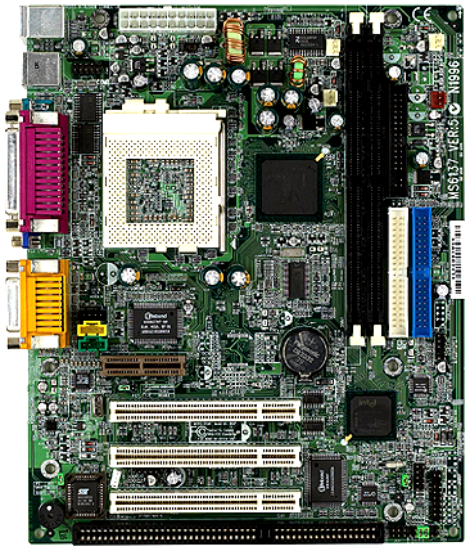
MSI

MICRO-STAR INTERNATIONAL

MS-6137 (v5.X) Micro ATX Mainboard



Version 5.0
G52-MA00452

Manual Rev: 5.0
Release Date: Sept. 2001

CE N1996

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

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

Micro-Star International MS-6137

FC **Tested to comply with FCC Standard**

For Home or Office Use

Edition
Sept. 2001

Copyright Notice

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Award is a registered trademark of Award Software Inc.

Revision History

Revision	Revision History	Date
V5.0	First release for PCB 5.X	Sept. 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 60^0C (140^0F), 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.

CONTENTS

Introduction 1

The MS-6137 v5.X Micro-ATX WH1 mainboard is a high-performance computer mainboard based on Intel® 810/810E chipset. It is designed for Intel® Celeron-Tualatin™, Pentium® III and VIA® C3, Samuel2 processors for inexpensive business/personal desktop markets.

The Intel® 810/810E chipset is the first generation Integrated Graphics chipset for Intel® Celeron™ and Pentium® III processors. The graphics accelerator architecture consists of dedicated multi-media engines executing in parallel to deliver high performance 3D, 2D and motion compensation video capabilities. An integrated centralized memory arbiter allocates memory bandwidth to multiple system agents to optimize system memory utilization. A new chipset component interconnect, the hub interface, is designed into the Intel® 810/810E chipset to provide an efficient communication channel between the memory controller hub and I/O controller hub.

The Intel® 810/810E chipset contains three core components. The GMCH integrates 66/100/133MHz for 810 and 66/100/133 MHz for 810E, P6 family system bus controller, integrated 2D/3D graphics accelerator, 100MHz SDRAM controller and high-speed hub interface for communication with the ICH0/ICH. The ICH0/ICH integrates an Ultra ATA/33 (ICH0) or Ultra ATA/66 (ICH) controller, USB host controller, LPC interface controller, FWH interface controller, PCI interface controller, AC`97 digital controller and a hub interface for communication with the GMCH/GMCHO. The Intel® 82802 Firmware Hub (FWH) component is part of the Intel® 810E chipset. The FWH is key to enabling future security and manageability infrastructure for the PC platform.

This chapter includes the following topics:

Mainboard Specification

CPU

- Supports Intel® Socket 370 Pentium III, Celeron-Tualatin, VIA C3, and Samuel2 processors.
- Supports up to 1.1GHz CPU.

Chipset

- Intel® 810/810E (GMCH) chipset. (421 BGA)
  - Integrated Graphics Controller.
  - Intel DDM Architecture.
  - SDRAM Memory Independent of System Bus.
- Intel® ICH chipset. (241 BGA)
  - AC'97 Controller Integrated.
  - 2 full IDE channels, up to ATA66.
  - Low Pin Count interface for SIO.

Front Side Bus (FSB)

- 66/100/133MHz clocks are supported.

Main Memory

- Support two 168-pin DIMM sockets.
- Support a maximum memory size of 256MB(64-bit) or 512MB(128-bit) SDRAM.

Slots

- One AMR (Audio Modem Riser) slot.
- Three PCI 2.2 32-bit PCI bus slots (support 3.3v/5v PCI bus interface)
- One 16-bit ISA bus slot (optional).

On-Board IDE

- An IDE controller on the ICH chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA66 operation modes.
- Can connect up to four IDE devices.

On-Board Peripherals

- On-Board Peripherals include:
  - 1 floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes.
  - 2 serial ports (COM A + COM B).

- 1 parallel port supports SPP/EPP/ECP mode.
- 4 USB ports (Rear * 2/ Front * 2).
- 1 IrDA connector for SIR.
- 1 VGA port.
- 1 audio/game port.

Video

- GMCH chip integrated.
- 2D/3D Graphics.

TV-Out (optional)

- Provide AV-composite and S-video output.
- TV output supporting up to 800*600.

Audio

- AC97 2.0 interface.
- ICH chip integrated.

BIOS

- The mainboard BIOS provides “Plug & Play” BIOS which detects the peripheral devices and expansion cards of the board automatically.
- The mainboard provides a Desktop Management Interface (DMI) function which records your mainboard specifications.

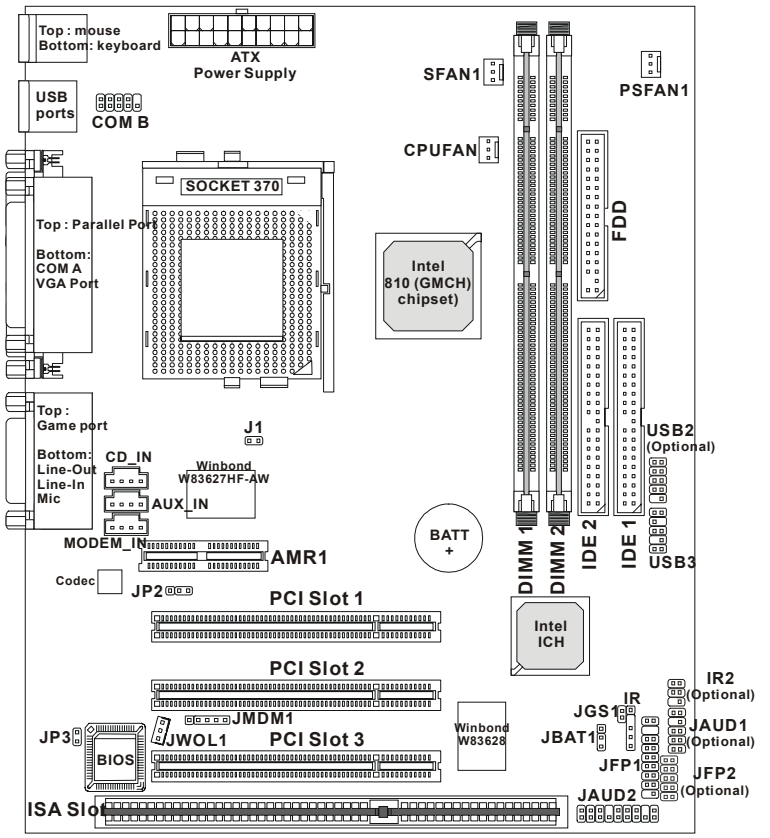
Dimension

- Micro ATX Form Factor.

Mounting

- 6 mounting holes.

