# MSI
MICRO-STAR INTERNATIONAL

745 Ultra
745 Ultra-E

## MS-6561 (v1.X) ATX Mainboard



**Version 1.1**
**G52-MA00564**

CE    N1996
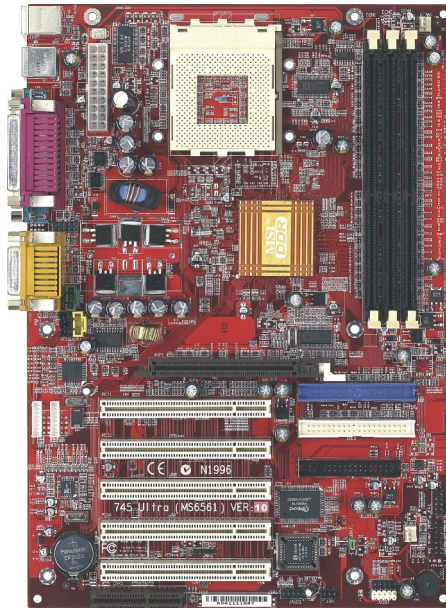
**FCC-B Radio Frequency Interference Statement**

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.
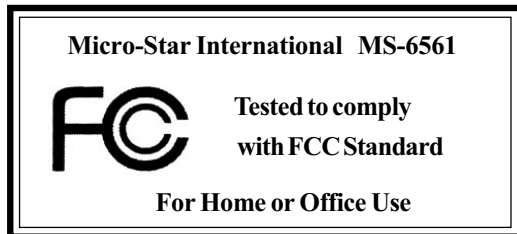
**Notice 1**
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**Notice 2**
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

**VOIRLANOTICED'INSTALLATIONAVANTDERACCORDERAURESEAU.**

| |
|---|
| **Micro-Star International  MS-6561** |
| FC  **Tested to comply** **with FCC Standard** |
| **For Home or Office Use** |

**Edition**

Feb. 2002

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**Revision History**

| Revision | Revision History | Date |
|----------|------------------|------|
| V1.1 | Add IEEE 1394 Connectors | Feb. 2002 |

# Safety Instructions

1. Read the safety instructions carefully.
2. Save this User's Guide for possible use later.
3. Keep this equipment away from humidity.
4. Lay this equipment on a stable and flat surface before setting it up.
5. The openings on the enclosure are used for air convection and to prevent the equipment from overheating. Note: Do not cover the openings.
6. Make sure that the power voltage is within its safety range and has been adjusted properly to the value of 110/220V before connecting the equipment to the power inlet.
7. Place the power cord in a way that people are unlikely to step on it. Do not place anything on the power cord.
8. Always unplug the power cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage the equipment or cause an electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - the power cord or plug is damaged
    - liquid has penetrated into the equipment
    - the equipment has been exposed to moisture
    - the equipment has not work well or you can not get it work according to User's Guide
    - the equipment was dropped and damaged
    - the equipment has obvious signs of breakage
12. Do not leave the equipment in an unconditioned environment with a storage temperature of $60^0$ C ($140^0$F) or above, which may damage the equipment.

**CAUTION:** To prevent explosion caused by improper battery replacement, use the same or equivalent type of battery recommended by the manufacturer only.

# CONTENTS

# *Getting Started* *1*

Thank you for purchasing the MS-6561 v1.X ATX mainboard. The MS-6561 v1.X is based on SiS 745 chipset for optimal system efficiency. Designed to fit the advanced AMD® Athlon/Athlon XP/Duron processor in the Socket-462 package, the MS-6561 delivers a high performance and professional desktop platform solution.

# Mainboard Specification

**CPU**
- Support Socket A (Socket-462) AMD® Athlon/Athlon XP/Duron processor up to 1900+MHz
- Support AMD PowerNow!™ technology

**Chipset**
- Sis 745 Chipset
  - applies the multi-threaded architecture- "Build-in Multi-threaded I/O Link" to provide enough I/O bandwidth up to 1.2GB/s
  - supports additional AGP slot with 4x/2x/1x and Fast Write Transaction
  - offers AC'97 compliant interface
  - built-in fast IDE controller supports the ATA PIO/DMA, and the Ultra DMA33/66/100 function that supports the data transfer rate up to 100MB per second

**Main Memory**
- Support six memory banks using three 184-pin DDR DIMM
- Support up to 2 unbuffered DIMM DDR333 or up to 3 unbuffered Double-Sided DIMM DDR266/200
- Support 3 unbuffered DIMM of 2.5V DDR DRAM, up to 1GB per DIMM with Max. Memory Size up to 3GB

**Slots**
- One AGP (Accelerated Graphics Port) 1x/2x/4x slot (support 1.5V/3.3V)
- Five PCI 2.2 32-bit Master PCI bus slots
- One CNR (Communication Network Riser) slot
- Support 3.3V/5V PCI bus Interface

**On-Board IDE**
- Provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 33/66/100 operation modes.
- Can connect up to four fast IDE drives

**On-Board Peripherals**

❑ On-board Peripherals include:
- 1 floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
- 2 serial ports (COM A + COM B)
- 1 parallel port supports SPP/EPP/ECP mode
- 4 USB ports (Rear x 2/ Front x 2)
- 1 Line-In/Line-Out/Mic-In/Game port
- 2 on-board IEEE1394 ports (optional)

**Audio**

❑ Chip integrated
❑ AC'97 codec supports 2 channel Audio

**BIOS**

❑ The mainboard BIOS provides "Plug & Play" function which detects the peripherals devices and expansion cards of the board automatically
❑ The mainboard provides a Desktop Management Interface (DMI) function which records your mainboard specifications

**Dimension**

❑ ATX Form Factor 30.5cm x 21.5cm

**Mounting**

❑ 6 mounting holes

**Others**

❑ Vcore/memory voltage adjustable
❑ Support WOR
❑ Support ACPI 1.0b spec., including S1, S3

# Mainboard Layout



Top : mouse
Bottom: keyboard

USB ports

ATX Power Supply

SOCKET 462

CFAN1

Top : Parallel Port

Bottom:
COM A
COM B

JDB1

SiS 745

Top :
Game port

Bottom:
Line-Out
Line-In
Mic

JMD1

JCD1    JAUX1

DIM 1    DIM 2    DIM 3

PCI Slot 1

IDE 1

PCI Slot 2

IDE 2

Codec

PCI Slot 3

FDD 1

JFP1

PCI Slot 4

JCI1

JBAT1    SFAN1

BATT +

JWR1

PCI Slot 5

BIOS

JFP2

CNR

JAUD1    JIR1    JUSB1
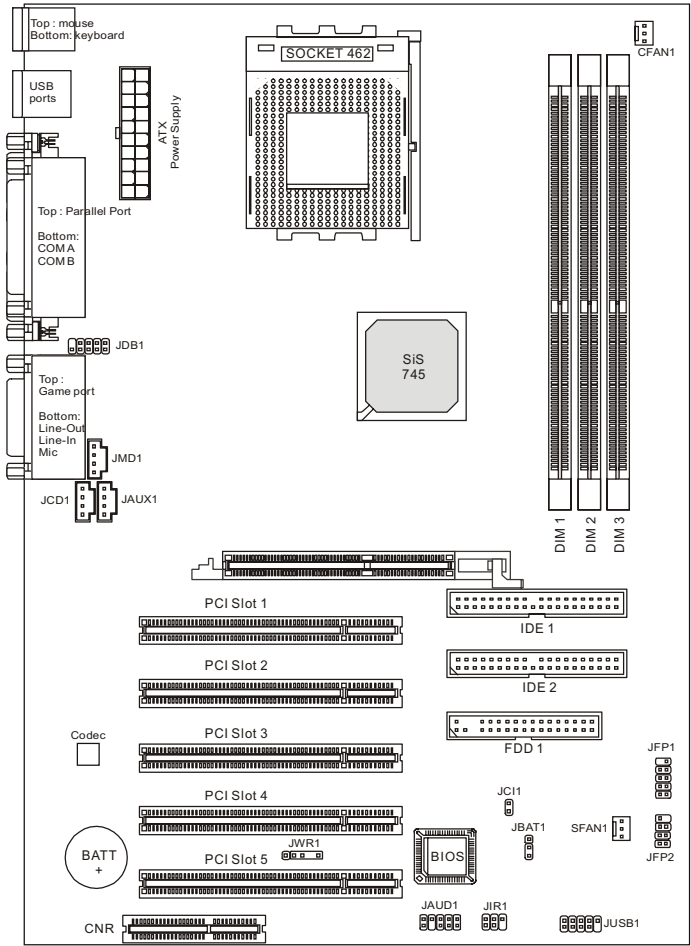
**745 Ultra (MS-6561 v1.X) ATX Mainboard**

Top : mouse
Bottom: keyboard

USB
ports

ATX
Power Supply

SOCKET 462

CFAN1

Top : Parallel Port

Bottom:
COM A
COM B

JDB1

Top :
Game port

Bottom:
Line-Out
Line-In
Mic

JMD1

JCD1    JAUX1

SiS
745

DIM 1
DIM 2
DIM 3

PCI Slot 1

IDE 1

J1394-2
J1394-1

PCI Slot 2

IDE 2

Codec

PCI Slot 3

FDD 1

JFP1

PCI Slot 4

JCI1

JBAT1    SFAN1

BATT
+

JWR1

PCI Slot 5

BIOS

JFP2

CNR

JAUD1    JIR1

JUSB1
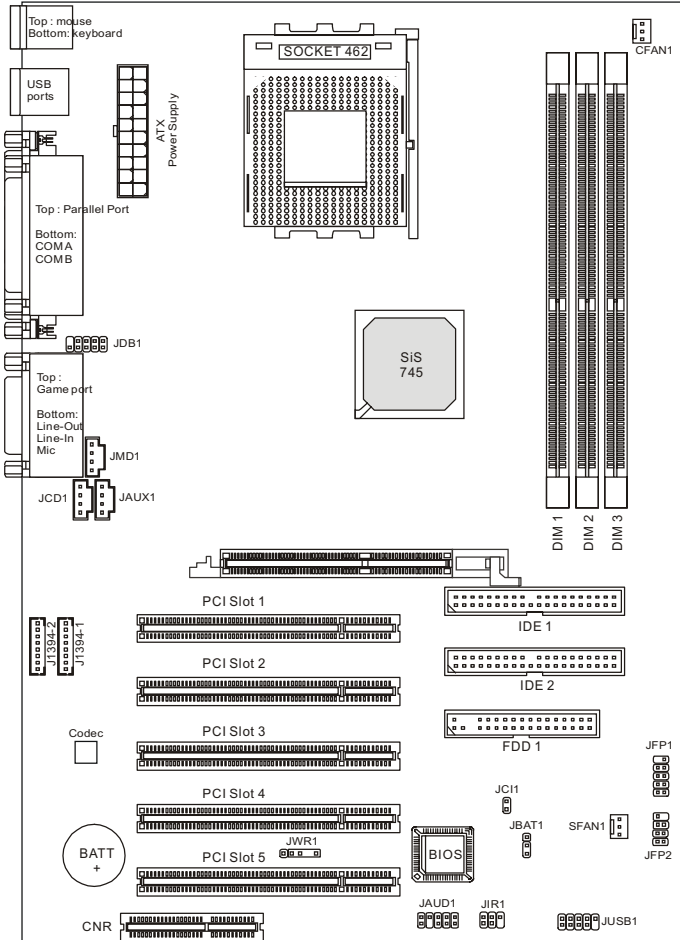
## 745 Ultra-E (MS-6561 v1.X) ATX Mainboard

