same time.
3. CNR devices are not provided with this mainboard.
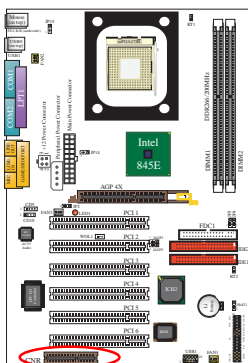
Slot CNR

2-10.5 Chassis Panel Connectors
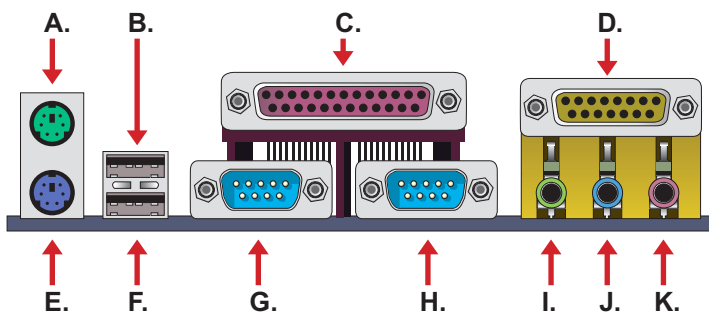
A : PS/2 MOUSE PORT
B : USB 0 PORT
C : LPT1 PORT
D : GAME/MIDI PORT
E : PS/2 KEYBOARD PORT
F : USB 1 PORT

G : COM1 PORT
H : COM2 PORT
I : LINE/SPEAKER OUT
J : LINE IN
K : MICROPHONE INPUT

2-10.6 Thermal Resistor and Connector RT1 and RT2

RT1

RT1 is mounted
with Thermal Resistor
by default.

RT2

To RT2   To Devices

Thermal Cable
(Optional)
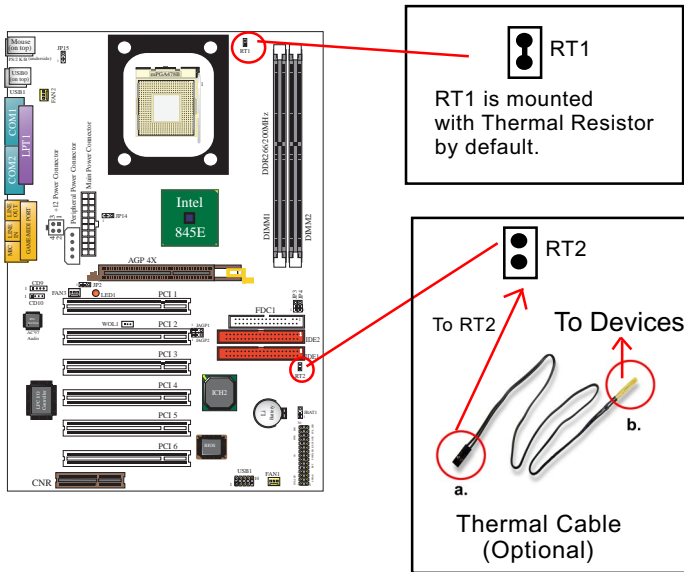
1. Resistor RT1: A thermal resistor is mounted by default to connector RT1 so as to detect the temperature of the CPU. What RT1 does is to transmit the thermal signal to BIOS or Hardware Monitor.

2. Connector RT2: A thermal cable is needed to connect RT2 to on-board devices such as HDD, Graphics card etc., so as to detect the temperature generated therein. Please connect the end (a) of the thermal cable to RT2, and tape another end (b) of thermal cable on to the device which you want to monitor. After you have finished the thermal cable installation, you will **see the detected temperature in BIOS setup or Hardware Monitor utility.**

2-10.7 Complex Header

This complex Header consists of the following connectors for various supports:

(optional) ① SMI
- GND — GND
- SMI SIGNAL — SUSPEND LED SIGNAL
⑤ **Suspend LED**

② **Power Switch**
- Vcc
- ATX POWER SWITCH — GND
— KLOCK
Keylock ⑥ **(optional)**

③ **Infrared(IR)**
- Vcc — GND (-)
- NO CONNECTION — NO CONNECTION
- INFRARED TRANSMIT SIGNAL — Vcc (+)
- GND
- INFRARED TRANSMIT SIGNAL — GND
Power LED ⑦

— RESET SIGNAL
Reset Switch ⑧

④
- **2nd HDD LED**
  - Logic High (+) — SPEAKER SIGNAL
  - HDD LED SIGNAL (-) — GND
- **1st HDD LED**
  - HDD LED SIGNAL (-) — NO CONNECTION
  - Logic High (+) — Vcc
Speaker ⑨

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(1) SMI Connector (Optional):
Connection: Connected to the case-mounted Suspend Switch.
Function: Manually selecting the Suspend Mode or "Green Mode" by System mangement Interupt for DOS system.

