MSI

MICRO-STAR INTERNATIONAL

MS-6395 Micro-ATX Mainboard

Version 5.0

G52-MA00451

Manual Rev: 5.0
Release Date: October 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-6395

FC **Tested to comply with FCC Standard**

For Home or Office Use

Edition

October 2001

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Revision History

Revision	Revision History	Date
5.0	First release for PCB 5.X	October 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.

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Introduction 1

Thank you for purchasing the MS-6395 (v5.X) Micro-ATX motherboard. The mainboard, based on **Intel® 810E & 82801BA (ICH2)** chipsets, is a high-performance computer mainboard designed for Intel® Celeron/Celeron (0.13 process)/Pentium® III (Tualatin) processor in the 370 pin package that provides a high-end and professional desktop platform solution.

This chapter includes the following topics:

Mainboard Specification	1-2
Mainboard Layout	1-4
Quick Components Guide	1-5
Key Features	1-6
MSI Special Features	1-7

Mainboard Specification

CPU

- Supports Socket 370 for Intel® Celeron™/Celeron™ (0.13 process)/ Pentium III (Tualatin)
- Supports 900MHz, 1.0GHz, 1.1GHz, 1.2GHz, 1.4GHz or higher

Chipset

- Intel® 810E (GMCH) chipset (421 BGA)
  - Integrated Graphics Controller
  - Intel DDM+ Architecture
  - SDRAM memory Independent of System Bus
- Intel® ICH2 chipset (241 BGA)
  - AC'97 Controller Integrated
  - 2 full IDE channels, up to ATA100
  - Low pin count interface for SIO
  - Supports 4 x USB

Front Side Bus (FSB)

- 100/133MHz clocks are supported.

MainMemory

- Supports two 168-pin DIMM sockets
- Supports a maximum memory size of 512MB SDRAM

Slots

- One CNR (Communication and Network Riser) slot
- Three 32-bit Master PCI Bus slots
- Supports 3.3v/5v PCI bus Interface
- One 16-bit ISA bus slot (optional)

On-BoardIDE

- An IDE controller on the ICH2 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA/100 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 (COMA + COMB pin header)
  - 1 parallel port supports SPP/EPP/ECP mode
  - 4 USB ports (2 Rear connectors + USB Front Pin Header)
  - 1 IrDA connector for SIR
  - 1 VGA port
  - 1 Audio/Game port

Video

- GMCH chip integrated
- 2D/3D Graphics
- Onboard 4MB Display Cache (optional)

Audio

- AC97 SW Codec
- ICH2 chip integrated

LAN (Optional)

- ICH2 + Intel 82562 (Optional)

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

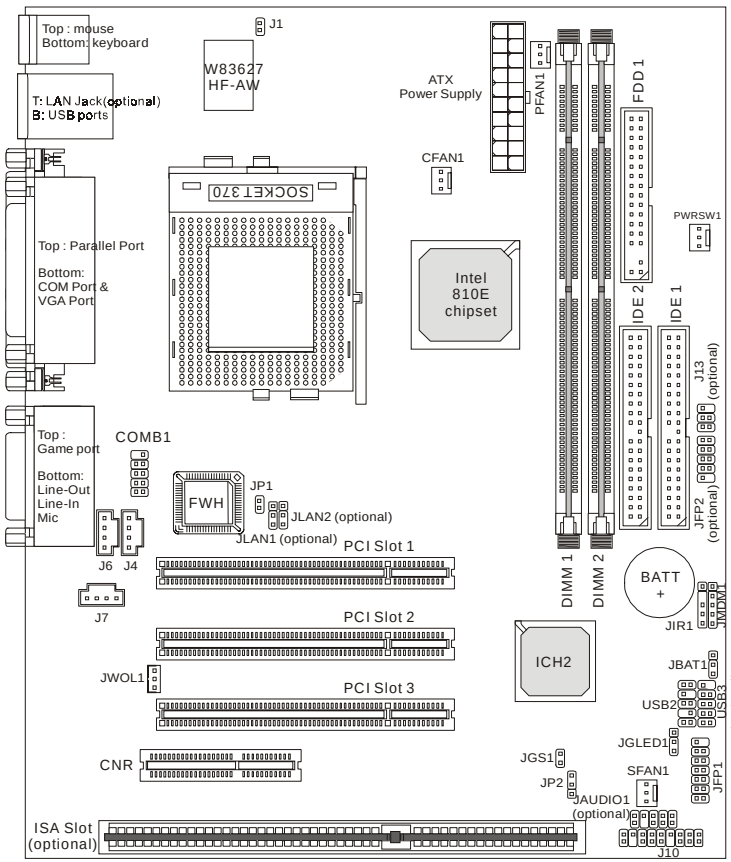
Dimension

- Micro ATX Form Factor: 24cm x 20cm

Mounting

- 6 mounting holes

Mainboard Layout



MS-6395 (V5.X) Micro ATX Mainboard

Note: *When the optional components **J13**, **JFP2**, **USB3** and **JAUDIO1** are integrated on the board, JIR1, JFP1, USB2, J10, PWRSW1 and JGLED1 will not exist.*