# Quick Components Guide

| Component | Function | Reference |
|---|---|---|
| JPWR1 | ATX 20-pin power connector | See p. 2-6 |
| JKBMS1 | Mouse connector | See p. 2-7 |
| JKBMS1 | Keyboard connector | See p. 2-8 |
| USB Connectors | Connecting to USB devices | See p. 2-8 |
| COM A & COM B | Serial port connector | See p. 2-9 |
| LPT1 | Parallel port connector | See p. 2-10 |
| FDD1 | Floppy disk drive connector | See p. 2-11 |
| JIR1 | IrDA infrared module connector | See p. 2-11 |
| IDE1~ IDE2 | Hard disk connectors | See p. 2-12 |
| JCD1 | CD-in connector | See p. 2-13 |
| JAUX1 | Aux line-in connector | See p. 2-13 |
| JMD1 | Modem-in connector | See p. 2-13 |
| CFAN1/SFAN1 | Fan power connectors | See p. 2-14 |
| JWR1 | Wake on ring connector | See p. 2-15 |
| JFP1/JFP2 | Front panel connectors | See p. 2-16 |
| JAUD1 | Front panel audio connector | See p. 2-17 |
| JUSB1 | Front USB connector | See p. 2-18 |
| JCI1 | Chassis Intrusion connector | See p. 2-19 |
| J1394-1 & J1394-2 | IEEE1394 Connector | See p. 2-20 |
| JDB1 | D-Bracket Connector | See p. 2-22 |
| JBAT1 | Clear CMOS jumper | See p. 2-23 |
| AGP Slot | Connecting to AGP card | See p. 2-24 |
| PCI Slots | Connecting to expansion cards | See p. 2-24 |
| CNR Slot | Connecting to expansion card | See p. 2-25 |

# MSI Special Features

## Fuzzy Logic™ III

The Fuzzy Logic™ III utility allows users to overclock the CPU FSB (Front Side Bus) frequency in the Windows environment. Select the CPU frequency you prefer and click *Go* to apply the frequency or click *Save* allowing the system to run at the specified frequency each time when the system is powered on.
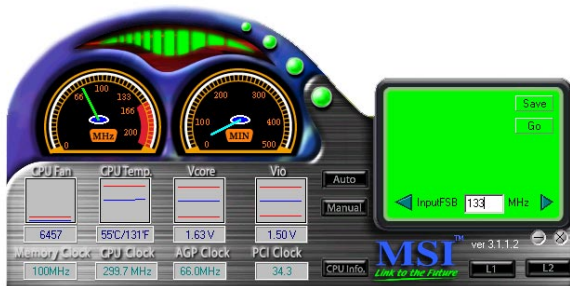


**Features:**

● Display Current System Status
  - CPU Fan
  - CPU Temp.
  - Vcore
  - Vio
  - Memory Clock
  - CPU Clock
  - AGP Clock
  - PCI Clock
● Adjust CPU FSB Frequency

## PC Alert™ III

The PC Alert™ III is a utility you can find in the CD-ROM disk. The utility is just like your PC doctor that can detect the following PC hardware status during real time operation:

      \* monitor CPU & system temperatures
      \* monitor fan speed(s)
      \* monitor system voltage
      \* monitor chassis intrusion

If one of the items above is abnormal, the program main screen will be immediately shown on the screen, with the abnormal item highlighted in red. This will continue to be shown until users disable the warning.
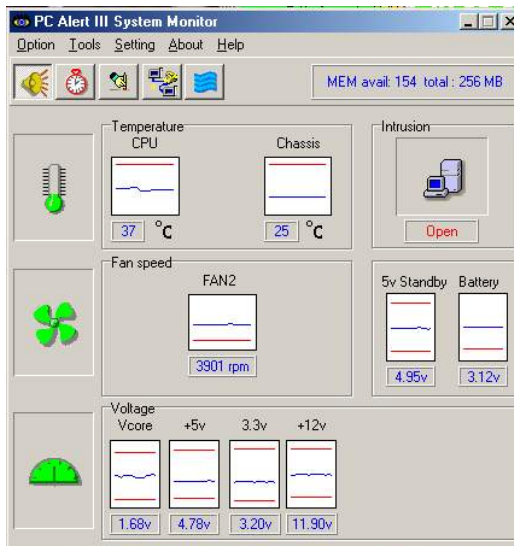


*Note: Items shown on PC Alert III vary depending on your system's status.*

## D-Bracket™ (Optional)

The D-Bracket™ which integrates four Diagnostic LEDs is optional. Definitions of the D-Bracket™ LED signals are shown below.

The D-Bracket™ uses graphic signal display to help users understand their system.  Four LEDs embedded in the mainboard provide up to 16 combinations of signals to debug the system. The 4 LEDs can debug all problems that fail the system, such as VGA, RAM or other failures. This special feature is very useful for the overclocking users. These users can use the feature to detect if there are any problems or failures.
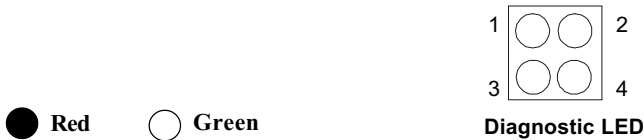
● **Red**  ○ **Green**

**Diagnostic LED**

| D-Bracket | Description |
|---|---|
| 1 ● ● 2<br>3 ● ● 4 | Processor Initialization<br>- This will show information regarding the processor<br> (like brand name, system bus, etc...) |
| ○ ●<br>● ● | Early Chipset Initialization |
| ● ○<br>● ● | Memory Detection Test<br>- Testing onboard memory size.  The D-LED will hang if the memory module is damaged or not installed properly. |
| ○ ○<br>● ● | Decompressing BIOS image to RAM for fast booting. |
| ● ●<br>○ ● | Initializing Keyboard Controller. |
| ○ ●<br>○ ● | Testing VGA BIOS<br>- This will start writing VGA sign-on message to the screen. |

*Chapter 1*

| D-Bracket | Description |
|---|---|
| 1 ● ○ 2<br>3 ○ ● 4 | Processor Initialization<br>- This will show information regarding the processor<br>  (like brand name, system bus, etc...) |
| ○ ○<br>○ ● | Testing RTC (Real Time Clock |
| ● ●<br>● ○ | Initializing Video Interface<br>- This will start detecting CPU clock, checking type of video onboard.  Then, detect and initialize the video adapter. |
| ○ ●<br>● ○ | BIOS Sign On<br>-This will start showing information about logo, processor brand name, etc... |
| ● ○<br>● ○ | Testing Base and Extended Memory<br>- Testing base memory from 240K to 640K and extended memory above 1MB using various patterns. |
| ○ ○<br>● ○ | Assign Resources to all ISA. |
| ● ●<br>○ ● | Initializing Hard Drive Controller<br>- This will initialize IDE drive and controller. |
| ○ ●<br>○ ○ | Initializing Floppy Drive Controller<br>- This will initialize Floppy Drive and controller. |
| ● ○<br>○ ○ | Boot Attempt<br>- This will set low stack and boot via INT 19h. |
| ○ ○<br>○ ○ | Operating System Booting |

## Live BIOS™/Live Driver™

The  Live BIOS™ & Live Driver™ is a tool used to detect and update your BIOS and drivers online so that you don't need to search for the correct BIOS or drivers version through the whole web site. To use the function, you need to install the "MSI Live Update Series" application. After installation, the "MSI Live Update Series" icon (as the right view) will appear on the screen.

Double click the "MSI Live Update Series" icon, and the following screen will appear.

Four buttons are placed on the left column of the screen. Click the  desired button to start the update process.

- **Live BIOS** – Updates the BIOS online. If your motherboard does not support the function, the "sorry" message is displayed.

- **Live Driver** – Updates the drivers online. If your motherboard does not support the function, the "sorry" message is displayed.

- **Live VGA BIOS** – Updates the VGA BIOS online. If your VGA device does not support the function, the "sorry" message appears.

- **Live VGA Driver** – Updates the VGA driver online. If your VGA device does not support the function, the "sorry" message is displayed.

For more information on the update instructions, insert the companion CD and refer to the "Live Update Series Guide" under the "Manual" tab.

# *Hardware Setup* *2*

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

# Central Processing Unit: CPU

The mainboard supports AMD® Athlon/Athlon XP/Duron processor. The mainboard uses a CPU socket called Socket-462 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

## CPU Installation Procedures

1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.

Open Lever

Sliding Plate

2. Look for the cut edge. The cut edge should point towards the lever pivot. The CPU will only fit in the correct orientation.

Cut edge

CPU

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

Close Lever

CPU
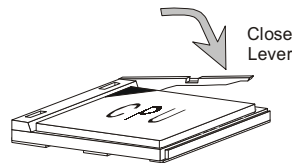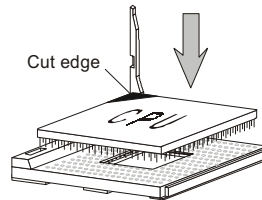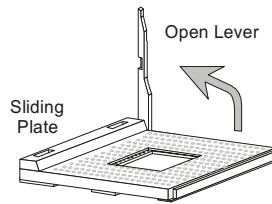
STOP  *Overheating will seriously damage the CPU and system,*
**WARNING!**  *always make sure the cooling fan can work properly to protect the CPU from overheating.*

## Thermal Issue for CPU

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly crucial when building computer systems. Maintaining the proper thermal environment is key to reliable operation. As such, the processor must be maintained in the specified thermal requirements. AMD recommends the use of high performance thermal interface material.

AMD Athlon™ processor with a speed of **600MHz and above** requires LARGER heatsink and fan. You also need to add thermal grease between the CPU and heatsink to improve heat dissipation. Then, make sure that the CPU and heatsink are securely fastened and in good contact with each other. These are needed to prevent damaging the processor and ensuring reliable operation.

You can check AMD's web site for more information on proper cooling.

## CPU Core Speed Derivation Procedure

| **If** | CPU Clock | = | 100MHz |
|---|---|---|---|
| | Core/Bus ratio | = | 7 |
| **then** | CPU core speed | = | Host Clock x Core/Bus ratio |
| | | = | 100MHz x 7 |
| | | = | 700MHz |

| | |
|---|---|
| 🛑 **WARNING!** | *While replacing the CPU, always turn off the ATX power supply or unplug the power cable of the ATX power supply from grounded outlet first to ensure the safety of CPU.* |

# Memory

The mainboard provides 3 slots for 184-pin, 2.5V unbuffered DDR DIMM. You can install PC1600/PC2100/PC2700 DDR SDRAM modules on the DDR DIMM slots (DDR 1~3). To operate properly, at least one DIMM module must be installed.



**DDR DIMM Slots
(DDR 1~3)**
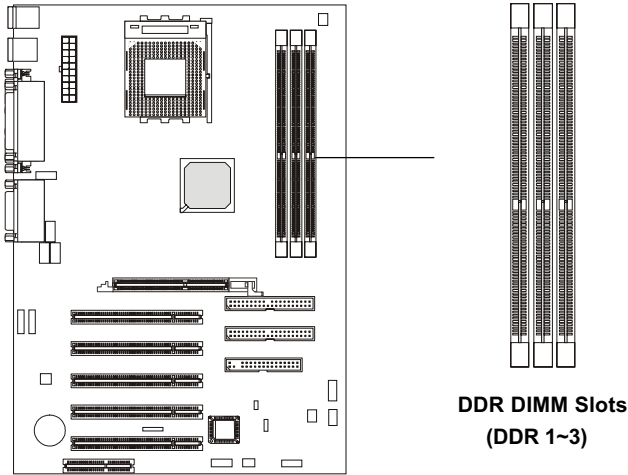
## Introduction to DDR SDRAM

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate by transferring data twice per cycle. It uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. High memory bandwidth makes DDR an ideal solution for high performance PC, workstations and servers.

