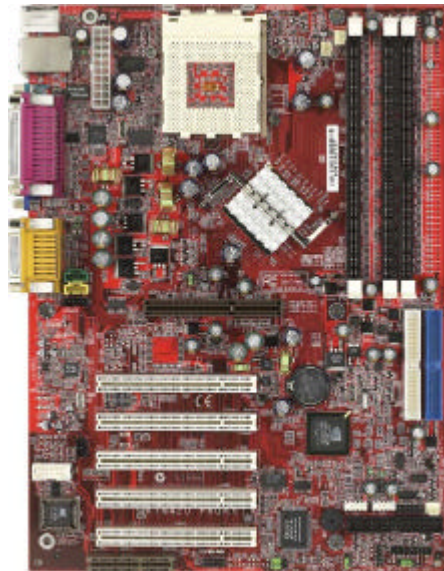# MSI

K7N420 Pro

MS-6373(v1.X) ATX Mainboard

Version 1.1
G52-MA00470

Manual Rev: 1.1
Release Date: Dec.2001

C E   **⊘ 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.

VOIR LA NOTICE D' INSTALLATION AVANT DE RACCORDER AU RESEAU.

```
┌─────────────────────────────────────────┐
│   Micro-Star International  MS-6373       │
│                                           │
│   FC       Tested to comply               │
│            with FCC Standard              │
│                                           │
│        For Home or Office Use             │
└─────────────────────────────────────────┘
```

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 (140^0F) 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

Congratulations on purchasing the MSI mainboard. ***K7N420 Pro (MS-6373)*** ATX mainboard is an excellent computer mainboard based on the innovative *n*Force 420D chipset, which supports the latest ***AMD®️ Athlon/Athlon XP/Duron*** processor series and provides you with a cost-effective solution.

TOPICS

Mainboard Specification

CPU

❏ Supports Socket A (Socket 462) for AMD Athlon/Athlon XP/Duron processors up to 1800+MHz

Chipset

❏ nForce 420D chipset
  - Support 200/266MHz FSB
  - Twinbank Memory Architecture/128-bit DDR memory controller
  - Integrated GeForceMX-class advanced Graphics Processing Unit
  - AGP 4x support
  - HyperTransport interface to MCP (800MB/sec max.)
❏ MCP-D (Media Communications Processor)
  - Dual ATA/100 controller
  - Support USB UHCI 1.0a, provide up to six USB ports
  - IEEE 802.3 compatible MAC (MII)
  - Integrated Audio Processor Unit, AC' 97 2.1 compliant
  - SPDIF output function

MainMemory

❏ Support up to three DDR DIMMs
  - Maximum memory size up to 1.5GB
  - Support 128-bit system memory

Slots

❏ One AGP slot
  - Support AGP 2.0 2x/4x (1.5V only)
❏ One CNR slot
❏ Five PCI slots
  - 32-bit Master PCI 2.2 compliant
  - Support 3.3v/5v PCI bus interface

On-boardIDE

❏ An IDE controller on the MCP chipset provides IDE HDD/CD-ROM with PIO, BusMaster and Ultra DMA 100 operation modes
❏ Support up to four IDE devices connection

Video

❏ 256-bit 2D/3D graphics accelerator

❏ Supports the 2nd generation T&L engine, nVIDIA Shading Rasterizer

❏ Supports TV-out daughter card (optional)

Audio

❏ APU (audio processing unit) integrated in MCP
   - Support up to 256 hardware-processed voices or 64 hardware voice in 3D
   - S/PDIF out through external bracket
   - CNR card for 6 channel analog (optional)

Network (optional)

❏ Chipset integrated 10/100 Base-T Ethernet/Fast Ethernet

On-board Peripherals

❏ One floppy port that supports two FDD with 360KB, 720KB, 1.44MB and 2.88MB

❏ Two serial ports COM A+COM 2 (pin header)

❏ One parallel port that supports SPP/EPP/ECP modes

❏ One VGA connector

❏ Six USB ports (2 x rear connectors and 2 x USB front pin header to support four ports)

❏ One IrDA connector

❏ One RJ-45 connector for Ethernet (optional)

❏ One Audio/Game port

❏ One D-Bracket pin header

BIOS

❏ The mainboard BIOS provides "Plug & Play" BIOS that can detect the periph-eral devices and expansion cards installed on the board automatically

❏ Support Desktop Management Interface (DMI) function that can record your mainboard specifications

Dimension

    30.5cm x 22.5cm

Mounting

    Six mounting holes

Mainboard Layout
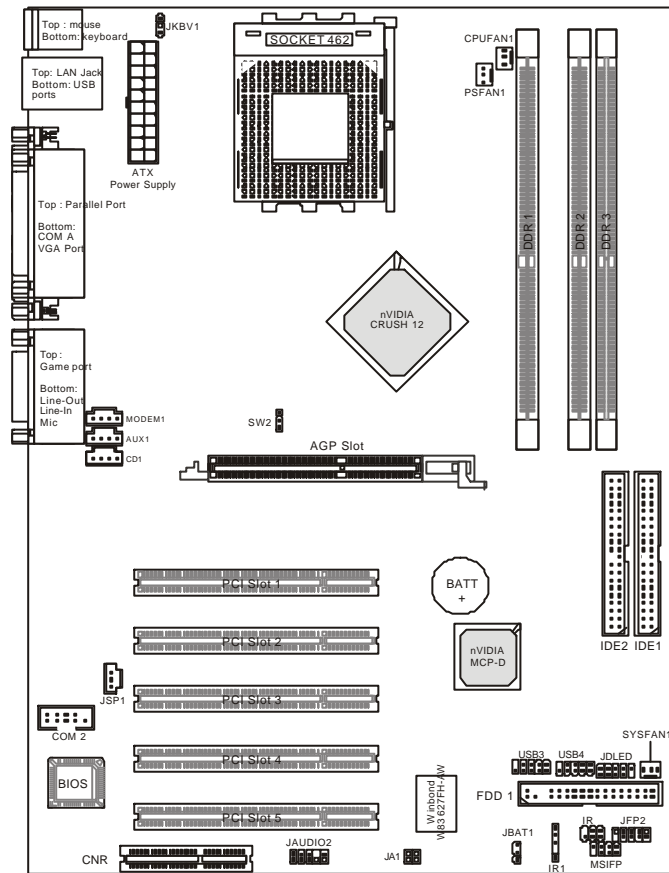
K7N420 Pro (MS-6373 v1.X) ATX Mainboard

MSI Special Features

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 user disables the warning.
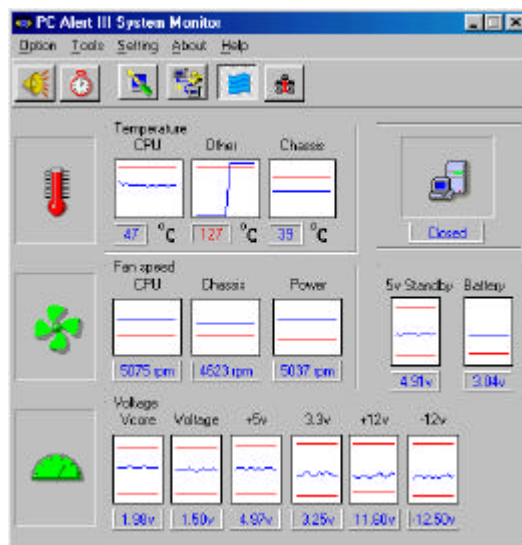
Note: Items shown on PC Alert III vary depending on your system's status.

Features:
- Network Management
  - Monitoring & remote control
- Basic System Utilities
  - Scandisk & Defragment to maintain your HDD
- 3D Graphics Design
  - Enables a more friendly user interface
- Sofware Utilities
  - SoftCooler Optimized Cooling

D-Bracket™(optional)

-Bracket™s an USB bracket integrating four Diagnostic LEDs, which use graphic signal display to help users understand their system. The LEDs 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.

D-Bracket™
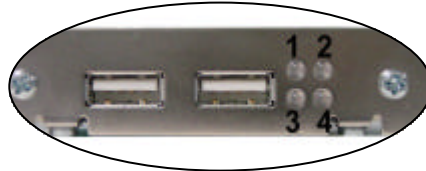
● **Red**   ○ **Green**

D-Bracket	Description
1 ● ● 2 3 ● ● 4	System Power ON - The D-LED will hang here if the processor is damaged or not installed properly.
○ ● ● ●	Early Chipset Initialization
● ○ ● ●	Memory Detection Test - Testing onboard memory size. The D-LED will hang if the memory module is damaged or not installed properly.
○ ○ ● ●	Decompressing BIOS image to RAM for fast booting.
● ● ○ ●	Initializing Keyboard Controller.
○ ● ○ ●	Testing VGA BIOS - This will start writing VGA sign-on message to the screen.

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

Live BIOS™/Live Driver™

The Live BIOS™ is a tool used to detect and update your BIOS online so that you don't need to search for the correct BIOS 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 provides a Socket A (Socket 462) to support the latest AMD Athlon/Athlon XP processor series. **To avoid the thermal issue* of the CPU, please make sure that the CPU has a heatsink and a cooling fan attached on its top.**

CPU Installation Procedure

To install the CPU, please follow the steps below:

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

2. Locate the cut edge on the CPU, and point it towards the lever pivot. Insert the pins of the CPU directly into the holes on the socket.