Quick Components Guide

Component	Function	Reference
DIMM1~2	Installing DIMM modules	See p. 2-4~2-5
Socket 370	Installing CPU	See p. 2-2~2-3
CFAN1	Connecting to CPU FAN	See p. 2-20
SFAN1	Connecting to SYSTEM FAN	See p. 2-20
PFAN1	Connecting to Power Supply FAN	See p. 2-20
ATX Power Supply	Installing power supply	See p. 2-6
IDE1& IDE2	Connecting to IDE hard disk drives	See p. 2-13
FDD1	Connecting to floppy disk drive	See p. 2-12
USB2/3	Connecting to USB interfaces	See p. 2-21
PCI Slot 1~3	Installing PCI expansion cards	See p. 2-29
CNR Slot	Installing CNR cards	See p. 2-29
ISA Slot	Installing ISA cards	See p. 2-29
JMDM1	Connecting to modem module	See p. 2-16
JWOL1	Connecting to LAN module	See p. 2-16
JBAT1	Clearing CMOS data	See p. 2-26
JFP1/2	Connecting to case	See p. 2-14
JGS1	Connecting to power saving switch	See p. 2-18
JGLED1	Connecting to power saving LED	See p. 2-24
JIR1 & J13	Connecting to IR modules	See p. 2-17
J1	Connecting to chassis intrusion switch	See p. 2-18
J10 & JAUDIO1	Connecting to audio connectors	See p. 2-22
PWRSW1	Connecting to power switch	See p. 2-25
JLAN1/2	Enabling onboard LAN function	See p. 2-27
JP1	Setting BIOS flash function	See p. 2-27
JP2	Enabling onboard audio codec	See p. 2-28

Key Features

- Micro ATX Form Factor
- CPU: Socket 370 for Intel® Celeron™/Celeron™ (0.13 process)/Pentium® III (Tualatin) Processors
- Memory: 2 SDRAM DIMMs
- Slot: 1 CNR slot, 3 PCI slots, 1 ISA slot (optional)
- I/O: 2 serial ports, 1 parallel port, 4 USB 1.1 ports, 1 floppy port, 1 IrDA connector, 1 Audio/Game port, 1 VGA port
- LAN Wake up Function
- Modem (Internal/External) Ring Wake up Function
- PC Alert™ III system hardware monitor
- TOP Tech™ III -- Thermal Overheat Protection Technology (optional)
- Audio & Video: Chip integrated

MSI Special Features

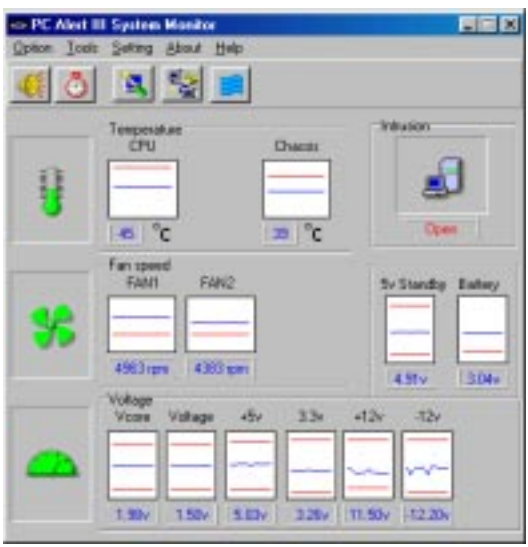
The MSI special features are designed by MSI R&D which are only available in MSI mainboards. The mainboard is equipped with PC Alert™ III and optional T.O.P. Tech™ III.

PC Alert™ III

The PC Alert™ III is an 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.*

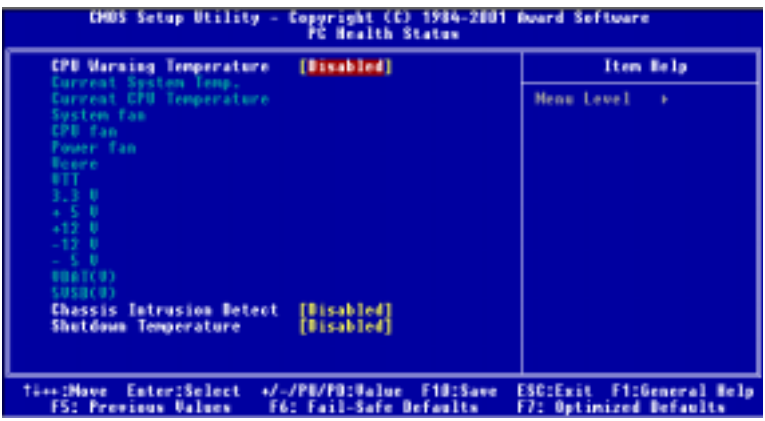
Features:

- 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

T.O.P Tech™ III (Optional)

The T.O.P Tech™ is a 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 temperaure on Setup menu



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:

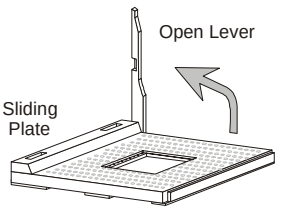
Central Processing Unit (CPU)	2-2
Memory	2-4
Power Supply	2-6
Back Panel	2-7
Connectors	2-12
Jumpers	2-26
Slots	2-29

Central Processing Unit: CPU

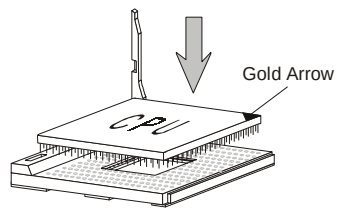
The mainboard supports Intel® Celeron™/Celeron™ (0.13 process) and Pentium® III (Tualatin) processors. It uses a CPU socket called Socket 370 for easy CPU installation. **Make sure the CPU has a Heat Sink and a cooling fan attached on the top to prevent overheating.** If you do not find the Heat Sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Installation Procedures

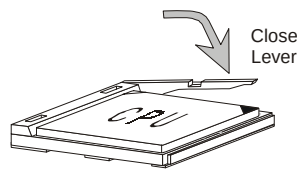
1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.



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 firmly, and then press the lever down 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	=	7
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 7
		=	700MHz

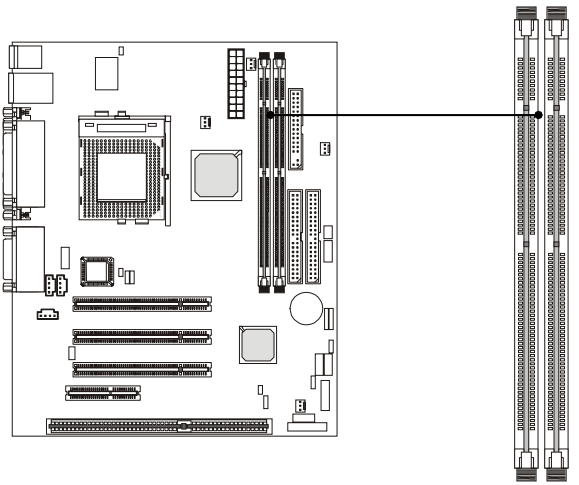
WARNING!

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

The mainboard supports a maximum memory size of 512MB. It provides two 168-pin **unbuffered** SDRAM DIMM (Double In-Line Memory Module) sockets and supports 32MB to 512MB technology.



DIMM Slots
(DIMM 1~2)

Introduction to SDRAM

Synchronous DRAM (SDRAM) 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.

DIMM Modules Combination

At least one DIMM module should be installed on the motherboard. Memory modules can be installed on the slots in any order. The single-/ double-sided module each DIMM slot supports is listed below:

Socket	Memory Module	Total Memory
DIMM 1 (Bank0 & Bank1)	S/D	32MB ~ 512MB
DIMM 2 (Bank2 & Bank3)	S/D	32MB ~ 512MB
Maximum System Memory Supported		32MB ~ 512MB

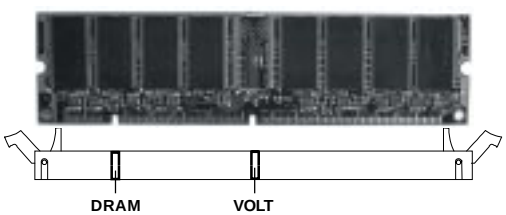
S: Single Side D: Double Side

Installing DIMM Modules

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.



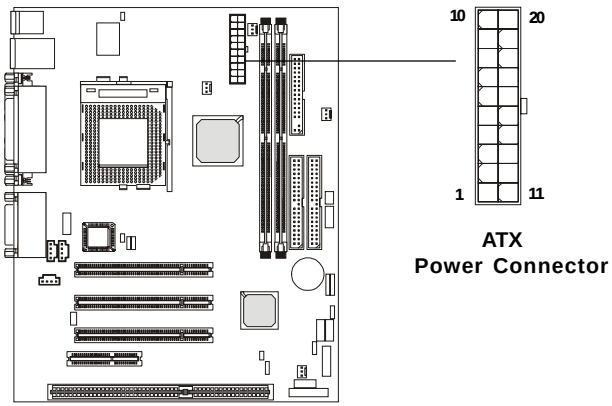
3. The plastic clip at each side of the DIMM slot will automatically close.