## DDR Module Combination

You can install either single-sided or double-sided 184-pin DDR DIMM modules into DDR DIMM slots to meet your needs. Different from the SDR DIMM, the DDR DIMM has only one notch on the center of module. The number of pins on either side of the breaks are different. The module will only fit in the right orientation.

You can install memory modules in any combination as follows:

| Slot | Momory Module | Total Memory |
|------|---------------|--------------|
| Slot 1 | 64MB, 128MB, 256MB, 512MB, 1GB | 64MB~1GB |
| Slot 2 | 64MB, 128MB, 256MB, 512MB, 1GB | 64MB~1GB |
| Slot 3 | 64MB, 128MB, 256MB, 512MB, 1GB | 64MB~1GB |
| Maximum System Memory Supported | | 64MB~3GB |

## Installing DDR Modules

1. The DDR DIMM has only one notch on the center of module. The module will only fit in the right orientation.

2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in.



Volt        notch
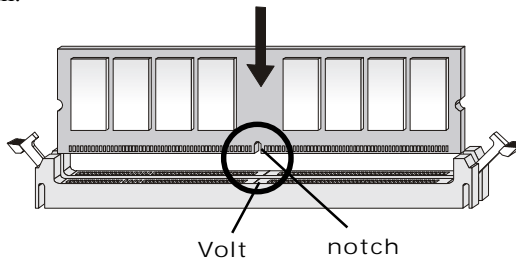
3. The plastic clip at each side of the DIMM slot will automatically close.
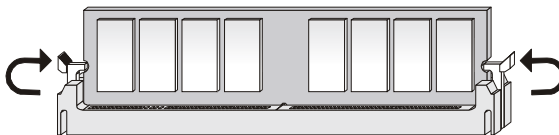
# Power Supply

The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

## ATX 20-Pin Power Connector: JPWR1

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plugs of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector. The power connector supports **instant power on** function which means that system will boot up immediately when the power supply connector is inserted on the board.
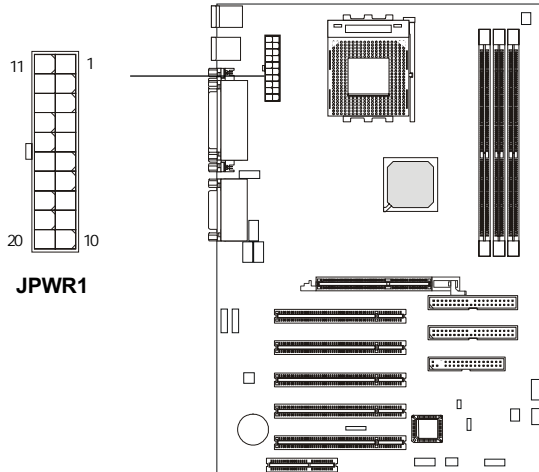


**JPWR1**

**JPWR1 Pin Definition**

| PIN | SIGNAL | PIN | SIGNAL |
|-----|--------|-----|--------|
| 1 | 3.3V | 11 | 3.3V |
| 2 | 3.3V | 12 | -12V |
| 3 | GND | 13 | GND |
| 4 | 5V | 14 | PS_ON |
| 5 | GND | 15 | GND |
| 6 | 5V | 16 | GND |
| 7 | GND | 17 | GND |
| 8 | PW_OK | 18 | -5V |
| 9 | 5V_SB | 19 | 5V |
| 10 | 12V | 20 | 5V |

# Back Panel

The Back Panel provides the following connectors:



**Mouse**   **Parallel**   **Midi/Joystick**

**Keyboard  USB      COM A        COM B       L-out  L-in  MIC**
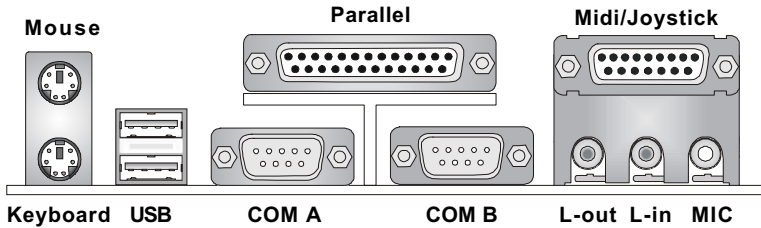
## Mouse Connector: JKBMS1

The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The connector location and pin assignments are as follows:
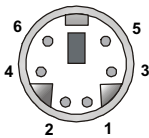


**PS/2 Mouse (6-pin Female)**

**Pin Definition**

| PIN | SIGNAL | DESCRIPTION |
|-----|--------|-------------|
| 1 | Mouse DATA | Mouse DATA |
| 2 | NC | No connection |
| 3 | GND | Ground |
| 4 | VCC | +5V |
| 5 | Mouse Clock | Mouse clock |
| 6 | NC | No connection |

## Keyboard Connector: JKBMS1

The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a PS/2® keyboard.  You can plug a PS/2® keyboard directly into this connector.

**Pin Definition**

| PIN | SIGNAL | DESCRIPTION |
|-----|--------|-------------|
| 1 | Keyboard DATA | Keyboard DATA |
| 2 | NC | No connection |
| 3 | GND | Ground |
| 4 | VCC | +5V |
| 5 | Keyboard Clock | Keyboard clock |
| 6 | NC | No connection |
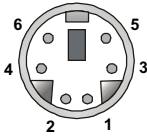
**PS/2 Keyboard (6-pin Female)**

## USB Connectors

The mainboard provides a UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices.  You can plug the USB device directly into ths connector.
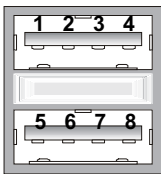
**USB Port Description**

| PIN | SIGNAL | DESCRIPTION |
|-----|--------|-------------|
| 1 | VCC | +5V |
| 2 | -Data 0 | Negative Data Channel 0 |
| 3 | +Data0 | Positive Data Channel 0 |
| 4 | GND | Ground |
| 5 | VCC | +5V |
| 6 | -Data 1 | Negative Data Channel 1 |
| 7 | +Data 1 | Positive Data Channel 1 |
| 8 | GND | Ground |

**USB Ports**

## Serial Port Connector: COM A & COM B

The mainboard offers two 9-pin male DIN connectors as serial ports COM A and COM B. The ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to them.

**1  2  3  4  5**

**6  7  8  9**

**9-Pin Male DIN Connectors**
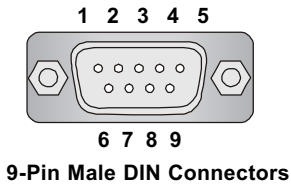
**Pin Definition**

| PIN | SIGNAL | DESCRIPTION |
|-----|--------|-------------|
| 1 | DCD | Data Carry Detect |
| 2 | SIN | Serial In or Receive Data |
| 3 | SOUT | Serial Out or Transmit Data |
| 4 | DTR | Data Terminal Ready) |
| 5 | GND | Ground |
| 6 | DSR | Data Set Ready |
| 7 | RTS | Request To Send |
| 8 | CTS | Clear To Send |
| 9 | RI | Ring Indicate |

## Joystick/Midi Connectors

You can connect a joystick or game pad to this connector.
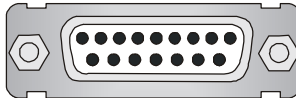
## Audio Port Connectors

**Line Out** is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

**1/8" Stereo Audio Connectors**

**Line Out   Line In    MIC**
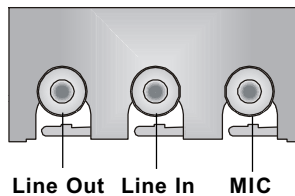
## Parallel Port Connector: LPT1

The mainboard provides a 25-pin female centronic connector for LPT. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.
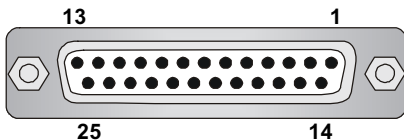
**Pin Definition**

| PIN | SIGNAL | DESCRIPTION |
|-----|--------|-------------|
| 1 | STROBE | Strobe |
| 2 | DATA0 | Data0 |
| 3 | DATA1 | Data1 |
| 4 | DATA2 | Data2 |
| 5 | DATA3 | Data3 |
| 6 | DATA4 | Data4 |
| 7 | DATA5 | Data5 |
| 8 | DATA6 | Data6 |
| 9 | DATA7 | Data7 |
| 10 | ACK# | Acknowledge |
| 11 | BUSY | Busy |
| 12 | PE | Paper End |
| 13 | SELECT | Select |
| 14 | AUTO FEED# | Automatic Feed |
| 15 | ERR# | Error |
| 16 | INIT# | Initialize Printer |
| 17 | SLIN# | Select In |
| 18 | GND | Ground |
| 19 | GND | Ground |
| 20 | GND | Ground |
| 21 | GND | Ground |
| 22 | GND | Ground |
| 23 | GND | Ground |
| 24 | GND | Ground |
| 25 | GND | Ground |

# Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, case, modem, LAN, USB Ports, IR module and CPU/System FAN.

## Floppy Disk Drive Connector: FDD1

The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.

**FDD1**
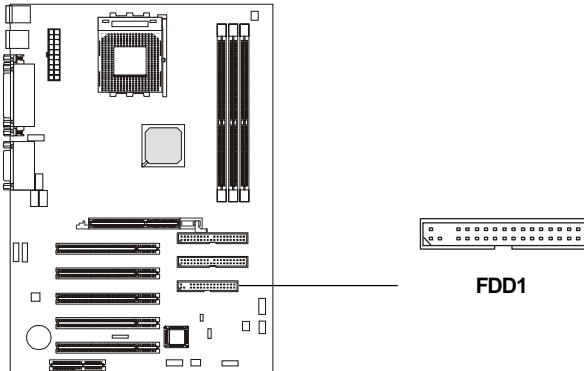
## IrDA Infrared Module Header: JIR1

This connector allows you to connect to IrDA Infrared modules. You must configure the setting through the BIOS setup to use the IR function. The JIR1 is compliant to Intel Front Panel I/O Connectivity Design Guide.

**JIR1**

**JIR1 Pin Definition**

| Pin | Signal |
|-----|--------|
| 1 | NC |
| 2 | NC |
| 3 | VCC5 |
| 4 | GND |
| 5 | IRTX |
| 6 | IRRX |
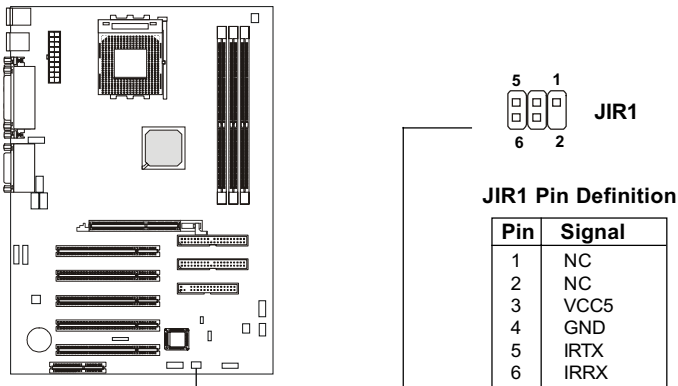
## Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA/33/66/100 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices. These connectors support the provided IDE hard disk cable.
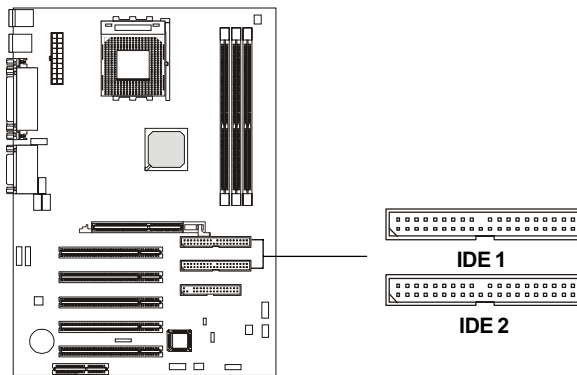


**IDE1** (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

**IDE2** (Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

**TIP:**

*If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.*

## CD-In Connector: JCD1

The connector is for CD-ROM audio connector.

