# Contents

## ITEM CHECKUP

- ☑ Mainboard
- ☑ Support CD
- ☑ Bundled Bonus Pack CD
- ☑ Bundled Bonus Pack Manual
- ☐ Temperature Sensor Cable (Optional)
- ☑ ATA66/100 IDE Cable
- ☑ FDD Cable
- ☑ User Manual
- ☐ RS232 Cable (optional)

# 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 845GE. The Intel P4 processor is a rapid execution engine providing 533/400MHz system bus, while North Bridge Intel 845GE  is a high performance integrated chipset providing DDR333/266 DRAM memory interface, Hub interface, AGP interface as well as another integrated VGA interface with one on-board display port.

Integrated with i845GE, South Bridge Intel ICH4 supports the LPC Super I/O, Upstream Hub interface, PCI interface, IDE 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 Mainboard Specifications**
**1-3 Mainboard Specification Table**
**1-4 Chipset Diagram**

# 1-1 Mainboard Layout



LAN Controller
Jp10 } **for 85MR3-L only**
RJ45
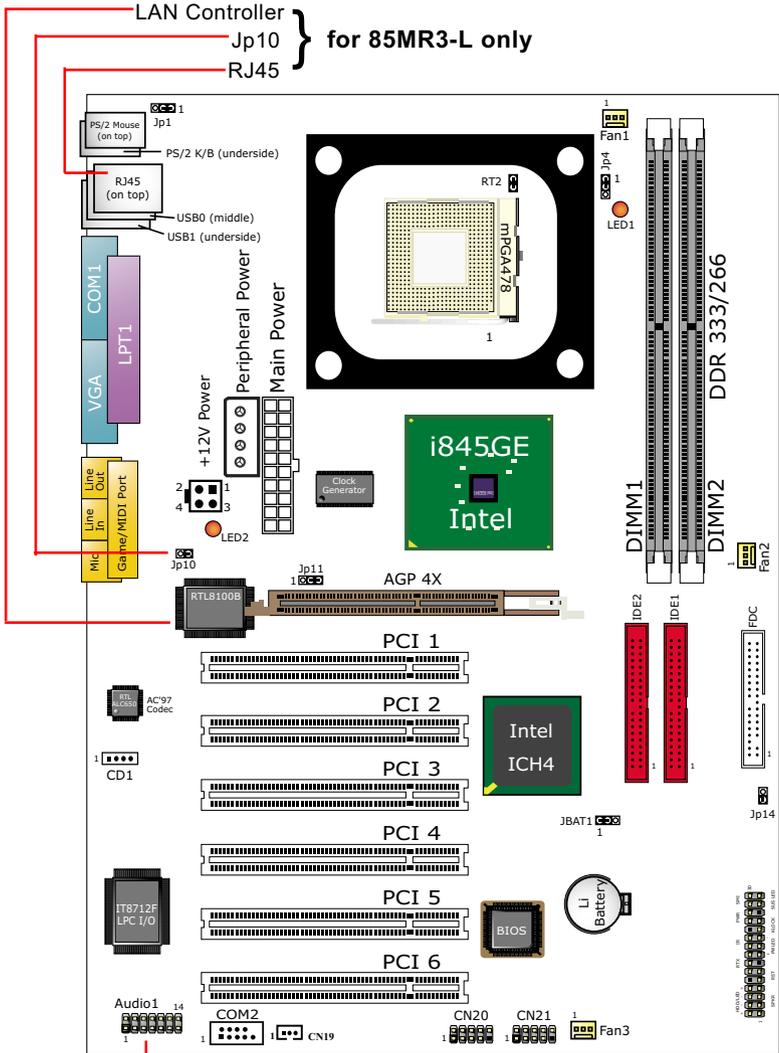
## 1-2 Mainboard Specifications

### 1-2.1 CPU Socket
CPU Socket 478B on board, supporting Intel® Pentium 4  processor (including hyper-threading CPUs) in  478-pin package for :

-- 533/400MHz System Bus
-- Hyper-pipelined technology
-- Advanced dynamic execution
-- Advanced transfer cache

### 1-2.2 System Chipsets
• North Bridge Intel 845GE:  a high performance integrated chipset providing processor interface, DDR 333/266 DRAM memory interface, Hub interface, AGP interface as well as an integrated VGA interface with one VGA display port.
• South Bridge Intel ICH4: supporting  the LPC Super I/O, Upstream Hub interface, PCI interface, IDE interface, USB 2.0 interface, AC'97 2.2 (2/6-channel) Audio interface and the interrupt control.

### 1-2.3 Memory
2 DDR DIMM 184-pin slots on board for DDR 333/266 DRAMs :
• Supporting unregistered, non-ECC DDR 333/266 DRAM up to 2GBs
• Supporting installation of mixed volumes yet same type of DDR DRAM modules

### 1-2.4 AMI BIOS
• Supporting Plug & Play V1.0
• Flash Memory for easy upgrade
• Supporting BIOS Writing Protection and Year 2000 compliant
• Supporting BIOS Setup (See Chapter 4 BIOS Setup)

### 1-2.5 Accelerated Graphics Port (AGP) Interface
AGP Controller embedded on board, supporting:
• 1.5V(4X) power mode only
• 4X AD and SBA signaling, AGP pipelined split-transaction longburst transfers up to 1GB/sec.
• AGP 4X only, AGP V2.0 compliant

### 1-2.6 2D/3D VGA on board
• Built-in VGA Graphics Controller in i845GE, supporting one 15-pin connector on board for CRT 2D, 3D VGA display
• VGA/AGP display safeguarded by jumper setting (see Jumper Setting section for VGA/AGP select
• VGA Driver enclosed in Support CD for user's installation

### 1-2.7 Advanced System Power Management
• ACPI 1.0B compliant (Advanced Configuration and Power Interface)
• APM V1.2 compliant (Legacy Power Management)
• ACPI STR (Suspend To RAM) mode and POS (Power On Suspend)
• PS/2 Keyboard / Mouse Power On
• Supporting Wake-on-LAN
• Real Time Clock (RTC) with date alarm, month alarm, and century field

### 1-2.8 Multi-I/O Functions
• PCI EIDE Controller, supporting:
    -- 2 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:
    -- 1 FDD connector supporting 2 floppy drives with drive swap support
• Universal Serial Bus Transfer Mode:
    -- USB V2.0 compliant; 480Mb/s USB Bus, supporting Win 2000 or later operating system
    -- USB drivers provided in Support CD for installation
    -- 2 built-in USB connectors and 2 USB Headers (CN20, CN21) which require 2 additional USB cables to provide 4 more additional USB ports
• PS/2 Keyboard and PS/2 Mouse
• UARTs (Universal Asynchronous Receiver / Transmitter):
    -- 2 complete serial ports (COM1 & COM2) on board

### 1-2.9 Expansion Slots
• 6 PCI Bus Master slots
• 1 AGP 4X slot
• 2 DDR DIMM slots

### 1-2.10 LAN on board (for 85MR3-L only)

PCI local bus single-chip Fast Ethernet Controller RTL8100B on board:
• 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.

### 1-2.11 Hardware Monitor on board

• Hardware Monitor in IT8712F, providing monitoring and alarm for
  flexible desktop management of hardware voltage, temperatures and
  fan speeds.
• Utility Software Smartguardian for displaying system status is en-
  closed in Support CD for user's installation.

### 1-2.12 AC'97 Audio Codec on board

AC'97 Audio Codec 2.2 compliant on board
• Supporting 6 channels 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.

### 1-2.13 6-channel Audio-out Support (optional)

• This series is designed with an optional 6-channel Audio-out connec-
  tor "Audio1". If this option is chosen, it will provide 3 additional audio-
  out ports for the 6-channel sound.

### 1-2.14 Form Factor

• ATX form factor, ATX power supply, version 2.03 compliant, supported
  by one Main Power Connector, one +12V Power Connector and one
  Peripheral Power Connector
• Mainboard size: 305mm x 230mm

## 1-3 Mainboard Specification Table

| 85MR3 / 85MR3-L Specifications and Features | |
|---|---|
| CPU | Socket 478B for Intel Pentium 4 CPU |
| North Bridge | Intel 845GE, supporting 533/400MHz FSB |
| South Bridge | Intel ICH4 |
| BIOS | AMI BIOS |
| Memory | Supporting DDR 333/266 DRAM, up to 2GB in two DDR DIMM slots |
| I/O Chip | IT8712F, with Hardware Monitor |
| AGP interface | AGP 4X mode only |
| Audio | AC'97 Audio 2.2 compliant, 2/6 channel audio |
| IDE Interface | 2 UATA 66/100 IDE ports |
| VGA Display | VGA built in, 1 VGA connector on board |
| PCI Slots | 6 PCI Master slots on board |
| I/O Connectors | 6 USB V2.0, 1 FDD port, 2 COM ports, 1 LPT, 1 IrDA, 1 PS/2 K/B, 1 PS/2 Mouse |
| Other common features | BIOS Writing Protection<br>Keyboard/Mouse Power On<br>ATX 2.03 Power Supply<br>ATX form factor |
| Optional Features ╲ Models | 85MR3 | 85MR3-L |
| LAN Controller on board | No | Yes |