Power Supply

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

ATX 20-Pin Power Supply

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plug 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.

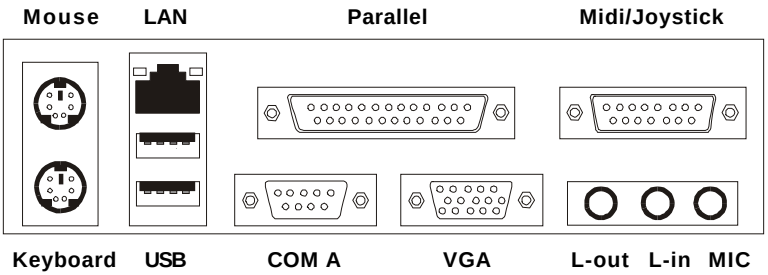


ATX
Power Connector

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

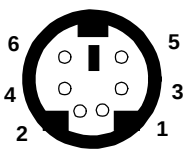
Back Panel

The Back Panel provides the following connectors:



Mouse Connector

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.



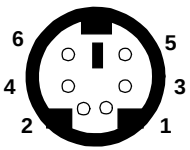
PS/2 Mouse (6-pin Female)

Pin Definition

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

Keyboard Connector

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



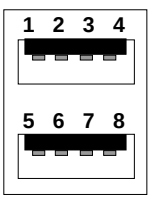
PS/2 Keyboard (6-pin Female)

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.



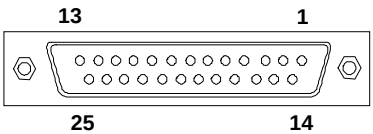
USB Ports

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

Parallel Port Connector

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

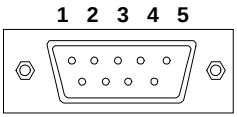


Pin Definition

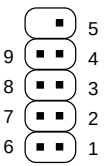
PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select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

Serial Port Connectors: COM A & COM B

The mainboard has two 9-pin connectors for serial port COM A & COM B. COM B is a pin header, to which you can attach a COM Port bracket. You can attach a serial mouse or other serial devices to the serial ports.



9-Pin Male DIN Connector



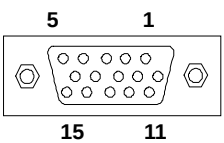
COM B1

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.



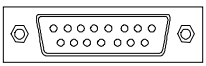
DB 15-Pin Female Connector

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

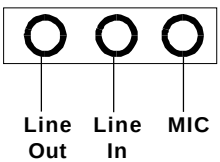
Joystick/Midi Connectors

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



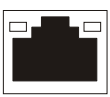
Audio Port Connectors

Line Out is to connect speakers or headphones. ***Line In*** is a connector for external CD player, Tape player or other audio devices. ***Mic*** is used to connect to a microphone.



LAN Jack (RJ-45) (Optional)

The mainboard provides one standard RJ-45 jack for connection to Local Area Network (LAN). You can connect a network cable to the LAN jack.



LAN RJ-45 Jack

Pin Definition

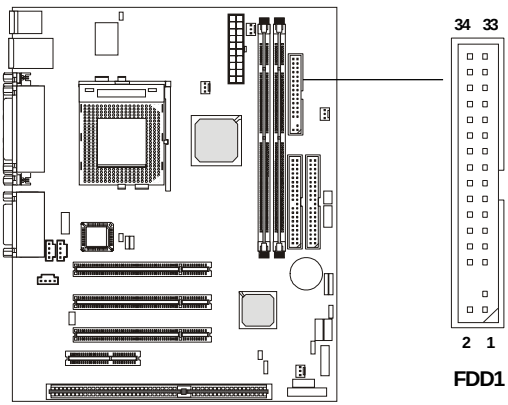
PIN	SIGNAL	DESCRIPTION
1	TDP	Transmit Differential Pair
2	TDN	Transmit Differential Pair
3	RDP	Receive Differential Pair
4	NC	Not Used
5	NC	Not Used
6	RDN	Receive Differential Pair
7	NC	Not Used
8	NC	Not Used