Mainboard Layout



MS-6137 v5.X Micro ATX Mainboard

Quick Components Guide

Component	Function	Reference
JWR1	ATX power connector	See p. 2-6
JKBMS1	Mouse/keyboard connector	See p. 2-7
USB Connectors	Connecting to USB devices	See p. 2-8
COM A & COM B	Serial port connector	See p. 2-9
LPT1	Parallel port connector	See p. 2-10
VGA port	Connecting to VGA monitor	See p. 2-11
FDD	Floppy disk drive connector	See p. 2-12
JGS1	Power saving switch connector	See p. 2-12
IDE1~ IDE2	Hard disk connectors	See p. 2-13
CPU/SYS/PS FAN	Fan power connectors	See p. 2-14
CD/AUX/MODEM_IN	CD/AUX/Modem-in connectors	See p. 2-15
JWOL1	Wake on LAN connector	See p. 2-16
JMDM1	Wake on ring connector	See p. 2-16
JFP1/JFP2	Front panel connector	See p. 2-17
JAUD1/JAUD2	Front panel audio connector	See p. 2-18
USB2/USB3	Connecting to USB devices	See p. 2-19
IR/IR2	IrDA infrared module connector	See p. 2-20
JBAT1	Clear CMOS jumper	See p. 2-21
JP3	BIOS flash jumper	See p. 2-22
J1	TV NTSC/PAL jumper	See p. 2-22
JP2	Onboard audio jumper	See p. 2-23
AMR Slot	Connecting to AMR cards	See p. 2-24
PCI Slots	Connecting to expansion cards	See p. 2-24
ISA Slot	Connecting to expansion cards	See p. 2-24

Key Features

- Microsoft® PC99 Compliant
- Micro ATX Form Factor
- Audio/Video Chip Integrated
- Support DMI(Desktop Management Interface) through BIOS
- TCAV (Build-in BIOS Anti-Virus)
- TOP Tech. (Thermal Overheat Protection Technology)
- PC Alert™ III system hardware monitor
- LAN Wake Up Function
- Modem (Internal/External) Ring Wake Up Function
- Suspend to RAM/Disk
- Support PC2001

MSI Special Features

T.O.P Tech™ (optional)

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

CPU Warning Temperature [Disabled] Current System Temp. Current CPU Temperature Current Top Tech. III Temp. SYSTEM fan POWER fan CPU fan Vcore VTT 3.3V +5V +12V -12V -5V VBAT(V) 5VSB(V) Chassis Intrusion Detect [Disabled] Shutdown Temperature [Disabled]	Item Help Menu Level >

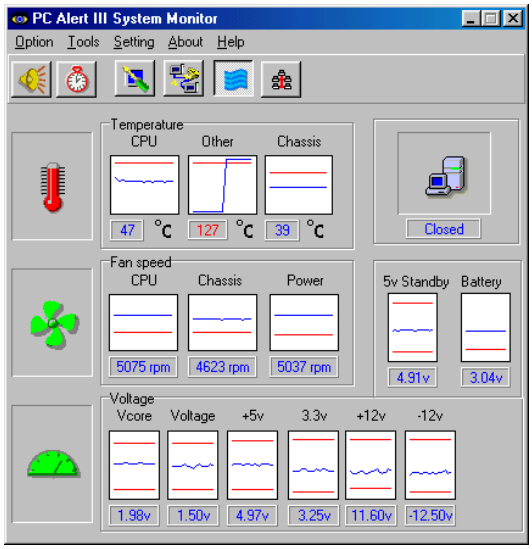
↑↓→← Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

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

2 Hardware Setup

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.

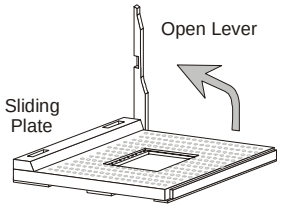
This chapter contains the following topics:

Central Processing Unit: CPU

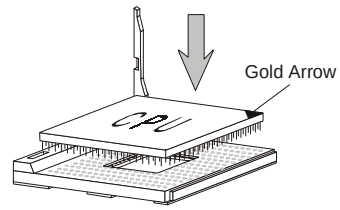
The mainboard supports Intel® Celeron™/Pentium® III processors. The mainboard uses a CPU socket called PGA370 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Installation Procedures

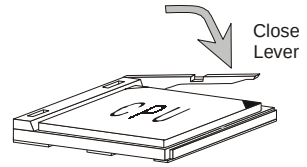
1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.



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	=	9
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 9
		=	900MHz

WARNING!

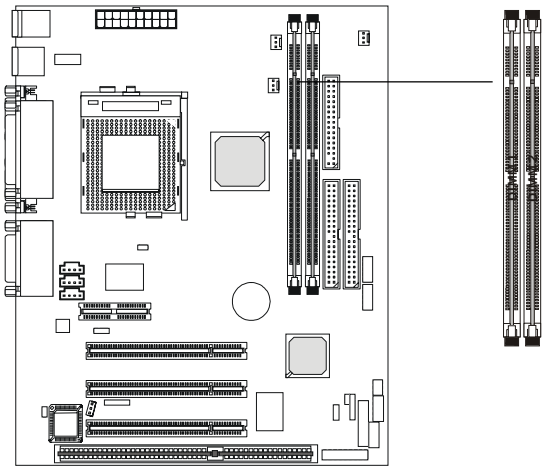
Overclocking

This motherboard is designed to support overclocking. However, please make sure your components are able to tolerate such abnormal setting, while doing overclocking. Any attempt to operate beyond product specifications is not recommended. ***We do not guarantee the damages or risks caused by inadequate operation or beyond product specifications.***

Memory Installation

Memory Bank Configuration

The mainboard supports a maximum memory size of 256MB (64-bit technology) or 512MB (128-bit technology for SDRAM). It provides two 168-pin **unbuffered** DIMMs (Double In-Line Memory Module) slots. It supports 8 MB to 128 Mbytes DIMM memory module.



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.

Memory Installation Procedures

Installing DIMM Modules

You can install memory modules in any combination as follows:

Slot	Memory Module	Total Memory
Slot 1 (Bank 0 & Bank 1)	8MB~256MB	8MB~256MB
Slot 2 (Bank 2 & Bank 3)	8MB~256MB	8MB~256MB
Total System Memory		8MB~512MB

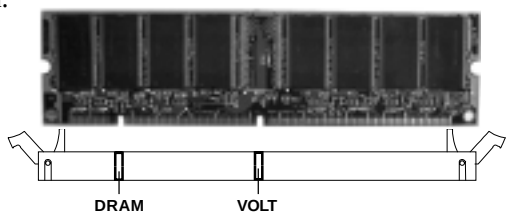
Memory Population Rules

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.

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

Front View **Rear View**

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



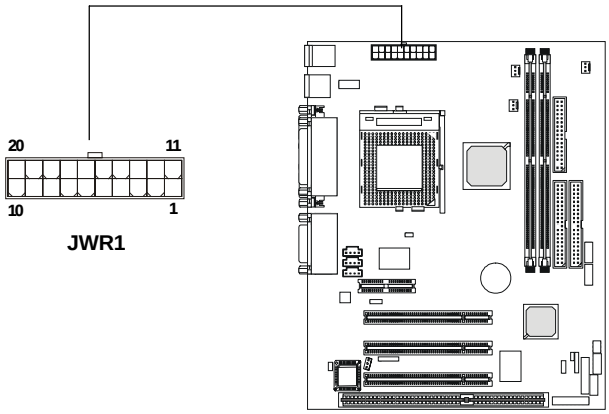
3. The plastic clip at the side of the DIMM slot will automatically close.

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: 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. 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.

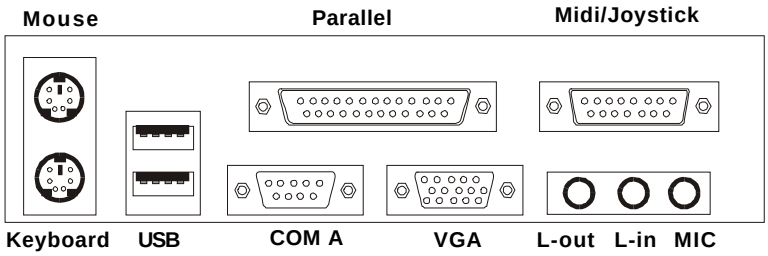


JWR1 Pin Definition

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

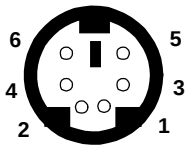
Back Panel

The Back Panel provides the following connectors:



Mouse Connector: JKBMS1

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



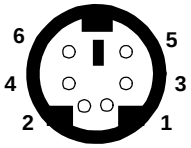
PS/2 Mouse (6-pin Female)

Pin Definition

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

Keyboard Connector: JKBMS1

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



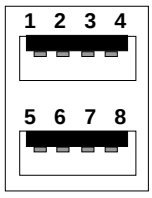
PS/2 Keyboard (6-pin Female)

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

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 Ports

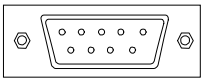
USB Port Description

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

Serial Port Connector: COM A & COM B

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

1 2 3 4 5



6 7 8 9

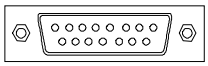
9-Pin Serial Connectors

Pin Definition

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

Joystick/Midi Connectors

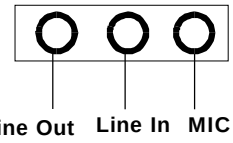
You can connect a joystick or game pad to this connector.