3. Press the lever down to complete the installation.
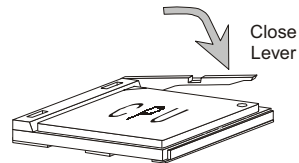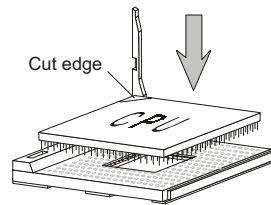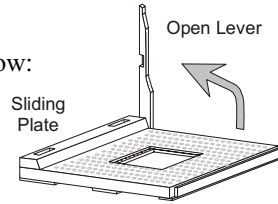
> *Note: The CPU is designed with the "corner pin" on the two of the four corners; thus, it should only fit in one correctly orientation as installing. In addition, with the weight of the heatsink and cooling fan attached, you can insert the CPU into the socket easily. **DO NOT** press the CPU down by force when installing in wrong orientation, this would bend and damage*

CPU Core Speed Derivation Procedure

If	CPU Clock	=	100MHz
	Core/Bus ratio	=	14
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 14
		=	1.4GHz

* Thermal issue for CPU
As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly crucial when building computer system. 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/Athlon XP processors with a speed of 600MHz and above require the LARGER heatsink and cooling fan. You also need to add thermal grease between the CPU and heatsink to improve heat dissipation; then, make sure that the CPU and the heatsink are securely fastened and in good contact with each other. These are needed to prevent damaging the processor and ensuring reliable operation.

For more information on the issue and proper cooling solution, please visit AMD website at: *http:// www.amd.com/products/cpg/athlon/pdf/ cooling_guide.pdf*

Memory

The mainboard provides three 184-pin DDR DIMM slots and supports a total memory size up to 1.5 GB.

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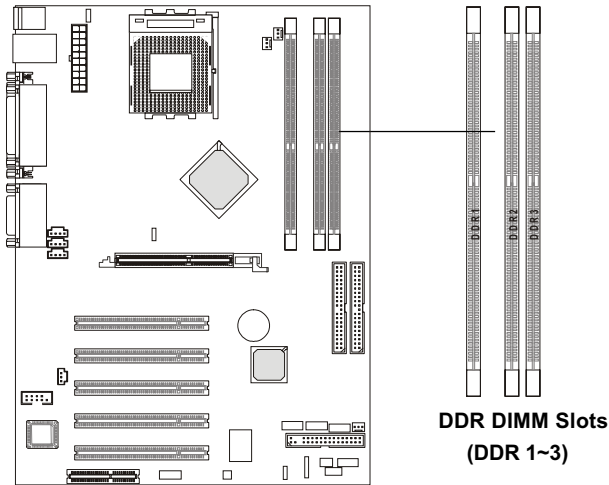
Introduction to DDR SDRAM

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. Two types of DDR are available at the time of writing: PC1600 & PC2100. PC1600 DDR SDRAM running at 100MHz will produce about 1.6GB/s memory bandwidth. PC2100 running at 133MHz will produce 2.1GB/s memory bandwidth. High memory bandwidth makes DDR an ideal solution for high performance PC, workstations and servers.

DDR Module Combination

You can install PC1600/PC2100 DDR SDRAM modules into the DDR DIMM slots (DDR 1~3) in any combination as follows:

Socket	Memory Module	Total Memory
DIMM 1	64MB, 128MB, 256MB, 512MB	64MB ~ 512MB
DIMM 2	64MB, 128MB, 256MB, 512MB	64MB ~ 512MB
DIMM 3	64MB, 128MB, 256MB, 512MB	64MB ~ 512MB
Maximum System Memory Supported		64MB ~ 1.5GB

DDR Module Installation Procedure

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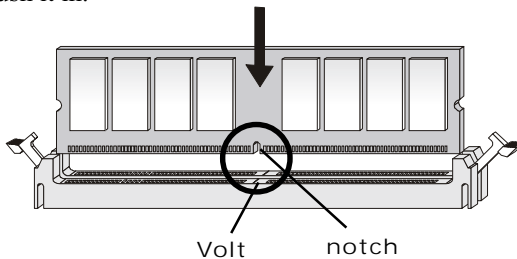
3. The plastic clip at each side of the DIMM slot will automatically close.
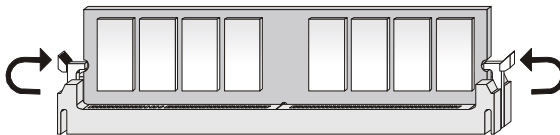
Power Supply

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

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.
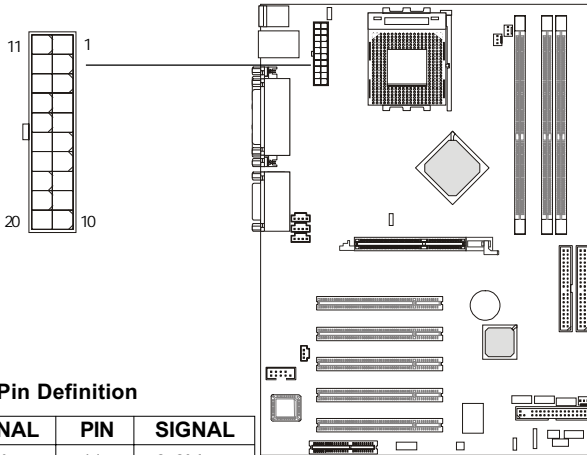
Pin Definition

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   LAN Jack   Parallel Port   Game Port

Keyboard   USB Ports   Serial Port   VGA Connector   Audio Ports
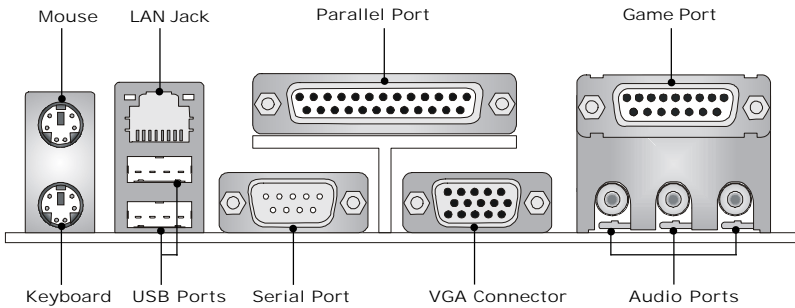
Mouse Connector

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
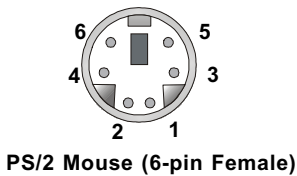
Keyboard Connector

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.
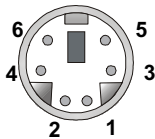
Pin Definition

PS/2 Keyboard (6-pin Female)

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

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.
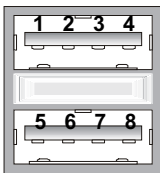
USB Port Description

USB Ports

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

Serial Port Connectors: COM A & COM 2 (optional)

The mainboard offers two 9-pin DIN connectors for serial ports COM A and COM 2. 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 3 5 7

2 4 6 8 9
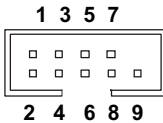
COM2

COM2 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	NDCDB	Data carry detect
2	NDSRB	Data set ready
3	NSINB	Serial or receive data
4	NRTSB	Request to send
5	NSOUT	Serial out or transmit data
6	NCTSB	Clear to send
7	NDTRB	Data terminal ready
8	NRIB	Ring Indicate
9	GND	Ground

1 2 3 4 5

6 7 8 9
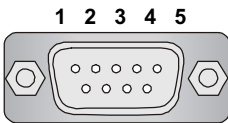
COMA

COM A 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

VGA Connector

The mainboard provides a DB 15-pin female connector to connect a VGA monitor.

5   1

15   11
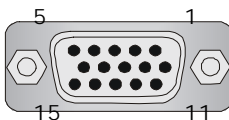
VGA Connector

(DB 15-pin)

Pin	Signal Description
1	RED
2	GREEN
3	BLUE
4	N/C
5	GND
6	GND
7	GND
8	GND
9	+5V
10	GND
11	N/C
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

RJ-45 LAN Jack (Optional)

The mainboard provides a RJ-45 connector that allows your computer to be connected to a network environment.
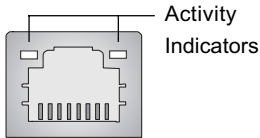
Pin	Signal	Description
1	TDP	Transmit differential pair
2	TDN	Transmit differential pair
3	RDP	Receive differential pair
4	NC	Not used
5	NC	Not used
6	RDN	Receive differential pair
7	NC	Not used
8	NC	Not used

Activity Indicators

LAN Jack
(RJ-45)

Joystick/Midi Connectors

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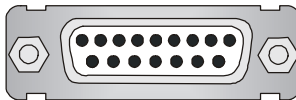
Audio Port Connectors

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
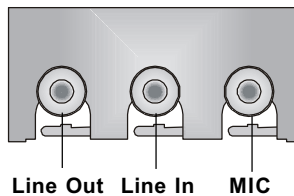
Parallel Port Connector

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.