## 1-4 Chipset System Block Diagram

```
                        ┌─────────────────────┐
                        │ Intel Pentium 4 CPU │
                        └─────────────────────┘
                                  ↕
                         System Bus 533/400MHz

┌───────────┐   VGA                                      DDR memory
│   VGA     │  Interface   ┌─────────────────┐           Interface      ┌──────────┐
│ Connector │──────────────│  Intel 845GE    │─────────────────────────│  System  │
└───────────┘              │  North Bridge   │           DDR 333/       │  Memory  │
                           │                 │           266 DRAM       └──────────┘
┌───────────┐   AGP 4X     │                 │
│  AGP Slot │──────────────│                 │
└───────────┘              └─────────────────┘
                                  ↕
                          Bi-directional
                          16-bit Data
                          Bus, 266MHz

                                                                    ┌──────────────┐
                           ┌─────────────────┐       PCI Bus        │  6 PCI Slots │
                           │      ICH4       │──────────────────────└──────────────┘
                           │                 │       AC'97 2.2      ┌──────────────┐
┌───────────┐  ATA 100/66/33│    South       │──────────────────────│ Audio Codec  │
│  4 IDE    │──────────────│    Bridge       │                      │ (6-channel)  │
│  Devices  │              │                 │                      └──────────────┘
└───────────┘              │                 │     ┌──────────┐   ┌───────┐
                           │                 │─────│ RTL8100B │───│ RJ45  │
                           │                 │     └──────────┘   └───────┘
                           │                 │        (Optional)
                           │                 │                      ┌──────────┐
                           └─────────────────┘     USB Bus V2.0     │   USB    │
                                                ────────────────────│  Ports   │
                                                                    └──────────┘

┌──────────────────┐
│ IR               │
│ FDD              │   ┌──────────┐                    ┌──────────┐
│ Mouse/Keyboard   │───│ LPC I/O  │────────────────────│   BIOS   │
│ Serial Ports     │   │ IT8712F  │                    └──────────┘
│ Printer Port     │   └──────────┘
│ Game/MIDI        │
│ H/Monitor        │
└──────────────────┘
```

**Pentium 4 + Intel 845GE + Intel ICH4 Diagram**

# Chapter 2 Hardware Setup
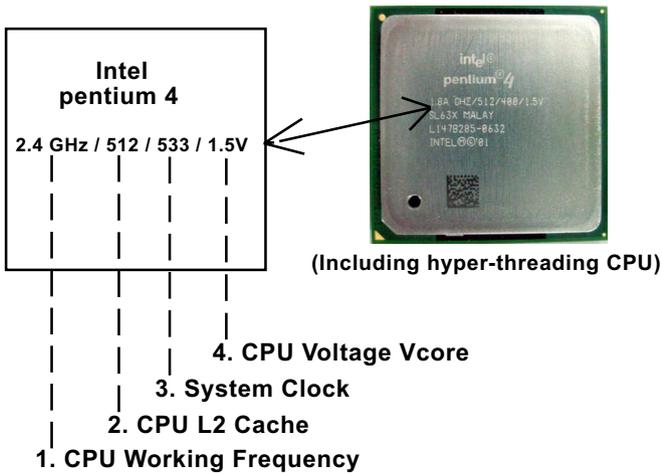
## To Get Things Ready for Hardware Setup !

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 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's 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 Installation**
**2-2 Pentium 4 CPU Fan Installation**
**2-3 Memory Installation**
**2-4 VGA/AGP 4X Installed with Jumper and LED Safeguard**
**2-5 IDE Connector Installation**
**2-6 Floppy Disk Connector (FDC) Installation**
**2-7 ATX 2.03 Power Supply Installation**
**2-8 Jumper Settings**
**2-9 Other Connectors Configuration**
**2-10 IRQ Description**

## 2-1 CPU Identification and Installation

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



**Intel pentium 4**

**2.4 GHz / 512 / 533 / 1.5V**

**(Including hyper-threading CPU)**

**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 hyper-threading 3.06GHz 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.

### 2-1.2 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 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.
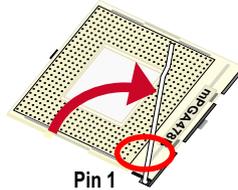


**Pin 1**

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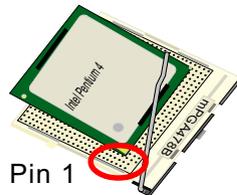
3. Make sure that all CPU pins have completely entered the socket and then lower down the lever to lock up CPU to socket.



Pin 1

**18**
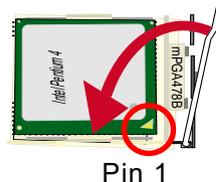
## 2-2 Pentium 4 CPU Fan Installation

CPU Fan Connector          Pentium 4 Fanbase



Press down the spring locks to lock up the fan
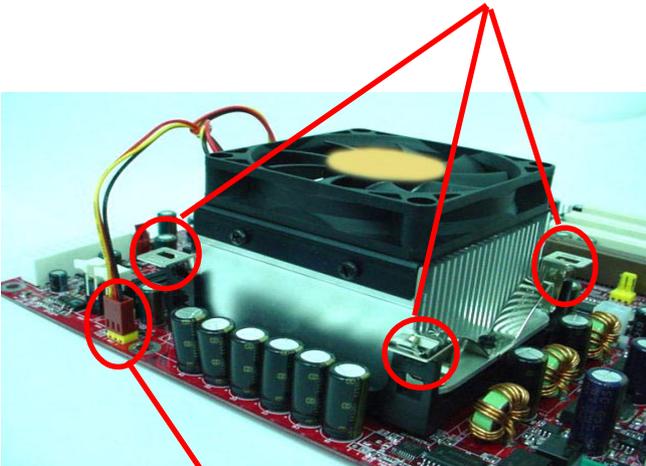


Connect to CPU FAN connector

## 2-3 Memory Installation

How to tackle 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.
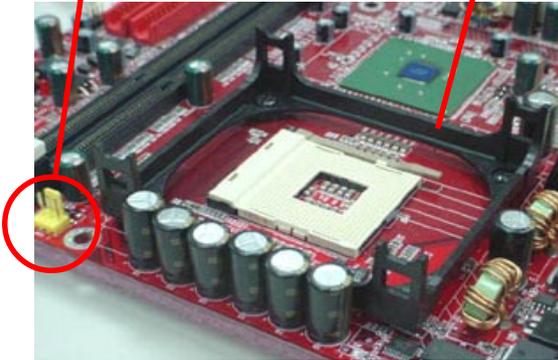
### 2-3.1 To Install/Remove DDR DRAM Module

- This series only supports up to 2GB unbuffered DDR 333/266 DRAM, 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 DRAM 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 (2.5V)**
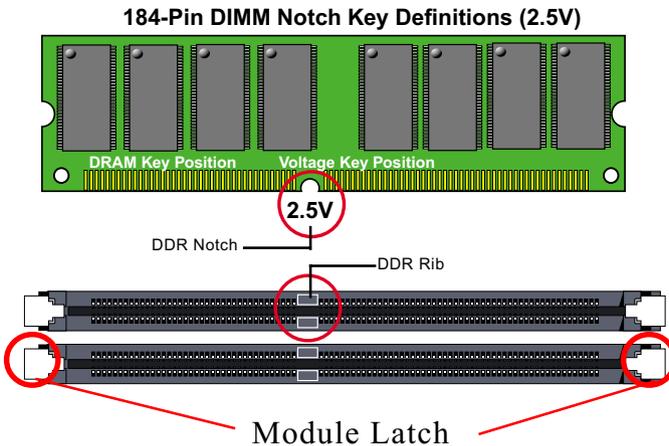


- To remove the DIMM, just press down the latches on both sides of a DIMM slot and the module will be released from it.

## 2-3.2 Indicator LED1: DIMM Powered On

An indicator LED 1 is designed on board.  Whenever system is started, all the DIMM slots on board will also get powered on, resulting in LED 1 lighting up.  This indicator is to warn users that, whenever DIMM slot  is powered, no memory module should be removed from or added onto it.

**Indicator LED1:  DIMM Powered On**
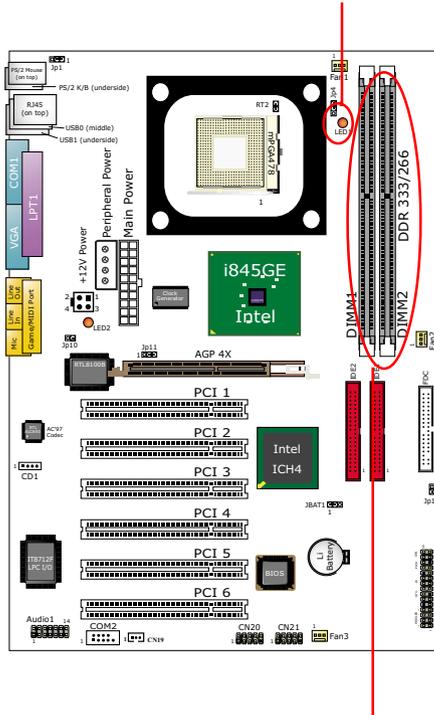


**DDR DIMM Slots(184-pin)**

## 2-3.3 To Remove a DIMM

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

## 2-4 Install VGA / AGP4X with LED2 & Jp11 Safeguard

1. To install on-board VGA, please connect your monitor directly to VGA connector on board. Default Jp11 2-3 closed is to assure booting system with on-board VGA or 1.5V AGP4X add-on card yet without safeguard against 3.3V AGP2X card.

   * <u>That is, if 3.3V AGP 2X card is mistakenly inserted for booting the system, the high voltage will burn the 1.5V circuitry on board. Never use a 3.3V or an unknow AGP card in this setting.</u>

2. To install AGP4X card on this mainboard, please insert AGP4X card into AGP slot and connect your monitor directly to the AGP4X card. To assure the use of a correct AGP4X card of 1.5V, please set Jp11 to 1-2 closed to allow only 1.5V AGP 4X card to boot system. With Jp11 1-2 closed, safeguard is enabled against AGP2X card. That is, system cannot boot with 3.3V AGP2X card or on-board VGA. In this setting, if user cannot boot with an AGP card inserted in AGP slot, it indicates that the AGP card is a wrong one. Find a 1.5V AGP4X card before booting this system.

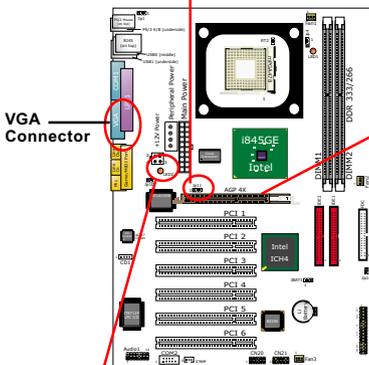3. LED1 is a Warning LED. Whenever an AGP card is not inserted to the AGP slot, or if the card is not a correct one, LED1 will keep lighting up until a proper installation is done.