Audio Port Connectors

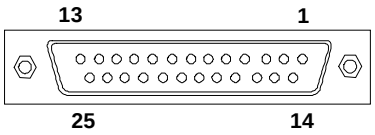
Line Out is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

1/8" Stereo Audio Connectors



Parallel Port Connector: LPT1

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

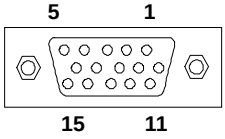


Pin Definition

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

VGA DB 15 Pin Connector

One DB 15-pin VGA connector is supplied for connection to a VGA monitor.



DB 15-Pin Female Connector

Pin Definition

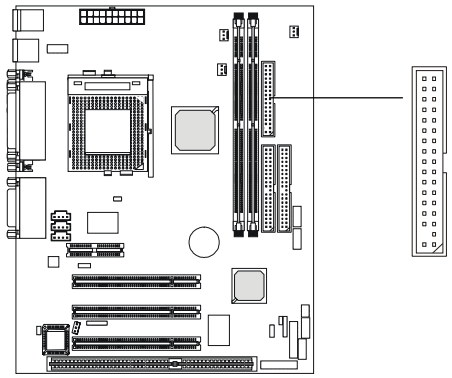
Analog Video Display Connector (DB-15S)	
PIN	**SIGNAL DESCRIPTION**
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Power
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

Connectors

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

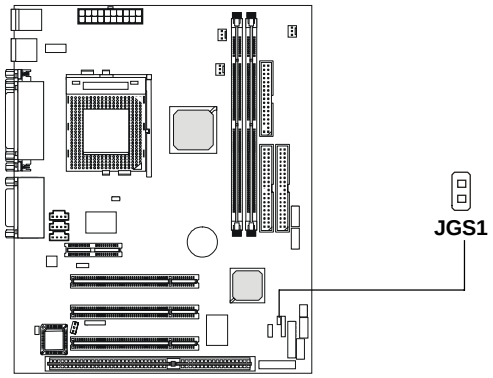
Floppy Disk Drive Connector: FDD

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



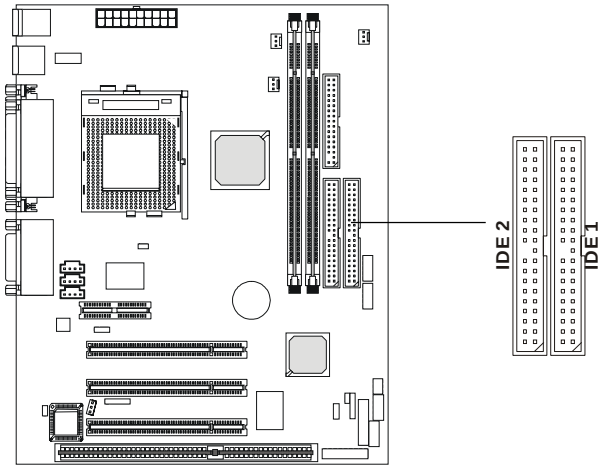
Power Saving Switch Connector: JGS1

Attach a power saving switch to this connector. Pressing the switch once will have the system enter the sleep/suspend state. Press any key to wake up the system.



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)

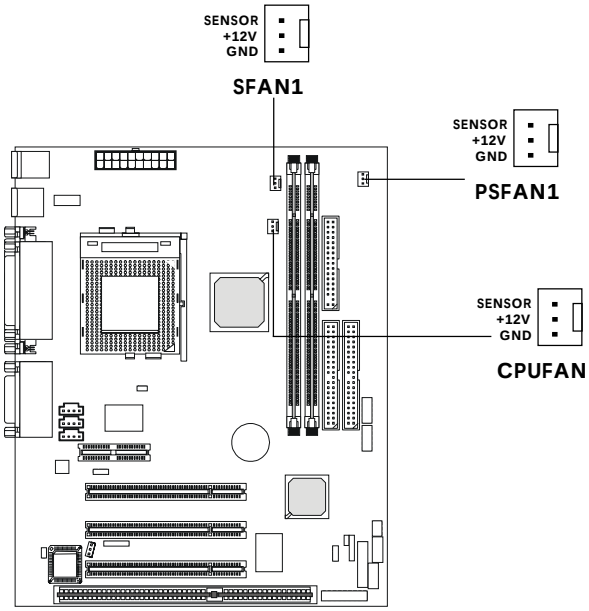
IDE2 can also connect a Master and a Slave drive.

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.

Fan Power Connectors: CPUFAN/SFAN1/PSFAN1

The CPUFAN (processor fan), SFAN1 (system fan), and 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.

CD-In Connector: CD_IN

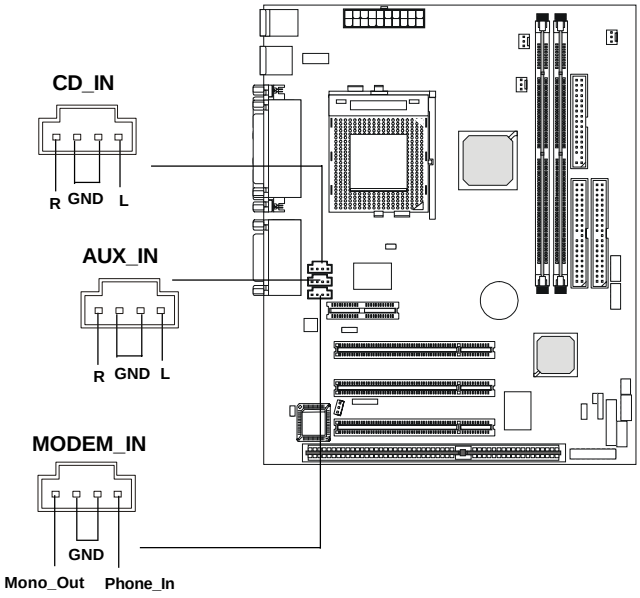
The connector is for CD-ROM audio connector.

Aux Line-In Connector: AUX_IN

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

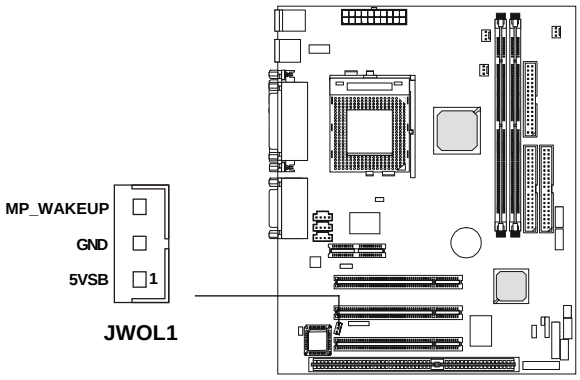
Modem-In Connector: MODEM_IN

The connector is for modem with internal audio connector.



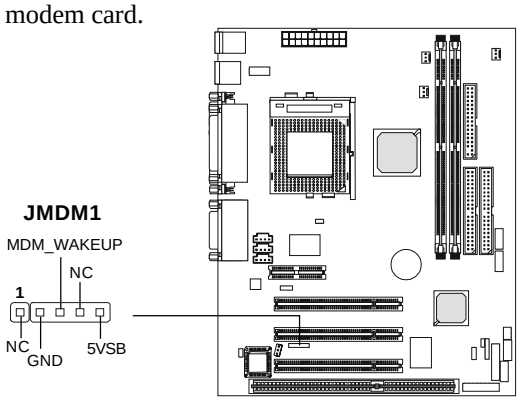
Wake On LAN Connector: JWOL1

This connector allows you to connect to a LAN card with Wake On LAN function. You can wake up the computer via remote control through a local area network.