## Aux Line-In Connector: JAUX1

The connector is for DVD add-on card with Line-in connector.

## Modem-In Connector: JMD1

The connector is for modem with internal audio connector.
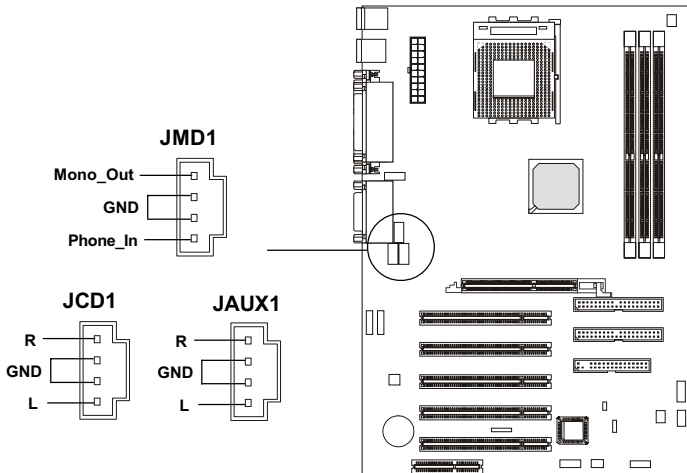
## Fan Power Connectors: CFAN1/SFAN1

The CFAN1 (processor fan) and SFAN1 (system fan) support system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.



GND
+12V
SENSOR

CFAN1

GND
+12V
SENSOR

SFAN1
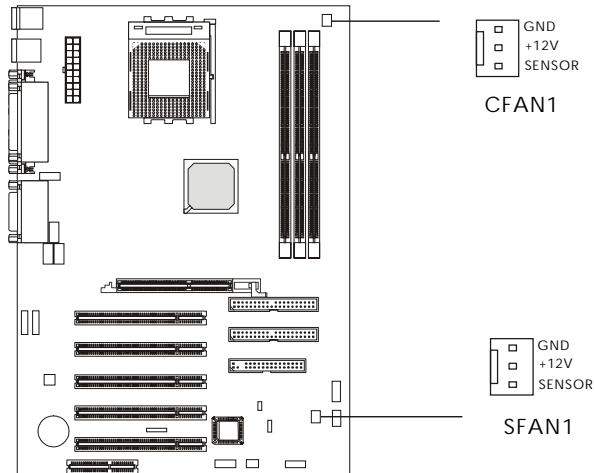
**Note:**
1. *Always consult the vendor for proper CPU cooling fan.*
2. *CPU Fan supports the fan control. You can install the PC Alert utility that will automatically control the CPU Fan speed according to the actual CPU temperature.*

# Wake On Ring Connector: JWR1

This connector allows you to connect to a modem card with Wake On Ring function. The connector will power up the system when a signal is received through the modem card.
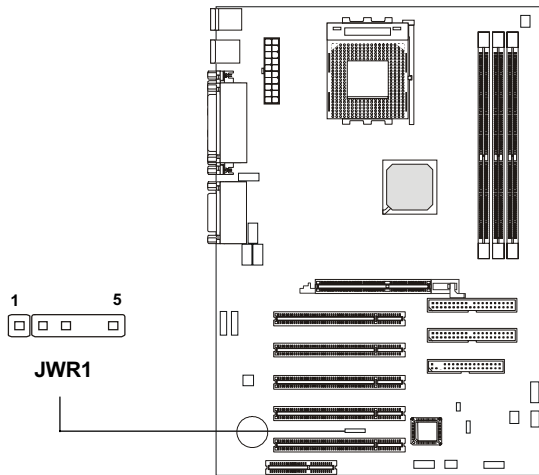


| Pin | Signal |
|-----|--------|
| 1 | NC |
| 2 | GND |
| 3 | MDM_WAKEUP |
| 4 | NC |
| 5 | 5VSB |

## Front Panel Connectors: JFP1 & JFP2

The mainboard provides two front panel connectors for electrical connection to the front panel switches and LEDs. Both JFP1 and JFP2 are compliant with Intel® Front Panel I/O Connectivity Design Guide.
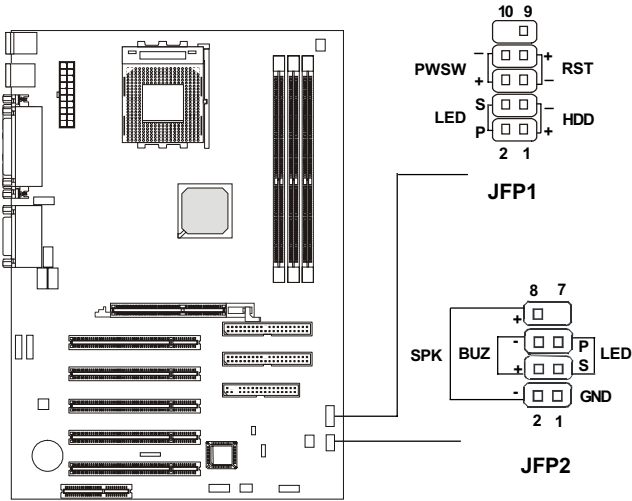


JFP1

JFP2

### JFP2 Pin Definition

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | GND | 5 | PLED |
| 2 | SPK- | 6 | BUZ- |
| 3 | SLED | 7 | NC |
| 4 | BUZ+ | 8 | SPK+ |

### JFP1 Switch/LED Front Panel Electrical Connection

| PIN | SIGNAL | DESCRIPTION |
|-----|--------|-------------|
| 1 | HD_LED_P | Hard disk LED pull-up to +5V |
| 2 | FP PWR/SLP | MSG LED pull-up to +5V |
| 3 | HD_LED_N | Hard disk active LED |
| 4 | FP PWR/SLP | MSG LED pull-up to +5V |
| 5 | RST_SW_N | Reset Switch low reference pull-down to GND |
| 6 | PWR_SW_P | Power Switch high reference pull-up to +5V |
| 7 | RST_SW_P | Reset Switch high reference pull-up to +5V |
| 8 | PWR_SW_N | Power Switch low reference pull-down to GND |
| 9 | RSVD_DNU | Reserved. Do not use. |

## Front Panel Audio Connector: JAUD1

You can connect an optional audio connector to the JAUD1 front panel audio connector. The JAUD1 is compliant to Intel® Front Panel I/O Connectivity Design Guide.

**9**     1

10     **2**

**JAUD1**
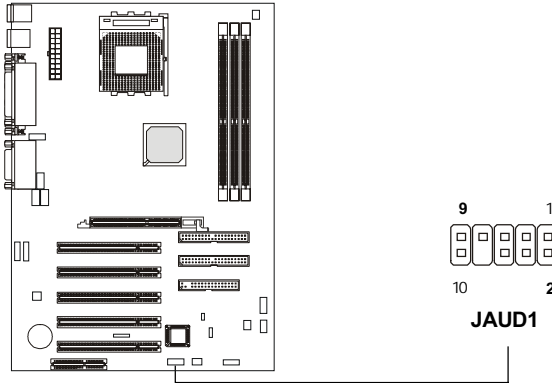
**Pin Definition**

| PIN | SIGNAL | DESCRIPTION |
|-----|--------|-------------|
| 1 | AUD_MIC | Front panel microphone input signal |
| 2 | AUD_GND | Ground used by analog audio circuits |
| 3 | AUD_MIC_BIAS | Microphone power |
| 4 | AUD_VCC | Filtered +5V used by analog audio circuits |
| 5 | AUD_FPOUT_R | Right channel audio signal to front panel |
| 6 | AUD_RET_R | Right channel audio signal return from front panel |
| 7 | HP_ON | Reserved for future use to control headphone amplifier |
| 8 | KEY | No pin |
| 9 | AUD_FPOUT_L | Left channel audio signal to front panel |
| 10 | AUD_RET_L | Left channel audio signal return from front panel |

**STOP** Note:
*If you don't want to connect to the front audio header, pins 5 and 6, 9 and 10 have to be shorted by jumper caps in order to have signal output directed to the rear audio ports.*

**9**   5

10   **6**
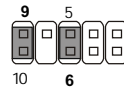
## Front USB Connectors: JUSB1

The mainboard provides one Front USB (Universal Serial Bus) pin header for users to connect to USB ports. JUSB1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.
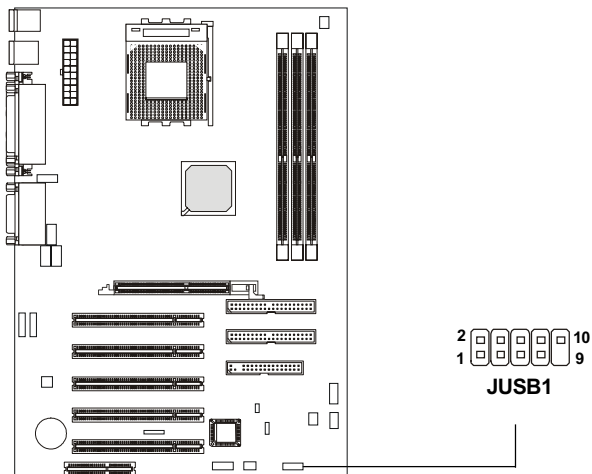


JUSB1

**JUSB1 Pin Definition**

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | USBPWR | 2 | USBPWR |
| 3 | USBP0- | 4 | USBP1- |
| 5 | USBP0+ | 6 | USBP1+ |
| 7 | GND | 8 | GND |
| 9 | NC | 10 | USBOC |

## Chassis Intrusion Switch Connector: JCI1

This connector is connected to a 2-pin chassis switch. If the chassis is opened, the switch will be short. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record. JCI1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.
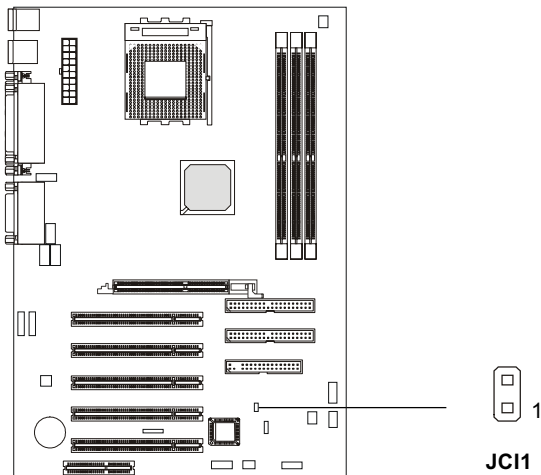


JCI1

**JCI1 Pin Definition**

| Pin | Signal |
|-----|--------|
| 1 | CINTRU (Chassis intrusion) |
| 2 | GND |

## IEEE 1394 Connectors: J1394-1 & J1394-2 (optional)

The mainboard provides two 1394 pin headers that allow you to connect optional IEEE 1394 ports.
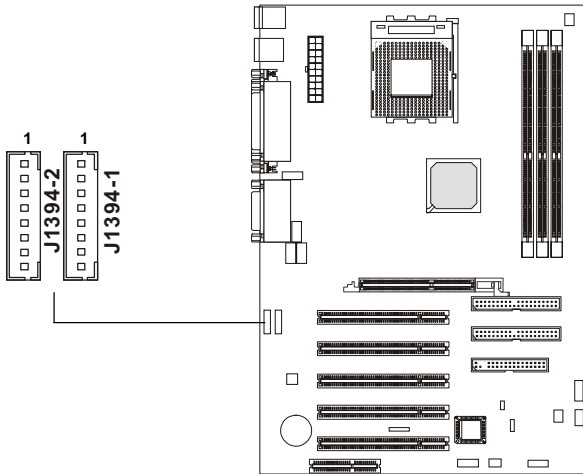


| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | PWR | 5 | TPA- |
| 2 | GND | 6 | TPA+ |
| 3 | TPB- | 7 | SHLD |
| 4 | TPB+ | 8 | SHLD |

**How to attach the IEEE 1394 Port:**

   1. Take out the IEEE 1394 Port.



   2. Locate the IEEE 1394 connectors (J6 & J7) on the mainboard.



   3. Insert the IEEE 1394 Port into the connector.



   4. Place the IEEE 1394 Port into the first slot of your system case.

## D-Bracket™ Connector: JDB1

The mainboard comes with a JDB1 connector for you to connect to D-Bracket™. D-Bracket™ is a USB Bracket integrating four LEDs and allows users to identify system problem through 16 various combinations of LED signals. For definitions of 16 signal combinations, please refer to *Chapter 1. D-Bracket™*.



