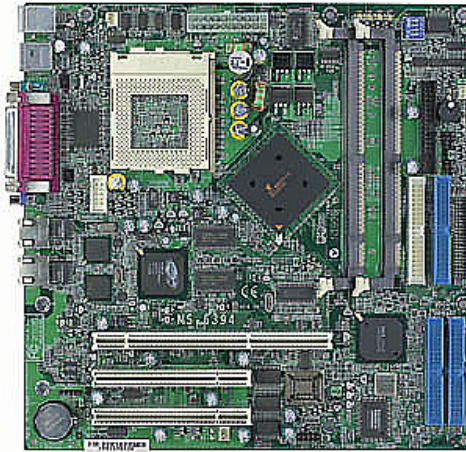


# MSI

MICRO-STAR INTERNATIONAL

## MS-6394 (v1.X) Micro ATX Mainboard



**Version 1.0**  
**G52-MA00315**

Manual Rev: 1.0  
Release Date: Nov. 2001



**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.

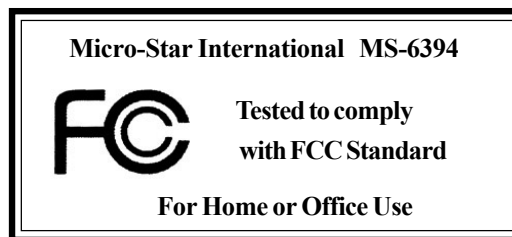
**Notice 1**

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.**



**Edition**

Nov. 2001

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**Revision History**

<b>Revision</b>	<b>Revision History</b>	<b>Date</b>
V1.0	First release	Nov. 2001

## Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. **DO NOT COVER THE OPENINGS.**
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over 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 or cause 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 Manual.
  - The equipment has dropped and damaged
  - If the equipment has obvious sign of breakage
12. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60°C (140°F), IT MAY DAMAGE THE EQUIPMENT.**



**CAUTION:** Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

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# Introduction

# 1

The MS-6394 V1.X Micro ATX mainboard is a high-performance computer mainboard based on ServerWorks® LC-T North Bridge & ServerWorks® CSB5 South Bridge chipsets. The MS-6394 is designed for Intel® Pentium® III (FC-PGA) processor for cost-effective business/personal desktop and entry-level server markets.

The ServerWorks® LC-T chipset provides an integrated high-performance main memory sub-system, a dual channel PCI bus bridge that provides an excellent data flow path between the processor bus and a 64-bit PCI bus/the processor and a 32-bit PCI bus. The DRAM interface provides support for 64-Mbit, 128 and 256Mbit technology, which will allow up to 128/256/512 Mbytes per two rows (Double Sided DIMM) and a maximum memory size of 2GB. It also implements I2C interface, which can be used to access the internal registers.

The ServerWorks® CSB5 chipset primarily works as a PCI to Low Pin Count (LPC) Bridge and is also a source of numerous other integrated functions. Its main features are: PCI-LPC address/data bridge, DMA controller, IDE (up to ATA100) & IDE RAID interfaces, ACPI, USB controller, SMBus host and slave interface,...and etc.

This chapter includes the following topics:

Mainboard Specifications	1-2
Mainboard Layout	1-5
Quick Components Guide	1-6
Key Features	1-7
MSI Special Features	1-8



## **Chapter 1**

### **Mainboard Specifications**

---

#### **CPU**

- Support Single Socket370 for Intel® Coppermine / Tualatin processors.
- Support up to 1.26GHz at 133MHz FSB

#### **Chipset**

- ServerWorks® LC-T chipset
  - 100/133MHz Host Bus Interface
  - Main memory interface with optimized support for PC100/PC133 SDRAM
  - 32-bit, 33MHz Primary PCI Bus Interface
  - 64-bit, 33/66MHz Secondary PCI Bus Interface
  - Extensive Data Buffering between all interfaces for high throughput and concurrence.
  - Dual parallel memory controller support
  - I2C bus support
- ServerWorks® CSB5 chipset
  - PCI to LPC (Low Pin Count) address/data bridge
  - Supports EISA type A & B DMA cycle to PCI or main memory
  - IDE interface (bus master capability and support for ATA66/100)
  - ACPI (Advanced Configuration and Power Interface)
  - Universal Serial Bus controller/root hub with 4 USB ports
  - SMBus (System Management Bus) host and slave interface

#### **Clock Generator**

- 100MHz and 133MHz clocks are supported.

#### **Main Memory**

- Support Two 3.3 volt, 168-pin registered DIMM (25-degree sockets) PC100 or PC133
- Support 16/64/128/256Mbit technology
- Up to 2 GB ECC registered SDRAM
- Note: Supports only registered ECC memory. Non-ECC or unbuffered SDRAM not supported.

#### **Slots**

- Two 32-bit, 33MHz PCI Bus Master Slots (support 3.3v/5v PCI bus Interface)
- One 3.3v 64-bit, 33/66MHz PCI Bus Master Slot

## ***Introduction***

### **On-Board IDE**

- An IDE controller on the CSB5 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA33/66/100 operation modes.
- Can connect up to four fast IDE drives
- ATA RAID 0.1 supported by Promise PDC20265R IDE RAID controller.

### **On-Board Peripherals**

- On-Board Peripherals include:
  - 1 floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes.
  - 1 serial port (COMA)
  - 1 parallel port supports SPP/EPP/ECP mode
  - 4 USB ports (Rear \* 2 / Front \* 2)
  - 1 VGA port
  - 2 LAN RJ45 Jacks
  - 1 COM2 serial pin header

### **Network**

- Dual Intel® 82550 LAN Controllers
  - Integrated IEEE802.3 10-BaseT & 100-BaseTX PHY
  - Wake-On-LAN and WFM 2.0 Supported (ET/EM)
  - Integrated IP Security (IPSec) encryption off-load engine

### **Video**

- Integrated ATI Rage XL graphics controller
- Support 3D acceleration
- Built-in DVD decoding
- Onboard 4MB Video SDRAM

### **BIOS**

- Supports ACPI (Advanced Configuration and Power Interface) and APM (Advanced Power Management)
- Slow blinking LED for Sleep State indicator
- Main switch override mechanism. Power-up mode control upon recovery from AC power loss
- PC Health Monitoring protects your system from problems even before they occur.

## **Chapter 1**

- DMI support
- RTC (Real -Time Clock) wakeup
- External modem remote ring-on when system is in Soft-Off state
- BIOS rescue hot keys for rescuing BIOS chip from flash failure
- Hardware BIOS virus protection
- 4 MB flash ROM

### **PC Health Monitoring**

- Two onboard voltage monitors for CPU core/s, 3.3V, -12V, -5V, 5VSB, VTT status monitor
- CPU/chassis temperature monitoring
- CPU fan auto-off in sleep mode
- LED and control for chassis intrusion detection
- System resource alert
- Support for system management software
- Auto-switching voltage regulator for CPU core, up to 23A of current

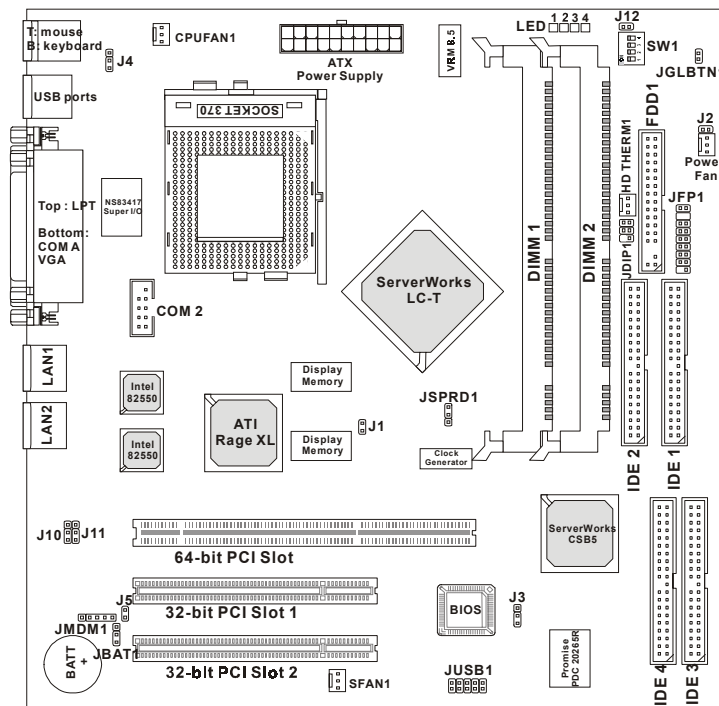
### **Dimension**

- Micro - ATX Form Factor: 9.6 in x 9.6 in. (W x H)

### **Mounting**

- 6 mounting holes.