**Jp11:** VGA/AGP4X Safeguard

1    1-2 closed
Safeguard against AGP2X Enabled;

1.5V AGP 4X Card to boot system only

1    2-3 closed (default)
safeguard Disabled;
VGA or AGP 4X to boot system
(Warning: 3.3V AGP card will burn 1.5V circuitry.)

**AGP Accelerator**

**4X notch**

**AGP4X Slot**

**VGA Connector**

*Warning:*
• *If a 3.3V AGP 2X card is mistakenlyinserted for booting the system, the high voltage will burn the 1.5V circuit on board. Never use a 3.3V or an unknown AGP card on this mainboard*

**LED2: AGP Warning Indicator**

## 2-5 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 device)

Black connector (To Master Device)

Red line

Blue connector (To Mainboard)

**IDE Flat Cable**
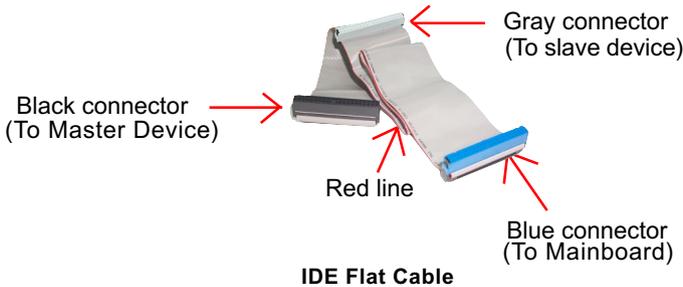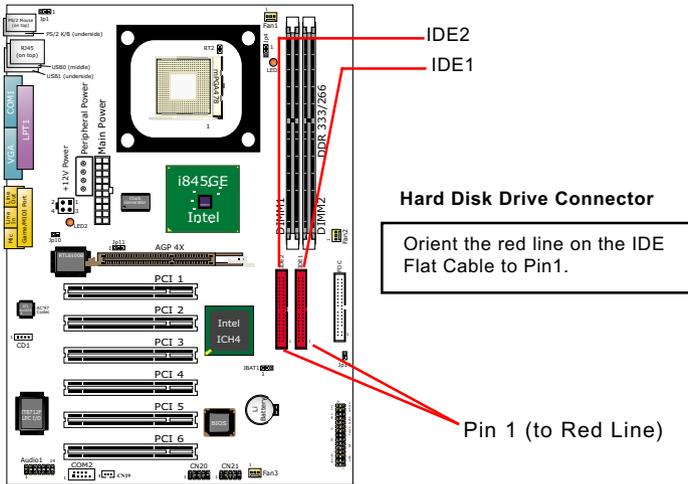
## 2-6 Floppy Drive Connector ( FDC ) Installation

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.
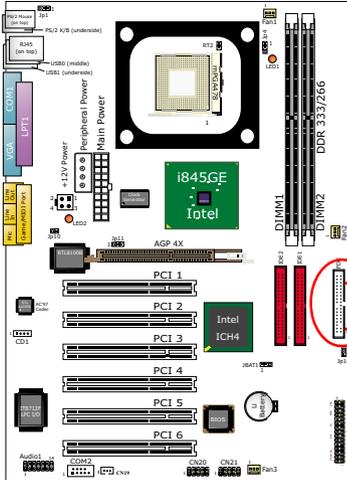


Floppy Drive Connector:

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

Pin 1 (to Red Line)



To 2nd Floppy Drive

Red line

To mainboard

To 1st Floppy Drive

**FDC Cable**

## 2-7 ATX V2.03 Power Supply Installation



**+12V Power Connector**

**Main Power Connector (20-pin)**

| | | |
|---|---|---|
| +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

**Peripheral Power Connector**

4        1

+12V    GND    GND    +5V
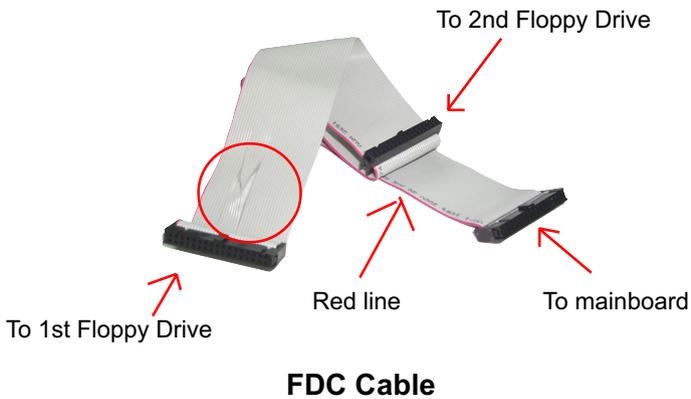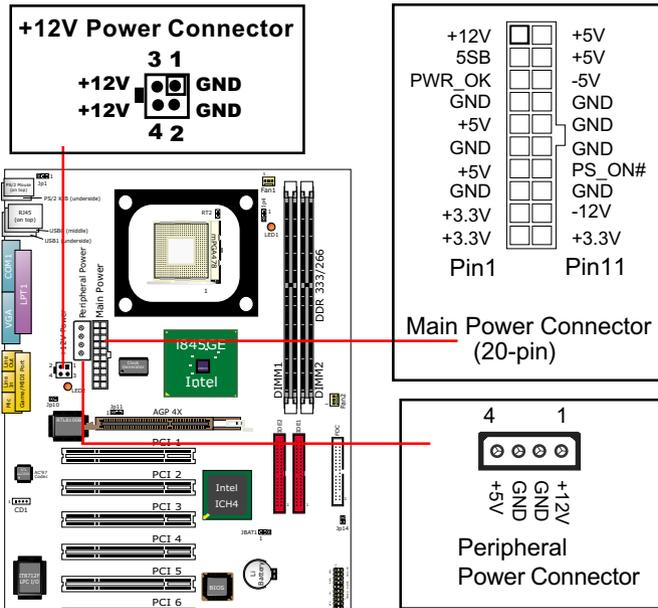
ATX V2.03 power supply is strongly recommended for mainboard running with 2GHz or higher CPU.

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 model.
2. If you use an ATX Power Supply Version 2.03 or the later ones, you can now connect the onboard 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 onboard 4-pin Peripheral Power Connector to your Power Supply.
3. If you use an ATX power Supply of an older version than V2.03, there will be no square-shaped +12V Connector. So please connect the onboard 4-pin Peripheral Power Connector to the 4-pin Peripheral Power Connector of your Power Supply.

## 2-8 Jumper Settings

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

**JP4**
**CPU Clock Select**
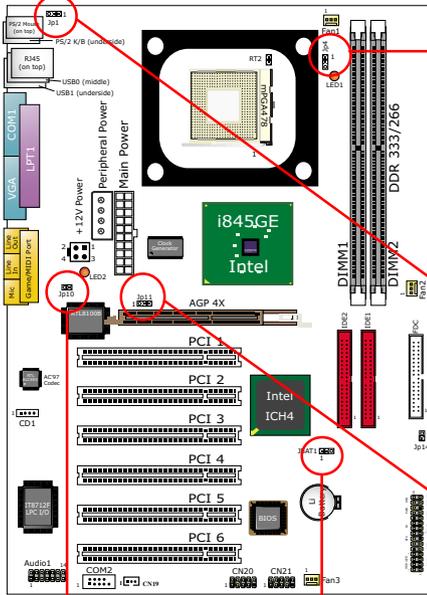
1 (default)
1-2 closed
CPU Autodetect

1 2-3 closed
for 133MHz CPU
Clock

**JP1**
**KB/Mouse/Power Button Select**

1
1-2 closed (default)
To power on by Power Button

1
2-3 closed
To power on by keyboard / Mouse

**Jp11:**
**VGA/AGP4X Safeguard**

1
1-2 closed
Safeguard against AGP2X Enabled;
1.5V AGP 4X Card to boot system only

1
2-3 closed (default)
safeguard Disabled;
VGA or AGP 4X to boot system
(Warning: 3.3V AGP card will burn
1.5V circuit burn.)

**Jp10**
**LAN Controller Select**
**(85MR3-L only)**

1
1-2 open (default)
LAN controller enabled

1
1-2 closed
LAN controller disabled

**JBAT1**
**Clear CMOS**

1
1-2 closed (default)
To hold data

1
2-3 closed
To clear CMOS

**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, this header is called a jumper in this manual.

A 2-pin Jumper Cap

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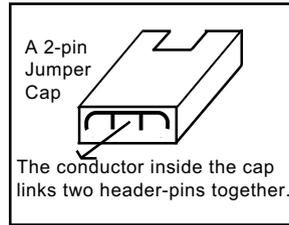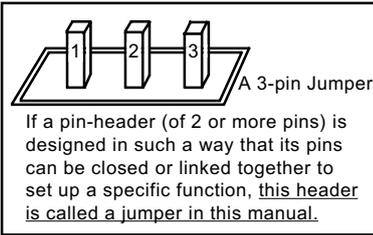
• A Jumper is usually but not necessarily given a "JpX" legend.
• In the Jumper setting diagram, the jumper pins covered with black marks stand for closed pins with jumper cap.

Jp X      1 **OCD** 3          1 **OOO** 3          1 **CDO** 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, the mainboard will be damaged.

## 2-8.1 Jp4: CPU Clock Select

Jp4 is designed to select 100/133MHz CPU clock for the system. Setting Jp4 to 1-2 closed will allow CPU on board to autodetect its own frequency and apply it to the System Bus.

Setting JP4 to 2-3 closed will manually configure a 100MHz CPU to 133MHz.