**JDB1**

9     1
10     2

Connected to JDB1

Connected to JUSB1

**D-Bracket™**

1 2
3 4
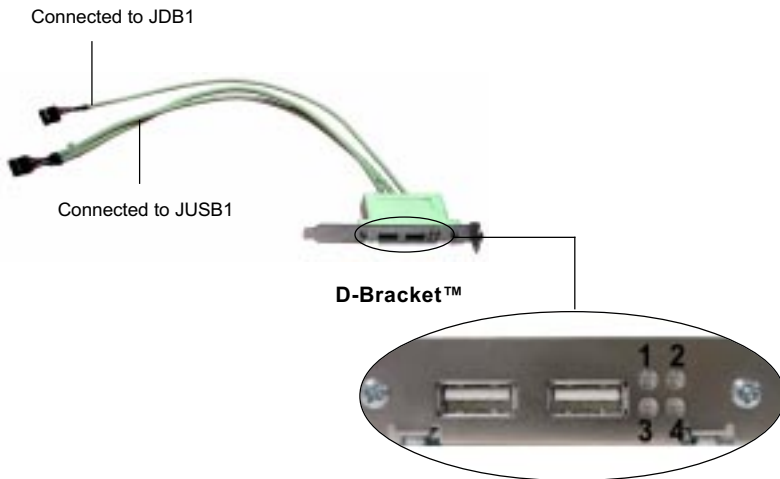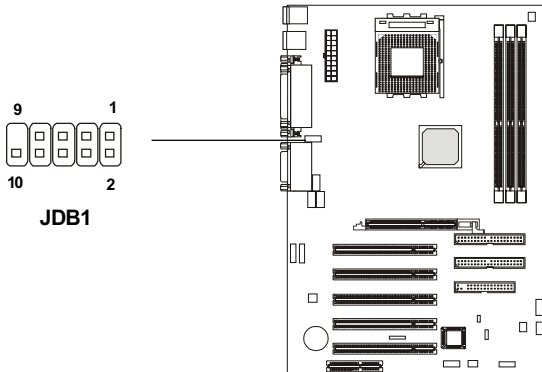
# Jumpers

The motherboard provides one jumper for you to set the computer's function. This section will explain how to change your motherboard's function through the use of the jumper.

## Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. That battery has long life time for at least 5 years. If you want to clear the system configuration, use the JBAT1 (Clear CMOS Jumper ) to clear data. Follow the instructions below to clear the data:

**JBAT1**

**1**
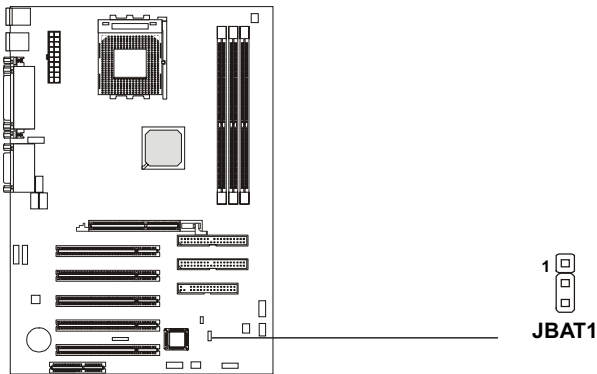
Keep CMOS          Clear CMOS

**1**
**3**

**1**
**3**

> **STOP**
> **WARNING!**
> *You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.*

# Slots

The motherboard provides five 32-bit Master PCI bus slots, one AGP slot and one CNR slot.
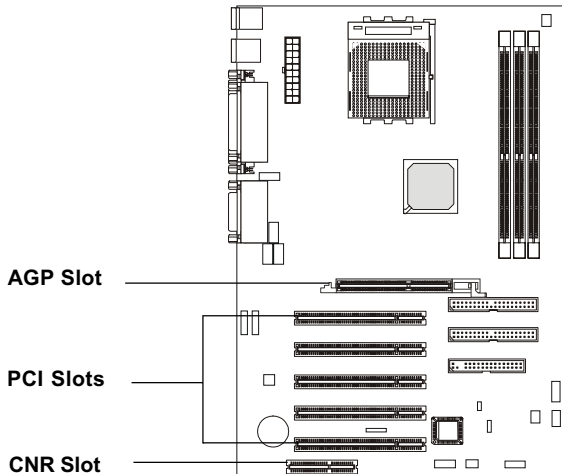


## AGP (Accelerated Graphics Port) Slot

The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory and provides three levels of throughputs: 1x (266Mbps), 2x (533Mbps) and 4x (1.07Gbps).

## PCI Slots

Five PCI slots allow you to insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

## CNR (Communication Network Riser)

The CNR slot allows you to insert the CNR expansion cards. CNR is a specially designed network, audio, or modem riser card for ATX family motherboards. Its main processing is done through software and controlled by the motherboard's chipset.

## PCI Interrupt Request Routing

The IRQ, abbreviation of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

|            | Order 1 | Order 2 | Order 3 | Order 4 |
|------------|---------|---------|---------|---------|
| PCI Slot 1 | INT A#  | INT B#  | INT C#  | INT D#  |
| PCI Slot 2 | INT B#  | INT C#  | INT D#  | INT A#  |
| PCI Slot 3 | INT C#  | INT D#  | INT A#  | INT B#  |
| PCI Slot 4 | INT D#  | INT A#  | INT B#  | INT C#  |
| PCI Slot 5 | INT A#  | INT B#  | INT C#  | INT D#  |

# *AMI BIOS Setup* *3*

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

■ An error message appears on the screen during the system booting up, and requests you to run SETUP.

■ You want to change the default settings for customized features.

# Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

DEL:Setup       F11:Boot Menu        F12:Network boot        TAB:Logo

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

## Selecting the First Boot Device

You are allowed to select the 1st boot device without entering the BIOS setup utility by pressing <F11>. When the same message as listed above appears on the screen, press <F11> to trigger the boot menu.

The POST messages might pass by too quickly for you to respond in time. If so, restart the system and press <F11> after around 2 or 3 seconds to activate the boot menu similar to the following.

| Select First Boot Device | | |
| --- | --- | --- |
| Floppy | : 1st Floppy | |
| IDE-0 | : IBM-DTLA-307038 | |
| CDROM | : ATAPI CD-ROM DRIVE 40X M | |
| [Up/Dn] Select | [RETURN] Boot | [ESC] cancel |

The boot menu will list all the bootable devices. Select the one you want to boot from by using arrow keys and then pressing <Enter>. The system will boot from the selected device. The selection will not make changes to the settings in the BIOS setup utility, so next time when you power on the system, it will still use the original first boot device to boot up.

# Control Keys

| | |
|---|---|
| <↑> | Move to the previous item |
| <↓> | Move to the next item |
| <←> | Move to the item in the left hand |
| <→> | Move to the item in the right hand |
| <Enter> | Select the item |
| <Esc> | Jumps to the Exit menu or returns to the main menu from a submenu |
| <+/PU> | Increase the numeric value or make changes |
| <-/PD> | Decrease the numeric value or make changes |
| <F5> | Restore the previous CMOS value from CMOS, only for Option Page Setup Menu |
| <F6> | Load High Performance Defaults |
| <F7> | Load BIOS Setup Defaults |
| <F10> | Save all the CMOS changes and exit |

# Getting Help

After entering the Setup utility, the first screen you see is the Main Menu.

### Main Menu

The main menu displays the setup categories the BIOS supplies. You can use the arrow keys ( ↑↓ ) to select the item. The on-line description for the selected setup category is displayed at the bottom of the screen.

### Default Settings

The BIOS setup program contains two kinds of default settings: the BIOS Setup and High Performance defaults. Bios Setup defaults provide stable but minimal performance settings for all devices and the system, while High Performance defaults provide the best system performance but may affect the system stability.

# The Main Menu

Once you enter AMIBIOS SIMPLE SETUP UTILITY, the Main Menu will appear on the screen. The Main Menu displays twelve configurable functions and two exit choices. Use arrow keys to move among the items and press <Enter> to enter the sub-menu.
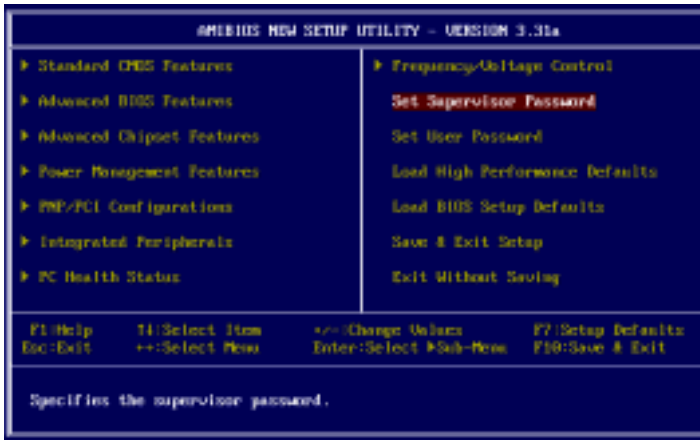


**Standard CMOS Features**
Use this menu for basic system configurations, such as time, date etc.

**Advanced BIOS Features**
Use this menu to setup the items of AMI® special enhanced features.

**Advanced Chipset Features**
Use this menu to change the values in the chipset registers and optimize your system's performance.

**Power Management Setup**
Use this menu to specify your settings for power management.

**PNP/PCI Configurations**
This entry appears if your system supports PnP/PCI.

**Integrated Peripherals**

Use this menu to specify your settings for integrated peripherals.

**PC Health Status**

This entry shows your PC health status.

**Frequency/Voltage Control**

Use this menu to specify your settings of frequency/voltage control.

**Set Supervisor Password**

Use this menu to set Supervisor Password.

**Set User Password**

Use this menu to set User Password.

**Load High Performance Defaults**

Use this menu to load the BIOS values for the best system performance, but the system stability may be affected.

**Load BIOS Setup Defaults**

Use this menu to load factory default settings into the BIOS for stable system performance operations.

**Save & Exit Setup**

Save changes to CMOS and exit setup.

**Exit Without Saving**

Abandon all changes and exit setup.

# Standard CMOS Features

The items inside STANDARD CMOS SETUP menu are divided into 9 categories. Each category includes none, one or more setup items. Use the arrow keys to highlight the item you want to modify and use the <PgUp> or <PgDn> keys to switch to the value you prefer.