## Mainboard Layout



MS-6394 V1.X Micro ATX Mainboard

## Chapter 1

### Quick Components Guide

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Component	Function	Reference
SW1	CPU Ratio Setting Switch	See p. 2-4
JWR1	ATX 20-Pin Power Connector	See p. 2-8
JKBMS1	Mouse & Keyboard Connectors	See p. 2-9
USB Connectors	Connecting to USB devices	See p. 2-10
RJ-45	LAN Jacks	See p. 2-10
LPT1	Parallel Port Connector	See p. 2-11
COM A & COM 2	Serial Port Connectors	See p. 2-12
VGA DB 15-Pin	Connecting to VGA monitor	See p. 2-12
FDD	Floppy Disk Drive Connector	See p. 2-13
JMDM1	Wake On Ring Connector	See p. 2-13
IDE1~ IDE2	Hard Disk Connectors	See p. 2-14
IDE3 & IDE4	IDE RAID Connectors	See p. 2-15
JFP1	Case Connector	See p. 2-16
CPU/S/Power Fan	Fan Power Connectors	See p. 2-17
HD THERM1	I <sup>2</sup> C Clock/Data Connector	See p. 2-18
JDIP1	Serial Connector	See p. 2-18
J2 & J12	LAN LED Connectors	See p. 2-19
JGLBTN1	Power Saving Switch Connector	See p. 2-19
J5	Chassis Intrusion Switch	See p. 2-20
JUSB1	USB Front Connector	See p. 2-20
JBAT1	Clear CMOS Jumper	See p. 2-21
JSPRD1	Clock Speed Spectrum Jumper	See p. 2-22
J1	VGA Enable/Disable Jumper	See p. 2-22
J3	IDE RAID Enable/Disable Jumper	See p. 2-23
J4	PS2 KB/MS Wake-Up Jumper	See p. 2-23
J10 & J11	LAN Enable/Disable Jumper	See p. 2-24
PCI Slot	Connecting to expansion cards	See p. 2-25

## **Key Features**

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- Micro-ATX form factor
- Power-up mode control upon recovery from AC power loss
- D-LED™ (Diagnostic LED)
- Onboard overheat buzzer
- Modem (External/Internal) Ring Wake up Function

## Chapter 1

### MSI Special Features

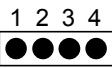





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#### D-LED™











The D-LED™ 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

D-LED	Description
	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.

## Introduction

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



## Chapter 1

### T.O.P Tech™

The T.O.P Tech™ is an extended sensing device that can 100% accurately detect the CPU's temperature. You can find out the temperature on BIOS setup menu. The PC Alert™ also provides the information.



### CPU temperature on Setup menu

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

Case Open Warning      [Disabled]
CPU Warning Temperature [Disabled]
Current System Temp.
Current CPU Temperature
Current Power FAN Speed
Current CPU FAN Speed
Current System FAN Speed
CPU VID
VT1
3.3V
+5 V
VCC25
-12 V
-5 V
VBAT(V)
5VSB(V)

Item Help
Menu Level  >

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

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## 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.

This chapter contains the following topics:

Central Processing Unit: CPU	2-2
Memory Installation	2-5
Power Supply	2-8
Back Panel	2-9
Connectors	2-13
Jumpers	2-21
Slots	2-25

## Chapter 2

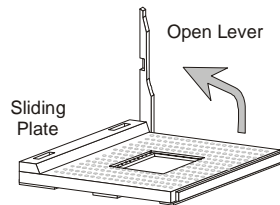
### Central Processing Unit: CPU

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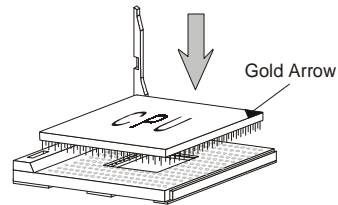
The mainboard operates with **Intel® Pentium® III**, **Intel® Coppermine™** / **Tualatin™** processors. The mainboard uses a CPU socket called Socket 370 for easy CPU installation. The CPU should always have a Heat Sink and a cooling fan attached to prevent overheating.

#### CPU Installation Procedures

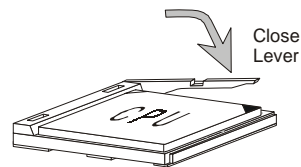
1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.



2. Look for the gold arrow. The gold arrow should point towards the end of lever. The CPU will only fit in the correct orientation.



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



**WARNING!**

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

**CPU Core Speed Derivation Procedure**

**If** CPU Clock = 100MHz  
Core/Bus ratio = 8.5  
**then** CPU core speed = Host Clock x Core/Bus ratio  
= 100MHz x 8.5  
= 850MHz



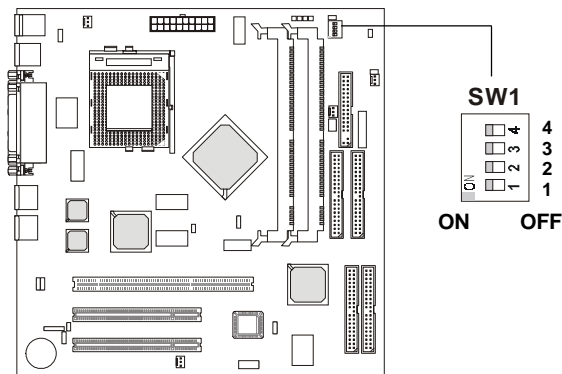
**WARNING!**

*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.*

## Chapter 2

### CPU Ratio Setting Switch: SW1

The SW1 switch is used to set the CPU core ratio. See the table below for details of ratio setting.

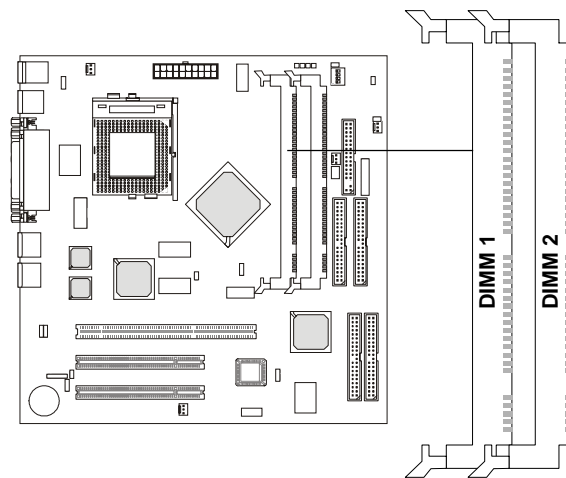


1	2	3	4	CPU Ratio
ON	ON	ON	ON	X4
ON	OFF	OFF	ON	X5
ON	ON	ON	OFF	X5.5/X9.5
OFF	OFF	ON	OFF	X6/X10
ON	OFF	ON	ON	X6.5/X10.5
OFF	ON	OFF	ON	X7
OFF	ON	OFF	OFF	X7.5
OFF	OFF	ON	ON	X8
ON	ON	OFF	ON	X8.5/X4.5
ON	ON	OFF	OFF	X9

## Memory Installation

---

The mainboard provides 2 sockets for 168-pin, 3.3V Register SDRAM DIMM only with 4 memory banks. To operate properly, at least one DIMM module must be installed. The mainboard supports the memory size up to 2GB.



### Introduction to SDR SDRAM

Synchronous DRAM is a type of dynamic RAM memory chip that has been widely used starting in the latter part of the 1990s. SDRAMs are based on standard dynamic RAM chips, but have sophisticated features that make them considerably faster. First, SDRAM chips are fast enough to be synchronized with the CPU's clock, which eliminates wait states. Second, the SDRAM chip is divided into two cell blocks, and data is interleaved between the two so that while a bit in one block is being accessed, the bit in the other is being prepared for access. This allows SDRAM to burst the second and subsequent, contiguous characters at a rate of 10ns, compared to 60ns for the first character.

SDRAM provides 800 MBps or 1 GBps data transfer depending on whether the bus is 100MHz or 133MHz.



Please refer to the following page for MA mapping for Row and Column Address for SDRAM. Please especially note that "\*" indicates Bank Select Bit.