However, overclocking should always take the whole mainboard into account. There is no 100% guaranty of success. In case overclocking fails, system boot will fail. You should then take the autodetect setting to boot system. Even more, you should clear CMOS before rebooting system. ( See JBAT 1 Clear CMOS ).

| JP4 |
| --- |
| **CPU Clock Select** |
| 1 (default) 1-2 closed CPU Autodetect |
| 1 2-3 closed for 133MHz CPU Clock |
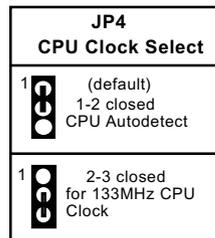
Further Notes on CPU Overclocking:
1. If you have successfully booted system with or without CPU overclock, you still can do another CPU overclock in BIOS Setup. Please enter BIOS Setup, choose "Frequency/Voltage Control" menu, and take the "Use Linear" option of the "Use CPU Linear Frequency". Then 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 as stated below 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 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 and choose "Load Optimized Defaults" to restore default BIOS .

## 2-8.2 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.

| JBAT1<br>Clear CMOS |
| --- |
| 1 <br>1-2 closed (default)<br>To hold data |
| 1 <br>2-3 closed<br>To clear CMOS |
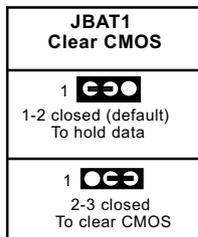
### 2-8.3 JP1: KB /Mouse / Power Button  Select

JP1 is designed to select keyboard/Mouse/Power button as the power-on controller. Setting JP1 to 1-2 closed will allow users to power on system by power button while setting JP1 to 2-3 closed will allow users to power up system by keyboard/Mouse. Yet users still have to choose the K/B Power-on mode on BIOS. (See Integrated Peripherals" in BIOS Setup.)

| JP1 KB/Mouse/Power Button Select |
|:---:|
| ▧ 1 |
| 1-2 closed (default) To power on by Power Button |
| ▧ 1 |
| 2-3 closed To power on by keyboard / Mouse |

### 2-8.4 Jp10: LAN Controller Select (85MR3-L only)

JP10 is a 2-pin jumper for enabling or disabling the on-board LAN Controller. Users can set JP10 OPEN to enable the on-board LAN Controller so as to set up the LAN driver, or to set it CLOSED to disable the on-board LAN Controller.  In such case, users are free to use an add-on PCI LAN card for networking.

| Jp10 LAN Controller Select (85MR3-L only) |
|:---:|
| 1 ▧ |
| 1-2 open (default) LAN controller enabled |
| 1 ▧ |
| 1-2 closed LAN controller disabled |

## 2-8.5 Jp11: VGA/AGP 4X Safeguard

1. Default Jp11(2-3 closed) is to disable safeguard against 3.3V AGP2X card and allow booting system with either 1.5V on-board VGA or 1.5V AGP4X add-on card. User can choose either VGA or AGP 4X as the initial display by changing BIOS Setup(see"PNP/PCI Configurations " in BIOS Setup).

2. Jp11 at 1-2 closed is to enable safeguard against AGP2X card and allow only 1.5V AGP 4X card to boot system. With JP11 1-2 closed, system cannot boot with onboard VGA or AGP 2X card. In this case, if user cannot boot with an AGP card inserted in AGP slot, it indicates that the AGP card is a wrong one. The AGP card should be changed to a 1.5V AGP 4X card for booting system.

> *Warning:*
> *• If a 3.3V AGP 2X card is mistakenly inserted for booting the system, the high voltage will burn the 1.5V circuitry on board. Never use a 3.3V or an unknow AGP card on this mainboard.*

| **Jp11:**<br>VGA/AGP4X Safeguard |
| :---: |
| 1 <br>1-2 closed<br>Safeguard against AGP2X Enabled;<br>1.5V AGP 4X Card to boot system<br>only |
| 1 <br>2-3 closed (default)<br>safeguard Disabled;<br>VGA or AGP 4X to boot system<br>(Warning: 3.3V AGP card will burn<br>1.5V circuit burn.) |

## 2-9 Other Connectors Configuration

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

### 2-9.1 On Board FAN Connectors
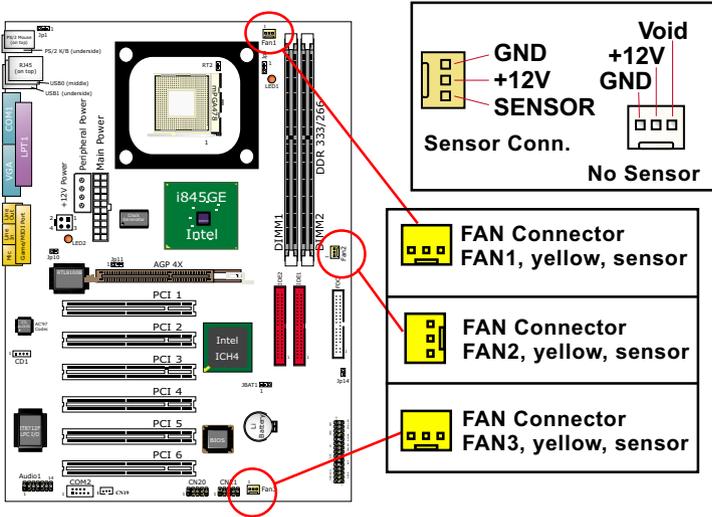


Both Sensor and No-sensor Fan Connectors support CPU/AGP/System/Case cooling fan with +12V mode. When connecting the wire to any Fan Connector, users should make sure that the red wire is for the positive current and should be connected to pin +12V, and the black wire is Ground and should be connected to pin GND.

A Hardware Monitor chipset is on board, with which 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" in CMOS 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 with the monitoring program.

### 2-9.2 USB Ports and USB Pin-headers

This series provides two USB ports USB0 and USB1 on board supporting various USB devices. In addition, two USB pin-headers are added on board to provide expansion of four more optional USB ports by using two additional USB cables.  Users can order the optional USB cables from your mainboard dealer or vendor.

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

All 6 USB ports are compliant with 1.0 / 2.0 USB Bus. USB 2.0 supports Win 2000 and up (not Win9X / Me). USB 1.0 / 2.0 drivers are provided in Support CD for user's installation.

USB Cable (Optional)

**USB connectors USB0 and USB1 (underside)**

USB Port

Red wire

1

10
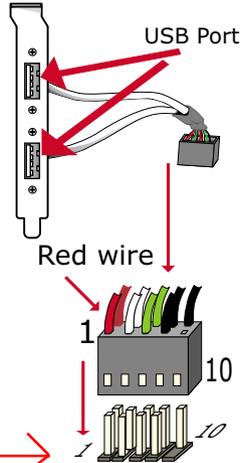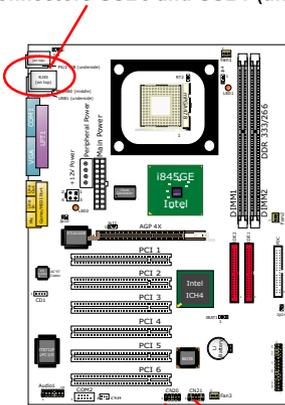
**USB Pin-headers CN20 and CN21**



**First USB Port  Wiring**

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**
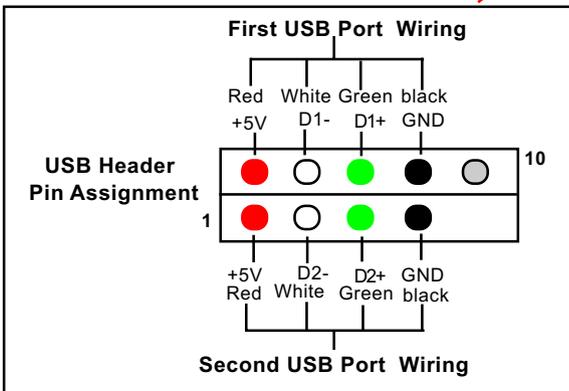
## 2-9.3 Chassis Panel Connectors

A.  B.  C.  D.

E.  F.  G.  H.  I.  J.  K.

A  : PS/2 Mouse
B  : RJ45 (top) (85MR3-L)
C  : LPT1 Port
D  : GAME/MIDI
E  : PS/2 Keyboard
F  : USB 1 (underside)
      USB 0 (middle)
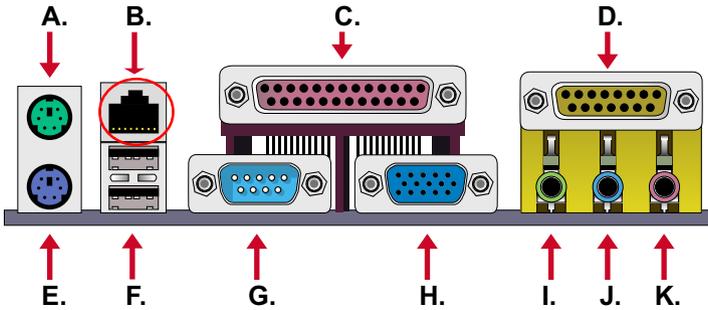
G  : COM1 Connector
H  : VGA Connector
I   : Line Out /
      Front Speaker Out
J   : Line in/
      Rear Speaker Out
K   : Microphone Input /
      Center Subwoofer Out

## 2-9.4 PS/2 Keyboard and PS/2 Mouse

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

Void  6        5   Mouse Clock
Vcc   4        3 GND
Void 2         1   Mouse Data

Void  6        5 Keyboard Clock
Vcc   4        3 GND
Void  2        1 Keyboard Data
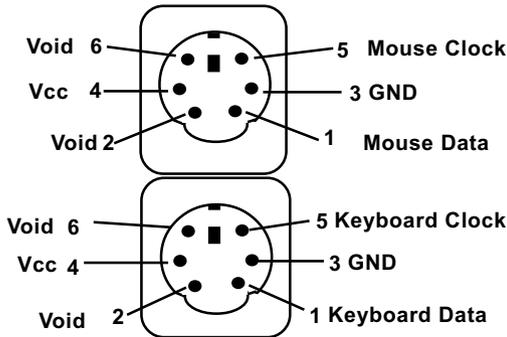
**(PS/2 Keyboard Connector:  Purple, Underside)**