13   **1**

25   **14**
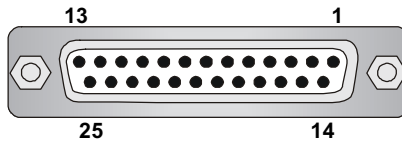
Pin Definition

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

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
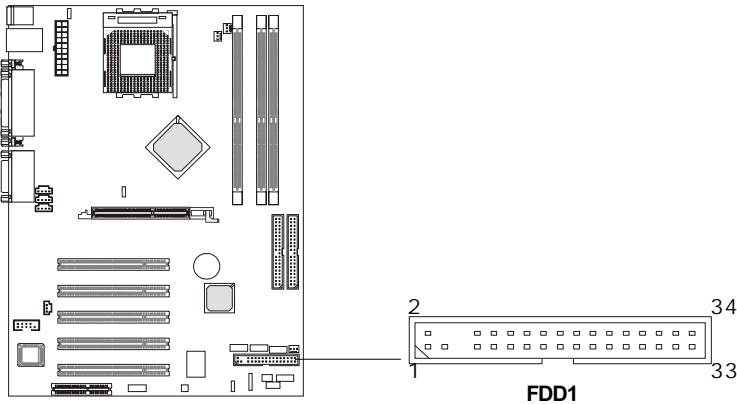
USB Front Connector: USB3 & USB4

The mainboard provides the Front USB (Universal Serial Bus) pin headers that allow you to connect optional USB ports for front panel.

Pin	Description	Pin	Description
1	VREG_FP_USBPWR0	2	VREG_FP_USBPWR0
3	USB_FP_P0-	4	USB_FP_P1-
5	USB_FP_P0+	6	USB_FP_P1+
7	Ground	8	Ground
9	Key	10	USB_FP_OC0

USB3/USB4
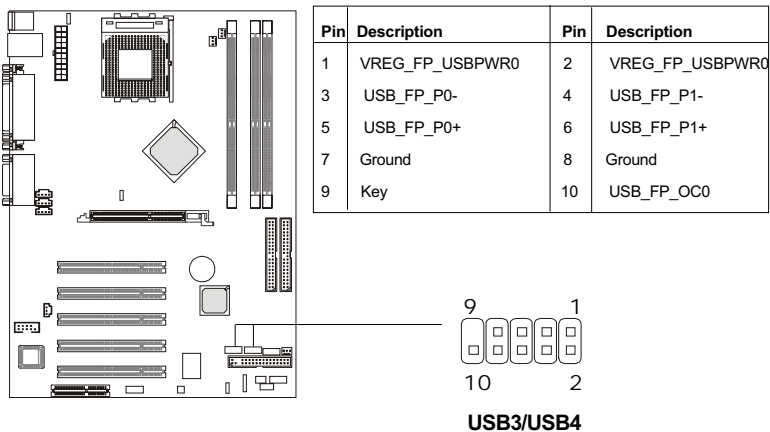
Hard Disk Connectors: IDE1 & IDE2

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.
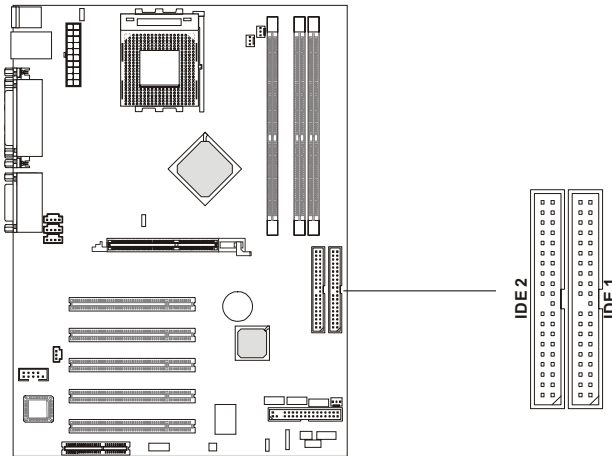
IDE1 (Primary IDE Connector)

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: CD1

The connector is for CD-ROM audio connector.

Aux Line-In Connector: AUX1

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

Modem-In Connector: MODEM1

The connector is for modem with internal audio connector.

SPDIF-Out Connector:JSP1

This connector is used to connect to the audio device with digital signal input.
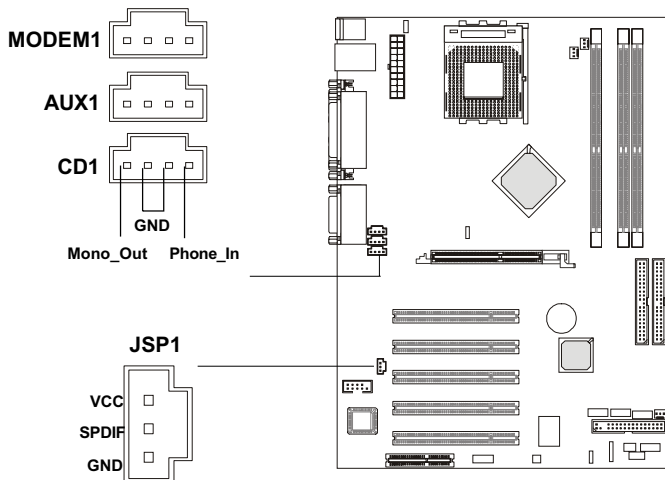
Fan Power Connectors: CPUFAN1/PSFAN1/SYSFAN1

The CPUFAN1 (processor fan), SYSFAN1 (system fan) & PSFAN1 (power supply 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.
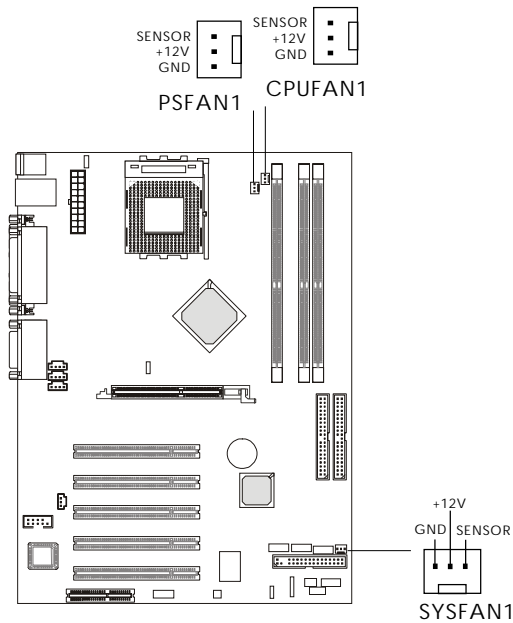
Note:

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.*

IrDA Infrared Module Header: IR or IR1

You may use IR1 or IR, depending on the actual mainboard layout, as the pin header to connect to an IrDA Infrared module. You must configure the setting through the BIOS setup to use the IR function.
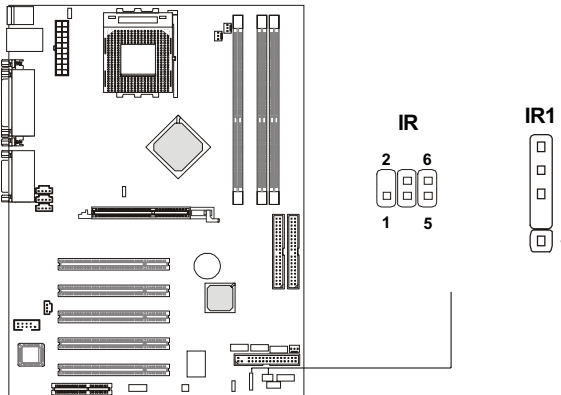
IR1 Pin Definition

PIN	SIGNAL
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX

IR Front Panel Electrical Connection

PIN	SIGNAL	IN/OUT	DESCRIPTION
1	Not Assigned	N/A	Not Assigned
2	(no pin)	N/A	Key
3	+5V	Out	IR Power
4	GND		Ground
5	IRTX	Out	IrDA serial output
6	IRRX	In	IrDA serial input

Case Connector: JFP2/Speaker Connector: MSIFP (optional)

The connector JFP2 is used to connect to the front panel switches and LEDs whereas MSIFP is for speaker connection.
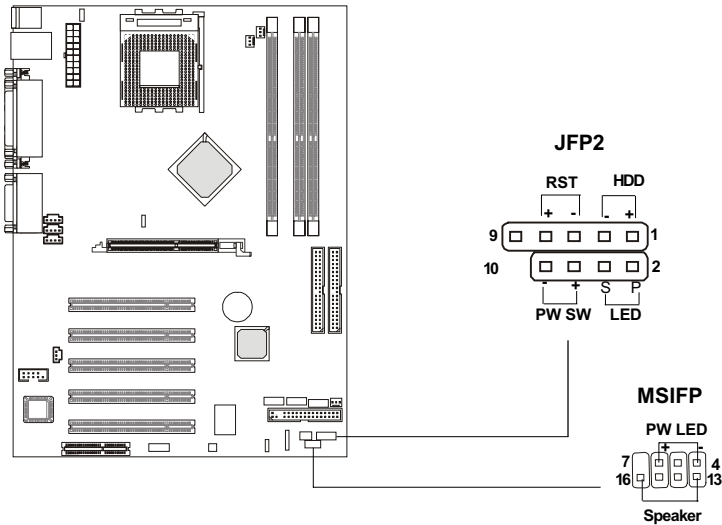
JFP2

JFP2 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.
10	NC	No connection

MSIFP

If on-board Buzzer is available:

Short pin (14, 15) ：On-board Buzzer Enabled

Open pin (14, 15) ：On-board Buzzer Disabled

D-Bracket™ Connector: JDLED (optional)

The mainboard comes with a JDLED 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™.*