Wake On Ring Connector: JMDM1

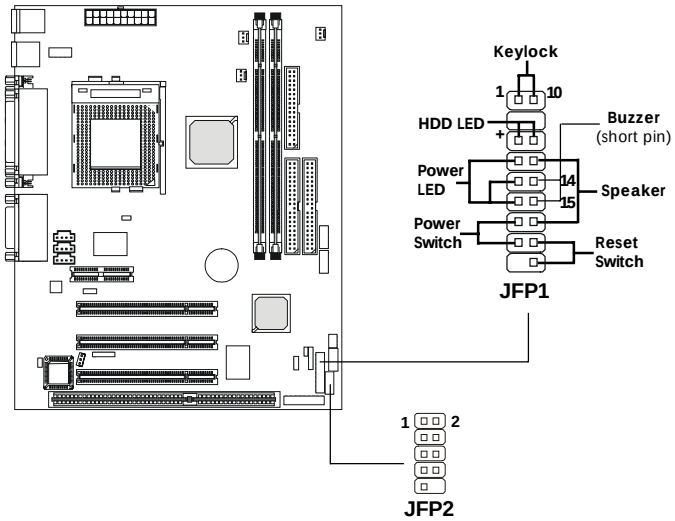
This connector allows you to connect to a modem card with Wake On Ring function. The connector will power up the system when a signal is received through the modem card.



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

Front Panel Connector: JFP1 or JFP2 (optional Intel spec)

This connector is for electrical connection to the front panel switches and LEDs.



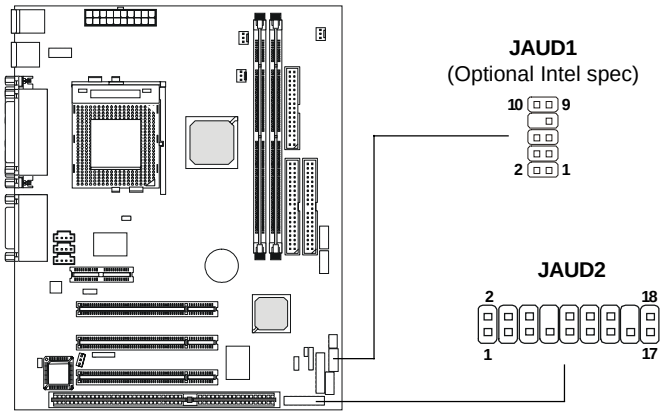
(Optional Intel spec)

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_1	Reset Switch 1
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_2	Reset Switch 2
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

Front Audio Header: JAUD2 or JAUD1 (optional Intel spec)

This connector allows you to connect to the front panel audio.



JAUD2 Pin Definition

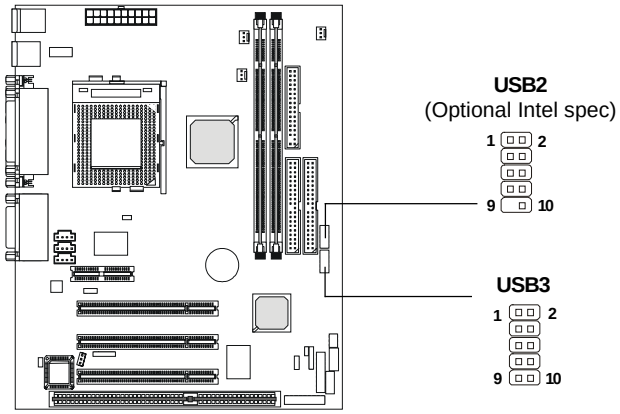
PIN	Description	PIN	Description
1	Active Line Out (R)	2	Active Line Out (L)
3	GND (ALO)	4	GND (ALO)
5	GND (+12)	6	GND (+12)
7	+12V (1A)	8	(Cut)
9	MIC	10	GND (MIC)
11	Front Line Out (R)	12	Line Next (R)
13	Front Line Out (L)	14	Line Next (L)
15	GND (FLO)	16	(Cut)
17	Line In (R)	18	Line In (L)

JAUD1 Pin Definition

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

USB Front Header: USB3 or USB2 (optional Intel spec)

The mainboard provides one front Universal Serial Bus connector for you to connect to USB devices.



USB3 Pin Definition

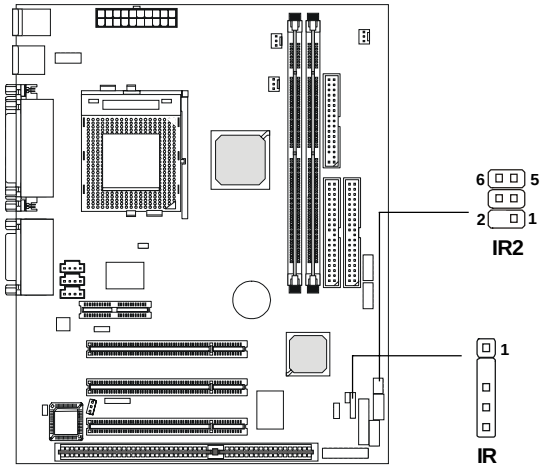
Pin	Description	Pin	Description
1	VCC	2	GND
3	DATA2-	4	GND
5	DATA2+	6	USB1+
7	GND	8	USB1-
9	GND	10	VCC

USB2 Pin Definition

Pin	Description	Pin	Description
1	VCC	2	VCC
3	DATA2-	4	DATA3-
5	DATA2+	6	DATA3+
7	GND	8	GND
9	NC	10	VCC

IrDA Infrared Module Header: IR or IR2 (optional Intel spec)

These connectors allow you to connect to IrDA Infrared modules. You must configure the setting through the BIOS setup to use the IR function. The difference between IR & IR2 is that IR2 is compliant to Intel Front Panel I/O Connectivity Design Guide.



IR Pin Definition

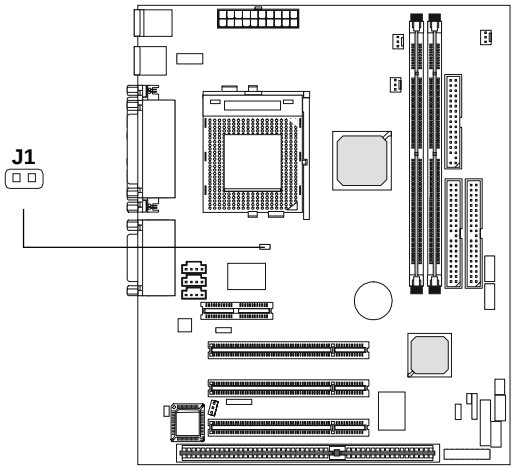
Pin	Signal
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX

IR2 Pin Definition

Pin	Signal
1	NC
2	NC
3	VCC
4	GND
5	IRTX
6	IRRX

Chassis Intrusion Switch Connector: J1

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

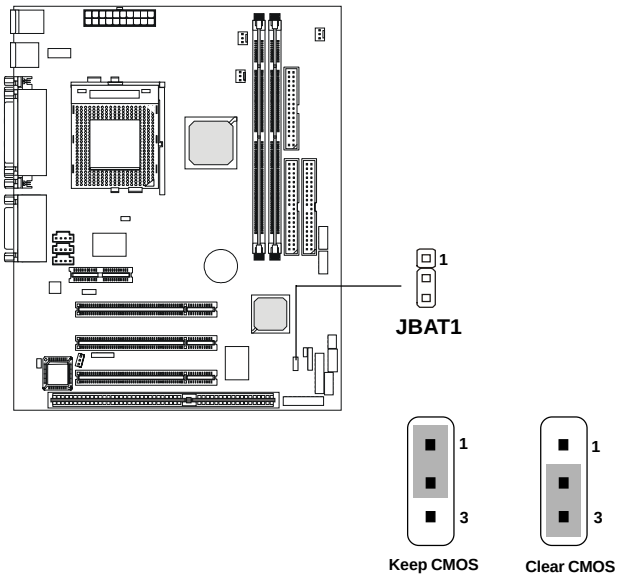


Jumpers

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

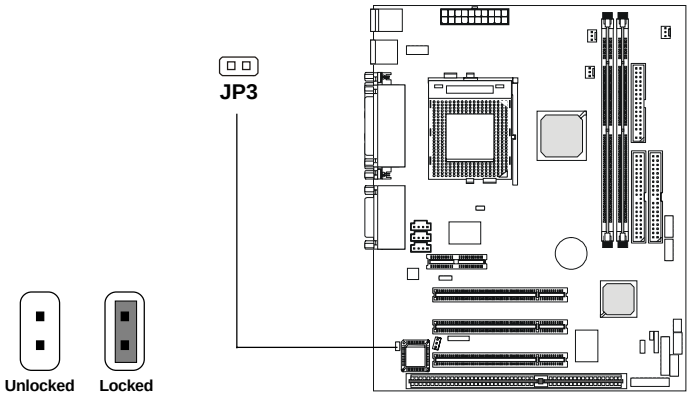
There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. That battery has long life time for at least 5 years. If you want to clear the system configuration,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