## 2-9.5 CD-ROM Audio Connectors (CD 1)

CD 1 is an audio connector connecting CD-ROM audio to mainboard.
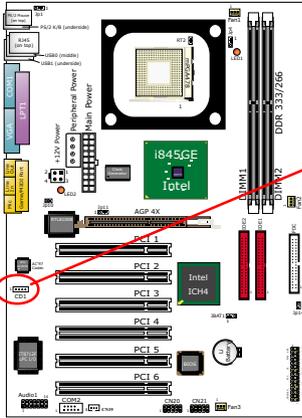


**CD-ROM Audio Connector**

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

## 2-9.6 Audio 1: 6-channel Sound Output Connector (optional)

This series is designed with an optional 6-channel Audio-out connector "Audio1". If this option is chosen, it will provide 3 additional audio-out ports for the 6-channel sound.
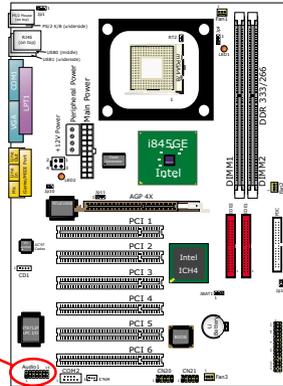


### 6-channel Audio-out Pin Assignment

2 ●●●●●●● 14
1 ●●●●●●● 13
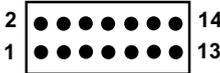
| | |
|---|---|
| Pin 1  LFE-out | Pin 2  Gnd |
| Pin 3  Center-out | Pin 4  Gnd |
| Pin 5  Surround-out-R | Pin 6  Gnd |
| Pin 7  Surround-out-L | Pin 8  Gnd |
| Pin 9  Jack-detect | Pin10  (Void) |
| Pin11  SPDIFI | Pin12  Gnd |
| Pin13  SPDIFO | Pin14  Gnd |

## 2-9.7 Connector CN19: 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.



**CN19**

**GND**

**+5V Standby**

**Ring**

Connect the Wake On LAN signal from LAN card to WOL1
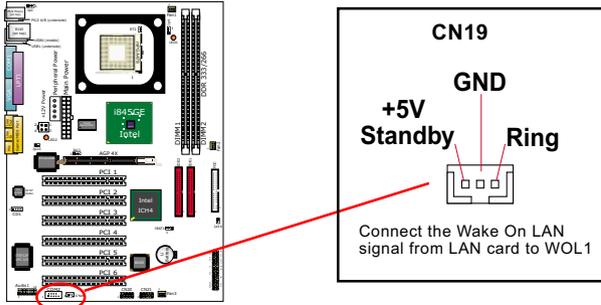
## 2-9.8  Pin-header COM 2: for one serial port

COM 2 Header is built on board , which requires a serial COM 2 cable to provide a 9-pin serial connector for a serial device connection. The RS232 COM 2 cable is optional in the mainboard package. When you insert COM 2 cable to COM 2 header, take notice that the red line of the cable must connect to Pin 1 of COM 2.



9-pin Serial Connector

**RS232 Cable (optional)**

**COM 2 Header**

Red Line to Pin 1

6   9

1   5

COM 2 female Header

35
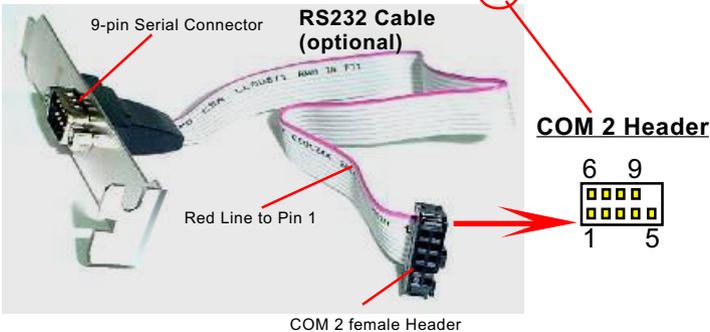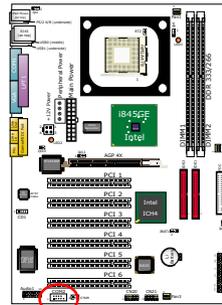
## 2-9.9 Complex Pin-header

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.



Case
Front Panel

① **SMI** — GND / SMI SIGNAL

GND / SUSPEND LED SIGNAL — **Suspend LED** ⑤

② **Power Switch** — Vcc / ATX POWER SWITCH

GND / KLOCK — **Keylock** ⑥ **(Optional)**

③ **Infrared(IR)** — Vcc / NO CONNECTION / INFRARED TRANSMIT SIGNAL / GND / INFRARED TRANSMIT SIGNAL

GND (−) / NO CONNECTION / Vcc (+) — **Power LED** ⑦

GND / RESET SIGNAL — **Reset Switch** ⑧

④ **2nd HDD LED** — Logic High (+) / HDD LED SIGNAL (−)

**1st HDD LED** — HDD LED SIGNAL (−) / Logic High (+)

SPEAKER SIGNAL / GND / NO CONNECTION / Vcc — **Speaker** ⑨

**36**

**1. SMI Connector (System Management Interrupt):**
   **Connection:** Connected to the case-mounted Suspend Switch.
   **Function    :** Manually placing the DOS system into a Suspend mode
   　　　　　　　 or "Green" mode by System Management Interrupt.

**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 mod
   　　　　　　　 ule 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 keylock switch.
   **Function    :** To lock/disable keyboard for security purpose.

**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 the 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.

## 2-9.10 RT2 and JP14: Thermal Connectors



RT2

RT2 is mounted with Thermal Resistor by default.

Jp14

To Jp14    To Devices

b.

a.
**Thermal Cable (Optional)**
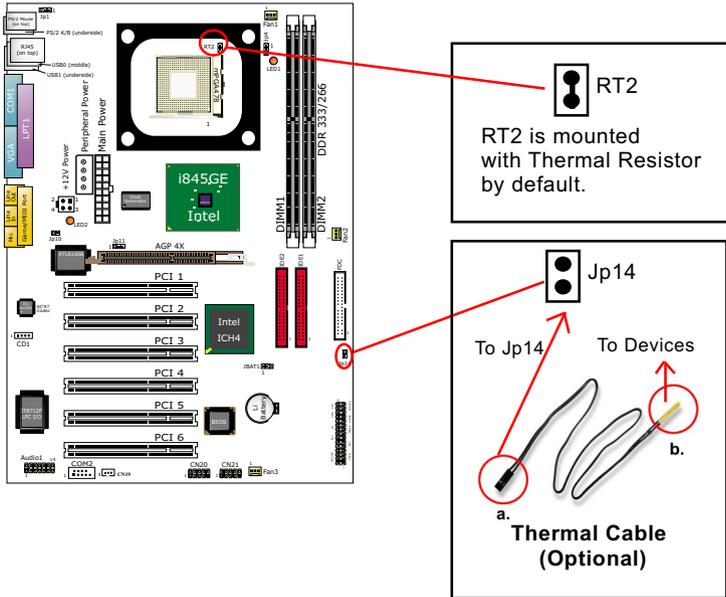
1. Connector RT2: A thermal resistor is mounted by default to connector RT2 so as to detect the temperature of the CPU. What RT2 does is to transmit the thermal signal to BIOS or Hardware Monitor.

2. Connector Jp14: A thermal cable is needed to connect Jp14 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 Jp14, 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 IRQ Description

| IRQ | Function Description | Priority |
|---|---|---|
| IRQ  0 | System Timer | 1 |
| IRQ  1 | Keyboard Controller | 2 |
| IRQ  2 | Programmable Interrupt | N/A |
| IRQ  3 | Serial Port (COM 2) | 11 |
| IRQ  4 | Serial Port (COM 1) | 12 |
| IRQ  5 | Free | 13 |
| IRQ  6 | Floppy Disk Controller | 14 |
| IRQ  7 | Parallel Port (LPT1) | 15 |
| IRQ  8 | Real Time Clock (RTC) | 3 |
| IRQ  9 | Free | 4 |
| IRQ  10 | Free | 5 |
| IRQ  11 | Free | 6 |
| IRQ  12 | PS/2 Mouse Port | 7 |
| IRQ  13 | Coprocessor | 8 |
| IRQ  14 | Primary IDE Channel | 9 |
| IRQ  15 | Secondary IDE Channel | 10 |

• Both ISA and PCI expansion cards may require IRQs. System IRQs are available to cards installed in the ISA expansion bus first, then any remaining IRQs are available to PCI cards. Currently, there are two types of ISA cards.

• The original ISA expansion card design, now referred to as "Legacy" ISA card, requires you to configure the card's jumpers manually and then install it in any available slot on the ISA bus. To see a map of your used and free IRQs in Windows 98, the **Control Panel** in **My Computer**, contains a **System** icon, which gives you a **Device Manager** tab. Double-Clicking on a specific hardware device gives you a **Resources** tab which shows the Interrupt number and address. Double-Clicking **Computers** to see all the interrupts and addresses for your system. Make sure that each ISA device should be assigned to one IRQ respectively. If ISA device share IRQ with any other device, your computer will easily get into trouble.

# 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.

• It is highly recommended that you save a copy of the original mainboard BIOS along with a Flash EPROM Programming utility (AMIXXX.EXE)to a bootable floppy disk so that you can reinstall the BIOS when in need.

• 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.

• "AMIFLASH.EXE" is a Flash EPROM Programming utility that updates the BIOS by uploading a new BIOS file to the programmable flash ROM on the mainboard. This program only works in ***DOS environment, the utility can not be executed in win95/98, ME, NT WINDOWS 2000  or Windows XP environment.***

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

Step 1.  Please visit the board maker's website, download latest BIOS file and  AMI update utility.  The file name of AMI update utility will be "AMIXXX.EXE" of which " XXX " stands for the version number of the file. 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  "AMIXXX.EXE" into the diskette.