## Chapter 2

### MA mapping for Row and Column Address for SDRAM

Size/ SDRAM Depth		BA (0)	BA (1)	12	11	10	9	8	7	6	5	4	3	2	1	0	Row Size in MB/ Index Value
64M 4-bank 12X8	Col								10	9	8	7	6	5	4	3	32/0
	Row	13*	12*	11	24	23	22	21	20	19	18	17	16	15	14		
16M 2-bank 11X9	Col							11	10	9	8	7	6	5	4	3	16/1
	Row	12*		12*	13	23	22	21	20	19	18	17	16	15	14		
16M 2-bank 11X10	Col					24	11	10	9	8	7	6	5	4	3		32/2
	Row	12*		12*	13	23	22	21	20	19	18	17	16	15	14		
128M 4-bank 12X11	Col			27		26	11	10	9	8	7	6	5	4	3		256/3
	Row	13*	12*	25	24	23	22	21	20	19	18	17	16	15	14		
256M 4-bank 13X11	Col			28		27	11	10	9	8	7	6	5	4	3		512/4
	Row	13*	12*	26	25	24	23	22	21	20	19	18	17	16	15	14	
64M 2-bank 13X10	Col					26	11	10	9	8	7	6	5	4	3		128/5
	Row	12*	23	25	24	13	22	21	20	19	18	17	16	15	14		
64M 4-bank 12X10	Col					26	11	10	9	8	7	6	5	4	3		128/6
	Row	13*	12*	25	24	23	22	21	20	19	18	17	16	15	14		
64M 4-bank 12X9	Col						11	10	9	8	7	6	5	4	3		64/7
	Row	13*	12*	25	24	23	22	21	20	19	18	17	16	15	14		
256M 4-bank 13X10	Col					27	11	10	9	8	7	6	5	4	3		256/8
	Row	13*	12*	26	25	24	23	22	21	20	19	18	17	16	15	14	
256M 4-bank 13X9	Col						11	10	9	8	7	6	5	4	3		128/9
	Row	13*	12*	26	25	24	23	22	21	20	19	18	17	16	15	14	
256M 4-bank 13X8	Col							10	9	8	7	6	5	4	3		64/10
	Row	13*	12*	23	25	24	11	22	21	20	19	18	17	16	15	14	
256M 4-bank 12X9	Col						11	10	9	8	7	6	5	4	3		64/11
	Row	13*	12*	25	24	23	22	21	20	19	18	17	16	15	14		
256M 4-bank 12X10	Col					26	11	10	9	8	7	6	5	4	3		128/12
	Row	13*	12*	25	24	23	22	21	20	19	18	17	16	15	14		

### SDRAM Module Combination

You can install memory modules in any combination as follows:

Slot	Memory Module	Total Memory
Slot 1 (Bank 0 & Bank 1)	64MB, 128MB, 256MB, 512MB, 1GB	64MB~1GB
Slot 2 (Bank 2 & Bank 3)	64MB, 128MB, 256MB, 512MB, 1GB	64MB~1GB
<b>Total System Memory</b>		64MB~2GB

### Memory Population Rules

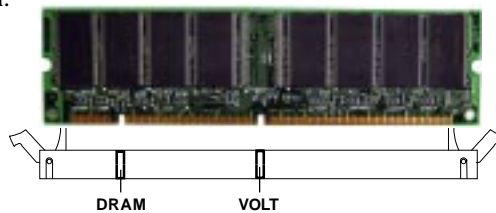
1. Supports only SDRAM DIMM.
2. To operate properly, at least one 168-pin DIMM module must be installed.
3. This mainboard supports Table Free memory, so memory can be installed on DIMM1 or DIMM 2 in any order.
4. Supports 3.3 volt DIMM.

### Installing SDRAM Modules

1. The DIMM slot has 2 Notch Keys “VOLT and DRAM”, so the DIMM memory module can only fit in one direction.



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



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



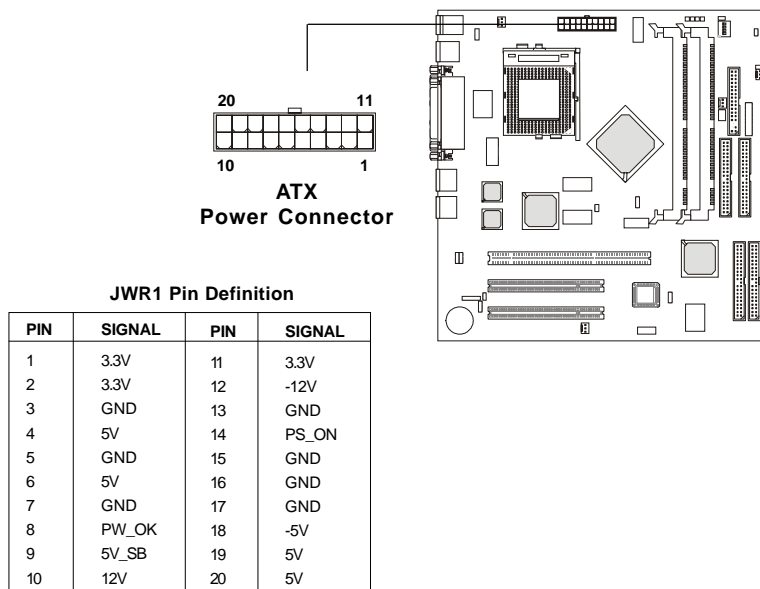
## Chapter 2

### 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 to ensure that no damage will be caused.

#### ATX 20-Pin Power Connector: JWR1

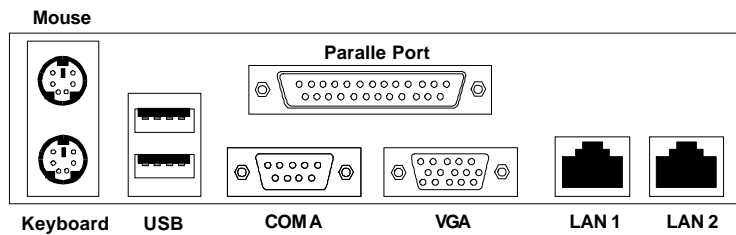
This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plugs of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.



*Since the mainboard has instant power on function, make sure that all components are installed properly before inserting the power connector to ensure that no damage will be done.*

## Back Panel

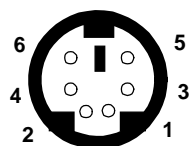
The Back Panel provides the following connectors:



### Mouse Connector

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

**Pin Definition**



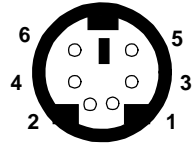
PIN	SIGNAL	DESCRIPTION
1	Mouse DATA	Mouse DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock	Mouse clock
6	NC	No connection

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

### Keyboard Connector

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

**Pin Definition**



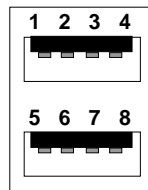
PIN	SIGNAL	DESCRIPTION
1	Keyboard DATA	Keyboard DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Keyboard Clock	Keyboard clock
6	NC	No connection

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

## Chapter 2

### 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 this connector.



USB Ports

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

### LAN Jacks (RJ-45)

The mainboard provides two standard RJ-45 jacks for connection to Local Area Network (LAN): LAN 1 and LAN 2. You can connect network cable(s) to the LAN jack(s).



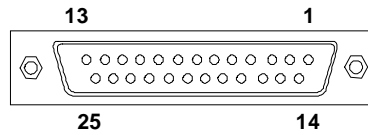
LAN RJ-45 Jack

Pin Definition

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

**Parallel Port Connector**

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



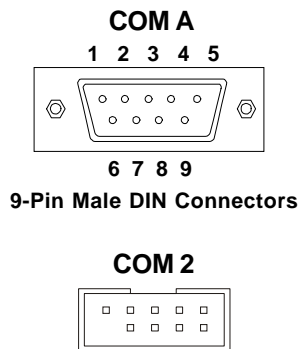
**Pin Definition**

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

## Chapter 2

### Serial Port Connector: COM A & COM 2

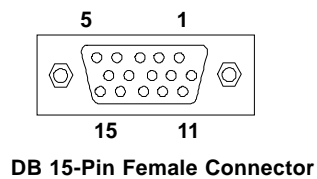
The mainboard has two 9-pin serial port connectors, one (COM A) in the back panel and one (COM 2) on-board. You can attach a serial mouse or other serial devices to them.



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 DB 15 Pin Connector

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



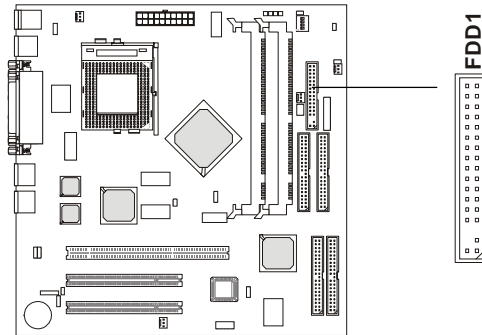
Pin Definition	
Analog Video Display Connector (DB-15S)	
PIN	SIGNAL DESCRIPTION
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Power
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

## Connectors

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

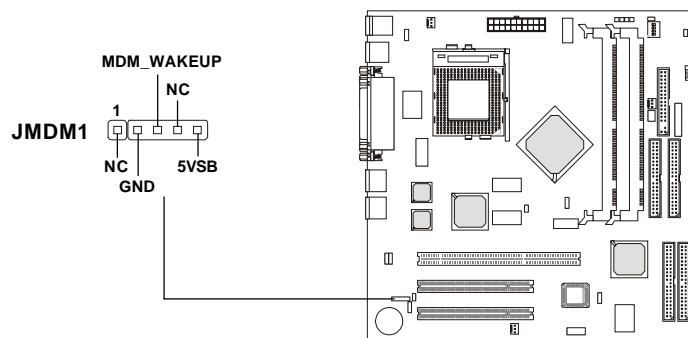
### Floppy Disk Drive Connector: FDD1

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



### Wake On Ring Connector: JMDM1

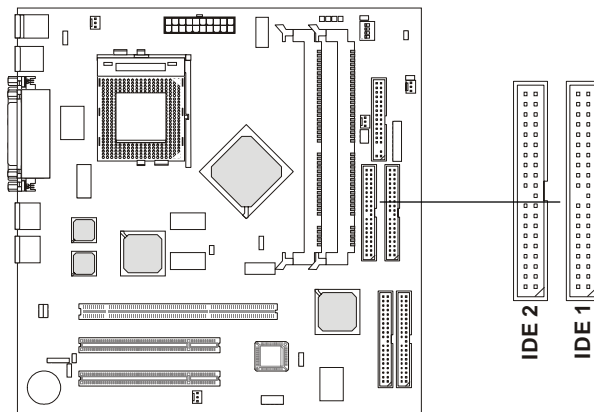
This connector allows you to connect to a modem card with Wake On Ring function. The connector will power up the system when a signal is received through the modem card.