JDLED

Connected to JDLED

Connected to USB3
or USB4

D-Bracket™
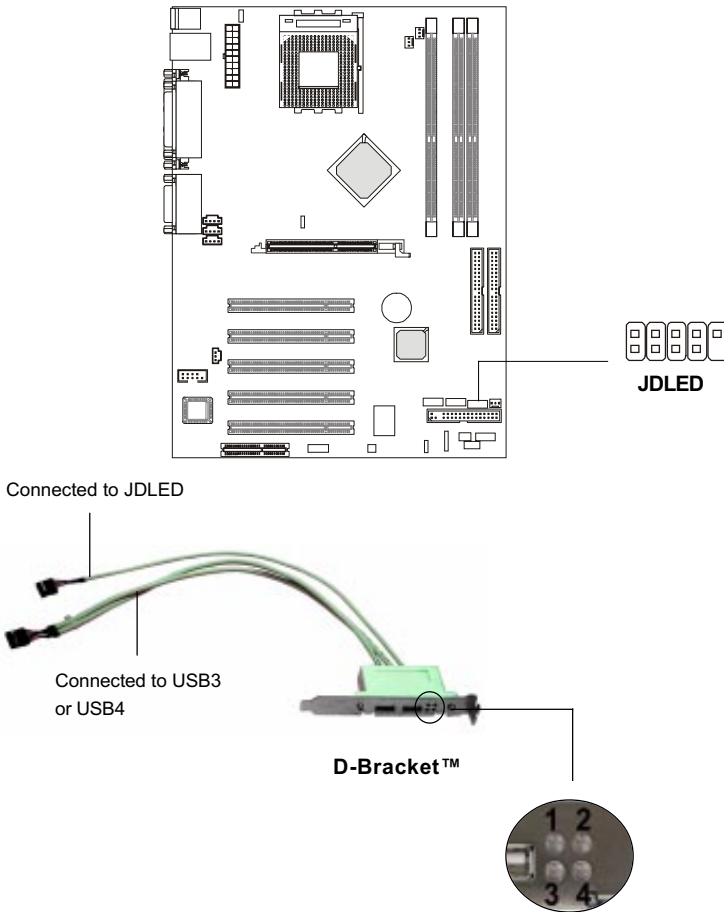
Front Panel Audio Connector: JAUDIO2

You can connect an optional audio connector to the JAUDIO2 front panel audio connector. The JAUDIO2 is compliant with the Intel Front Panel I/O Connectivity Design Guide.

JAUDIO2
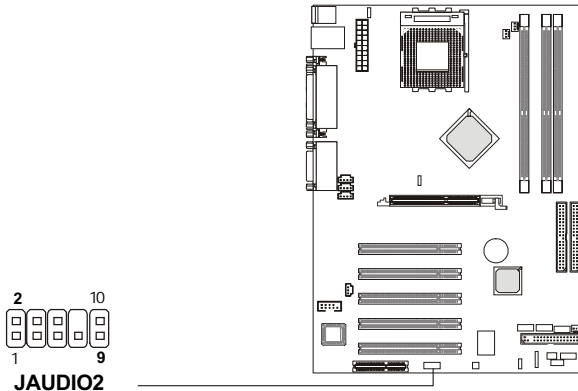
Pin Definition

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

Note:

1. 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.

2. Disconnect the rear speakers before using the front earphone jack.
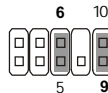
Jumpers

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:

Keep CMOS   Clear CMOS

1 JBAT1

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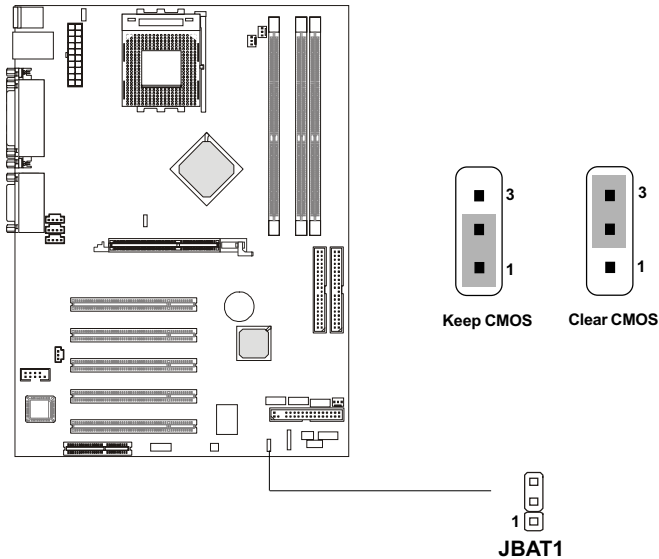
WARNING! *You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.*

FSB Mode Jumper: SW2

This jumper allows you to set the CPU FSB mode. When the system is down while doing the overclocking, you can use this jumper to set the safe mode that allows you to reset the system. After the computer is reset, remember to set to user mode. In addition, you also need to set the FSB frequency to 133MHz in BIOS "Frequency/Voltage Control".

SW2
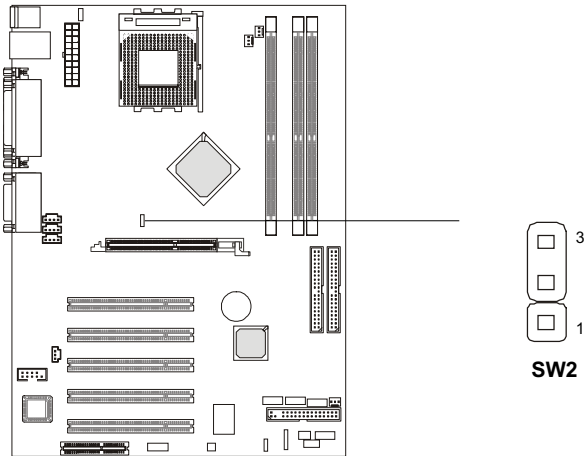
Auto Mode
(user Mode)
133MHz

Safe Mode
100MHz

Audio Control Jumper: JA1

This jumper is used to control the audio interface. The factory default is set to short connected. Please do not change the default setting to ensure proper audio outputs.

JA1

Short
(Default Setting)
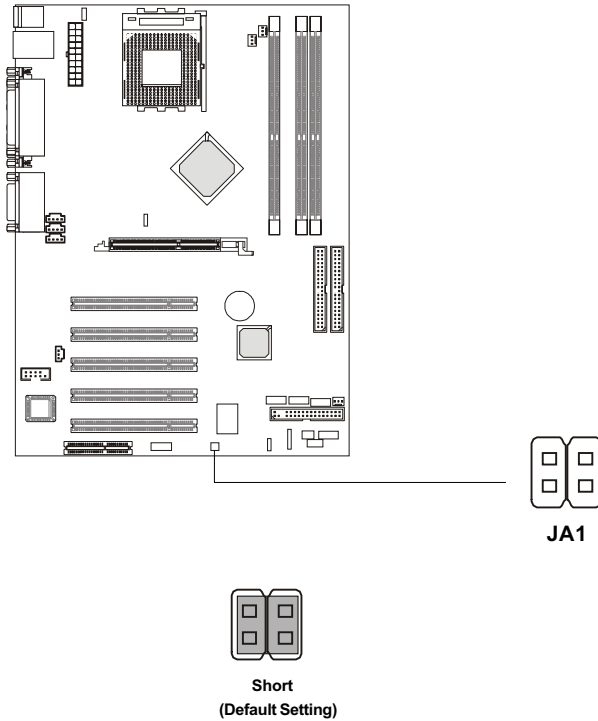
Keyboard Wake-up Jumper: JKBV1

The JKBV1 jumper is used to set the PS/2 keyboard/mouse and **Rear** USB wake-up function. To use the function, you should also go to BIOS to enable the PS/2 keyboard/mouse & USB wake-up (power on) function.

Please note that once the ATX Power Supply cord was unplugged, the keyboard wake-up password will be cleared. Reset the keyboard password to restart the keyboard wake-up function.

JKBV1

5V Standby
Enable Keyboard Power On function

VCC 5V (Default)
Disable Keyboard Power On Function
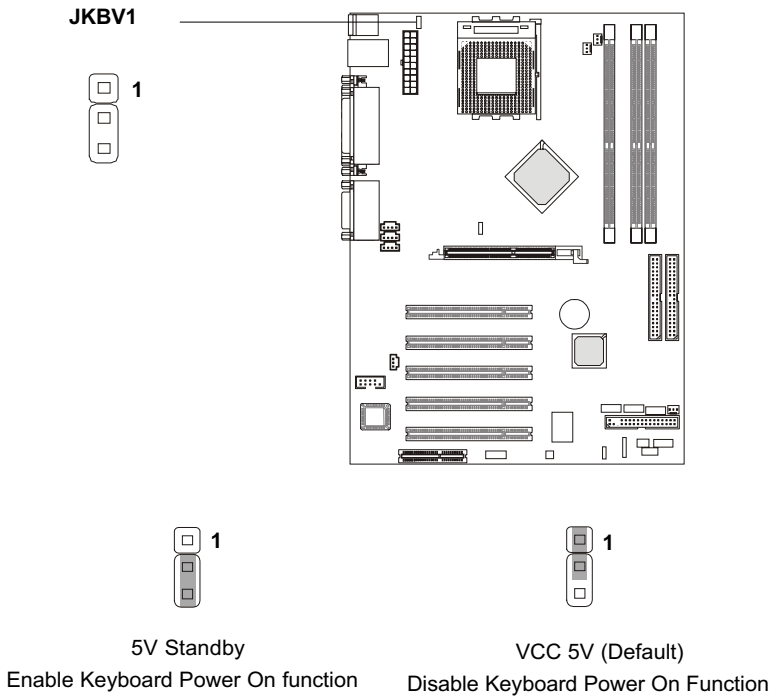
Note: To enable this function, you need a power supply that provides enough power for this feature. (Power Supply with 750mA 5V Standby)

Slots

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

AGP Slot

PCI Slots

CNR Slot
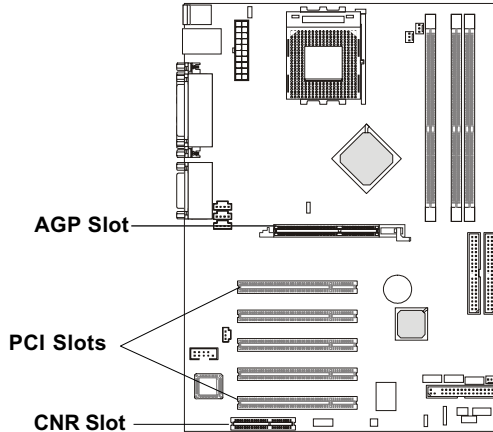
AGP (Accelerated Graphics Port) Slot

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).