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

Step 4. Under " A " prompt, type **" AMIXXX.EXE  \*.ROM "**  and then press <Enter>  to run BIOS update program. Please note that there should be a space between AMIXXX.EXE 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).

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 SETUP 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.

```
┌─────────────────────────────────────────────────────────────────┐
│           AMIBIOS NEW SETUP UTILITY - VERSION 3.31a               │
├─────────────────────────────────────────────────────────────────┤
│  ▶ Standard CMOS Features          Set Supervisor Password        │
│                                                                   │
│  ▶ Advanced BIOS Features          Load Optimal Defaults          │
│                                                                   │
│  ▶ Advanced Chipset Features       Save & Exit Setup              │
│                                                                   │
│  ▶ Power Management Features        Exit Without Saving           │
│                                                                   │
│  ▶ PNP/PCI Configurations                                         │
│                                                                   │
│  ▶ Integrated Peripherals                                         │
│                                                                   │
│  ▶ Hardware Monitor Status                                        │
│                                                                   │
│  ▶ Frequency/Voltage Control                                      │
├─────────────────────────────────────────────────────────────────┤
│  F1: Help      ↑↓: Select Item    +/- : Change Values   F9: Setup Defaults │
│  Esc: Exit     ←→: Select Menu    Enter: Select ▶Sub-Menu   F10: Save and Exit │
├─────────────────────────────────────────────────────────────────┤
│    Set Time, Date, Hard Disk Type ...                             │
└─────────────────────────────────────────────────────────────────┘
```

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 & Exit Setup" saves your changes and reboots the system, and "Exit Without Saving" ignores your changes and exits the program.

## 4-6.2 Standard CMOS Setup

Standard CMOS Setup records some basic system hardware configuration and sets the system clock and error handling. Modify the configuration values of this option if you want to change your system hardware configuration or after you clear CMOS data.

Run the Standard CMOS Setup as follows:

1. Choose "Standard CMOS Setup" from the Main Menu and a screen with a list of options will appear:

| **Standard CMOS Features** | | **Setup Help** |
|---|---|---|
| System Time | 00 19 29 | |
| System Date | Dec 05 2001 Wed | |
| ▶ Floppy options. | | |
| ▶ IDE Device Config | | |
| | | |
| | | |

| | | | |
|---|---|---|---|
| F1: Help  ↑↓: Select Item | +/- : Change Values | F9: Setup Defaults | |
| Esc: Previous Menu | Enter: Select ▶ Sub-Menu | F10: Save and Exit | |

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys. An explanation of the <F> keys follows:

  <F1>: "Help" gives options available for each item.
  <F9>: Setup BIOS default values.
  <F10>: Save and Exit Setup.

3. Press <ESC> to return to the Main Menu when you finish setting up all items.  The following item descriptions are provided as a quick guide to your setup.

**System Time**  The BIOS shows the time of the day in the format: hh:mm:ss. Choose the field with the Arrow keys and change the time with the Page Up/Page Down +/- keys.

**System Date**  The BIOS shows the date of the day in the format: mm:dd:yy :day of the Week. Choose the field with the Arrow keys and change the value with the Page Up/Page Down +/- keys.

**Floppy options**  Press Enter on "Floppy options" will let you select this field to the type(s) of floppy disk drive(s) installed in your system. The choices are:
1.2MB, 5.25 in.
720KB, 3.5 in.
1.44MB, 3.5 in.
2.88MB, 3.5 in.
Not Installed

**IDE Device Config**  Press Enter on IDE Device Config will let you configure the IDE devices on board and the following menu will reveal the following submenu for your configuration of the hard Disk you have installed:

| Primary IDE Master :Maxtor 82560 A4 | | Setup Help |
|---|---|---|
| Type | Auto | |
| Cylinders | 4962 | |
| Heads | 16 | |
| Write Precompensation | | |
| Sectors | 63 | |
| Maxium Capacity | 2561 Mb | |
| LBA Mode | On | |
| Black Mode | On | |
| Fast Programmed I/O Modes | 4 | |
| 32 Bit Transfer Mode | On | |

F1: Help  ↑↓ : Select Item  +/- : Change Values  F9 : Setup Defaults
Esc: Previuos Menu  Enter: Select ▶ Sub-Menu  F10 : Save & Exit

**Type** This option shows the types of configuration for the
IDE devices:
  1-50: Predefined types
  USER: set Parameters by User
  Auto: Set parameters automatically
  CD-ROM: Use for ATAPI CD-ROM drives
Double click [Auto] to set all HDD parameters
automatically, including "Cylinders, Heads, Write
Precompensation, Sectors, Maximum Capacity and
32 Bit Transfer Mode.

## 4-6.3 Advanced BIOS Features

Advanced BIOS Features improves your system performance or sets up system features according to your preference.

Run the Advanced BIOS Features as follows:

1. Choose "Advanced BIOS Features" from the Main Menu and a screen with a list of options will appear:

**AMIBIOS NEW SETUP UTILITY - VERSION 3.31a**

| Advanced BIOS Features | | Setup Help |
|---|---|---|
| Quick Boot | Enabled | |
| Delay for Hard Drive (Sec.) | 2 | |
| 1st Boot Device | Floppy: 1.44 MB 3.5 | |
| 2nd Boot Device | CD-ROM | |
| 3rd  Boot Device | IDE-0 :Maxtor 20560 A4  - | |
| Try Other Boot Devices | Yes | |
| S.M.A.R.T for Hard Disks | Disabled | |
| Bootup Num-lock | On | |
| Floppy Drive Swap | Disabled | |
| Floppy Drive Seek | Disabled | |
| PS/2 Mouse Support | Enabled | |
| Primary Display | VGA/EGA | |
| Password Check | Setup | |
| Boot To OS/2 | No | |
| CPU Microcode Update | Enabled | |
| L1 Cache | Enabled | |
| L2 Cache | Enabled | |
| System BIOS Cacheable | Enabled | |
| C000,32K Shadow | Cached | |
| C800,16K Shadow | Disabled | |
| CC00,16K Shadow | Disabled | |
| D000,16K Shadow | Disabled | |
| D400,16K Shadow | Disabled | |
| D800,16K Shadow | Disabled | |
| DC00,16K Shadow | Disabled | |

| F1: Help    ↑↓: Select Item | +/- : Change Values | F9: Setup Defaults |
|---|---|---|
| Esc: Previous Menu | Enter: Select ▶ Sub-Menu | F10: Save and Exit |

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / -  keys. An explanation of the <F> keys follows:

<F1>: "Help" gives options available for each item.
<F9>: Setup BIOS default values.
<F10>: Save and Exit Setup.

3. Press <ESC> to return to the Main Menu when you finish setting up all items.  The following item descriptions are provided as a quick guide.

| | |
|---|---|
| **Quick Boot** | Allows you to enable / disable quick boot of your system. |
| **Delay for Hard Drive (Sec.)** | Allows you to adjust the time of detecting hard disk on board at booting system. Choices: Disabled; 1~10 sec. in 1 sec. stepping. |
| **1st/2nd/3rd Boot Device** | Allows you to set floppy or IDE devices already installed to be the 1st/2nd/3rd boot device. Choises: Disabled; Device(s) installed |
| **Try Other Boot Devices** | Allows you to enable/disable system to try to boot with other boot devices. Choises: Yes; No |
| **S.M.A.R.T. for Hard Disks** | Allows you to enable / disable the Self Monitoring Analysis and Reporting Technology for the hard disk. Choices: Enabled; Disabled |
| **Bootup Num-lock** | Allows you to toggle between On 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. |
| **Floppy Drive Swap** | Disabled (default), Floopy Drive A will not be chnged to B, nor B to A.  Enabled, Floppy Drive a and B will change position. |

**Floppy Drive Seek** Disabled (default), Floppy Drives will not be checked and diagnosed at system bootup; Enabled, Floppy Drives will be checked and diagnosed at system bootup.

**PS/2 Mouse  Support** Enabled (default), PS/2 mouse is supported. Disabled, PS/2 Mouse is not supported

**Primary Display** Allows you to choose the primary display for the system. Choices: VGA/EGA (default); CGA40x25; CGA80x25; Mono; Absent

**Password Check** Allows you to set BIOS to check up password with a password prompt at BIOS Setup or whenever re-starting system.
Choices: Setup; Always

**Boot to OS/2** Allows you to set your system to OS/2 operating system.
Choices: Yes; No (default)

**CPU Microcode Update** Allows you to enable/disable the CPU Microcode Update function.
Choices: Disabled; Enabled (default)

**L1 /L2 Cache** Use this item to enable/disable the L1/L2 cache.
Choices: Enabled; Disabled

**System BIOS Cacheable** Allows you to enable / disable  the System BIOS Cacheable function.

**C000, 32K Shadow** Allows you to set these addresses cached, Enabled or Disabled. Default: Cached

**C800,CC00,D000,D400, D800,DC00  16K Shadow** Allows you to set these addresses cached, Enabled or Disabled. Default: Disabled

## 4-6.4 Advanced Chipset Features

Advanced Chipset Features is used to modify the values of chipset buffers. These buffers control the system options.