(2) Power Switch Connector:
Connection**:** Connected to a momentary button or switch.
Function: Manually switching the system between "On" and "Soft Off". Pressing the momentary button for more than 4 seconds will also turn the system off.

(3) IR Connector (Infrared Connector):
Connection: Connected to Connector IR on board.
Function: Supporting wireless transmitting and receiving module on board.

(4) 1st HDD LED Connector/2nd HDD LED Connector:
Connection: Connected to HDD LED.
Function: To supply power to HDD LED.

(5) Suspend LED Connector:
Connection: Connected to Suspend Indicator.
Function: To supply power to "Suspend Indicator".

(6) Keylock Connector (Optional):
Connection: Connected to keyboard.
Function: To lock keyboard and disable keyboard function.

(7) Power LED Connector:
Connection: Connected to System Power LED.
Function: To supply power to "System Power LED".

(8) Reset Switch Connector:
Connection: Connected to case-mounted "Reset Switch".
Function: To supply power to "Reset Switch" and support system reboot function.

(9) Speaker Connector:
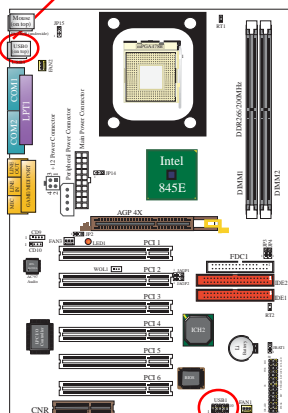Connection: Connected to the case-mounted Speaker.
Function: To supply power to the case-mounted Speaker.

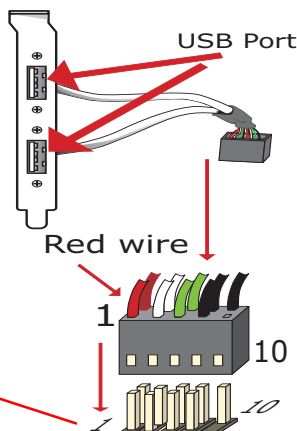## 2-10.8 USB Ports and USB Header (Header USB 1)

This mainboard provides two USB ports USB0 and USB1 on board supporting various USB devices. In addition, Header USB1 is added on board to provide expansion of 2 more optional USB ports by using one additional USB Cable. User can order the optional USB cable from your mainboard dealer or vender.

When plugging the USB cable to USB Header USB1, user must make sure the red wire is connected to Pin 1.

USB Ports USB 0 & 1

USB Cable (Optional)
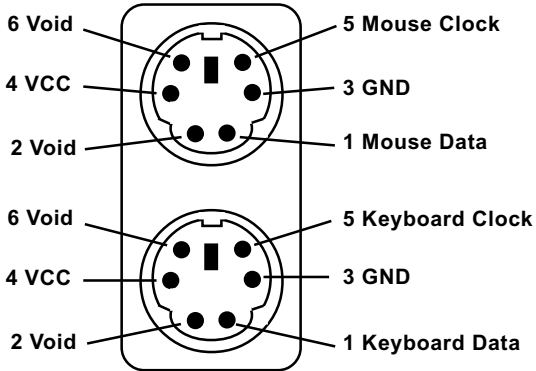
USB Port

Red wire

1

10

Header USB 1

First USB Port Wiring for Front USB

Red White Green black
+5V D1- D1+ GND

USB Header Pin Assignment

10

1

+5V D2- D2+ GND
Red White Green black

Second USB Port Wiring for Front USB
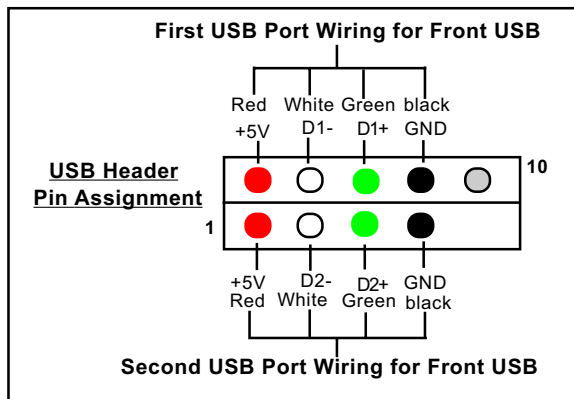
2-10.9 PS/2 Mouse And PS/2 Keyboard

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

```
6 Void ─────────        ───────── 5 Mouse Clock

4 VCC  ─────────        ───────── 3 GND

2 Void ─────────        ───────── 1 Mouse Data


6 Void ─────────        ───────── 5 Keyboard Clock

4 VCC  ─────────        ───────── 3 GND

2 Void ─────────        ───────── 1 Keyboard Data
```

(PS/2 Keyboard Connector: Underside, purple)