> **STOP**
> **WARNING!**
> *The AGP slot **DOES NOT support 3.3V AGP card**. Use of 3.3V AGP card may cause damages to the mainboard. To identify the spec of your AGP card, refer to the documentation supplied with the AGP card or check the view of its contact pins (golden fingers) before you install it.*

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 expansioncard 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.

AWARD 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
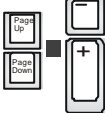
Turn on the computer. When the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press <Delete> key or simultaneously press <Ctrl>, <Alt> and <Esc> to enter the SETUP program.

```
TO ENTER SETUP BEFORE BOOT, PRESS <CTRL-ALT-
ESC>
```

If the message disappears before you respond and you still want to enter SETUP, restart the system by turning off then on the power or pressing the Reset button to try again. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Control Keys

After entering the BIOS setup program, you can use the keyboard to navigate through the setup menus and change the settings. A brief description of keyboard usage is listed below:

Key(s)	Function
↑ ↓	Move to the previous/next item
← →	Move to the item in the left/right hand
Page Up Page Down +	Increase/decrease the numeric value or make changes
Enter	Select the item
Esc	Jump to the Exit menu or return to the Main menu from a sub-menu
F1	General help
F5	Restore the previous CMOS value from CMOS
F7	Load BIOS Setup defaults
F10	Save all the CMOS changes and exit

Getting Help
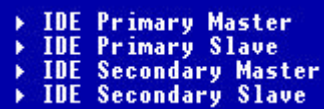
Main Menu

The Main menu lists the setup functions you can make changes to. You can use the control keys (↑, ↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown as below) appears to the left of certain fields, which means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use control keys (↑, ↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, press the <Esc>.

```
▶ IDE Primary Master
▶ IDE Primary Slave
▶ IDE Secondary Master
▶ IDE Secondary Slave
```

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

Default Settings

The BIOS setup program contains two kinds of default settings: the High Performance and BIOS Setup defaults. The High Performance defaults provide the best system performance but may affect the system stability.

Setup Menus

Main Menu

Once you enter Award®BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from twelve setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to enter the sub-menu.

```
      CMOS Setup Utility - Copyright (C) 1984-2001 Award Software

   ▶ Standard CMOS Features          ▶ Frequency/Voltage Control
   ▶ Advanced BIOS Features            Load High Performance Defaults
   ▶ Advanced Chipset Features         Load BIOS Setup Defaults
   ▶ Integrated Peripherals            Set Supervisor Password
   ▶ Power Management Setup            Set User Password
   ▶ PnP/PCI Configurations            Save & Exit Setup
   ▶ PC Health Status                  Exit Without Saving

   Esc : Quit        F9 : Menu in BIOS   | ↑ → ←  : Select Item
   F10 : Save & Exit Setup

                  Time, Date, Hard Disk Type...
```

Standard CMOS Features
Use this menu for basic system configurations.

Advanced BIOS Features
Use this menu to set the items of Award special enhanced features.

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

Integrated Peripherals
Use this menu to specify your settings of integrated peripherals.

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

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This entry shows your PC health status.

Frequency/Voltage Control

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

Load BIOS Setup Defaults

Use this menu to load the BIOS default values for the most stable system performance.

Load High Performance Defaults

Use this menu to load the BIOS default values that are factory settings for optimal system performance.

Set Supervisor Password

Use this menu to set Supervisor Password.

Set User Password

Use this menu to set User Password.

Standard CMOS Features

The items in Standard CMOS Features menu are divided into 13 categories. Each category includes none, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp>or <PgDn> keys to select the value you want in each item.
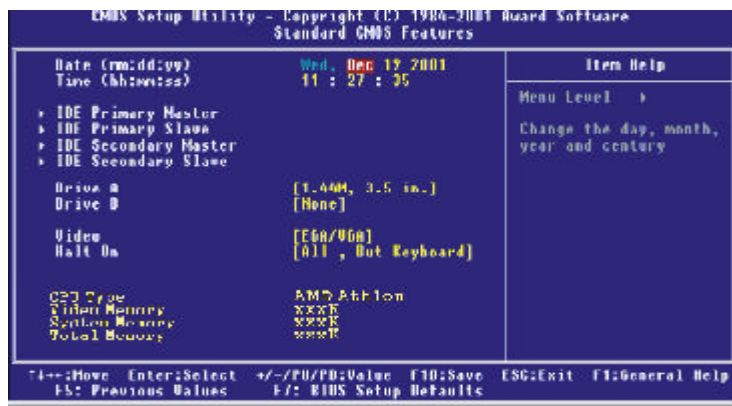
Date(mm:dd:yy)

This item allows you to set the system to the date that you specify (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, depends on the year of the BIOS.

Time (hh:mm:ss)

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

IDE Primary/Secondary Master/Slave

Press PgUp/<+> or PgDn/<-> to select the hard disk drive category. The specification of hard disk drive will show on the right hand according to your selection. You can press <Enter> to enter the sub-menu. The sub-menu will appear as the following example:
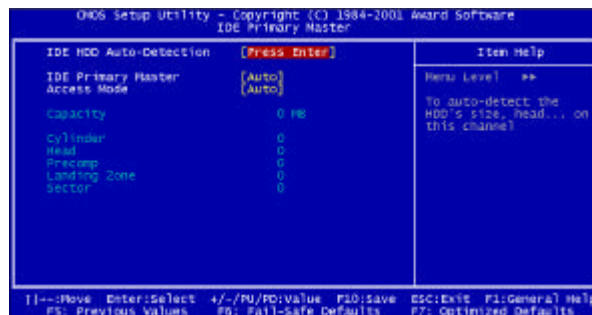
Access Mode	The settings are CHS, LBA, Large, and Auto
Capacity	The formatted size of the storage device
Cylinder	Number of cylinders
Head	Number of heads
Precomp	Write precompensation
Landing Zone	Cylinder location of the landing zone
Sector	Number of sectors

Drive A/B

The two items allow you to set the type of floppy drivers installed. Available options are [None], [360K, 5.25 in], [1.2M, 5.25 in], [720k, 3.5 in], [1.44M, 3.5in], and [2.88M, 3.5in].

Video

This item allows you to set the type of video card. Available options are [EGA/VGA], [CGA40], [CGA80], and [MONO].

Halton

This item allows you to set the type of errors that will cause system halt on. Available options are [All Errors], [No Errors], [All, But Keyboard], [All, But Diskette], and [All, But Disk/Key].

All Errors	The system will halt on and display the error message if any error happens.
No Errors	The system will not halt on no matter any error happens.
All, But Keyboard	The system will halt on if any error happens. But the system will not halt on if the keyboard function is not normal.
All, But Diskette	The system will halt on if any error happens. But the system will not halt on if the disk drive function is not normal.
All, But Disk/Key	The system will halt on if any error happens. But the system will not halt on if the disk drive and keyboard function is not normal.

CPU Type/Video Memory/System Memory/Total Memory

The four items show the CPU type and memory status of your system (read only).

Advanced BIOS Features
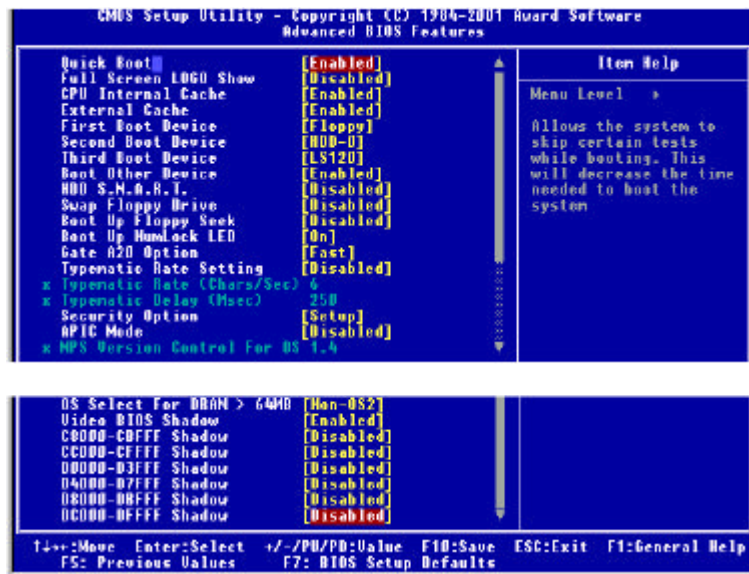
Quick Boot

The option speeds up Power On Self Test (POST) after you power on the computer. When setting the item to *Enabled*, BIOS will shorten or skip some check items during POST. Settings: *Enabled* and *Disabled*.