**Date**
This allows you to set the system to the date that you want (usually the current date).   The format is <day><month> <date> <year>.

| | |
|---|---|
| **day** | Day of the week, from Sun to Sat, determined by BIOS.  Read-only. |
| **month** | The month from Jan. through Dec. |
| **date** | The date from 1 to 31 can be keyed by numeric function keys. |
| **year** | The year can be adjusted by users. |

**Time**
This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

**Pri Master/Pri Slave/Sec Master/Sec Slave**
Press PgUp/<+> or PgDn/<-> to select the hard disk drive type. The specification of hard disk drive will show up on the right hand according to your selection.

| | |
|---|---|
| TYPE | Type of the device. |
| SIZE | Capacity of the device. |
| CYLS | Number of cylinders. |
| HEAD | Number of heads. |
| PRECOMP | Write precompensation. |
| LANDZ | Cylinder location of Landing zone. |
| SECTOR | Number of sectors. |
| MODE | Access mode. |

**Floppy Drive A:/B:**
This item allows you to set the type of floppy drives installed. Available options: *Not Installed*, *360 KB 5¼*, *1.2 MB 5¼*, *720 KB 3½*, *1.44 MB 3½* and *2.88 MB 3½*.

**Boot Sector Virus Protection**
The item is to set the Virus Warning  feature for IDE Hard Disk boot sector protection. When *Enabled*, BIOS will issue a virus warning message and beep if a write to the boot sector or the partition table of the HDD is attempted. Setting options: *Disabled* and *Enabled*.

*Note: This feature only protects the boot sector, not the whole hard disk.*

# Advanced BIOS Features
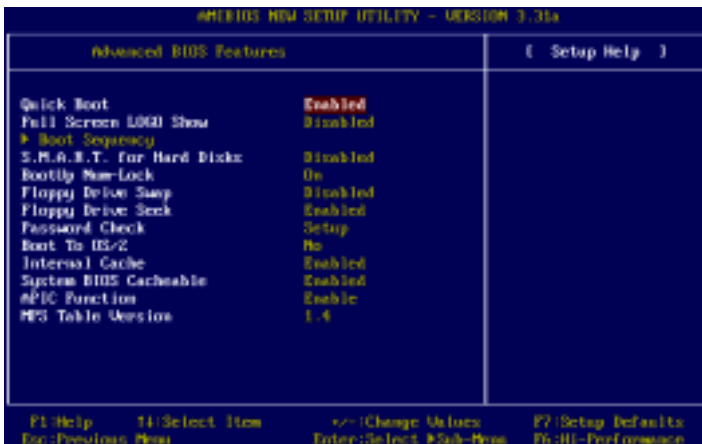


**Quick Boot**

Setting the item to *Enabled* allows the system to boot within 5 seconds since it will skip some check items. Available options: *Enabled* and *Disabled*.

**Full Screen Logo Show**

This item enables you to show the company logo on the bootup screen. Settings are:

| | |
|---|---|
| *Disabled* | Shows the POST messages at boot. |
| *Enabled* | Shows a still image (logo) on the full screen at boot. |

**Boot Sequency**

**1st/2nd/3rd Boot**

The items allow you to set the sequence of boot devices where AMIBIOS attempts to load the operating system. The settings are:

| | |
|---|---|
| *IDE-0* | The system will boot from the first HDD. |
| *IDE-1* | The system will boot from the second HDD. |
| *IDE-2* | The system will boot from the third HDD. |
| *IDE-3* | The system will boot from the fourth HDD. |
| *Floppy* | The system will boot from floppy drive. |
| *ARMD-FDD* | The system will boot from any ARMD device, such as LS-120 or ZIP drive, that functions as a floppy drive. |
| *ARMD-HDD* | The system will boot from ARMD device, such as MO or ZIP drive, that functions as hard disk drive. |
| *CDROM* | The system will boot from the CD-ROM. |
| *SCSI* | The system will boot from the SCSI. |
| *NETWORK* | The system will boot from the Network drive. |
| *BBS-0* | The system will boot from the first BBS (BIOS Boot Specification) compliant device. |
| *BBS-1* | The system will boot from the second BBS (BIOS Boot Specification) compliant device. |
| *BBS-2* | The system will boot from the third BBS (BIOS Boot Specification) compliant device. |
| *BBS-3* | The system will boot from the fourth BBS (BIOS Boot Specification) compliant device. |
| *Disabled* | Disable this sequence. |

*Note: Available settings for "1st/2nd/3rd Boot Device" vary depend-ing on the bootable devices you have installed. For example, if you did not install a floppy drive, the setting "Floppy" does not show up.*

**Other Boot Device**

Setting the option to *Yes* allows the system to try to boot from other devices if the system fails to boot from the 1st/2nd/3rd boot device.

**S.M.A.R.T. for Hard Disks**

This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Re-porting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an oppor-

tunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline. Settings: *Enabled* and *Disabled*.

**BootUp Num-Lock**
This item is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow end users to use the arrow keys on the numeric keypad. Setting options: *On* and *Off*.

**Floppy Drive Swap**
Setting to *Enabled* will swap floppy drives A: and B:.

**Floppy Drive Seek**
This setting causes the BIOS to search for floppy disk drives at boot time. When enabled, the BIOS will activate the floppy disk drives during the boot process: the drive activity light will come on and the head will move back and forth once. First A: will be done and then B: if it exists. Setting options: *Disabled*, *Enabled*.

**Password Check**
This specifies the type of AMIBIOS password protection that is implemented. Setting options are described below.

| Option | Description |
| --- | --- |
| Setup | The password prompt appears only when end users try to run Setup. |
| Always | A password prompt appears every time when the computer is powered on or when end users try to run Setup. |

**Boot to OS/2**
This allows you to run the OS/2® operating system with DRAM larger than 64MB. When you choose *No*, you cannot run the OS/2® operating system with DRAM larger than 64MB. But it is possible if you choose *Yes*.

**Internal Cache**
Cache memory is additional memory that is much faster than conventional DRAM (system memory). When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster

access by the CPU. The setting enables/disables the internal cache (also known as L1 or level 1 cache). Setting to *Enabled* will speed up the system performance.

**System BIOS Cacheable**
Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Setting options: *Enabled, Disabled*.

**APIC Function**
This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system. Settings: *Enabled* and *Disabled*.

**MPS Table Version**
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: *1.4* and *1.1*.

# Advanced Chipset Features
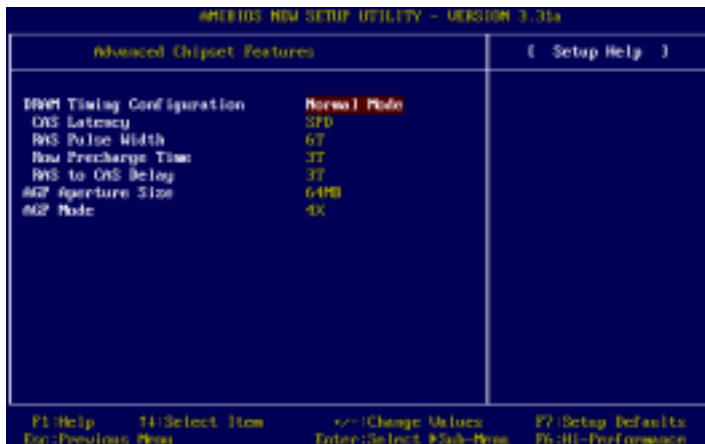


*Note: Change these settings only if you are familiar with the chipset.*

**DRAM Timing Configuration**
The DRAM timing is controlled by the DRAM Timing Registers. The Timings programmed into this register are dependent on the system design. Slower rates may be required in certain system designs to support loose layouts or slower memory. Setting options: *Safe mode, Normal mode, Fast mode* and *Turbo mode*.

**CAS Latency**
The field controls the CAS latency, which determines the timing delay before SDRAM starts a read command after receiving it. Setting options: *By SPD, 2.5 T, 2 T*. *2T* increases system performance while *2.5 T* provides more stable system performance. Setting to *By SPD* enables *DRAM CAS# Latency* automatically to be determined by BIOS based on the configurations on the SPD (Serial Presence Detect) EEPROM on the DRAM module.

**RAS Pulse Width**
This setting allows you to select the number of clock cycles allotted for the RAS pulse width, according to DRAM specifications. The less the clock

cycles, the faster the DRAM performance.  Settings: *6T* and *5T*.

### Row Precharge Time
This setting controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Setting options: *2 T*, *3 T*.

### RAS to CAS Delay
When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance. Setting options: *3 T*, *2 T*.

### AGP Aperture Size
The field selects the size of the Accelerated Graphics Port (AGP) aperture. Aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. Settings: *4MB*, *8MB*, *16MB*, *32MB*, *64MB*, *128MB*.

### AGP Mode
The item sets an appropriate mode for the installed AGP card.  Settings are: *1x, 2x, 4x.*  Select 4x only if your AGP card can support it.

# Power Management Setup



**IPCA Function**
This item is to activate the ACPI (Advanced Configuration and Power Man-agement Interface) function. If your operating system is ACPI-aware, such as Windows 98SE/2000/ME, select *Yes*. Available options: *Yes* and *No*.

**ACPI Standby State**
This item specifies the power saving modes for ACPI function. Options are:

*S1/POS*     The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.

*S3/STR*     The S3 sleep mode is a lower power state where the infor-mation of system cofiguration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when an "wake up" event occurs.

*Auto*        The operating system will determine when to enter S1 or S3 mode.

**Power Management**
Setting to *Enabled* will activate an Advanced Power Management (APM) device to enhance Max Saving mode and stop CPU internal clock. Settings are *Disabled* and *Enabled*.

**Init VGA BIOS By S3**
This setting allows the system to initialize the VGA BIOS when system resumes from S3 (Suspend to RAM). Settings: *Enabled* and *Disabled*.

**Power/Sleep LED**
This item configures how the system uses power LED on the case to indicate the sleep state. Available options are:

| | |
|---|---|
| *Single LED* | The power LED blinks to indicate the sleep state without changing its color. |
| *Dual LED* | The power LED changes its color to indicate the sleep state. |

**Suspend Time Out**
After the selected period of system inactivity, all devices except the CPU shut off. Settings: *Disabled, 1 min, 2 min, 3 min, 4 min, 5 min, 10 min, 15 min, 20 min, 30 min*.

**Power Button Function**
This feature sets the function of the power button. Settings are:

| | |
|---|---|
| *On/ Off* | The power button is a normal power on/off function key. |
| *Suspend* | When you press the power button, the computer enters the suspend/sleep mode, but if the button if pressed for more than four seconds, the computer is turned off. |

**After AC Power Loss**
This setting specifies whether your system will reboot after a power failure or interrupts occurs. Available settings are:

| | |
|---|---|
| *Power Off* | Leaves the computer in the power off state. |
| *Power On* | Reboots the computer. |
| *Last State* | Restores the system to the status before power failure or interrupt occurs. |

**Set Wake Up Events**
Press <Enter> to enter the sub-menu and the following screen appears:
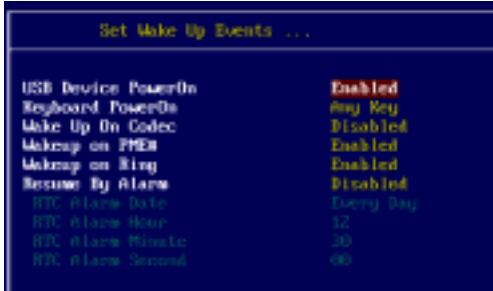


**USB Device PowerOn, Wake Up On Codec, Wakeup on PME#, Wakeup on Ring**
These items specify whether the system will be awakened from power savingh modes when activity or input signal of the specified hardware peripheral or component is detected.