Run the Advanced Chipset Features as follows:

1. Choose "Advanced Chipset Features" from the Main Menu and a list of option will appear:

**AMIBIOS NEW SETUP UTILITY - VERSION 3.31a**

| Advanced Chipset Features | | Setup Help |
|---|---|---|
| (Hyper-threading Function) | (Enabled) | |
| DRAM Timing | | |
| SDRAM Frequency | Auto | |
| Configure SDRAM timing by SPD | Disabled | |
| SDRAM CAS# Latency | 2.5 Clocks | |
| SDRAM RAS# Precharge | 3 Clocks | |
| SDRAM RAS# to CAS# Delay | 3 Clocks | |
| SDRAM Precharge Delay | 7 Clocks | |
| SDRAM Burst Length | 4 | |
| Memory Hole | Disabled | |
| APIC interrupt Mode | Disabled | |
| Internal Graphics Mode Select | 1MB | |
| AGP Aperture Size | 64MB | |
| USB Controller | 6 USB Ports | |
| USB 1.1 Device Legacy Support | Disabled | |
| USB 1.1 Port 64/60 Emulation | Disabled | |
| Display Setting | | |
| Boot display Device | Auto | |
| Flat Panel Type | 640x480LVDS | |
| TV Standard | Auto | |
| Flat Panel Scaling | Auto | |

| F1: Help ↑↓: Select Item | +/- : Change Values | F9: Setup Defaults |
|---|---|---|
| Esc: Previous Menu | Enter: Select ▶ Sub-Menu | F10: Save and Exit |

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys. An explanation of the <F> keys follows:

<F1>: "Help" gives options available for each item.
<F9>: Setup BIOS default values.
<F10>: Save and Exit Setup.

3. Press <ESC> to return to the Main Menu when you finish setting up all items. The following item descriptions are provided as a quick guide to your setup.

**(Hyper-threading Function)** If hyper-threading CPU is running on board, this item appears to show the enabled status.
Choices: Enabled; Disabled

**SDRAM Frequency** Allows you to set the SDRAM frequency.
Choicesfor 100MHz CPU: Auto; 200MHz; 266MHz
Choices for 133MHz CPU: Auto; 200MHz;266MHz; 333MHz

**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.

**SDRAM CAS# Latency** With SDRAM Timing by SPD disabled, you can select the SDRAM CAS# (Column Address Strode)latency manually.
Choices: 2Clocks; 2.5 Clocks

**SDRAM RAS# Precharge** With SDRAM Timing by SPD disabled, you can select the SDRAM RAS# (Row Address Strode) Precharge cycle manually.
Choices: 2Clocks; 3 Clocks

**SDRAM RAS# to CAS# Delay** With SDRAM Timing by SPD disabled, you can select the SDRAM RAS# to CAS# delay cycle manually.
Choices: 2Clocks; 3 Clocks

**SDRAM Precharge Delay** Allows you to set the SDRAM Precharge Delay cycle.
Choices: 5 clocks; 6 clocks; 7 clocks

**SDRAM Burst Length** With SDRAM Timing by SPD disabled, you can select the SDRAM Burst length manually.
Choices: 8; 4

**Memory Hole** Allows you to enabled / disabled (default) the support of Memory Hole which is reserved for ISA card.

**APIC Interrupt Mode** Allows you to enable / disable (default) the APIC function for selecting the APIC interrupt Mode.

**Internal Graphic Mode Select** Allows you to set the internal graphic mode.
Choices: 512KB; 1MB; 8MB; Disabled

**AGP Aperture Size** Allows you to set the AGP Aperture Size.
Choices: 4MB; 8MB; 16MB; 32MB; 64MB; 128MB; 256MB;

**USB Controller** Allows you to set the USB Controller on the USB port(s).
Choices: 6 USB Ports; 4 USB Ports;
2 USB Ports; disabled

**USB 1.1 Device Legacy Support** Allows you to select the USB Device Legacy support.
Choices: No Mice; all Devices; Disabled

**USB 1.1 Port 64/60 Emulation** Allows you to enable / disable (default) the Port 64/60 Emulation.

**Boot display Device** Allows you to select the Boot isplay device.
Choices: Auto; CRT; TV; EFP; CRT+EFP; LFP; CRT+LFP

**Flat panel Type** Allows you to select the flat panel type.
Choices: 640x480LVDS;800x600LVDS;
1024x768LVDS; 1280x1024LVDS;
1400x1050LVDS;1600x1200LVDS;
640x480CMOS; 800x600CMOS; 1024x768CMOS;
1280x1024CMOS;1400x1050CMOS;
1600x1024CMOS

**TV Standard** Allows you to select the TV standard.
Choices: Auto; NTSC; PAL; SECAM

**Flat Panel Scaling** Allows you to select the mode for flat panel scaling.
Choices: Auto; Force Scaling; Disabled

## 4-6.5 Power Management Features

Power Management Features allows you to set the system's power saving functions.

Run the Power Management Features as follows:

1. Choose "Power Management Features" from the Main Menu and a list of options will appear:

**AMIBIOS NEW SETUP UTILITY - VERSION 3.31a**

| Power Management Features | | Setup Help |
|---|---|---|
| ACPI Standby State | S1/POS | |
| USB Device Wakeup From S3/S4 | Disabled | |
| Call VGABIOS at S3 Resume | Enabled | |
| Power Management/APM | Enabled | |
| Video Power Down Mode | Suspend | |
| Hard Disk Power Down Mode | Standby | |
| Standby Time Out (Minute) | Disabled | |
| Suspend Time Out (Minute) | Disabled | |
| Power Button Function | On/Off | |
| Restore on AC/Power Loss | Last State | |
| Resume On Ring | Disabled | |
| Resume On LAN | Disabled | |
| Resume On PME# | Disabled | |
| Resume On RTC Alarm | Disabled | |
| RTC Alarm Date | 15 | |
| RTC Alarm Hour | 12 | |
| RTC Alarm Minute | 30 | |
| RTC Alarm Second | 30 | |

| F1: Help    ↑↓: Select Item    +/- : Change Values | F9: Setup Defaults |
|---|---|
| Esc: Previous Menu    Enter: Select ▶ Sub-Menu | F10: Save and Exit |

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / -  keys. An explanation of the <F> keys follows:

 <F1>: "Help" gives options available for each item.
 <F9>: Setup BIOS default values.
 <F10>: Save and Exit Setup.

3. Press <ESC> to return to the Main Menu when you finish setting up all items.  The following item descriptions are provided as a quick guide to your setup.

**ACPI Standby State** This item allows you to select the ACPI Suspend type. You can select S3(STR) for suspending to DRAM if your system supports this mode. Or you can select S1 (POS) for Power on Suspend under ACPI mode.

**USB Device Wake Up from S3/S4** If STR mode is selected, this item allows you to en- able /disable (default) this function.

**Re-Call VGA BIOS at S3 Resuming** If STR mode is selected, this item allows you to en- able / disable this function.

**Power Management/ APM** Allows you to enable / disable the Power manage- ment / 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; Suspend

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

**Resume on Ring** Allows you to enable / disable the Resume on Ring Signal function.
An input signal on the serial Ring Indicator (RI) Line (in other words, an incoming call on the modem) awakens the system from a soft off state.

**Resume on LAN** Allows you to enable / disable the Resume on LAN function.

**Resume on PME#**  Allows you to enable / disable the Resume on PME function.

**Resume On RTC Alarm**  Allows you to enable / disable the Resume On RTC Alarm function.

**RTC Alarm Date / Hour**  If resume On RTC Alarm is enabled, this field al-
**/ Minute / Second**  lows you to set the Alarm date Hour, Minute and second.
Date Choices: Every Day; 01 ~ 31
Hour Choices: 00 ~ 23
Minute Choices: 00 ~ 59
Second Choices: 00 ~ 59

## 4-6.6 PNP / PCI Configurations

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

Run the PNP/PCI Configurations as follows:

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

**AMIBIOS NEW SETUP UTILITY - VERSION 3.31a**

| PNP/PCI Configurations | | Setup Help |
|---|---|---|
| Clear NVRAM | No | |
| PCI Latency Timer (PCI Clocks) | 32 | |
| Init. Graphics Adapter Priority | AGP/Int-VGA | |
| PCI IDE Busmaster | Disabled | |
| PCI Slot1 IRQ Priority | Auto | |
| PCI Slot2 IRQ Priority | Auto | |
| PCI Slot3 IRQ Priority | Auto | |
| PCI Slot4 IRQ Priority | Auto | |
| PCI Slot5 IRQ Priority | Auto | |
| PCI Slot6 IRQ Priority | Auto | |

| F1: Help ↑↓ : Select Item | +/- : Change Values | F9: Setup Defaults |
|---|---|---|
| Esc: Previous Menu | Enter: Select ▶ Sub-Menu | F10: Save and Exit |

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / -  keys. An explanation of the <F> keys follows:

<F1>: "Help" gives options available for each item.
<F9>: Setup BIOS default values.
<F10>: Save and Exit Setup.

3. Press <ESC> to return to the Main Menu when you finish setting up all items.  The following item descriptions are provided as a quick guide to your setup.

**Clear NVRAM** Allows BIOS to clear the NVRAM data.
Choices: No (default); Yes

**PCI Latency Timer (PCI Clocks)** Allows you to set the PCI Latency Time.
Choices: 32; 64; 96; 192; 128; 160; 192; 224; 248;

**Init. Graphics Adapter priority** Allows you to select the initial Graphics Adapter.
Choices: AGP/Int-VGA (default); AGP/PCI;
PCI/AGP; PCI/Int-VGA; Internal VGA;

**PCI IDE BusMaster** Allows you to enable / disable the PCI IDE Bus Master function.

**PCI Slot 1/2/3/4/5/6 IRQ Priority** Allows you to specify the IRQ for the PCI slots.
Choices: Auto; 3; 4; 5; 7; 9; 10; 11

## 4-6.7 Integrated Peripherals

Integrated Peripherals option allows you to get some information inside your system when it is working.