Full Screen Logo Show

This item allows you to enable or disable the full screen Logo show capability. Available options are [Disabled] and [Enabled].

CPU Internal Cache

Cache memory is additional memory that is much faster than the system memory. This item allows you to enable or disable the level 1 (L1) cache. The internal cache is built in the processor. Available options are [Disabled] and [Enabled].

External Cache
This item allows you to enable or disable the level 2 (L2) cache. Available options are [Disabled] and [Enabled].**Quick Power On Self Test**
This item allows you to speed up Power On Self Test (POST) after you power on the computer. If this is set to [Enabled], BIOS will shorten or skip some check items during POST. Available options are [Disabled] and [Enabled].

First/Second/Third Boot Device
These three items allow you to set the sequence of boot device from that the BIOS attempts to load the operating system. Available options are [Floppy], [LS120], [HDD-0], [SCSI], [CDROM], [HDD-1], [HDD-2], [HDD-3], [ZIP100], [LAN], and [Disabled].

Boot Other Device
This item allows the system to try to boot from other device if the system fails to boot from the 1st/2nd/3rd boot device. Available options are [Disabled] and [Enabled].

HDD S.M.A.R.T.
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting 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 opportunity 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*.

Swap Floppy Drive
This item allows you to choose from the default of [Disabled] or choose [Enabled] to switch the floppy disk drives between being designated as A and B. Available options are [Disabled] and [Enabled].

Boot Up Floppy Seek
This function allows the system to check if floppy installed or uninstalled when booting up the computer. Available options are [Disabled] and [Enabled].

Boot Up Num-Lock LED

This item allows you to set the NumLock status when you boot up your computer. When you choose from the default of [On], the keypad is numeric keys; when you choose [Off], the keypad is arrow keys. Available options are [On] and [Off].

Gate A20 Option

This allows you to set the Gate A20 status. When set to [Fast], Gate A20 is controlled by chipset. When set to [Normal], Gate A20 is controlled by a specific pin from the keyboard controller. Available options are [Fast] and [Normal].

Typematic Rate Setting

This item allows you to set the keystrokes repeat rate determined by keyboard controller. When set to [Enabled], the following two items **Typematic Rate** and **Typematic Delay** can be selected. Available options are [Disabled] and [Enabled].

Typematic Rate (Chars/Sec)

This item allows you to set the number of times a second to repeat a keystroke when you hold the key down. Available options are [6], [8], [10], [12], [15], [20], [24], and [30]. Default value is [6].

Typematic Delay (Msec)

This item allows you to set the delay time before the key begins to repeat the keystroke while holding down the key. Available options are [250], [500], [750], and [1000]. Default value is [250].

Security Option

This item allows you to limit access to the system and Setup program, or just to Setup program. When set to [Setup], the system will boot, but access to Setup program will be denied if the correct password is not entered at the prompt. When you choose [System], the system will not boot and access to Setup program will be denied if the correct password is not entered at the prompt. Available options are [Setup] and [System].

APICMode
This item is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance to PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQs resources for the system. Available options are [Enabled] and [Disabled].

MPS Version Control For OS
This item 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. Available options are [1.4] and [1.1].

OS Select For DRAM > 64MB
This item is set for the users running OS/2®operating system. When set to [Non-OS2], you can not run the OS/2®operating system when DRAM installed is larger than 64 MB. When set to [OS2], it is possible. Available options are [Non-OS2] and [OS2].

Video BIOS Shadow
This item allows you to increase the video performance by caching the data from video ROM to Shadow RAM. When set to [Enabled], the system obtains better video performance but, at this time, any program attempts to write to this memory area will cause a system error. Available options are [Disabled] and [Enabled].

C8000-CBFFF/CC000-CFFFF/D0000-D3FFF/D4000-D7FFF/D8000-DBFFF/DC000-DFFFFShadow
These items specify whether the contents of the adapter ROM named in the items will be copied into RAM to improve the performance of ROM firmware for adapters. You need to know the address of each adapter ROM occupies to shadow (copy) it into the correct area of RAM. Available options are [Disabled] and [Enabled].

Advanced Chipset Features
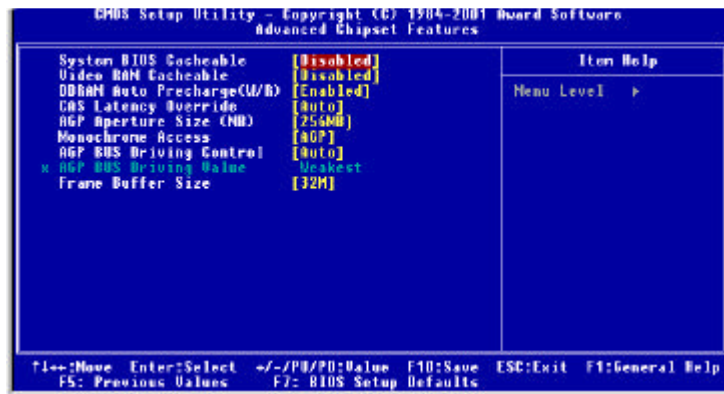
Note: Change these settings only if you are familiar with the chipset

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. Available options are [Enabled] and [Disabled].

VideoRAM Cacheable

Selecting [Enabled] allows caching of the video RAM, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Available options are [Enabled] and [Disabled].

DDRAM Auto Precharge (W/R)

Auto Precharge is a SDRAM feature that allows the memory to close a page (bits along one row) automatically at the end of the burst. You can enable the Auto Precharge function of the installed DDR SDRAM to provide a selftimed row precharge for each burst access. Available options are [Enabled] and [Disabled].

CAS Latency Override

This allows you to set the function of CAS Latency Override. Available options are [2 clocks], [2.5 clocks], [3 clocks] and [Auto].

3-13

AGP Aperture Size (MB)

This setting controls just how much system RAM can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The option allows the selection of an aperture size of 4MB, 8MB, 16MB, 32MB, 64MB, 128MB, and 256MB.

Monochrome Access

This allows you to control when MDA (Monochrome Display Adapter) accesses are sent to the AGP device or to PCI bus. Available options are [AGP] and [PCI].

AGP Bus Driving Control

This filed is used to adjust the AGP driving force. Selecting [Manual] allows you to select an AGP driving force in **AGP Bus Driving Value**. It is strongly suggested to select [Auto] to avoid causing any system error.

AGP Bus Driving Value

This item specifies an AGP bus driving value. Available options are [Weakest], [Medium], and [Strongest].

Frame Buffer Size

Frame Buffer is the video memory that stores data for video display (frame). Larger frame buffer size increases video performance. Available options are [8M], [16M], and [32M].

Integrated Peripherals
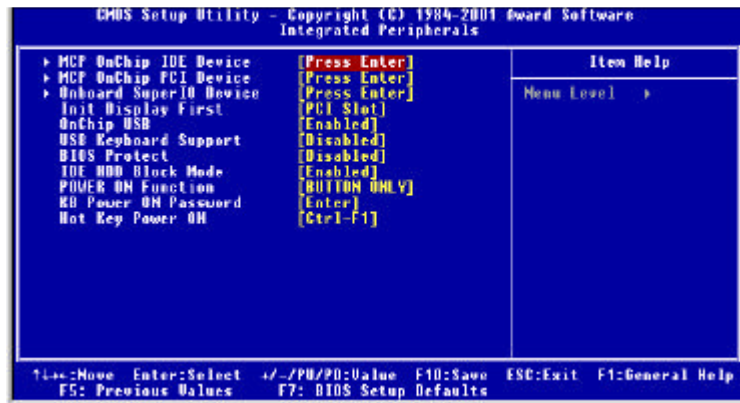
MCP OnChip IDE Device

Press <Enter> to enter the sub-menu, which contains the following items for advanced control:
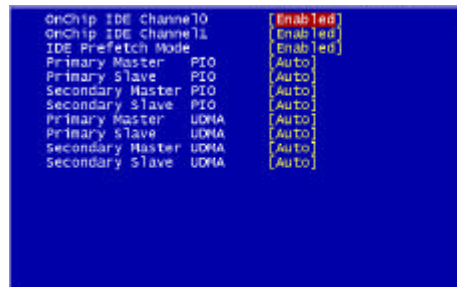
OnChip IDE Channel0/1

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Choose [Enabled] to activate each channel separately.

IDE Prefetch Mode

The onboard IDE drive interfaces supports prefetching, for faster drive accesses. Set to [Disabled] if your primary and/or secondary

add-in IDE interface does not support prefetching.

Primary/Secondary Master/Slave PIO
The four fields allow you to set a PIO (Programmed Input/Output) mode for each of the four IDE devices that the onboard IDE interface supports. Modes 0~4 provide increased performance. In Auto mode, BIOS automatically determines the best mode for each IDE device.

Primary/Secondary Master/Slave UDMA
Ultra DMA implementation is possible only if your IDE device supports it and your operating environment contains a DMA driver. If both your hard drive and software support Ultra DMA, select [Auto] to enable BIOS support.

MCP OnChip PCI Device
Press <Enter> to enter the sub-menu, which contains the following items for advanced control:

```
MCP AC97 Audio        [Enable]
MCP MC97 Modem        [Disabled]
MCP OnChip Lan        [Auto]
MCP SPDIF Out         [Enable]
```

MCP AC97 Audio
This item allows you to enable/disable the MCP chipset's feature to support AC97 Audio.