🔍 *Note 1: You need to install a modem supporting power on function for Wake Up On Ring function.*

*Note 2: If you change these settings, you must reboot the system until it enters the operating system and then power off the system. By doing so, the changed settings will come into effect next time when you power on the system.*

**Keyboard PowerOn**
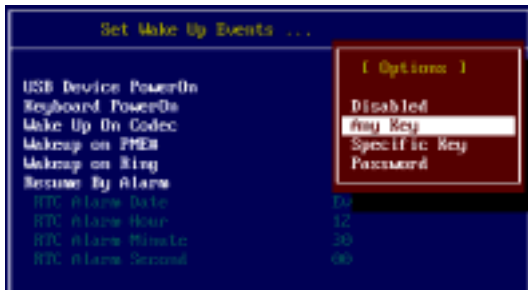
The item specify how the system will be awakened from power saving mode when input signal of the keyboard is detected.  If set to *Specific Key*, <Ctrl+Alt+BackSpace> is the only one Power On event.  If set to *Password*, please press <Enter> to input password and its maximum password is 5 character.  Options are: *Disabled, Any Key, Specific Key and Password*.

**Resume By Alarm**

If *Resume By Alarm* is set to *Enabled*, the system will automatically resume (boot up) on a specific date/hour/minute/second specified in these fields.  Available settings for each item are:

Alarm Date              01~31, Every Day
Alarm Hour              00~23
Alarm Minute            00~59
Alarm Second            00~59

# PNP/PCI Configurations

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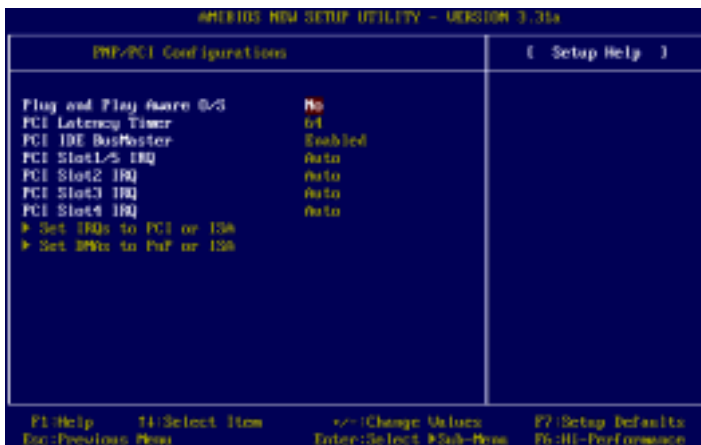


**Plug and Play Aware O/S**
When set to *YES*, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows 98, 2000 or ME. When set to *NO*, BIOS will initialize all the PnP cards. Select *Yes* if the operating system is Plug & Play aware.

**PCI Latency Timer**
This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values. Settings range from 32 to 248 at a 32 increment.

**PCI IDE Bus Master**

Set this option to *Enabled* to specify that the IDE controller on the PCI local bus has bus mastering capability. Options are *Disabled* and *Enabled*.

**PCI Slot 1/5 IRQ, PCI Slot 2 IRQ, PCI Slot 3 IRQ, PCI Slot 4 IRQ**

This item specifies the IRQ line for each PCI slot. Settings: *3, 4, 5, 7, 9, 10, 11* and *Auto*. Selecting *Auto* allows BIOS to automatically determine the IRQ line for each PCI slot.

**Set IRQs to PCI or ISA**

Press <Enter> to enter the sub-menu and the following screen appears:
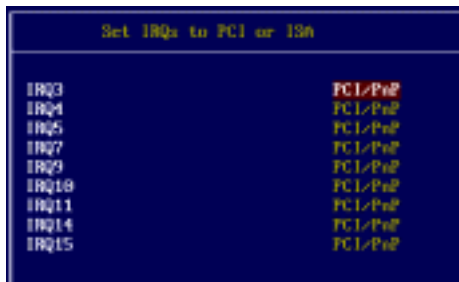


### IRQ 3/4/5/7/9/10/11/14/15

These items specify the bus where the specified IRQ line is used. The settings determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the IRQ pool, the end user can use these settings to reserve the IRQ by assigning an *ISA/EISA* setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as *PCI/PnP*. If all IRQs are set to ISA/EISA, and IRQ 14/15 are allocated to the onboard PCI IDE, IRQ 9 will still be available for PCI and PnP devices. available settings: *ISA/EISA* and *PCI/PnP*.

**Set DMAs to PnP or ISA**

Press <Enter> to enter the sub-menu and the following screen appears:
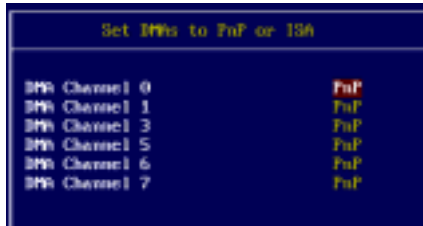


### DMA Channel 0/1/3/5/6/7

These items specify the bus that the system DMA (Direct Memory Access) channel is used.

The settings determine if AMIBIOS should remove a DMA from the available DMAs passed to devices that are configurable by the system BIOS. The available DMA pool is determined by reading the ESCD NVRAM. If more DMAs must be removed from the pool, the end user can reserve the DMA by assigning an *ISA/DISA* setting to it.

# Integrated Peripherals
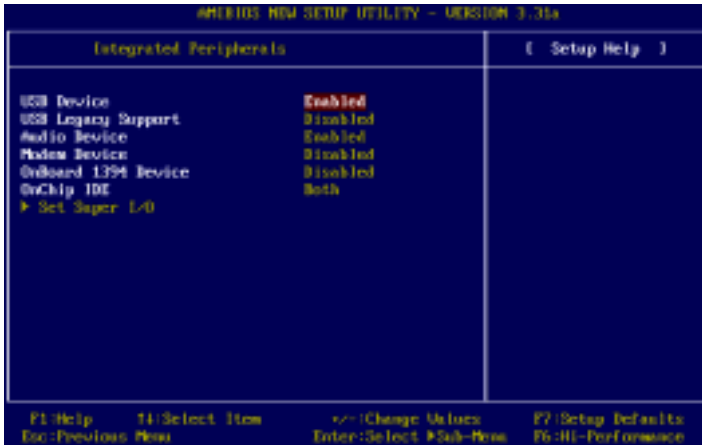


**USB Device**
This setting is used to enable/disable the onboard USB controllers. Settings: *Enabled*, *Disabled*.

**USB Legacy Support**
Set to *KeyB+Mouse+FDD* if your need to use any USB device in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix. Setting options: *Disabled, KeyB+Mouse+FDD*.

**Audio Device**
*Enabled* allows the mainboard to detect whether an audio device is used. If the device is detected, the onboard AC'97 (Audio Codec'97) controller will be enabled; if not, it is disabled. Disable the controller if you want to use other controller cards to connect an audio device. Settings: *Enabled*, *Disabled*.

**Modem Device**
*Enabled* allows the mainboard to detect whether a modem is used. If a modem is used, the onboard MC'97 (Modem Codec'97) controller will be enabled; if not, it is disabled. Disable the controller if you want to use other controller cards to connect to a modem. Settings: *Enabled*, *Disabled*.

**OnBoard 1394 Device**
This setting controls the onboard 1394 device.  Settings: *Disabled, S200, S400*.

**On-Chip IDE**
This setting controls the on-chip IDE controller. Setting options: *Disabled*, *Primary*, *Secondary, Both*.

**Set Super I/O**
Press <Enter> to enter the sub-menu and the following screen appears:



```
            Set Super I/O

FDC Function                    Auto
Serial Port1                    Auto
Serial Port2                    Auto
  Serial Port2 Mode             Normal
    IR Pin Select               IRRX/IRTX
Parallel Port                   Auto
  Port Mode                     ECP
    EPP Version                 N/A
    IRQ                         Auto
    DMA Channel                 Auto
OnBoard Midi Port               330h
  Midi IRQ Select               5
OnBoard Game Port               200h
```
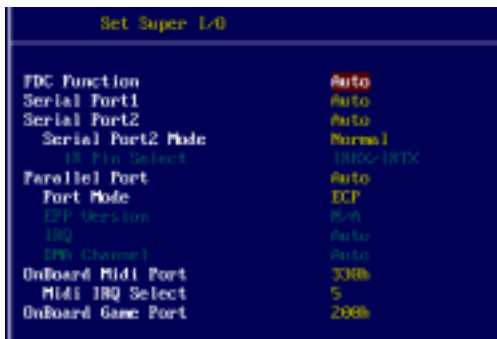
**FDC Function**
This is used to enable or disable the onboard Floppy controller.

| Option | Description |
|---|---|
| Auto | BIOS will automatically determine whether to enable the onboard Floppy controller or not. |
| Enabled | Enables the onboard Floppy controller. |
| Disabled | Disables the onboard Floppy controller. |

**Serial Port 1/2**
These items specify the base I/O port addresses of the onboard Serial Port 1 (COM A)/Serial Port 2 (COM B).  Selecting *Auto* allows AMIBIOS to automatically determine the correct base I/O port address. Settings: *Auto, 3F8/COM1*, *2F8/COM2*, *3E8/COM3*, *2E8/COM4* and *Disabled*.

**Serial Port2 Mode**
This item sets the operation mode for Serial Port 2. Settings: *Normal*,

*1.6uS*, *3/16 Baud* and *ASKIR* (the last three operation modes are setting options for IR function).

### IR Pin Select

Set to *IRRX/IRTX* when using an internal IR module connected to the IR connector. Set to *SINB/SOUTB.* when connecting an IR adapter to COM 2.

## Parallel Port

These items specify the base I/O port addresses of the onboard parallel port. Selecting *Auto* allows AMIBIOS to automatically determine the correct base I/O port address. Settings: *Auto, 378, 278, 3BC and Disabled.*

### Parallel Port Mode

This item selects the operation mode for the onboard parallel port: *ECP, Normal, Bi-Dir or EPP.*

### EPP Version

The item selects the EPP version used by the parallel port if the port is set to *EPP* mode. Settings: *1.7* and *1.9*.

### Parallel Port IRQ

When *Parallel Port* is set to *Auto*, the item shows *Auto* indicating that BIOS determines the IRQ for the parallel port automatically. Settings: *5, 7, Auto*.

### Parallel Port DMA

This feature needs to be configured only when *Parallel Port Mode* is set to the *ECP* mode. When Parallel Port is set to *Auto*, the field will show *Auto* indicating that BIOS automatically determines the DMA channel for the parallel port. Available options: *0, 1, 3, Auto*.

## OnBoard Midi Port

The field specifies the base I/O port address for the onboard Midi Port. The settings are: *Disabled, 330h, 300h, 290h and 292h*.

### Midi IRQ Select

The item is used to select the IRQ line for onboard Midi port. Options: *5, 10, 11*.

**OnBoard Game Port**
This item is used to specify the address for the onboard game port.  The settings are: *Disabled, 200h, and 208h*.

# PC Health Status

This section shows the status of your CPU, fan, warning for overall system status.



**Chassis Intrusion**
Set this option to enable, reset, or disable the chassis intrusion detector. During *Enabled*, any intrusion on the system chassis will be recorded. The next time you turn on the system, it will show a warning message. To be able to clear those warnings, choose *Reset*. After clearing the message it will go back to *Enabled*.

**CPU Fan Detect**
Select *Enabled* to detect the CPU FAN status. If the CPU FAN stops runnoing, the system will beep and shows a warning message on the screen. Select *Disabled* to bypass the detection if you are plugging the CPU fan to the Power Supply.

**CPU/System Fan Speed, CPU/System Temperature, Vcore, +3.3V, +5.0V, +12.0V, -12.0V, -5.0V, VBAT**
These items display the current status of all of the monitored hardware devices/components such as system voltages, temperatures and fan speeds.