Connectors

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

Floppy Disk Drive Connector: FDD1

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

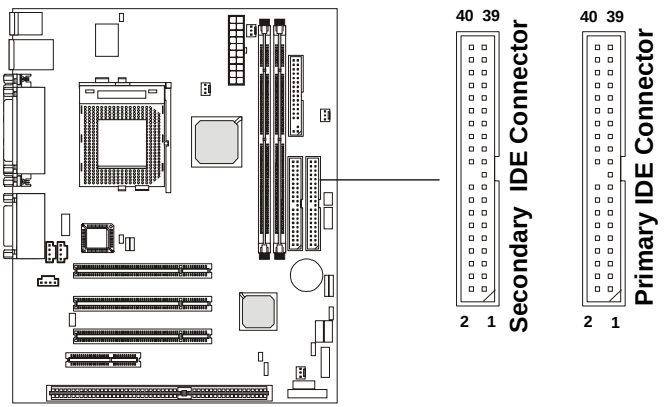


Hard Disk Connectors: IDE1 & IDE2

The mainboard uses an IDE controller on the ICH2 chipset that provides PIO mode 0-4, Bus Master, and Ultra DMA 100 modes. It has two HDD connectors IDE1 (Primary) and IDE2 (Secondary). You can connect up to four hard disk drives, CD-ROM or 120MB Floppy to IDE1 and IDE2.

IDE1 (Primary IDE Connector)
- The first hard disk drive should always be connected to IDE1. You can connect a Master and a Slave drive to IDE1.

IDE2 (Secondary IDE Connector)
- You can connect a Master and a Slave drive to IDE2.



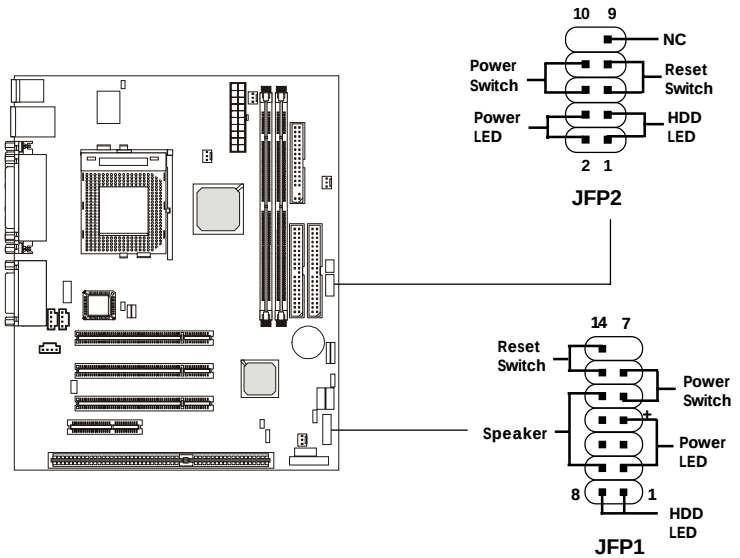
TIP

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.

Case Connectors: JFP1 & JFP2 (Intel Spec Optional)

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

The other case connector block **JFP2 is compliant to Intel Front Panel I/O Connectivity Design Guide** and can connect to the the Power Switch, Reset Switch, Power LED and HDD LED on the case. **JFP2 is OPTIONAL.**



JFP2 Pin Definition

Pin	Description	Pin	Description
1	HDD+	2	PLED
3	HDD-	4	SLED
5	RST-	6	PWSW+
7	RST+	8	PWSW-
9	NC	10	NC

JFP1 Pin Definition

Pin	Description	Pin	Description
1	HDD+	8	HDD-
2	SLED-	9	SPK-
3	PLED-	10	BUZ+
4	PLED+	11	BUZ-
5	PWSW+	12	SPK+
6	PWSW-	13	RST+
7	NC	14	RST-

Power Switch

Connect to a 2-pin push button switch.

Reset Switch

Reset switch is used to reboot the system rather than turning the power ON/ OFF. Avoid rebooting while the HDD is working. 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 (JFP1 only)

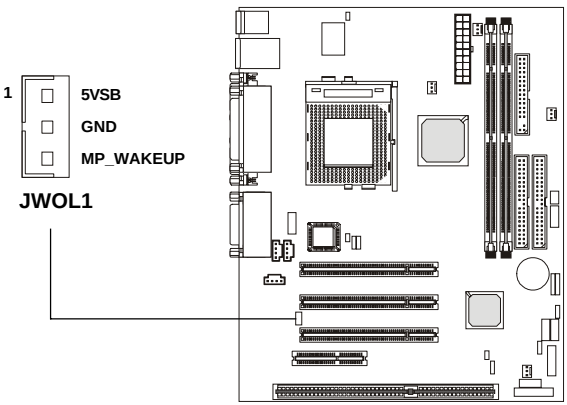
Speaker from the system case is connected to this pin.