MCP MC97 Modem
This item allows you to enable/disable the MCP chipset's feature to support MC97 Modem.

MCP OnChip Lan
This item allows you to enable/disable the onboard LAN function.

MCP SPDIF Out
This item allows you to enable/disable the onboard S/PDIF function.

OnboardSuperIO Device

Press <Enter> to enter the sub-menu, which contains the following items for advanced control:

OnboardFDCController

Select Enabled if your system has a floppy disk controller (FDD) installed on the system board and you wish to use it. If you install add-on FDC or the system has no floppy drive, select Disabled in this field. Available options are [Enabled] and [Disabled].

OnboardSerial Port1/OnboardSerial Port2

Select an address and corresponding interrupt for the first and second serial ports. Available options are [3F8/IRQ4], [2E8/IRQ3], [3E8/IRQ4], [2F8/IRQ3], [Disabled], and [Auto].

UART Mode Select

This item allows you to determine which InfraRed(IR) function of the onboard I/O chip, this functions uses.

RxD,TxD Active

This item allows you to determine the active of RxD, TxD. Available options are [Hi,Hi], [Lo,Lo], [Lo,Hi], and [Hi,Lo].

IR Transmission Delay

This item allows you to enable/disable the IR transmission delay. Available options are [Enabled] and [Disabled].

3-17

UR2 Duplex Mode
This item allows you to select the IR half/full duplex function. Available options are [Half] and [Full].

Use IR Pins
Consult your IR peripheral documentation to select the correct setting of the TxD and RxD signals.

Onboard Parallel Port
Select a logical LPT port address and corresponding interrupt for the physical parallel port.

Parallel Port Mode
The item allows you to select the operating mode for the parallel port. Available options are [SPP], [EPP], [ECP], and [ECP+EPP].

EPP Mode Select
The item allows you to select the EPP version by the parallel port when the port is set to [EPP] or [ECP+EPP] mode. Available options are [EPP1.7] and [EPP1.9].

ECP Mode Use DMA
The item automatically specifies an DMA channel 1 or 3 for the parallel port when it is set to [EPP] or [ECP+EPP] mode.

Game Port Address
The items disable or assign the address of the Game port.

Midi Port Address
The items disable or assign the address of the Midi port.

Midi Port IRQ
The item specifies an IRQ for the Midi port.

Init Display First
Initialize the AGP video display before initializing any other display device on the system. Thus the AGP display becomes the primary display. Available options are [PCI slot] and [AGP].

OnChip USB

Select [Enabled] if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. Available options are [Enabled] and [Disabled].

USB Keyboard Support

Select [Enabled] if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard. Available options are [Enabled] and [Disabled].

BIOS Protect

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When set to [Enabled], the BIOS data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you'll need to disable this BIOS protection function.

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support. Available options are [Enabled] and [Disabled].

POWER ON Function

This controls how the PS/2 mouse or keyboard can power on the system. Available settings are [Password], [Hot KEY], [Mouse Left], [Mouse Right], [BUTTON ONLY] and [Keyboard 98].

KB Power ON Password

If POWER ON Function is set to [Password], then you can set a password in the field for the PS/2 keyboard to power on the system.

Hot Key Power ON

If POWER ON Function is set to [Hot KEY], you can assign a hot key combination in the field for the PS/2 keyboard to power on the system. Settings: [Ctrl-Fl] through [Ctrl-F12].

Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.
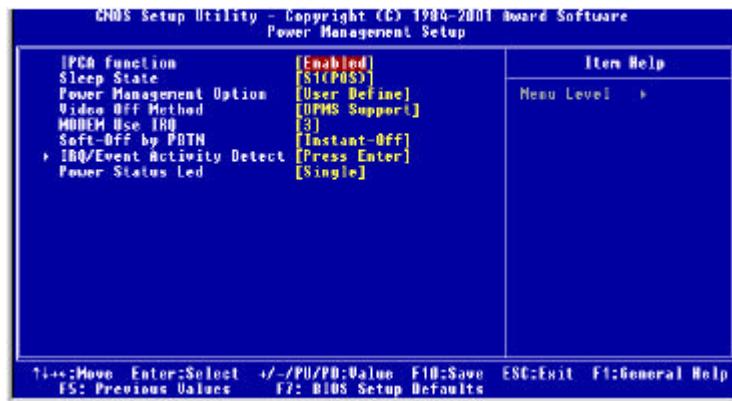
IPCA Function

This item allows you to set ACPI (Advanced Configuration and Power Management) function. Available options are [Enabled] and [Disabled].

Sleep State

This item specifies the power saving modes for ACPI function. Available options are.

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

S3(STR) The S3 state is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains power 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.

Power Management Option

This category allows you to select the type (or degree) of power saving and is directly related to the following items: **Standby Mode** and **HDD Power Down**. There are three selections for Power Management, two of which have fixed mode settings:

Min Power Saving	Minimum power management. Standby Mode = 1 Hour; HDD Power Down = 15 min.
Max Power Saving	Maximum power management. Standby Mode = 30 Sec; HDD Power Down = 1 min.
User Defined	Allows you to set the values of each mode individually.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Modem Use IRQ

Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system. Settings are *3*, *4*, *5*, *7*, *9*, *10*, *11* and *NA*.

Soft-Off by RBTN

This item allows you to configure the power button as a normal power ON/OFF button or a soft-off button. Settings are:

Instant-Off	The power button functions as a normal power ON/OFF button.
Delay 4 Sec.	Pressing the power button for more than 4 seconds will place the system in a very low power usage state (Soft-Off state), with only

enough circuitry receiving power to detect power button activity or Wake Up On LAN/ Ring activity.

IRQ/Event Activity Detect

Press <Enter> to enter the sub-menu and the following screen appears:
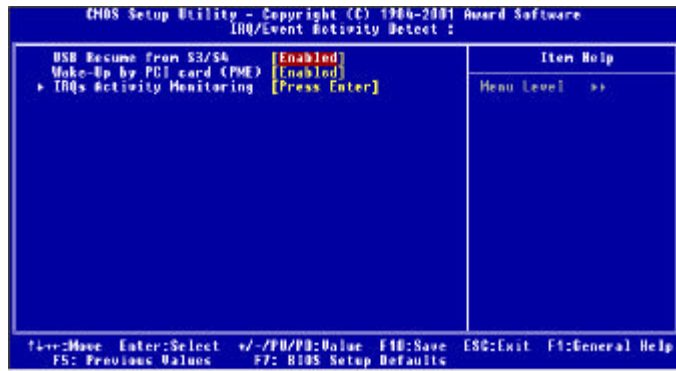
USB Resume from S3/S4

Allows the activity of USB device to wake up the system from S3 or S4 power saving modes. Settings are *Enabled* and *Disabled*.

Wake Up by PCI CArd (PME)

These items specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected.

IRQs Activity Monitoring

Press <Enter> to enter the sub-menu. A similar screen to the following appears:
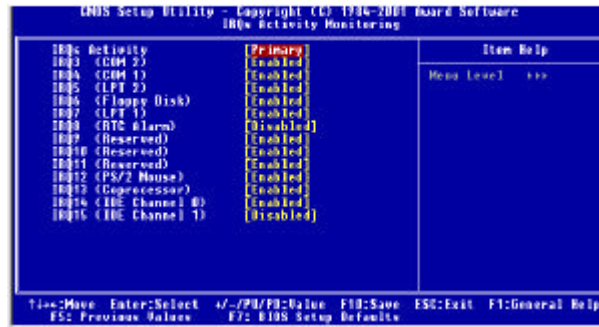
IRQ3 ~ IRQ15 enable or disable the monitoring of the specified IRQ line. If set to [Enabled], the activity of the specified IRQ line will prevent the system from entering power saving modes or awaken it from power saving modes.

Note: IRQ (Interrupt Request) lines are system resources allocated to I/O devices. When an I/O device needs to gain attention of the operating system, it signals this by causing an IRQ to occur. After receiving the signal, when the operating system is ready, the system will interrupt itself and perform the service required by the I/O device.

Power Status LED

This item sets how the system uses Power LED on the case to indicate the suspend state. Settings are:

Single	The Power LED remains the same color.
Dual	The Power LED changes its color to indicate the suspend state.