🔍 **Note:** *Changing CPU Vcore could result in unstable system; therefore, it is not recommended to change the default setting for long-term purpose.*

# Frequency/Voltage Control

This section describes how to set the Chassis Intrusion feature, CPU FSB frequency, monitor the current hardwae status including CPU/system temperatures, CPU/System Fan speeds, Vcore etc. Monitor function is available only if there is hardware monitoring mechanism onboard.
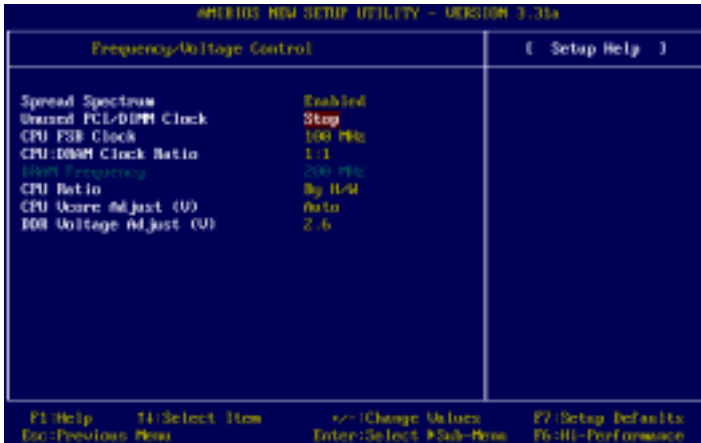


**Spread Spectrum**
When the motherboard clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at *Disabled* for optimal system stability and performance. But if you are plagued by EMI, setting to *Enabled* for EMI reduction. Remember to disable Spread Spectrum if you are overclocking be cause even a slight jitter can introduce a temporary boost in clockspeed which may just cause your overclocked processor to lock up.

**Unused PCI Slot/DIMM Clock**
This setting enables you to stop or activate the unused PCI slot & DIMM clock. Setting options: *Stop, Action*.

**CPU FSB Clock (Mhz)**
This setting allows you to select the CPU Front Side Bus clock frequency. Setting options: *100MHz~200MHz* at 1MHz increment.

**CPU : DRAM Clock Ratio**
This setting controls the ratio of CPU FSB Clock & DRAM Frequency to enable the CPU & DRAM to run at different frequency combinations. Please note that the setting options vary according to the CPU FSB Clock preset.

| CPU FSB Clock | Setting Options |
|---|---|
| 100~132MHz | 1:1, 3:4 |
| 133~165MHz | 4:3, 1:1, 4:5 |
| 166~200MHz | 5:4, 1:1 |

**DRAM Frequency**
This item shows the current frequency of DDR DRAM.

**CPU Ratio**
This setting controls the multiplier that is used to determine the internal clock speed of the processor relative to the external or motherboard clock speed.

**CPU Vcore Adjust**
This setting allows you to adjust the CPU core voltage. The default setting is *Auto*. Please note that it may be dangerous to adjust the Vcore over 10%.

> *Note: Changing CPU Vcore could result in unstable system; therefore, it is not recommended to change the default setting for long-term purpose.*

**DDR Voltage Adjust**
This setting allows you to set the appropriate DDR voltage. Setting options: *2.5V to 2.8V* at 0.1V increment.

# Load High Performance/BIOS Setup Defaults

The two options on the main menu allow users to restore all of the BIOS settings to High Performance defaults or BIOS Setup defaults. The High Performance Defaults are the default values set by the mainboard manufacturer for the best system performance but probably will cause a stability issue. The BIOS Setup Defaults are the default values also set by the mainboard manufacturer for stable performance of the mainboard.

When you select Load High Performance Defaults, a message as below appears:

Load High Performance Defaults (Y/N) ? N

Pressing 'Y' loads the default BIOS values that enable the best system performance but may lead to a stability issue.

When you select Load BIOS Setup Defaults, a message as below appears:

Load BIOS Setup Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory settings for stable system performance.

> **STOP**
> **WARNING!**
>
> ***The option is for power or overclocking users only.*** *Use of high performance defaults will tighten most timings to increase the system performance. Therefore, a high-end system configuration is a must, which means you need high-quality VGA adapter, RAM and so on.* ***We don't recommend that users should apply the high performance defaults in their regular systems.*** *Otherwise, the system may become unstable or even crash. If the system crashes or hangs after enabling the feature, please CLEAR CMOS DATA to resolve the problem. For more information, refer to "Clear CMOS Jumper:JBAT1" in Chapter 2.*
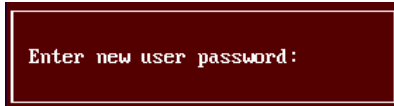
# Supervisor/User Password

When you select Supervisor Password, a message as below will appear on the screen:

```
Enter current supervisor password:
```

When you select User Password, a message as below will appear on the screen:

```
Enter new user password:
```

Type the password, up to six characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter  it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also have AMIBIOS to request a password each time the system is booted. This would prevent unau-

thorized use of your computer. The setting to determine when the password prompt is required is the PASSWORD CHECK option of the ADVANCED BIOS FEATURES menu. If the PASSWORD CHECK option is set to *Always*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when you try to enter Setup.

*About Supervisor Password & User Password:*

*Supervisor password:*    Can enter and change the settings of the setup menu.

*User password:*    Can only enter but do not have the right to change the settings of the setup menu.

# *Glossary*

**ACPI** (*Advanced Configuration & Power Interface*)
This power management specification enables the OS (operating system) to control the amount of power given to each device attached to the computer. Windows 98/98SE, Windows 2000 and Windows ME can fully support ACPI to allow users managing the system power flexibly.

**AGP** (*Accelerated Graphics Port*)
A new, high-speed graphics interface that based on PCI construction and designed especially for the throughput demands of 3-D graphics. AGP provides a direct channel (32-bit wide bus) between the display controller and main memory for high graphics quality and performance.

**ATX**
A modern shape and layout of mainboard that supersedes the widely-used Baby AT form factor. It improves many placement of components and makes a more efficient design.

**BIOS** (*basic input/output system*)
On PCs, an essential software that contains all the control code of input/output inter-face (such as keyboard, disk drives, etc.). It executes hardware test on booting the system, starts the OS, and provides an interface between the OS and the components. The BIOS is stored in a ROM chip.

**Bus**
A set of hardware lines within the computer system, through which the data is trans-ferred among different components. In a PC, the term *bus* usually refers to a local bus that connects the internal components to the CPU and main memory.

**Cache**
A special memory subsystem that is used to speed up the data transfer. It stores the contents of frequently accessed RAM locations and the addresses where these data items are stored.

**Chipset**
A collection of integrated chips designed to perform one or more related functions. For

example, a modem chipset contains all the primary circuits for transmitting and receiving data; a PC chipset provides the electronic interfaces between all subsystems.

**CMOS (***complementary metal-oxide semiconductor***)**
CMOS is a widely used type of semiconductor, which features high speed and low power consumption. PCs usually contain a small amount of battery-powered CMOS memory to retain the date, time, and system setup parameters.

**COM**
In MS-DOS system, the name of a serial communications port. DOS supports four serial ports. For example, if a modem is connected to one serial port and a serial mouse to another, they are identified as COM1 and COM2.

**DIMM (***dual in-line memory module***)**
A small circuit board that holds memory chips. A **SIMM *(single in-line memory module)*** has a 32-bit path to the memory chips whereas a DIMM has 64-bit path.

**DRAM (***Dynamic RAM***)**
A most common type of computer memory. It usually uses one transistor and a capacitor to represent a bit. As the development of technology, the memory type and specification used in computer becomes variety, such as SDRAM, DDR SDRAM, and RDRAM. For further instruction, please see the table below:

| Dynamic RAM (DRAM) Memory Technologies | | | | | |
|---|---|---|---|---|---|
| **Type** | **First Used** | **Clock Rate** | **Bus* Width** | **Peak Bandwidth** | **Volts** |
| FPM (60,70ns) | 1990 | 25MHz | 64 bits | 200 MBps | 5v |
| EDO (50,60,70ns) | 1994 | 40MHz | 64 bits | 320 MBps | 5v |
| SDRAM (66MHz) | 1996 | 66MHz | 64 bits | 528 MBps | 3.3v |
| SDRAM (100MHz) | 1998 | 100MHz | 64 bits | 800 MBps | 3.3v |
| SDRAM (133MHz) | 1999 | 133MHz | 64 bits | 1.1 GBps | 3.3v |
| RDRAM (Direct Rambus) | 1999 | 400MHz | 16 bits | 1.6 GBps | 2.5v |
| DDR SDRAM (100MHz) | 2000 | 100MHz | 64 bits | 1.6 GBps | 3.3v |
| DDR SDRAM (133MHz) | 2000 | 133MHz | 64 bits | 2.1 GBps | 3.3v |
| * Memory channel width (64 bits started with 75MHz Pentium) | | | | | |

*Source: Computer Desktop Encyclopedia*

**ECC Memory** (*error correcting code memory*)
A type of memory that contains special circuitry for testing the accuracy of data and correcting the errors on the fly.

**IDE** (*Integrated Drive Electronics*)
A type of disk-drive interface widely used to connect hard disks, CD-ROMs and tape drives to a PC, in which the controller electronics is integrated into the drive itself, eliminating the need for a separate adapter card. The IDE interface is known as the ATA (AT Attachment) specification.

**IEEE 1394**
A new, high speed external bus standard, also known as *FireWire* or *iLink*, which supports data transfer rates of up to 400 Mbps for connecting up to 63 external devices.

**IrDA** (*Infrared Data Association*)
A group of device vendors, including computer, component and telecommunications, who have developed a standard for transmitting data via infrared light waves. This enables you to transfer data from one device to another without any cables.

**LAN** (*local area network*)
A computer network that covers a relatively smaller area, such as in a building or an enterprise. It is made up of servers, workstations, shared resources, a network operating system and a communications link. These individual PCs and devices on a LAN are known as "nodes", and are connected by cables to access data and devices anywhere on the LAN, so that many users can share expensive devices and data.

**LED** (*light emitting diode*)
A semiconductor device that converts electrical energy into light. Since it lights up (usually red) when electricity is passed through it, it is usually used for the activity lights on computer's component, such as disk drivers.

**LPT** (*line printer terminal*)
Logical device name for a line printer; a name reserved by the MS-DOS for up to three parallel printer ports: LPT1, LPT2, and LPT3. It is frequently used by the OS to identify a printer.

*Glossary*

**PCI** (*Peripheral Component Interconnect*)
A local bus standard developed by Intel that first appeared on PCs in late 1993. PCI provides "plug and play" capability and allows IRQs to be shared. The PCI controller can exchange data with the system's CPU either 32 bits or 64 bits at a time.

**PnP** (*Plug and Play*)
A set of specifications that allows a PC to configure itself automatically to work with peripherals. The user can "plug" in a peripheral device and "play" it without configuring the system manually. To implement this useful feature, both the BIOS that supports PnP and a PnP expansion card are required.

**POST** (*Power On Self Test*)
During booting up your system, the BIOS executes a series of diagnostic tests, include checking the RAM, the keyboard, the disk drives, etc., to see if they are properly connected and operating.

**PS/2 Port**
A type of port developed by IBM for connecting a mouse or keyboard to a PC. The PS/2 port supports a mini DIN plug containing just 6 pins. Most modern PCs equipped with PS/2 ports so that the special port can be used by another device, such as a modem.

**USB** (*universal serial bus*)
A hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, etc. USB provides a maximum bandwidth of 12 Mbit/sec (Mbps) for connecting up to 127 peripheral devices to PC. USB features hot swap capability and multiple data streams, allows external devices to be plugged in and unplugged without turning the system off.

**Virus**
A program or a piece of code that infects computer files by inserting in those files copies of itself. The virus code is buried within an existing program, and is activated when that program is executed. All the viruses are man-made, and often have damaging side effects.