## Chapter 2

### 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:**

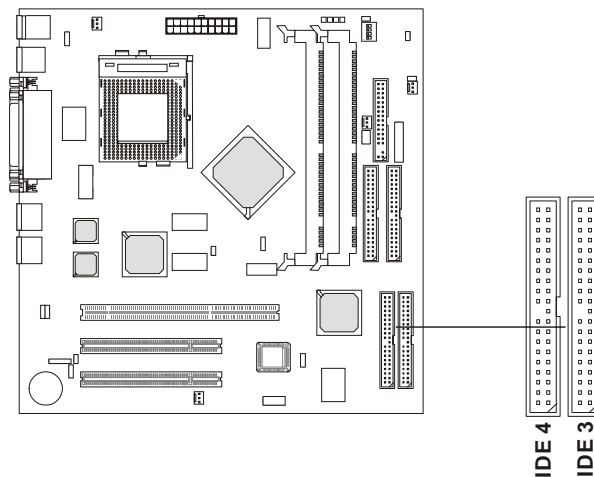
*If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.*

### IDE RAID Connectors: IDE3 & IDE4

The mainboard offers a low-cost RAID (Redundant Array of Independent Disks) solution by integrating two IDE RAID connectors that support PIO mode 0-4, Bus Master, and Ultra DMA 33/66/100 modes. The IDE RAID connectors allow you to connect Ultra ATA/DMA hard disks and use RAID technology for high performance, data security and fault tolerance. The connectors support RAID 0 (striping) and RAID 1 (mirroring).

#### IDE RAID Connectors

- You can connect a Master and a Slave drive to each IDE RAID connector.
- **For more information on IDE RAID, please refer to IDE RAID Manual.**
- Please note that only the two master HDDs will adopt RAID function.



**TIP:**

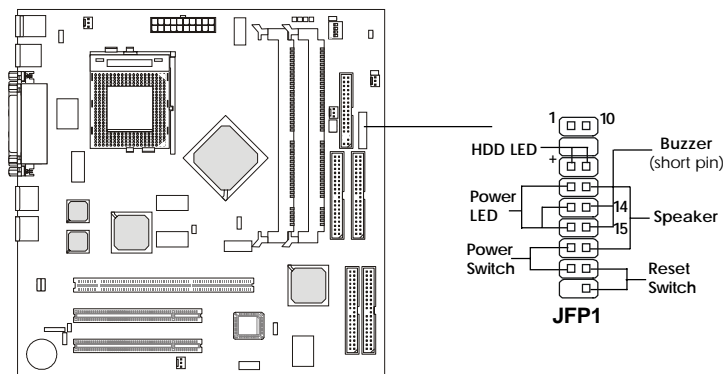
*If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.*



## Chapter 2

### Case Connector: JFP1

The case connector block JFP1 allows you to connect to the Power Switch, Reset Switch, Speaker, Power LED, and HDD LED on the case.



#### Power Switch

Connect to a 2-pin push button switch. This switch has the same feature with JRMS1.

#### Reset Switch

Reset switch is used to reboot the system rather than turning the power ON/OFF. Avoid rebooting while the HDD LED is lit. You can connect the Reset switch from the system case to this pin.

#### Power LED

The Power LED is lit while the system power is on.

#### Speaker

Speaker from the system case is connected to this pin.

If on-board Buzzer is available:

Short pin 14-15: On-board Buzzer Enabled.

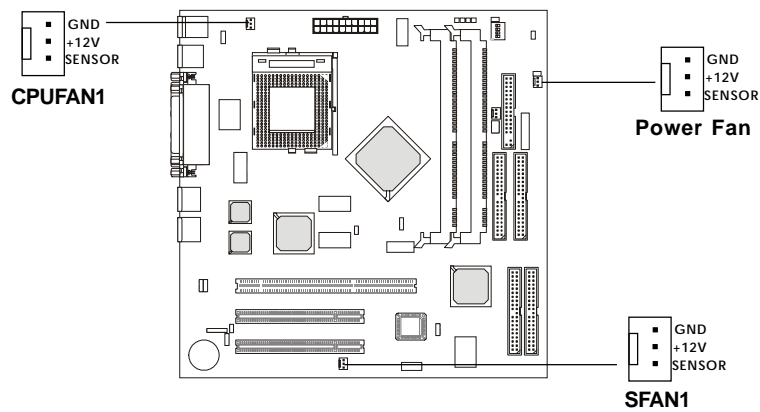
Open pin 14-15: On-board Buzzer Disabled.

#### HDD LED

HDD LED shows the activity of a hard disk drive. Avoid turning the power off while the HDD led is lit. You can connect the HDD LED from the system case to this pin.

### **Fan Power Connectors: CPUFAN1/SFAN1/Power Fan**

The CPUFAN1 (processor fan), SFAN1 (system fan), and Power 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.



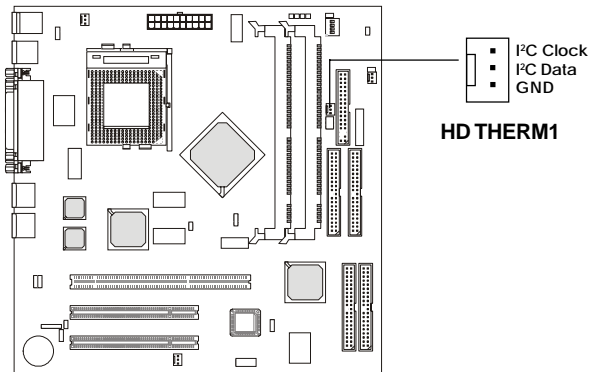
**Note:**

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.

## Chapter 2

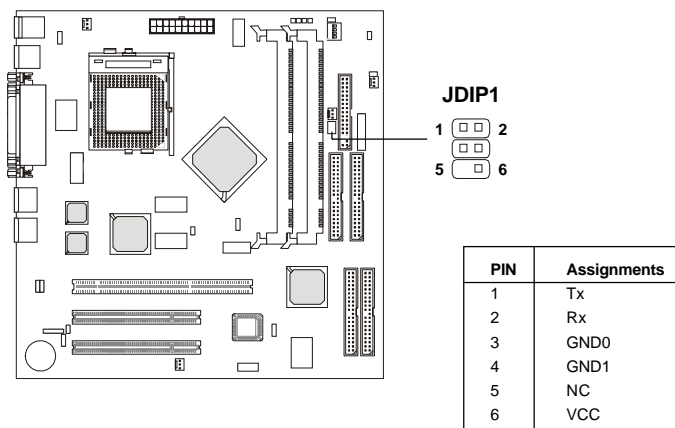
### I<sup>2</sup>C Clock/Data Connector: HD THERM1

The connector is for connection to an external display to show I<sup>2</sup>C clock and data.



### Serial Connector: JDIP1

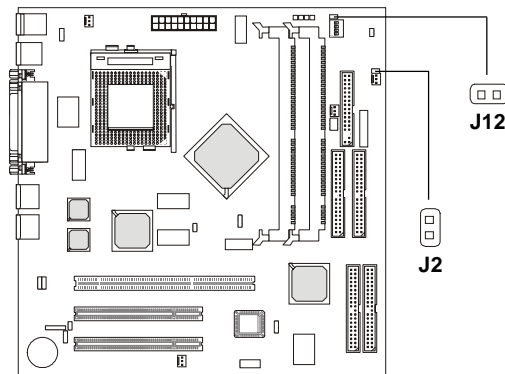
The connector is additionally provided for serial data input/output.



## Hardware Setup

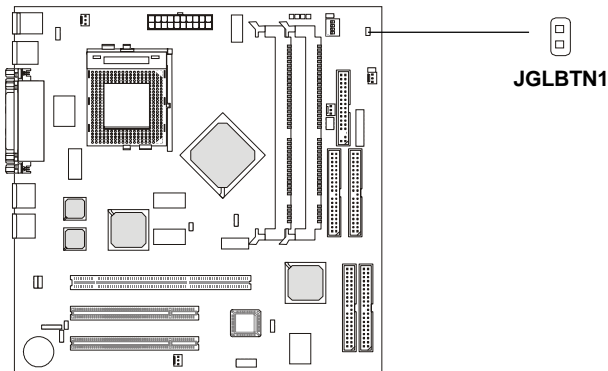
### LAN LED Connectors: J2 & J12

The LAN LED connectors are used to connect to optional LAN LEDs, which show the activity of the LAN. The J2 is for LAN1 port and the J12 is for LAN2 port. Both LAN1 & LAN2 ports are located on the back panel.