HDD LED

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

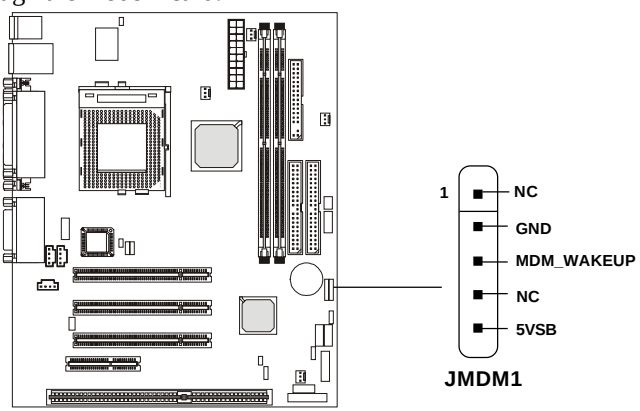
Wake On LAN Connector: JWOL1

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

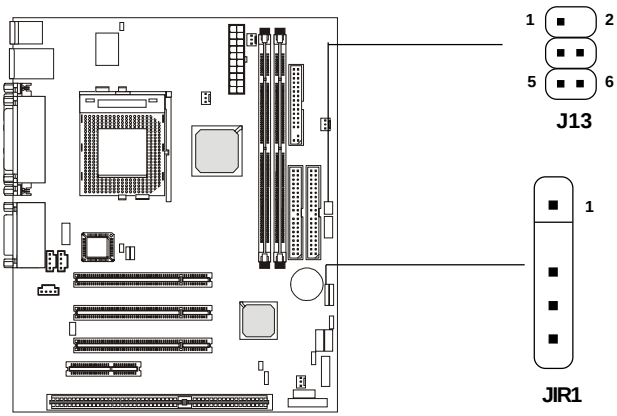
This connector allows you to connect to a modem card with Wake On Ring function. The connector will power up the system when a signal is received through the modem card.



Note: *Modem wake-up signal is active "low".*

IrDA Infrared Module Connectors: JIR1 & J13 (Intel Spec Optional)

These connectors allow you to connect to IrDA Infrared modules. You must configure the setting through the BIOS setup to use the IR function. **J13 is compliant to Intel Front Panel I/O Connectivity Design Guide. This connector is OPTIONAL.**



J13 Pin Definition

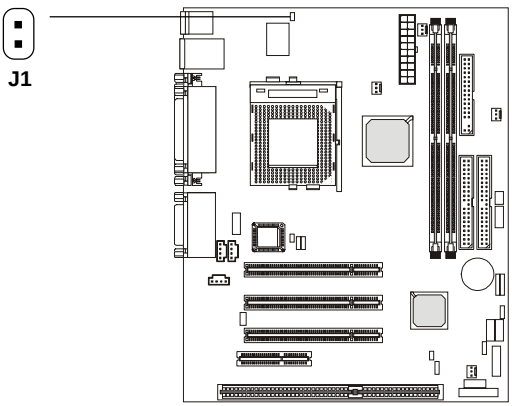
Pin	Signal
1	NC
2	NC
3	VCC5
4	GND
5	IRTX
6	IRRX

JIR1 Pin Definition

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

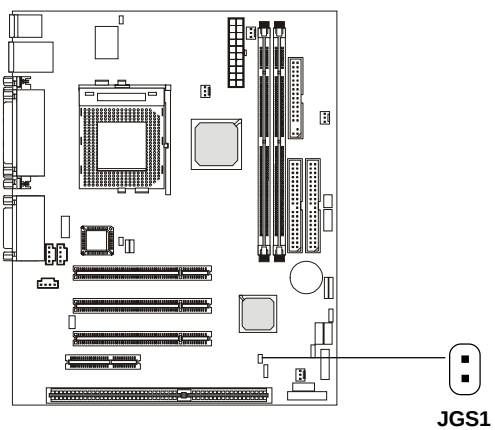
Chassis Intrusion Switch Connector: J1

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



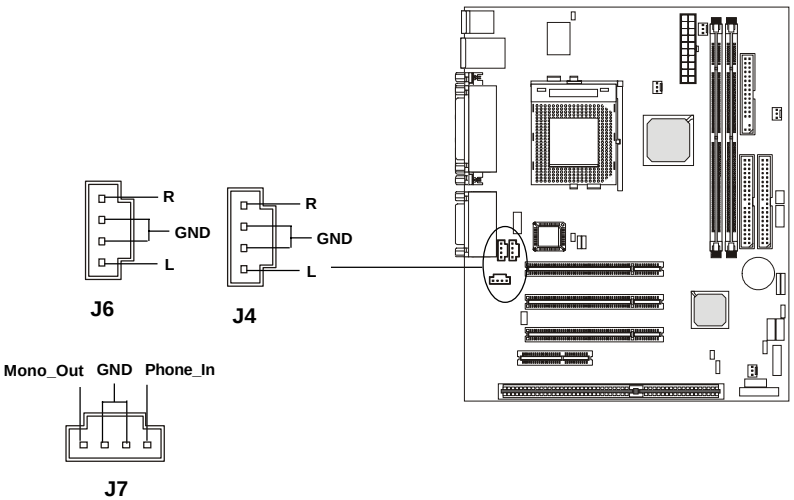
Power Saving Switch Connector: JGS1

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.