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.*

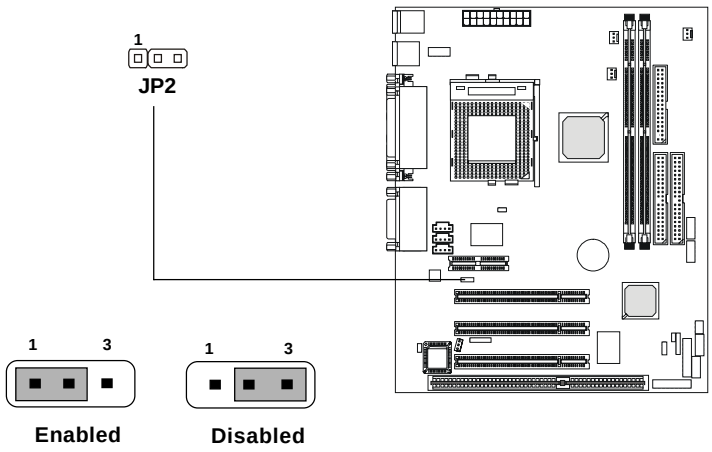
BIOS Flash Jumper: JP3

The jumper is used to lock or unlock the boot block area on the BIOS. When unlocked, the BIOS boot block area can be updated. When locked, the area cannot be updated.



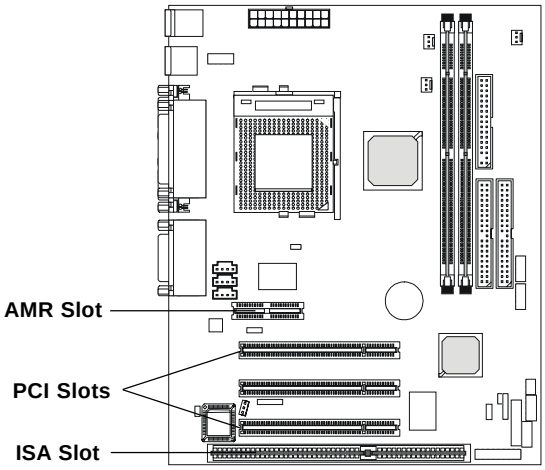
Onboard Audio Jumper: JP2

This jumper is used to enable/disable the onboard audio.



Slots

The motherboard provides three 32-bit Master PCI bus slots, one AMR slot, and one optional 16-bit ISA slot.



AMR (Audio Modem Riser) Slot

AMR is an Intel specification that lets manufacturers create motherboards without analog I/O functions (codecs). These functions that are required for auido and/or modem operation are placed on a separate AMR card. You can install any AMR card with audio and/or modem codec chip on the AMR slot.

PCI Slots

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

ISA Slot

The slot allows you to install ISA expansion card.

PCI Interrupt Request Routing

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

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

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

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

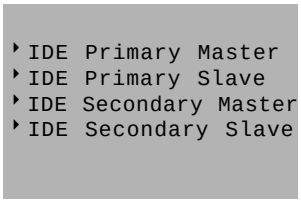
After entering the Setup menu, the first menu you will see is the Main Menu.

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 containing additional options can be launched from this field. 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 <Esc >.



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.

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 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 for frequency/voltage control.

Load Fail-Safe Defaults
Use this menu to load the BIOS default values for minimal but stable system performance.

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

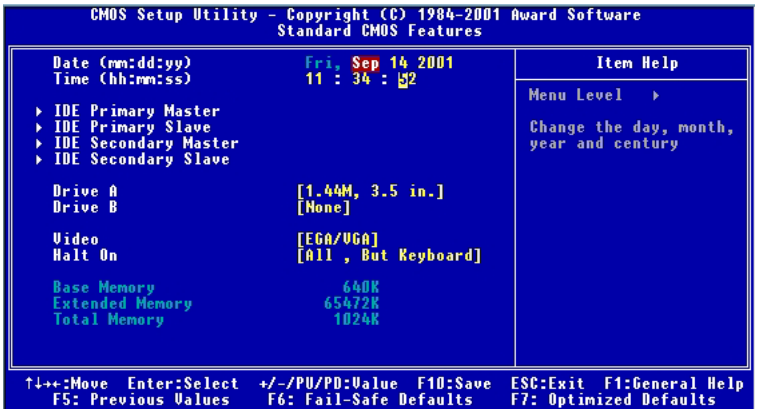
Supervisor/User Password
Use this menu to set User and Supervisor Passwords.

Save & Exit Setup
Save CMOS value changes to CMOS and exit setup.

Exit Without Saving
Abandon all CMOS value changes and exit setup.

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-

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".

Access Mode	The settings are CHS, LBA, Large, 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.

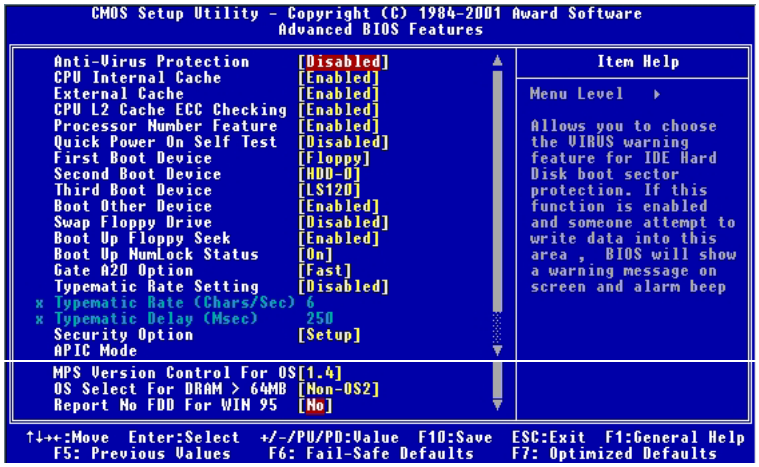
Drive A/B
This item allows you to set the type of floppy drives installed. Available options are *None*, *360K, 5.25 in.*, *1.2M, 5.25 in.*, *720K*, 3.5 in., *1.44M, 3.5 in., 2.88M, 3.5 in.*

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:

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

Advanced BIOS Features



Anti-Virus Protection
The setting is to set the virus warning feature for IDE hard disk boot sector protection. If the function is enabled and any attempt to write data into this area is made, BIOS will display a warning message on the screen and beep. Setting options: *Disabled*, *Enabled*.

CPU Internal/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. This setting enables/disables 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*, *Disabled*.

Processor Number Feature
This option is for Pentium® III processor only. During *Enabled*, this will check

the CPU Serial number. Disable this option if you don't want the system to know the serial number.

Quick Power On Self Test
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*.

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:

Floppy	The system will boot from floppy drive.
LS120	The system will boot from LS-120 drive.
HDD-0	The system will boot from the first HDD.
SCSI	The system will boot from the SCSI.
CDROM	The system will boot from the CD-ROM.
HDD-1	The system will boot from the second HDD.
HDD-2	The system will boot from the third HDD.
HDD-3	The system will boot from the fourth HDD.
ZIP100	The system will boot from ATAPI ZIP drive.
LAN	The system will boot from the Network drive.
Disabled	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
Setting to *Enabled* will swap floppy drives A: and B:.

Boot Up Floppy Seek
Setting to *Enabled* will make BIOS seek floppy drive A: before booting the system. Settings: *Disabled* and *Enabled*.

Boot Up NumLock Status
This setting is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow users to use the arrow keys on the numeric keypad. Setting options: *On*, *Off*.

Gate A20 Option
This item is to set the Gate A20 status. A20 refers to the first 64KB of extended memory. When the default value *Fast* is selected, the Gate A20 is controlled by Port92 or chipset specific method resulting in faster system performance. When *Normal* is selected, A20 is controlled by a keyboard controller or chipset hardware.

Typematic Rate Setting
This setting is used to enable or disable the typematic rate setting including Typematic Rate & Typematic Delay.