### Power Saving Switch Connector: JGLBTN1

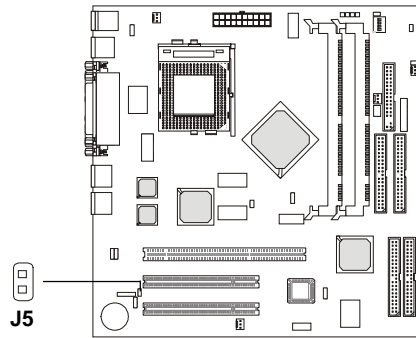
Connect a power saving switch to JGLBTN1. When the switch is pressed, the system immediately enters into suspend/sleep mode. Press any key and the system wakes up.



## Chapter 2

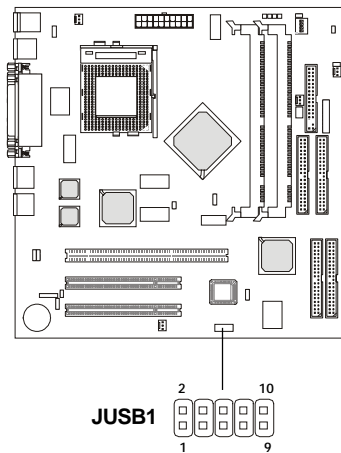
### Chassis Intrusion Switch Connector: J5

This connector is connected to a 2-pin chassis switch. If the chassis is open, the switch will be short. The system will record this status and show a warning on the screen. To clear the warning, you must enter the BIOS utility and clear the record.



### Front USB Connector: JUSB1

The mainboard provides a front Universal Serial Bus connector. This is an optional USB connector for front panel.



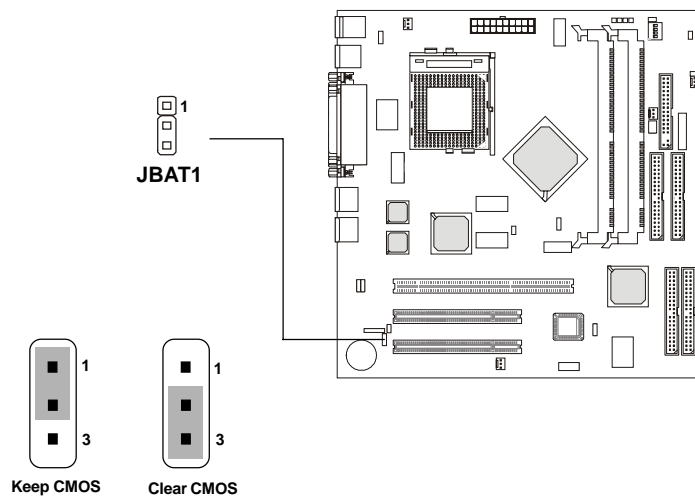
Pin	Description	Pin	Description
1	VCC	2	GND
3	USB2-	4	GND
5	USB2+	6	USB3+
7	GND	8	USB3-
9	GND	10	VCC

## Jumpers

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

### 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:



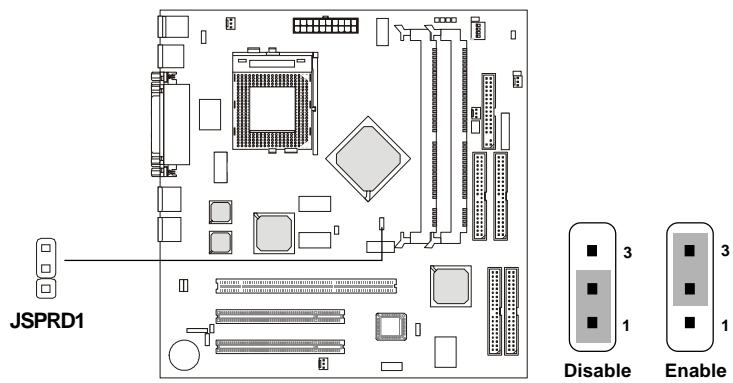
**WARNING!**

*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.*

## Chapter 2

### Clock Speed Spectrum Jumper: JSPRD1

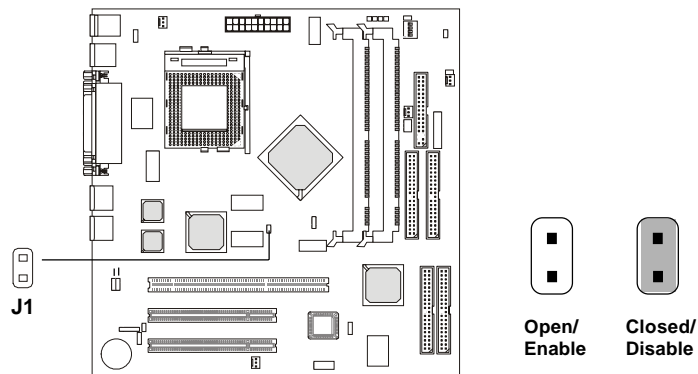
The jumper is used to enable or disable the clock speed spectrum.



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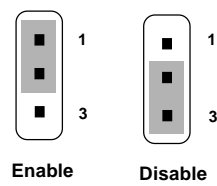
### VGA Enable/Disable Jumper: J1

For onboard VGA port, you can use this jumper to enable or disable the VGA controller.

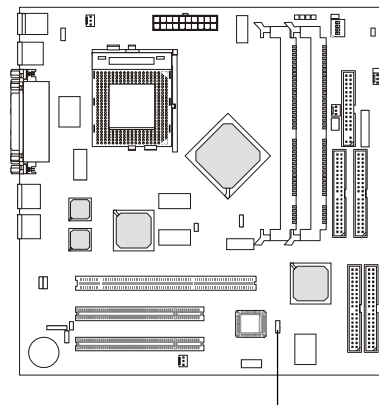


### IDE RAID Enable/Disable Jumper: J3

For onboard IDE RAID connectors, you can use this jumper to enable or disable the IDE RAID controller.

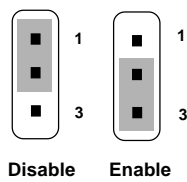


J3

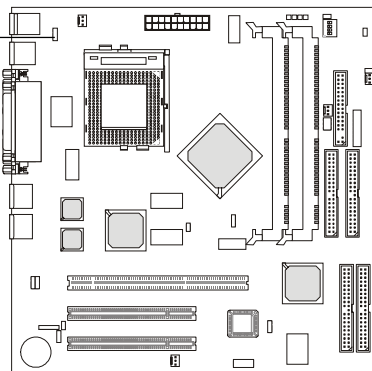



### PS2 KB/MS Wake-Up Jumper: J4

The J4 jumper is used to set PS2 keyboard/mouse wake-up feature. To use this function, you should also go to BIOS to enable the keyboard and mouse wake-up function.



J4



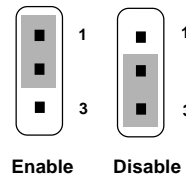
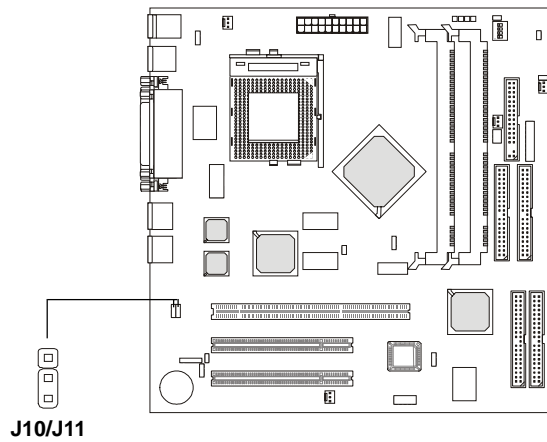
 **Note:** To be able to use this function, you need a power supply that provides enough power for this feature. (Power supply with 750mA 5V Stand-by)



## Chapter 2

### LAN Enable/Disable Jumpers: J10 & J11

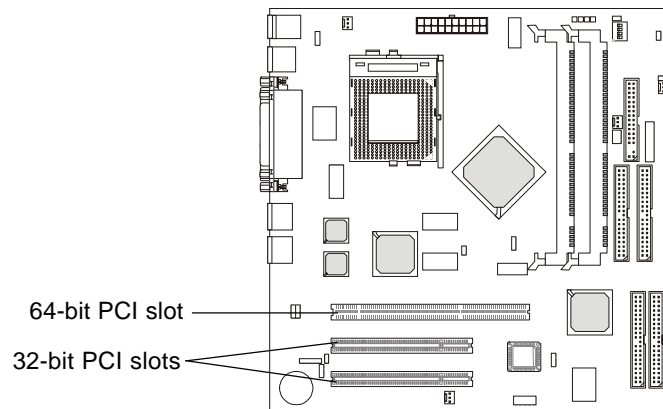
These connectors are used to enable/disable the onboard LAN controllers for the LAN ports (JLAN1/JLAN2) on the back panel. Please especially note that the J10 is for JLAN1 and the J11 is for JLAN2.