Run the Integrated Peripherals as follows:
1. Choose "Integrated Peripherals" from the Main Menu and a list of options will appear:

**AMIBIOS NEW SETUP UTILITY - VERSION 3.31a**

| Integrated Peripherals | | Setup Help |
|---|---|---|
| Onboard IDE | Both | |
| Onboard LAN (Optional) | Enabled | |
| Onboard AC'97 Audio | Auto | |
| Onboard FDC | Auto | |
| Onboard Serial Port 1 | Auto | |
| Onboard Serial Port 2 | Auto | |
| Serial Port 2 Mode | Normal | |
| Onboard Parallel Port | Auto | |
| Parallel Port Mode | ECP | |
| Parallel Port IRQ | Auto | |
| Parallel Port DMA Channel | Auto | |
| Onboard MIDI Port | Disabled | |
| MIDI Port IRQ | 5 | |
| Onboard Game Port | 200 | |
| K/B PowerOn Function | Disabled | |
| Stroke Keys Selected | N/A | |
| PS/2 Mouse Power-on Function | Disabled | |

| F1: Help    ↑↓: Select Item | +/- : Change Values | F9: Setup Defaults |
|---|---|---|
| Esc: Previous Menu | Enter: Select ▶ Sub-Menu | F10: Save and Exit |

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys. An explanation of the <F> keys follows:

 <F1>: "Help" gives options available for each item.
 <F9>: Setup BIOS default values.
 <F10>: Save and Exit Setup.

3. Press <ESC> to return to the Main Menu when you finish setting up all items.  The following item descriptions are provided as a quick guide to your setup.

**Onboard IDE** Allows you to choose the Onboard IDE Mode.
Choices: Disabled; Primary; Secondary; Both

**(Optional) Onboard LAN** If this option is on board, this item allows you to en-
able / disable the onboard LAN.
Choices: Enabled; Disabled

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

**OnBoard FDC** Allows you to enable / disable the Onboard FDC.
Choices: Auto; Enabled; disabled

**Onboard Serial Port 1** Allows you to set the Onboard Serial Port 1.
Choices; auto; Disabled; 3F8/COM1; 2F8/COM2;
3E8/COM3; 2E8/COM4;

**Onboard Serial Port 2** Allows you to set the Onboard Serial Port 2.
Choices; auto; Disabled; 3F8/COM1; 2F8/COM2;
3E8/COM3; 2E8/COM4;

**Serial Port 2 Mode** Allows you to set the Serial Port 2 Mode.
Choices: Normal; IrDA; ASKIR;

**OnBoard Parallel Port** Allows you to configure onboard Parallel port .
Choices: auto; Disabled; 378; 278; 3BC;

**Parallel Port Mode** If Parallel Port is not disabled, this item allows you
to configure parallel port mode.
Choices: ECP; EPP + ECP; Normal; EPP

**Parallel Port IRQ** If Parallel Port Mode is set at EPP, this item allows
you to set the Parallel Port IRQ.
Choices: 5; 7

**Parallel Port DMA Channel** If Parallel Port Mode is set at ECP, this item allows
you to set the DMA Channel.
Choices: 0; 1; 3

**OnBoard MIDI Port** Allows you to configure onboard MIDI port address.
The choices: Disabled; 300h; 330h

**MIDI Port IRQ** If the onboard MIDI port is set at 300h or 330h, this item shows up to allow you to configure the MIDI Port IRQ to IRQ 5.

**OnBoard Game Port** Allows you to configure Onboard Game port address.
The choices: Disabled; 200h; 208h

**Keyboard Power On Function** Allows you to configure the Keyboard PowerOn Function.
Choices: Disabled; By Stroke Key; By Password.

**Stroke Keys Selected** If Keyboard PowerOn function is set at "by Stroke Key", this item shows up to allow you to select the stroke key.
Choices: Wake; power; Ctrl + F1~F6

**Password for PoweOn** If Keyboard Power-on function is set at "By Password", this item shows up to allow you to type a password for the power-0n function.
Choices: N/A; Password

**PS/2 Mouse Power-on Function** Allows you to disable or use the PS/2 mouse to power on system..
choices: Disabled; Enabled

### 4-6.8 Hardware Monitor Status

This menu helps you to read only and get more information on the working CPU temperature, FAN speed and voltage.

1. Choose "Hardware Monitor Status" from the Main Menu and a screen with a list of current status of your working system will appear:

**AMIBIOS EASY SETUP UTILITY - VERSION 3.31a**

| Hardware Monitor Status | | Setup Help |
|---|---|---|
| Temperature 1 | 44 $^0$C/111 $^0$F | |
| Temperature 2 | -55 $^0$C/-131 $^0$F | |
| Temperature 3 | | |
| Fan 1 | 4891 RPM | |
| Fan 2 | 4905 RPM | |
| Fan 3 | 0 RPM | |
| CPU Vcore | +1.680 V | |
| +1.5V | +1.504 V | |
| +3.3V | +3.408 V | |
| +5.0V | +5.126 V | |
| +12.0V | +11.187V | |
| -12.0V | -11.972V | |
| -5.0V | -4.939V | |
| 5V SB | +5.164V | |
| Battery | +3.296V | |

F1: Help    ↑↓: Select Item    +/- : Change Values     F9: Setup Defaults
Esc: Previous Menu       Enter: Select ▶ Sub-Menu    F10: Save and Exit

2. Press <ESC> to return to the Main Menu. In case any irregular reading appears about your system, it indicates that a problem exists therein. To solve the problem, a hardware engineer or your dealer is recommended.

**Temperature 1** Shows current CPU internal temperature.

**Temperature 2** Shows current CPU external temperature.

**Temperature 3** Shows current system temperature.

**Fan 1 / 2 /3** Displays the current speed of CPU Fan, and other two onboard devices which user has connected to the onboard Fan Connectors.

**CPU Vcore** Shows CPU core actual voltage value.

**+1.5V** Shows current voltage against the +1.5V power supply.

**+3.3V** Shows current voltage against the +3.3V power supply.

**+5.0V** Shows current voltage against the +5.0V power supply.

**+12V** Shows current voltage against the +12V power supply.

**-12V** Shows current voltage against the -12V power supply.

**-5.0V** Shows current voltage against the -5.0V power supply.

**+5V SB** Shows current voltage against the +5V SB power supply.

**Battery** Shows current voltage against battery power supply.

## 4-6.9 Frequency/Voltage Control

Run the "Frequency/Voltage Control" as following:

1. Choose "Frequency/Voltage Control" from the Main Menu and a screen with a list of options will appear:

**AMIBIOS EASY SETUP UTILITY - VERSION 3.31a**

| Frequency/Voltage Control | | Setup Help |
|---|---|---|
| RedStorm Overclocking Tech (Optional) | (Press Enter) | |
| CPU Ratio Selection | Locked | |
| CPU Linear Freq | Disabled | |
| CPU Clock | (100 MHz) | |
| PCI Clock Auto Detection | Disabled | |
| Spread Spectrum Selection | Disabled | |
| CPU Voltage Control | Auto | |
| AGP Voltage Control | 1.5V | |
| DIMM Voltage Control | 2.5V | |

F1: Help    ↑↓: Select Item    +/- : Change Values      F9: Setup Defaults
Esc: Previous Menu      Enter: Select ▶ Sub-Menu      F10: Save and Exit

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys. An explanation of the <F> keys follows:

 <F1>: "Help" gives options available for each item.
 <F9>: Setup BIOS default values.
 <F10>: Save and Exit Setup.

3. Press <ESC> to return to the Main Menu when you finish setting up all items. The following item descriptions are provided as a quick guide to your setup.

**(Optional) Redstorm Overclocking Tech** Press <Enter> to start *RED STORM OVERCLOCKING TECH*. This option gives user an easy way to overclocking. It will increase CPU external clock automatically. When CPU external clock increases to an unacceptably high value, BIOS will restart your system, then running at an acceptable CPU external clock.

**CPU Ratio Selection** If CPU onboard is one with an adjustable or unlocked CPU ratio, this item allows you user to adjust the CPU Ratio.

**CPU Linear Frequency** This item allows you to enable / disable this setting function.

**CPU Clock** If CPU Linear Frequency is set Enabled, this item allows you to set CPU Clock.
Choices: 100MHz ~200MHz in 1MHz stepping.

**PCI Clock Auto Detection** Allows you to enable / disable this auto detection function on PCI clock.

**Spread Spectrum Selection** If CPU Linear Frequency is disabled, use this item toenable/disable Spread Spectrum Selection. This function will reduce the EMI (Electromagnetic Interference) in your system. If you do not have an EMI problem, leave this item disabled.

**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; 1.100V ~1.850V in 0.025 stepping

**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

## 4-6.10 Set Supervisor Password

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

1. Choose "Set Supervisor Password" in the Main Menu 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 8 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:

**[ Retype new supervisor 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.

[ New supervisor password installed ]

Any Key to Continue

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

7. After the Supervisor password is set, you have to choose whether the password is for entering the system or only for entering BIOS Setup program. To make the choice, please enter BIOS Setup and choose  "Advanced BIOS Features" in the main menu. (At entering BIOS Setup, you have to enter the password now.) In "Advanced BIOS Features", choose "Password Check" and change the option. The "Setup" option is to set the password only for entering BIOS Setup. The "Always" option is to set the password for entering the system.

8. To change or remove a current supervisor password, choose "Set Supervisor Password" and press <Enter>. An instruction box appears on the screen, prompting you to enter the current password first:

```
[ Enter current supervisor password ]
```

9. Type the current password with keyboard and then press <Enter>. An instruction box appears, prompting you to enter new supervisor password:

```
[ Enter new supervisor password ]
```

10. 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:

```
[ Supervisor password disabled ]

Any Key to Continue
```

**NOTE:** If you forget or lose a supervisor password, the only way to access the system is to clear the CMOS. All setup informations will then be cleared including the password and you need to run the BIOS setup program again so as to reconfigure BIOS.

### 4-6.11 Load Optimized Defaults

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

```
[ Load Optimized Defaults ]

Press [Enter] to continue
   or [ESC] to abort
```

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

### 4-6.12 Save & Exit Setup

Save & Exit Setup 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 current settings and exit ]

Press [Enter] to continue
   or [ESC] to abort
```

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

### 4-6.13 Exit Without Saving

Exit Without Saving option allows you to 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:

```
[ Quit Without Saving Changes ]

Press [Enter] to continue
   or [ESC] to abort
```

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