Typematic Rate (Chars/Sec)
After *Typematic Rate Setting* is enabled, this item allows you to set the rate (characters/second) at which the keys are accelerated. Settings: *6*, *8*, *10*, *12*, *15*, *20*, *24* and *30*.

Typematic Delay (Msec)
This item allows you to select the delay between when the key was first pressed and when the acceleration begins. Settings: *250*, *500*, *750* and *1000*.

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

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

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

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

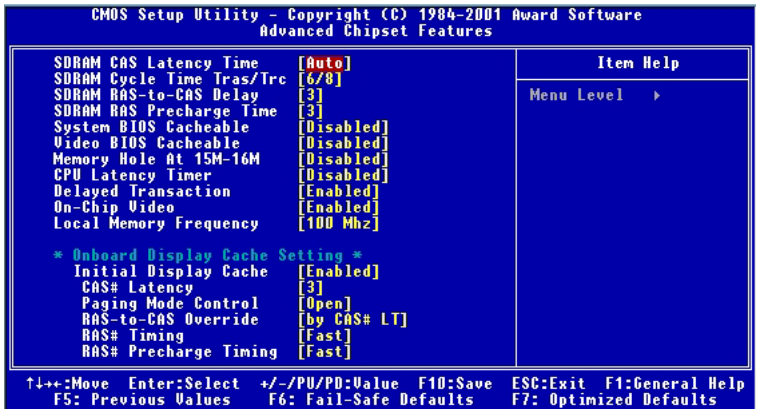
OS Select For DRAM > 64MB
This allows you to run the OS/2® operating system with DRAM greater than 64MB. Setting options: *Non-OS2, OS2*.

Report No FDD For WIN 95
For compatibility with Windows 95 logo certification, select *Yes* to release IRQ6 when the system contains no floppy drive. When this setting is set to *Yes*, users have to select *Disabled* for the *Onboard FDC Controller* in the Integrated Peripherals menu. Setting options: *Yes, No*.

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.

Choose the "ADVANCED CHIPSET FEATURES" from the Main Menu and the following screen will appear.



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

SDRAM CAS Latency Time
The field controls the CAS latency, which determines the timing delay before SDRAM starts a read command after receiving it. Setting options: *3, 2* (clock cycles), *Auto*. *2* increases system performance while *3* provides more stable system performance.

SDRAM Cycle Time Tras/Trc
This setting controls the number of SCLKs for an access cycle. Setting options: *5/7*, *6/8*.

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

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

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

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

CPU Latency Timer
During *Enabled*, a deferrable CPU cycle will only be Deferred after it has been in a Snoop Stall for 31 clocks and another ADS# has arrived. During *Disabled*, A deferrable CPU cycle will be Deferred immediately after the GMCH receives another ADS#.

Delayed Transaction
The chipset has an embedded 32-bit posted write buffer to support delayed transactions cycles so that transactions to and from the ISA bus are buffered and PCI bus can perform other transactions while the ISA transaction is underway. Select *Enabled* to support compliance with PCI specification version 2.1. Setting options: *Enabled, Disabled*.

On-Chip Video
The setting disables/enables the onchip video controller. Setting options: *Disabled, Enabled*.

Local Memory Frequency
This option determines the local memory frequency. The settings are 100MHz or 133MHz.

Onboard Display Cache Setting

Initial Display Cache
This setting enables/disables the onboard display cache. During *Enabled*, the *CAS# Latency*, *Paging Mode Control*, *RAS-to-CAS Override*, *RAS# Timing*, and *RAS# Precharge Timing* can be configured.

CAS# Latency
This setting controls the display cache CAS latency. Setting options: *3, 2*.

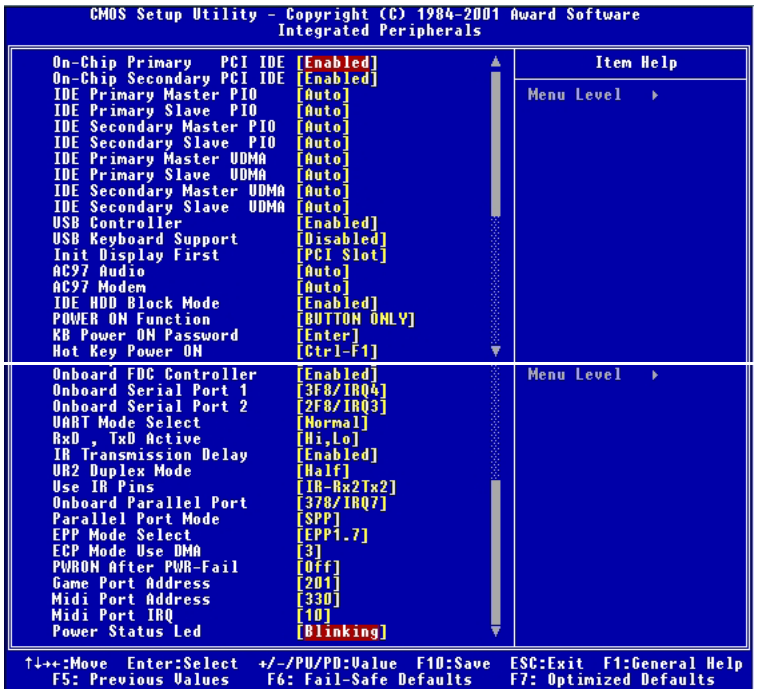
Paging Mode Control
This setting determines if the GMCH memory controller will leave pages open or closed. Setting options: *Open*, *Close*.

RAS-to-CAS Override
This setting determines the display cache RAS-to-CAS override. Setting options: *by CAS# LT*, *Override (2)*.

RAS# Timing
This setting controls RAS# active to precharge, and refresh to RAS# active delay. Setting options: *Fast*, *Slow*.

RAS# Precharge Timing
This setting controls RAS# precharge clocks. Setting options: *Fast, Slow*.

Integrated Peripherals



On-Chip Primary/Secondary PCI IDE
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Choose *Enabled* to activate each channel separately.

IDE Primary/Secondary Master/Slave PIO
The four items 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.

IDE 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 33/66/100, select *Auto* to enable BIOS support.

USB Controller
Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. Setting options: *Enabled, Disabled*.

USB Keyboard Support
Set to *Enabled* if your need to use an USB keyboard in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix.

Init Display First
This item specifies which VGA card is your primary graphics adapter. Settings: *PCI Slot* and *Onboard*.

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

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

IDE HDD Block Mode
This allows your hard disk controller to use the fast block mode to transfer data to and from the hard disk drive. Block mode is also called block transfer, multiple commands or multiple sector read/write. *Enabled* enables IDE controller to use block mode; *Disabled* allows the controller to use standard mode.

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*, *BUTTON ONLY* and *Keyboard 98*.

KB Power ON Password
If *POWER ON Function i*s 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-F1* through *Ctrl-F12*.

Onboard FDC Controller
The item is used to enable or disable the onboard Floppy controller. Select *Enabled* when you have installed a floppy disk drive and want to use it.

Onboard Serial Port 1/2
The items specify the base I/O port address and IRQ for the onboard Serial Port A/Serial Port B. Selecting *Auto* allows BIOS to automatically determine the correct base I/O port address. Settings: *Disabled*, *3F8/IRQ4*, *2F8/IRQ3*, *3E8/IRQ4*, *2E8/IRQ3* and *Auto*.

UART Mode Select
The field allows you to specify the operation mode for serial port "COM B". Settings are:

Normal: RS-232C Serial Port
IrDA: IrDA-compliant Serial Infrared Port
ASKIR: Amplitude Shift Keyed Infrared Port

RxD, TxD Active
This setting controls the receiving and transmitting speed of the IR peripheral in use. Setting options: *Hi/Hi, Hi/Lo, Lo/Hi, Lo/Lo*.

IR Transmission Delay
This setting determines whether the IR transmission rate will be delayed while converting to receiving mode. Setting options: *Disabled, Enabled*.

UR2 Duplex Mode
This setting controls the operating mode of IR transmission/reception. Setting options: *Full, Half*. Under Full Duplex mode, synchronous, bi-directional transmission/reception is allowed. Under Half Duplex mode, only asynchronous, bi-directional transmission/reception is allowed.