## Slots

---

The mainboard provides one 64-bit & two 32-bit Master PCI bus slots.



### PCI Slots

This mainboard offers two types of PCI slots for you to insert the desired expansion cards:

1. PCI 64bit/66MHz (can be downgraded to PCI 32bit/33MHz or PCI 64bit/33MHz)
2. PCI 32bit/33MHz

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.

---

## AWARD® BIOS Setup

# 3

The mainboard uses AWARD® BIOS ROM that provides a Setup utility for users to modify the basic system configuration. The information is stored in a battery-backed CMOS RAM so it retains the Setup information when the power is turned off.

This chapter provides you with the overview of the BIOS Setup program. It contains the following topics:

Entering Setup	3-2
Control Keys	3-2
Getting Help	3-3
The Main Menu	3-4
Standard CMOS Features	3-6
Advanced BIOS Features	3-8
Advanced Chipset Features	3-14
Integrated Peripherals	3-16
Power Management Setup	3-20
PNP/PCI Configurations	3-23
PC Health Status	3-25
Load Fail-Safe/Optimized Defaults	3-26
Set Supervisor/User Password	3-27

### Chapter 3

## 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.

Press DEL to enter SETUP

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.

## 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
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu
<F5>	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
<F6>	Load the default CMOS value from Fail-Safe default table, only for Option Page Setup Menu
<F7>	Load Optimized defaults
<F10>	Save all the CMOS changes and exit

## Getting Help

---

After entering the Setup menu, the first menu you will see is the Main Menu.

### 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 in the right view) appears to the left of certain fields that 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, just 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.

## Chapter 3

### The Main Menu

---

Once you enter Award® BIOS CMOS Setup Utility, the Main Menu (Figure 1) 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 accept or enter the sub-menu.



#### Standard CMOS Features

Use this Menu for basic system configurations.

#### Advanced BIOS Features

Use this menu to set the Advanced Features available on your system.

#### 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 for integrated peripherals.

#### Power Management Setup

Use this menu to specify your settings for power management.

#### PnP/PCI Configuration

This entry appears if your system supports PnP/PCI.

**AWARD® BIOS Setup**

**PC Health Status**

This entry shows your PC health status.

**Load Fail-Safe Defaults**

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

**Load Optimized Defaults**

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

**Supervisor/User Password**

Use this menu to set User and Supervisor Passwords.

**Save & Exit Setup**

Save CMOS value changes to CMOS and exit setup.

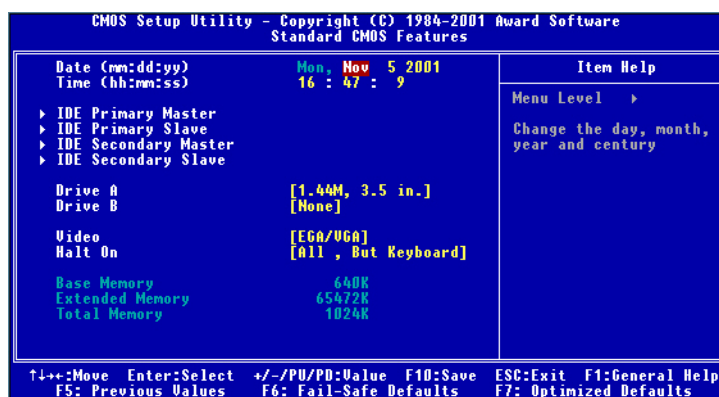
**Exit Without Saving**

Abandon all CMOS value changes and exit setup.

## Chapter 3

### Standard CMOS Features

The items in Standard CMOS Features Menu are divided into 10 categories. Each category includes no, 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

The date 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

The time format is <hour> <minute> <second>.

#### IDE Primary/Secondary Master/Slave

Press PgUp/<+> or PgDn/<-> to select Manual, None, Auto type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Manual to define your own drive type manually.

If you select Manual, related information is asked to be entered to the follow-



## AWARD® BIOS Setup

ing items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is SCSI, the selection shall be “None”.

If the controller of HDD interface is CD-ROM, the selection shall be “None”.

<b>Access Mode</b>	The settings are CHS, LBA, Large, Auto.
<b>Capacity</b>	The formatted size of the storage device.
<b>Cylinder</b>	Number of cylinders.
<b>Head</b>	Number of heads.
<b>Precomp</b>	Write precompensation.
<b>Landing Zone</b>	Cylinder location of the landing zone.
<b>Sector</b>	Number of sectors.

### Drive A/B

This item allows you to set the type of floppy drives installed. Available options are *None*, *360K, 5.25 in.*, *1.2M, 5.25 in.*, *720K, 3.5 in.*, *1.44M, 3.5 in.*, *2.88M, 3.5 in.*.

### Video

The setting controls the type of video adapter used for the primary monitor of the system. Available options are *EGA/VGA*, *CGA 40*, *CGA 80* and *Mono*.

### Halt On

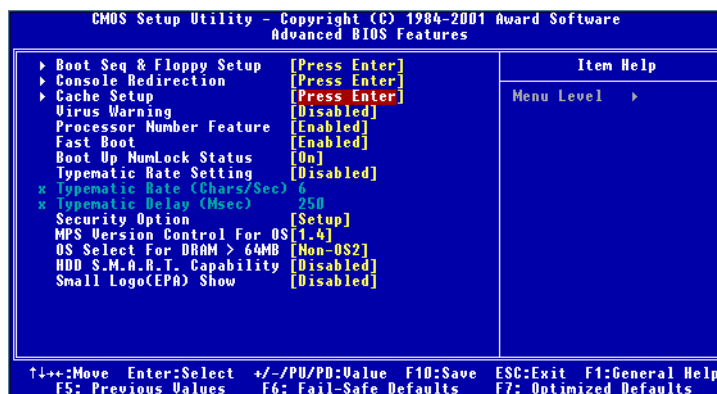
The setting determines whether the system will stop if an error is detected at boot. Available options are:

<i>All Errors</i>	The system stops when any error is detected.
<i>No Errors</i>	The system doesn't stop for any detected error.
<i>All, But Keyboard</i>	The system doesn't stop for a keyboard error.
<i>All, But Diskette</i>	The system doesn't stop for a disk error.
<i>All, But Disk/Key</i>	The system doesn't stop for either a disk or a keyboard error.

## Chapter 3

### Advanced BIOS Features

---



#### Boot Seq & Floppy Setup

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



#### Promise & SCSI Boot Order

This setting determines the boot order of the onboard IDE RAID device and the external SCSI device. If no SCSI device is connected, the system will automatically boot the onboard IDE RAID device. Setting options: ATA, SCSI & SCSI, ATA.

### First/Second/Third Boot Device

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

<i>Floppy</i>	The system will boot from floppy drive.
<i>LS120</i>	The system will boot from LS-120 drive.
<i>HDD-0</i>	The system will boot from the first HDD.
<i>SCSI</i>	The system will boot from the SCSI.
<i>CDROM</i>	The system will boot from the CD-ROM.
<i>HDD-1</i>	The system will boot from the second HDD.
<i>HDD-2</i>	The system will boot from the third HDD.
<i>HDD-3</i>	The system will boot from the fourth HDD.
<i>ZIP</i>	The system will boot from ATAPI ZIP drive.
<i>LAN</i>	The system will boot from the Network drive.
<i>Disabled</i>	Disable this sequence.

### Boot Other Device

Setting the option to *Enabled* allows the system to try to boot from other device if the system fails to boot from the First/Second/Third boot device.

### Swap Floppy Drive

This setting switches the floppy disk drives between being designated as A and B. Setting options: *Disabled, Enabled*.

### Boot Up Floppy 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*.

### Report No FDD For WIN95

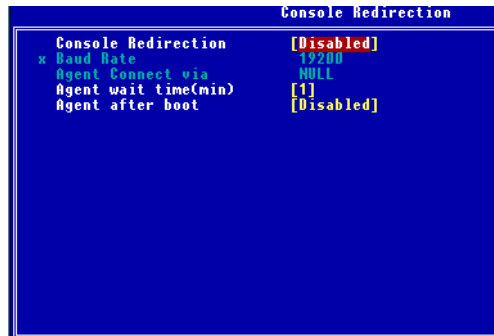
This setting determines whether or not to report no FDD for Win 95. Setting options: *Yes, No*.

### Console Redirection

The sub-menu handles *Console Redirection*, which operates in host systems that do not have a monitor and keyboard attached. To operate the system's console redirection, you need a terminal supporting ANSI terminal protocol and a RS-232 null modem cable connected between the host system and terminal

### Chapter 3

(s). Press <Enter> to enter the sub-menu and the following screen appears:



#### Console Redirection

This setting enables/disables the operation of console redirection. When set to *Enabled*, BIOS redirects and sends all contents that should be displayed on the screen to the serial COM port for display on the terminal screen. Besides, all data received from the serial port is interpreted as keystrokes from a local keyboard. Setting options: *Disabled, Enabled*.