PnP/PCI Configurations

This section describes the PCI bus system configuration. PCI (Personal Computer Interconnect) is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own 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.

```
      CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                      PnP/PCI Configurations

   PNP OS Installed        [No]                    Item Help
   Reset Configuration Data [Disabled]
                                            Menu Level  ►
   Resources Controlled By  [Auto(ESCD)]
 x IRQ Resources            Press Enter     Select Yes if you are
                                            using a Plug and Play
   PCI/VGA Palette Snoop   [Disabled]       capable operating
                                            system Select No if
                                            you need the BIOS to
                                            configure non-boot
                                            devices




  ↑↓→←:Move  Enter:Select +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
        F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```

PNP OS Installed
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. When set to [No], BIOS will initialize all the PnP cards. So, select [Yes] if your operating system is Plug & Play aware.

Reset Configuration Data
Normally, you leave this field [Disabled]. Select [Enabled] to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot. Available options are [Enabled] and [Disabled].

Resources Controlled By
The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating

system such as Windows 98. When set to [manual], you can choose specific resources by going into each of the sub menu that follows this field (a sub-menu is preceded by a "8"). Available options are [Auto(ESCD)] and [Manual]. (If you choose *Auto*, the IRQ Resources will not have function.)

IRQ Resources
This item is adjustable only when **Resources Controlled By** is set to [Manual]. Press [Enter] and you will enter the sub-menu of the items. This item lists IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ/DMA.

PCI/VGA Palette Snoop
When set to [Enabled], multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). Available options are [Enabled] and [Disabled].

PC Health Status

This section helps you to get more information about your system including CPU temperature, FAN speed and voltages. It is recommended that you contact with your mainboard supplier to get proper value about your setting of the CPU temperature.
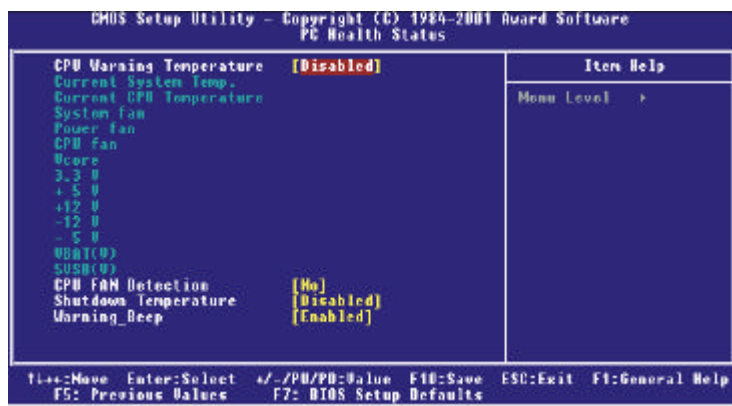
CPU Warning Temperature
Select the combination of lower and upper limits for the CPU temperature. If the CPU temperature extends beyond either limit, any warning mechanism programmed into your system will be activated. Available options are [50°C/122°F],[53°C/127°F],[56°C/133°F],[60°C/140°F],[63°C/145°F],[66°C/151°F],[70°C/158°F],and [Disabled].

Current System Temp./Current CPU Temperature/System fan/Power fan/CPU fan/Vcore(V)/+3.3V/+5V/+12V/-12V/-5V/VBAT(V)/5VSB(V)
These items display the current status of all of the monitored hardware devices and components such as CPU voltages, temperatures and all fans's speed.

CPU FAN Detection
Select [Yes] to detect the CPU FAN status. If the CPU FAN stops running, the system will beep and shows a warning message on the screen. Select [No] to bypass the detection if you are plugging the CPU fan to the Power Supply.

Shutdown Temperature

This item allows you to set the shutdown temperature level for the processor. When the processor reach the temperature you set, this will shutdown the system. This function only works in ACPI-aware OS (such as Windows 98/ME/2000). Available options are [60°C/140°F], [65°C/149°F], [70°C/158°F], [75°C/167°F], and [Disabled].

Warning_Beep

This allows you to use the function of warning beep. Available options:

[Disabled], [Enabled].

Frequency/Voltage Control

This section is for setting CPU Frequency/Voltage Control.
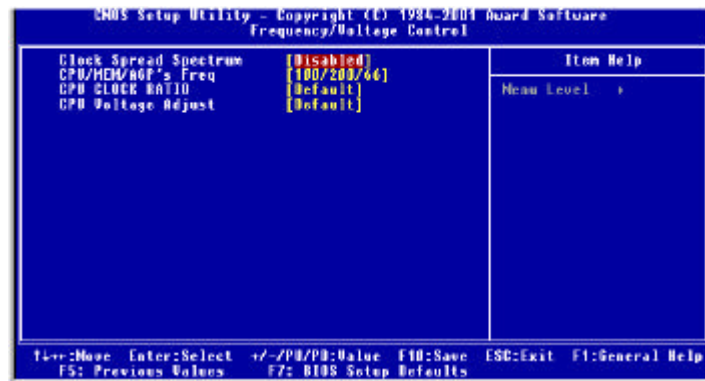
Clock Spread Spectrum

This item is used to enable or disable the clock generator's Spread Spectrum feature. When overclocking the processor, always set it to *Disabled*. Setting options: [0.5%], [1.00%], [2.00%] and [Disabled]

CPU/MEM/AGP' sFreq

This item specifies the clock frequency of CPU host bus, DDR RAM bus, and AGP bus.

CPU CLOCK RATIO

End users can overclock the processor by specifying the CPU ratio (clock multiplier) in this field.

CPU Voltage Adjust

This allows you to adjust the CPU voltage capability. Available options: [-0.05V], [-0.02V], [Default], [+0.02V], [+0.05V], [+0.10V].

Load High Performance/BIOS Setup Defaults

The two options on the main menu allow users to restore all of the BIOS settings to the default High Performance or BIOS Setup values. The High Performance Defaults are the default values set by the mainboard manufacturer specifically for the optimal performance of the mainboard. The BIOS Setup Defaults are the default values set by the BIOS vendor for the stable system performance.

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

Load High Performance (Y/N)? N

Pressing *Y* loads the BIOS default values for the optimal system performance.

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

Load BIOS Setup Defaults (Y/N)? N

Pressing *Y* loads the default factory settings for the most 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" on page 2-19.*

Set Supervisor/User Password

When you select this function, a message as below will appear on the screen.

```
Enter Password:
```

Type the password (up to eight characters in length) and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

When a password has been enabled, 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 require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

About Supervisor Password & User Password
Supervisor Password
Can enter and change the options of the setup menus.
User Password
Can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

Appendix: *DDR DIMM Configuration*

Configuration Rules

Observe the following rules when configuring DDR DIMMs:

1. Follow correct DIMM installation order. DIMMs must be populated consecutively, in order, starting with the DIMM1 socket.

2. Do not populate DIMM3 socket with any dual load (dual bank) modules (for BIOS ver. 210 or later version).

*Do not populate DIMM2 socket with any dual load (dual bank) modules (for BIOS ver.200).

Note: Dual load refers to physical device beds on the data bus

Note: For best performance on 128bit system, we recommend you to use the same DDR DIMM for both slots.

Population Rules

Table 1. Memory Loads

Capacity	DIMM1	DIMM2	DIMM3
128MB	64MB - 1B or 2B	64MB - 1B or 2B	X
192MB	128MB - 1B or 2B	64MB - 1B or 2B	X
256MB	128MB - 1B or 2B	128MB - 1B or 2B	X
128MB - 1B or 2B	64MB - 1B or 2B	64MB - 1B	64MB – 1B
384MB	256MB - 1B or 2B	128MB - 1B or 2B	X
128MB - 1B or 2B	128MB - 1B or 2B	128MB - 1B	128MB – 1B
512MB	256MB - 1B or 2B	256MB - 1B or 2B	X
256MB - 1B or 2B	128MB - 1B or 2B	128MB - 1B	128MB – 1B
768MB	512MB - 1B or 2B	256MB - 1B or 2B	X
256MB - 1B or 2B	256MB - 1B or 2B	256MB - 1B	256MB – 1B
1GB	512MB - 1B or 2B	512MB - 1B or 2B	X
512MB - 1B or 2B	256MB - 1B or 2B	256MB - 1B	256MB – 1B
1.25GB	512MB - 1B or 2B	512MB - 1B or 2B	256MB - 1B
1.5GB	512MB - 1B or 2B	512MB - 1B or 2B	512MB - 1B

Note:

Memory loads must be distributed as provided in the Table 1. Not all possible combinations are listed in the table. Populate designs only with DIMMs that follow JEDEC standard 184-pin unbuffered non-ECC DDR DIMMs. DDR DIMMS with CAS LATENCY of 2.0 (PC2100A) or 2.5 (PC2100B) are supported.

Legend:

1B: A one bank (single load) module

2B: A two bank (dual load) module

64MB - 1B: 64MB DDR DIMM using 4 8Mx16 (128Mb) devices - ONE BANK

64MB - 2B: 64MB DDR DIMM using 8 4Mx16 (64Mb) devices - TWO BANKS 1

128MB - 1B: 128MB DDR DIMM using 8 16Mx8 (128Mb) devices - ONE BANK

128MB - 2B: 128MB DDR DIMM using 8 8Mx16 (128Mb) devices - TWO BANKS

256MB - 1B: 256MB DDR DIMM using 8 32Mx8 (256Mb) devices or 16 32Mx4

              (128Mb) devices - ONE BANK 2

256MB - 2B: 256MB DDR DIMM using 16 16Mx8 (128Mb) devices – TWO BANKS

512MB - 1B: 512MB DDR DIMM using 16 64Mx4 (256Mb) devices – ONE BANK

512MB - 2B: 512MB DDR DIMM using 16 32Mx8 (256Mb) devices – TWO BANKS

              X: DO NOT POPULATE

Notes:

1 64MB - 2B is an uncommon configuration and is included in the population matrix for completeness

2 256MB - 1B using 16 32Mx4 devices is an uncommon configuration and is included in the population matrix for completeness

3 512MB - 1B using 16 64Mx4 devices is an uncommon configuration and is included in the population matrix for completeness

Recommended DDR Devices

SEC K4H280838B-TCBO 128MB PC2100
Hyundai HY5DU28822T-H 128MB PC2100
Winbond W942516AH-7 128MB PC2100
Micron MT46V16M8TG-75 128MB PC2100
Toshiba TC59WM807BFT-70 256MB PC2100
Winbond W942508AH-7 256MB PC2100
Micron MT46V16M8TG-75A 256MB PC2100

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 interface (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 transferred 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 traffer. 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 netwoek 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.

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.