Use IR Pins
Please consult your IR peripheral documentation to select the correct setting

of the TxD and RxD signals. Setting options: *RxD2/TxD2, IR-Rx2Tx2*.

Onboard Parallel Port
This specifies the I/O port address and IRQ of the onboard parallel port. Settings: *378/IRQ7*, *278/IRQ5*, *3BC/IRQ7* and *Disabled*.

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.

EPP Mode Select
The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the following message will be displayed on the screen: "EPP Mode Select." At this time either EPP 1.7 spec or EPP 1.9 spec can be chosen.

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.

PWRON After PWR-Fail
This setting specifies whether your system will reboot after a power failure or interrupts occurs. Available settins are:

Off	Leaves the computer in the power off state.
On	Reboots the computer.
Former-Sts	Restores the system to the status before power failure or interrupt occurs.

Game Port Address/Midi Port Address
This setting disables or assigns an address for the onboard game/midi port.

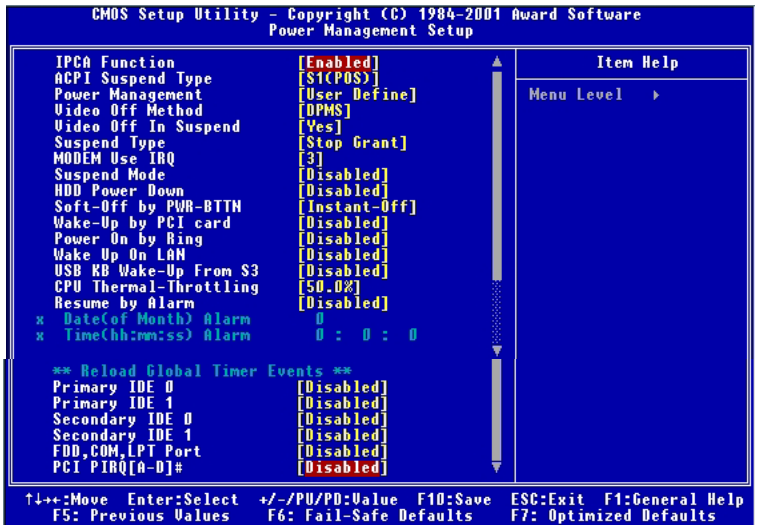
Midi Port IRQ
This setting specifies an IRQ for the onboard midi port.

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

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

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 is to activate the ACPI (Advanced Configuration and Power Management Interface) function. If your operating system is ACPI-aware, such as Windows 98SE/2000/ME, select *Enabled*. Available options: *Enabled* and *Disabled*.

ACPI Suspend Type
This item specifies the power saving modes for ACPI function. Options are:

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

S3/STR The S3 sleep mode is a power-down state in which power is supplied only to essential components such as main memory and wake-capable devices and all system con-

text is saved to main memory. The information stored in memory will be used to restore the PC to the previous state when an "wake up" event occurs.

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 and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	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*.

Suspend Type
This setting allows you to select the type of Suspend mode. Setting options: *Stop Grant* (saves the state of the entire system to disk and then powers off the system), *PwrOn Suspend* (the CPU and core system remain powered on in a very low-power mode).

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*.

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*.

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.

Wake Up by PCI Card, Power On by Ring, Wake Up On LAN, USB KB Wake-Up From S3
These fields 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 "Power On by Ring" and "Wake Up On LAN", you need to install a modem/LAN card supporting power on function.

CPU Thermal-Throttling
The item allows you to specify the CPU speed (at percentage) to which it will slow down when the CPU reaches the predetermined overheat temperature. Settings range from 12.5% to 87.5% at 12.5% increment.

Resume by Alarm
The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

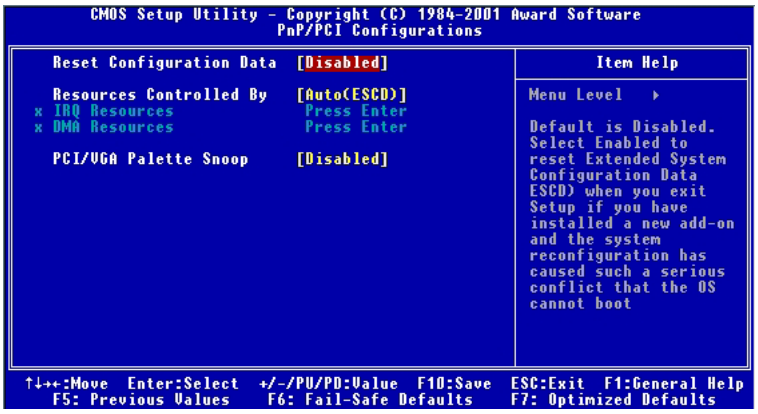
Date (of Month) Alarm
The field specifies the date for Resume by Alarm. Settings: 0~31.

Time (hh:mm:ss) Alarm
The field specifies the time for *Resume by Alarm. F*ormat is <hour> <minute><second>.

Reload Global Timer Events: Primary IDE 0/1, 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.

PNP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, 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.



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 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/DMA Resources
The items are adjustable only when *Resources Controlled By* is set to *Manual*.

Press <Enter> and you will enter the sub-menu of the items. IRQ Resources & *DMA Resources* list IRQ 3/4/5/7/9/10/11/12/14/15 and DMA 0/1/3/5/6/7 for users to set each IRQ/DMA a type depending on the type of device using the IRQ/DMA. Settings are:

PCI/ISA PnP	For Plug & Play compatible devices designed for PCI or ISA bus architecture.
Legacy ISA	For devices compliant with the PC AT bus specification, requiring a specific interrupt.

PCI/VGA Palette Snoop

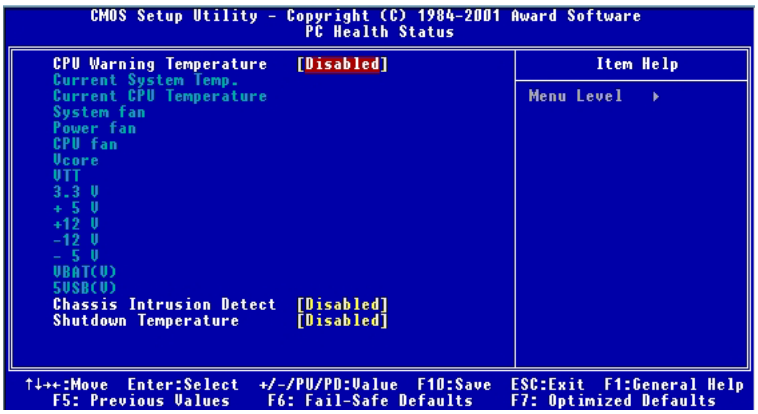
When set to *Enabled*, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two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

VGA Palette Snoop Bit Setting	Action
Disabled	Data read or written by the CPU is only directed to the PCI VGA device's palette registers.
Enabled	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.



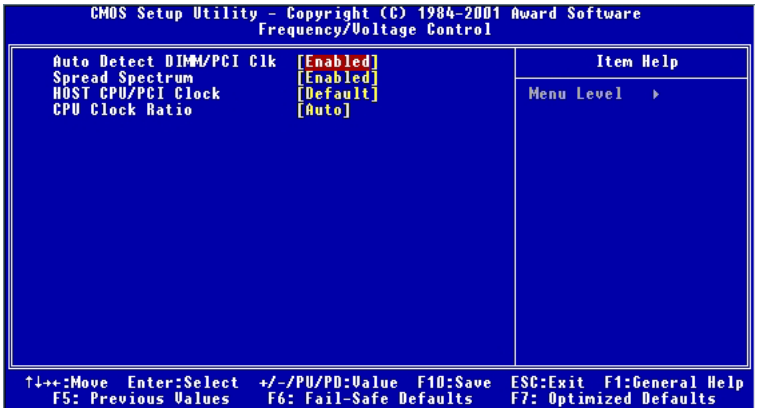
CPU Warning Temperature
If the CPU temperature reaches the upper limit preset in this setting, the warning mechanism will be activated. This helps you to prevent the CPU overheat problem.

Current System/CPU Temperature, System/Power/CPU FAN, Vcore, VTT, +3.3V, +5V, +12V, -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.

Chassis Intrusion Detect
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*.

Shutdown Temperature
The setting allows ACPI-aware OS to automatically shutdown if the system temperature reaches a thermal level preset in the field. This can prevent the system components from being damaged due to overheat.