#### Baud Rate

This setting specifies the baud rate of *Console Redirection*.

#### Agent Wait Time (Min)

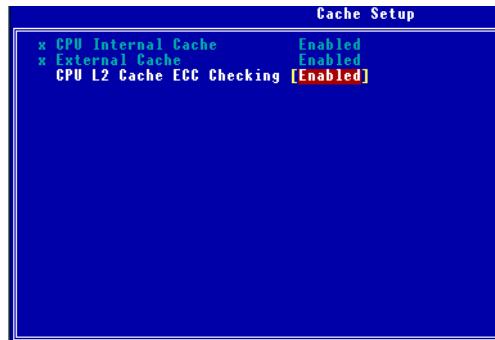
This setting controls the timeout for terminals' (console redirection) connection to the host system. Setting options: *1, 2, 4, 8 (Min)*.

#### Agent After Boot

This setting determines whether or not to keep terminals' console redirection running after the OS has booted. Setting options: *Disabled, Enabled*.

#### Cache Setup

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



#### CPU Internal Cache/External 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 settings enable/disable the internal cache (also known as L1 or level 1 cache) and external cache (also known as L2 or level 2 cache). Setting options: *Disabled, Enabled*.

#### CPU L2 Cache ECC Checking

This setting allows you to enable or disable the ECC (Error-Correcting Code) feature for error detection and correction when data passes through L2 cache memory. Setting options: *Enabled* and *Disabled*.

#### Virus Warning

This setting allows you to choose the virus warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempts to write data into this area, BIOS will show a warning message on screen and alarm beep.

- |                 |   |
|-----------------|---|
| <i>Disabled</i> | No warning message appears when anything attempts to access the boot sector or hard disk partition table.   |
| <i>Enabled</i>  | Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector of hard disk partition table. |

#### Processor Number Feature

This option is for Pentium® III processors only. During *Enabled*, this will check the CPU Serial number. Disable this option if you don't want the system

### Chapter 3

to know the serial number.

#### **Fast Boot**

The setting allows the system to skip certain tests while booting. This will decrease the time needed to boot the system. HDD will be the first boot device if previous boot was successful to OS that supports Simple Boot Flag Spec. Setting options: *Enabled, Disabled*.

#### **Boot Up NumLock Status**

This feature controls the functionality of the Numeric Keyboard at boot up. If set to *On*, the Numeric Keyboard will function in the numeric mode (for typing out numbers) but if set to *Off*, it will function in the cursor control mode (for controlling the cursor). Setting options: *Off, On*.

#### **Typematic Rate Setting**

Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected. The settings are: *Enabled, Disabled*.

#### **Typematic Rate (Chars/Sec)**

Sets the number of times a second to repeat a key stroke when you hold the key down. The settings are: 6, 8, 10, 12, 15, 20, 24, 30.

#### **Typematic Delay (Msec)**

Sets the delay time after the key is held down before it begins to repeat the keystroke. The settings are: 250, 500, 750, 1000.

#### **Security Option**

This specifies the type of BIOS password protection that is implemented. Settings are described below:

<b>Option</b>	<b>Description</b>
<i>Setup</i>	The password prompt appears only when end users try to run Setup.
<i>System</i>	A password prompt appears every time when the computer is powered on or when end users try to run Setup.

**MPS Version Control For OS**

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. The MPS is a specification by which PC manufacturers design Intel architecture systems with two or more processors. Most newer server operating systems support MPS 1.4, such as Novell IntranetWare 4.1 or Microsoft Windows Server NT 4.0. To find out which version to use, consult the vendor of your operating system. Settings are *1.4* and *1.1*.

**OS Select For DRAM > 64MB**

This setting allows you to run the OS/2® operating system with DRAM greater than 64MB. Setting options: *Non-OS2*, *OS2*.

**HDD S.M.A.R.T. Capability**

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*.

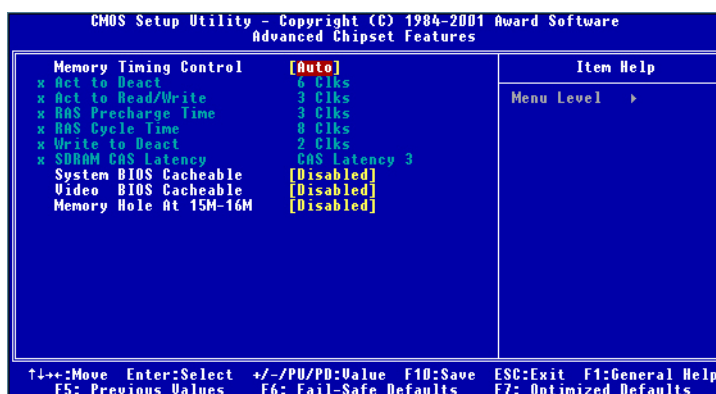
**Small Logo (EPA) Show**


This setting disables/enables the Small Logo (EPA) Show function. Setting options: *Disabled*, *Enabled*.

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### Advanced Chipset Features

The Advanced Chipset Features Setup option is used to change the values of the chipset registers. These registers control most of the system options in the computer.



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

#### Memory Timing Control

This setting controls the memory timing. When set to *Manual*, users will be able to set the memory timing by themselves. When set to *Auto*, the BIOS will automatically set the memory timing. Setting options: *Manual, Auto*.

#### Act to Deact

This setting controls the number of clock cycles needed after a bank active command before a precharge can occur. Setting options: *6 Clks, 5 Clks*.

#### Act to Read/Write

This setting controls the number of clock cycles needed after a bank active command before data read/write can occur. Setting options: *3 Clks, 2 Clks*.

#### RAS Precharge Time

This item 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. The settings are: *2 Clks, 3 Clks*.



**RAS Cycle Time**

This setting determines the time RAS takes to read from and write to a memory cell. Setting options: *7 Clks, 8 Clks, 9 Clks, 10 Clks.*

**Write to Deact**

This setting controls the number of clock cycles needed after a data write command before a precharge can occur. Setting options: *2 Clks, 1 Clks.*

**SDRAM CAS Latency**

The field controls the CAS latency, which determines the timing delay before SDRAM starts a read command after receiving it. Setting options: *CAS Latency 2, CAS Latency 3.* *2* increases system performance while *3* provides more stable 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. The settings are: *Enabled, Disabled.*

**Video BIOS Cacheable**

Selecting *Enabled* allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result. Settings: *Enabled, Disabled.*

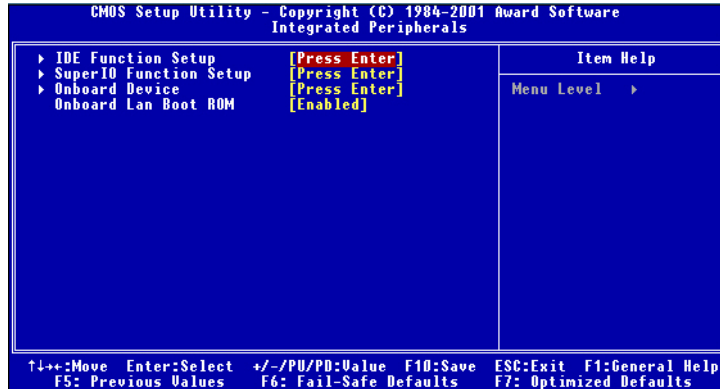
**Memory Hole At 15M-16M**

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements. The settings are: *Enabled, Disabled.*

## Chapter 3

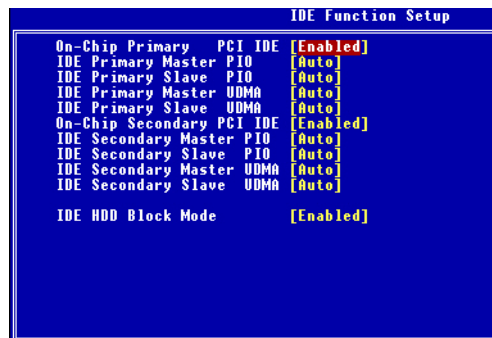
### Integrated Peripherals

---



#### IDE Function Setup

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



#### On-Chip Primary/Secondary PCI IDE

This setting enables or disables the internal primary and secondary PCI & IDE controllers. Setting options: *Disabled, Enabled*.

#### IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for

## AWARD® BIOS Setup

each device. The settings are: *Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.*

### IDE Primary/Secondary Master/Slave UDMA

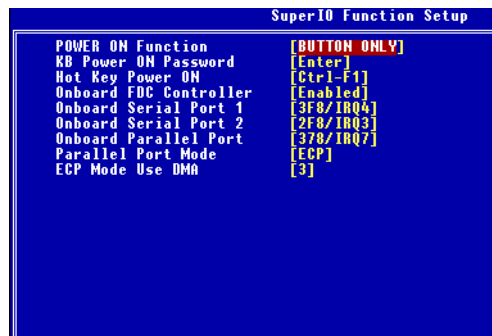
Ultra DMA 33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, Ultra DMA/66 and Ultra DMA/100 select *Auto* to enable BIOS support. The settings are: *Auto, Disabled.*

### 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. The settings are: *Enabled, Disabled.*

## Super IO Function Setup

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



### Power On Function

This controls which part on the PS/2 mouse or keyboard can power on the system. Settings: *Password, Hot KEY, Mouse Left, Mouse Right, Any Key, 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.