CD-In/Aux Line-In/Modem-In Connector: J6/J4/J7

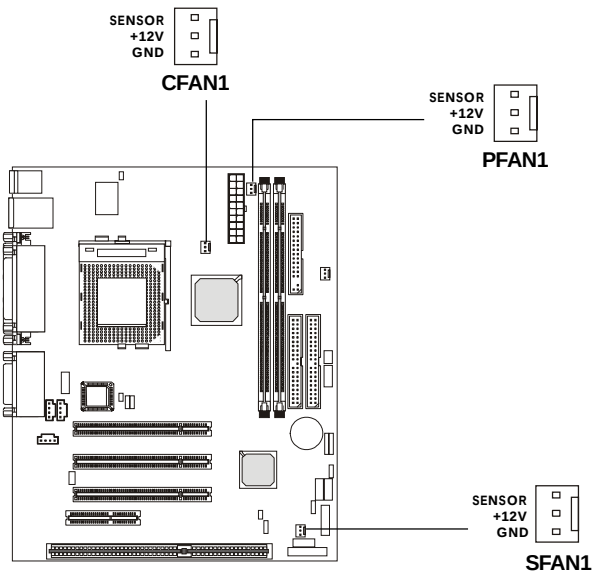
J6 connector is for CD-ROM audio connector.
J4 connector is for DVD add-on card with Line-in connector.
J7 connector is for modem with internal audio connector.



Note:
Mono_Out is connected to the Modem speaker-out connector.
Phone_In is connected to the Modem Microphone-In connector.

Fan Power Connectors: CFAN1/SFAN1/PFAN1

The PFAN1 (processor fan), SFAN1 (system fan) and PFAN1 (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.



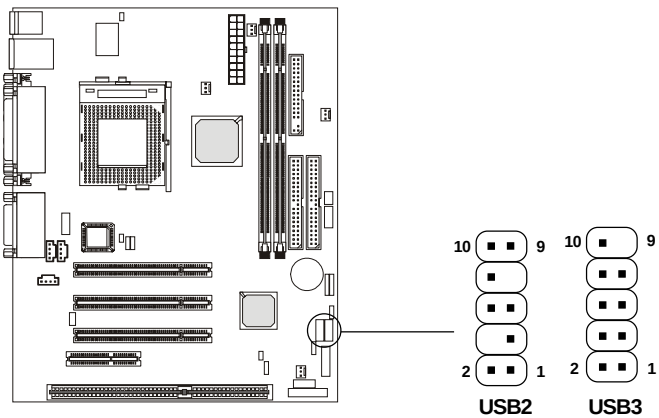
Note:

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.

USB Front Panel Connectors: USB2 & USB3 (Intel Spec Optional)

The mainboard provides two Front USB (Universal Serial Bus) pin headers that allow you to connect optional USB ports for front panel. **USB3 is compliant to Intel Front Panel I/O Connectivity Design Guide. USB3 is OPTIONAL.**



USB2 Pin Definition

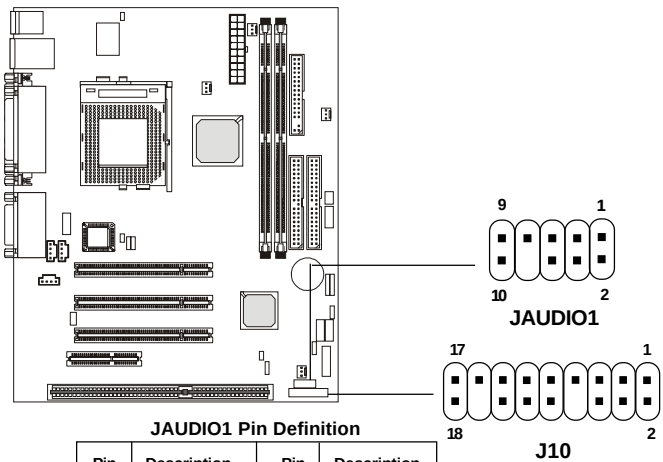
Pin	Description	Pin	Description
1	USBPWR	2	GND
3	USBP2-	4	NC
5	USBP2+	6	USBP3+
7	NC	8	USBP3-
9	GND	10	USBPWR