Frequency/Voltage Control



Auto Detect DIMM/PCI Clk
To reduce the occurrence of electromagnetic interference (EMI), the BIOS detects the presence or absence of components in DIMM and PCI slots and turns off system clock generator pulses to empty slots. The settings are: *Enabled, Disabled*.

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

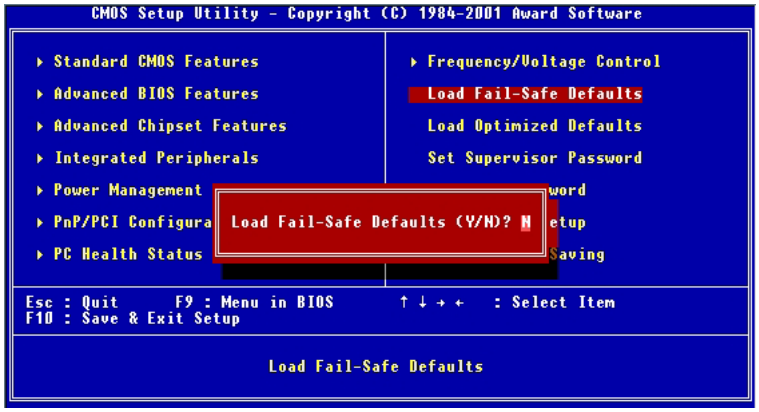
Host CPU/PCI Clock
This setting controls the timing combination for the CPU and the PCI bus. When set to *Default*, the BIOS uses the actual CPU and PCI bus clock values.

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

Load Fail-Safe/Optimized Defaults

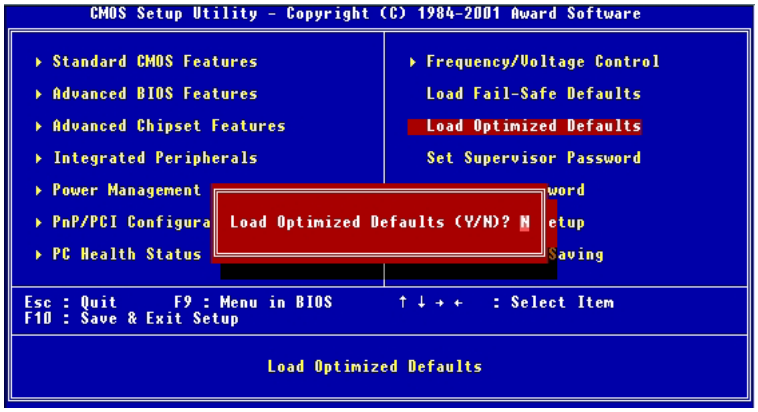
The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard. The Fail-Safe Defaults are the default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

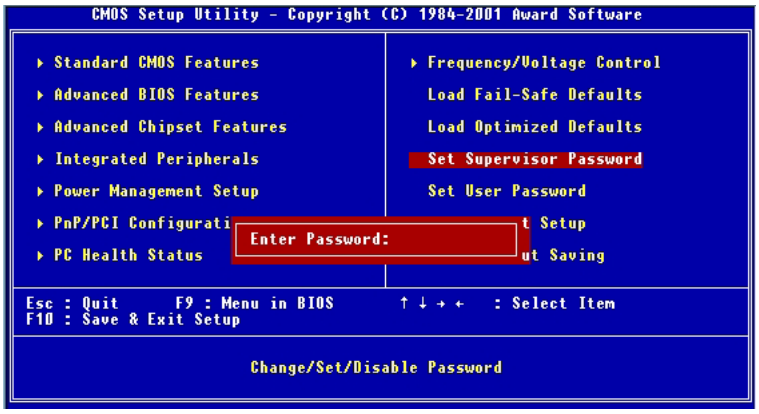
When you select Load Optimized Defaults, a message as below appears:



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:



Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously set password from CMOS memory. You will be prompted to confirm the password. Re-type 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 BIOS 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 Security Option of the Advanced BIOS Features menu. If the Security Option is set to *System*, the password is required both at boot and at

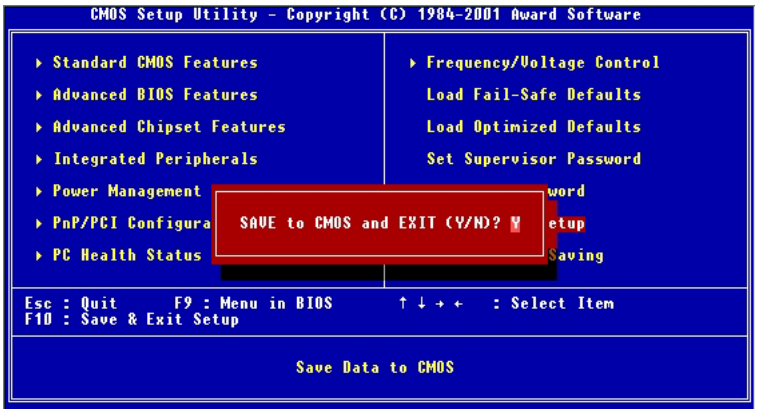
entry to Setup. If set to *Setup*, password prompt only occurs when trying to enter Setup.

About Supervisor Password & User Password:

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

Save & Exit Setup

When you want to quit the Setup menu, you can select this option to save the changes and quit. A message as below will appear on the screen:

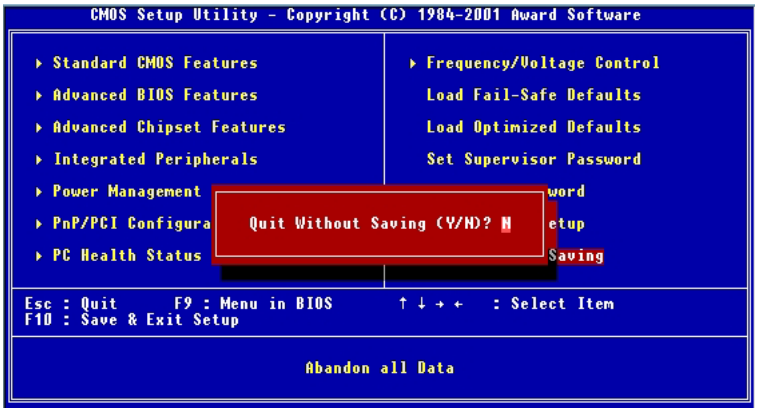


Typing “Y” will allow you to quit the Setup Utility and save the user setup changes to RTC CMOS.

Typing “N” will return to the Setup Utility.

Exit Without Saving

When you want to quit the Setup menu, you can select this option to abandon the changes. A message as below will appear on the screen:



Typing "Y" will allow you to quit the Setup Utility without saving any changes to RTC CMOS.

Typing "N" will return to the Setup Utility.

Glossary A

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.

Buffer
A region of memory reserved as a temporary storage area. In most cases, the OS or applications will create buffer areas to save the necessary data, and the applications can find the data in the areas first to increase the processing speed.

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 **m**etal-**o**xide **s**emiconductor*)
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 (***d**ual **i**n-line **m**emory **m**odule*)
A small circuit board that holds memory chips. A ***SIMM** (**s**ingle **i**n-line **m**emory **m**odule)* has a 32-bit path to the memory chips whereas a DIMM has 64-bit path.

DMA (***d**irect **m**emory **a**ccess*)
A transfer mode between the main memory and the peripheral devices that without passing through the CPU. Using the DMA controller, data is transferred much faster.

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 (***e**rror **c**orrecting **c**ode memory*)
A type of memory that contains special circuitry for testing the accuracy of data and correcting the errors on the fly.

IDE (***I**ntegrated **D**rive **E**lectronics*)
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 (***I**nfrar**e**d **D**ata **A**ssociation*)
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 (***l**ocal **a**rea **n**etwork*)
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 (***l****ight* ***e****mitting* ***d****iode*)
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 (*l**ine** **p**rinter* ***t****erminal*)
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 (***P****eripheral* ***C****omponent* ***I****nterconnect*)
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 (***P****lug a****n****d* ***P****lay*)
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 (***P****ower* ***O****n* ***S****elf* ***T****est*)
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 (***u****niversal* ***s****erial* ***b****us*)
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.