## Chapter 3

### 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-F1* through *Ctrl-F12*.

### Onboard FDC Controller

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. The settings are: *Enabled, Disabled*.

### Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports. The settings are: *3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto*.

### Onboard Parallel Port

There is a built-in parallel port on the on-board Super I/O chipset that provides Standard, ECP, and EPP features. It has the following options:

*Disabled*  
*3BC/IRQ7* Line Printer port 0  
*278/IRQ5* Line Printer port 2  
*378/IRQ7* Line Printer port 1

### Parallel Port Mode

SPP : Standard Parallel Port

EPP : Enhanced Parallel Port

ECP : Extended Capability Port

ECP + EPP: Extended Capability Port + Enhanced Parallel Port

*SPP/EPP/ECP/ECP+EPP*

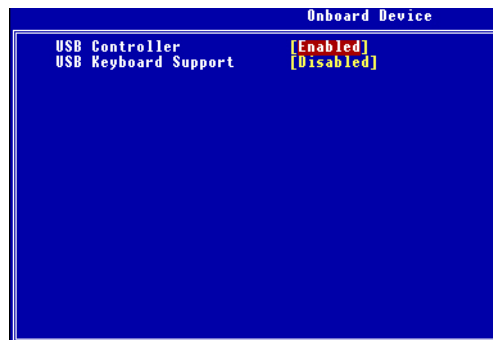
To operate the onboard parallel port as Standard Parallel Port only, choose "SPP." To operate the onboard parallel port in the EPP mode simultaneously, choose "EPP." By choosing "ECP", the onboard parallel port will operate in ECP mode only. Choosing "ECP + EPP" will allow the onboard parallel port to support both the ECP and EPP modes simultaneously.

### ECP Mode Use DMA

The ECP mode has to use the DMA channel, so choose the onboard parallel port with the ECP feature. After selecting it, the following message will appear: "ECP Mode Use DMA." At this time, the user can choose between DMA channel 3 or 1.

### Onboard Device

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



### USB Controller

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The settings are: *Enabled*, *Disabled*.

### USB Keyboard Support

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard. The settings are: *Enabled*, *Disabled*.

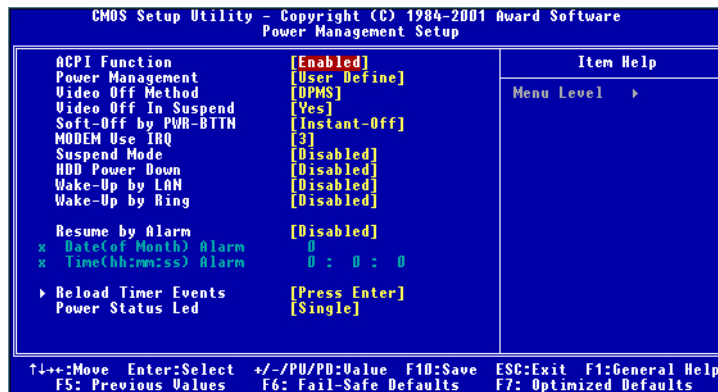
### Onboard LAN Boot ROM

This setting determines whether or not to activate the boot ROM of the onboard LAN chip. Setting options: *Enabled*, *Disabled*.

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### Power Management Setup

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



#### ACPI Function

This setting allows you to enable/disable the Advanced Configuration and Power Interface (ACPI). Setting options: *Enabled*, *Disabled*.

#### Power Management

This item is used to select the degree (or type) of power saving and is related to these modes: Suspend Mode and HDD Power Down. There are three options for power management:

*Min Saving* Minimum Power Management. Suspend Mode = 1 Hour, and HDD Power Down = 15 Min.

*Max Saving* Maximum Power Management. Suspend Mode = 1 Min, and HDD Power Down = 1 Min.

*User Define* Allows end users to configure each mode separately.

#### 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

*Blank Screen* and write blanks to the video buffer.  
*DPMS* This option only writes blanks to the video buffer.  
Initial display power management signaling.

**Video Off In Suspend**

This setting determines whether the monitor will be turned off during suspend mode. Setting options: *Yes, No*.

**Soft-Off by PWR-BTTN**

This feature allows users to configure the power button function. Settings are:

- Instant-Off* The power button functions as a normal power-on/-off button.
- Delay 4 Sec.* When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

**Modem Use IRQ**

This setting determines the IRQ which the MODEM can use. The settings are: *3, 4, 5, 7, 9, 10, 11, NA*.

**Suspend Mode**


After the selected period of system inactivity, all devices except the CPU shut off. Settings are *Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min* and *1 Hour*.

**HDD Power Down**

If HDD activity is not detected for the length of time specified in this field, the hard disk drive will be powered down while all other devices remain active. Settings are *Disabled* and *1 through 15 Min*.

**Wake-Up by LAN/Wake-Up by Ring**

These settings 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.

 *Note: To use the function of “Wake-Up by Ring” and “Wake-Up by LAN”, you need to install a modem/LAN card supporting power on function.*

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### Resume by Alarm

This function is for setting date and time for your computer to boot up. During *Disabled*, you cannot use this function. During *Enabled*, choose the Date and Time Alarm:

**Date (of month) Alarm** You can choose which month the system will boot up. Set to 0, to boot every day.

**Time (hh:mm:ss) Alarm** You can choose what hour, minute and second the system will boot up.



*Note: If you have change the setting, you must let the system boot up until it goes to the operating system, before this function will work.*

### Reload Timer Events

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

```
Reload Timer Events
** Reload Global Timer Events **
Primary IDE 0      [Disabled]
Primary IDE 1      [Disabled]
Secondary IDE 0    [Disabled]
Secondary IDE 1    [Disabled]
FDD, COM, LPT Port [Disabled]
PCI PIRQ[A-D]     [Disabled]
```

#### Primary/Secondary IDE 0/1, FDD/COM/LPT Port, PCI PIRQ [A-D]

Global Timer Events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device that is configured as *Enabled*, even when the system is in a power down mode. Setting options: *Disabled*, *Enabled*.

### Power Status LED

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

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



## PNP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **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.



### 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® 95 or 98. When set to *No*, BIOS will initialize all the PnP cards. So, select *Yes* if the 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 can not boot. The settings are: *Enabled* and *Disabled*.

### Resource 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

### Chapter 3

means absolutely nothing unless you are using a Plug and Play operating system such as Windows 95/98. If you set this field to “*Manual*”, choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a “➤”). The settings are: *Auto (ESCD)*, *Manual*.

#### IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

#### PCI/VGA Palette Snoop

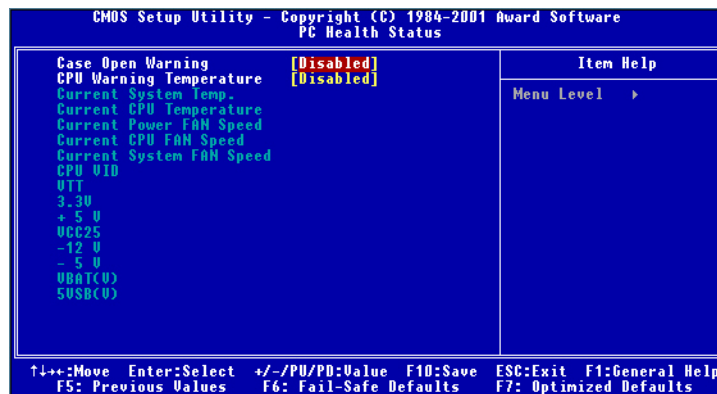
When set to *Enabled*, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and one ISA) and the:

VGA Palette Snoop Bit Setting	Action
<i>Disabled</i>	Data read or written by the CPU is only directed to the PCI VGA device's palette registers.
<i>Enabled</i>	Data read or written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device's palette registers, permitting the palette registers of both VGA devices to be identical.

The setting must be set to *Enabled* if any ISA bus adapter in the system requires VGA palette snooping.

## PC Health Status

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



### Case Open Warning

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*. Setting options: *Disabled*, *Enabled*, *Reset*.

### CPU Warning Temperature

If the CPU temperature reaches the upper limit preset in this setting, the warning mechanism will be activated. This helps you to prevent the CPU overheat problem.

### Current System & CPU Temperature/Current CPU, Power & System Fan Speed/CPU VID/VTT/3.3V/+5V/VCC25/-12V/-5V/VBAT(V)/5VSB(V)

These items display the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and all fans' speeds.

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### Load Fail-Safe/Optimized Defaults

---

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

When you select Load Fail-Safe Defaults, a message as below appears:



Pressing *Y* loads the BIOS default values for the most stable, minimal system performance.

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



Pressing *Y* loads the default factory settings for optimal system performance.

## 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 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 unauthorized 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 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 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

## Glossary

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*

## *Glossary*

### **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.