USB3 Pin Definition

Pin	Description	Pin	Description
1	USBPWR	2	USBPWR
3	USBP4-	4	USBP5-
5	USBP4+	6	USBP5+
7	GND	8	GND
9	NC	10	USBOC

Front Panel Audio Connectors: J10 & JAUDIO1 (Intel Spec Optional)

You can connect optional audio connectors to Front Panel Audio Headers. **JAUDIO1 is compliant to Intel Front Panel I/O Connectivity Design Guide and the connector is OPTIONAL.**



JAUDIO1 Pin Definition

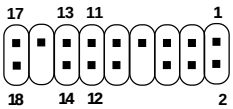
Pin	Description	Pin	Description
1	MIC	2	GND
3	MICPWR	4	VCC5
5	FOUTR	6	RETR
7	NC	8	NC
9	FOUTL	10	RETL

J10 Pin Definition

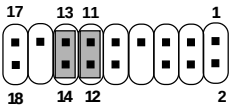
PIN	Description	PIN	Description
1	Active Line Out (R)	2	Active Line Out (L)
3	GND (ALO)	4	GND (ALO)
5	GND (+12)	6	GND (+12)
7	+12V (1A)	8	NC
9	MIC	10	GND (MIC)
11	Front Line Out (R)	12	Line Next (R)
13	Front Line Out (L)	14	Line Next (L)
15	GND (FLO)	16	NC
17	Line In (R)	18	Line In (L)

Note: *To have the Line-out connector on the back panel work properly, you need to* ***place the jumper on pin# 11~14 of the J10 connector or on pin#5~6 and 9~10 of the JAUDIO1 connector.*** *Otherwise, this Line-out connector will not function and nothing can be heard through speakers or headphones attached to the connector. But front panel audio connector is enabled at this point and allows you to connect speakers or headphones.*

J10

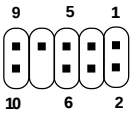


(OPEN pin# 11~14)

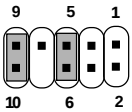


(SHORT pin# 11~14)

JAUDIO1



(OPEN pin# 5~6 and 9~10)



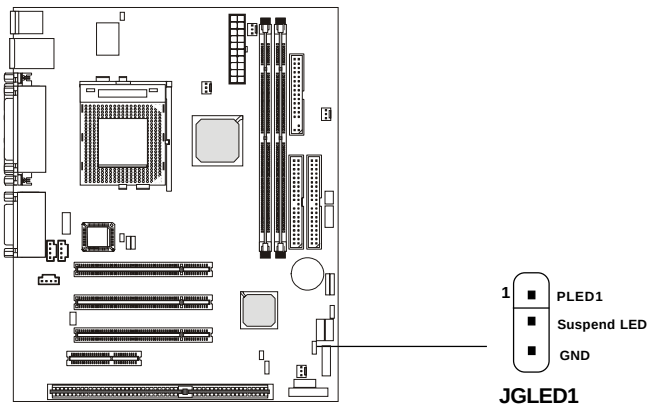
(SHORT pin# 5~6 and 9~10)

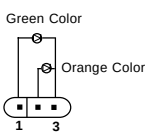
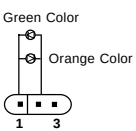
- Disable Line-out connector **on the back panel**
- **Enable Front Panel Audio Connector**

- Enable Line-out connector **on the back panel**
- **Disable Front Panel Audio Connector**

Power Saving LED Connector: JGLED1

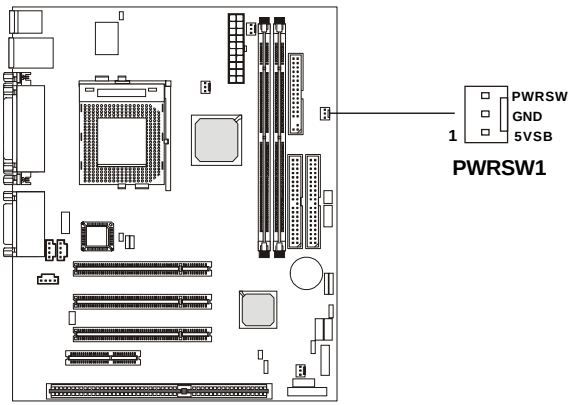
JGLED1 is connected to a power saving LED. There are three types of LED that you can use: 3-pin dual color or 2-pin single/dual color LED. If connected to a dual color LED, the LED light is green when system is turned on, and turns to orange color while entering the sleep state. For single color LED, the LED is lit when system is on, and blinks during the sleep state.



3-Pin LED	2-Pin LED
	
Green:Full-on Mode **Orange: Sleep Mode**	**Dual Color**

Power Switch Connector: PWRSW1

Attach a power switch to this connector. Pressing the switch will turn on/off the system.

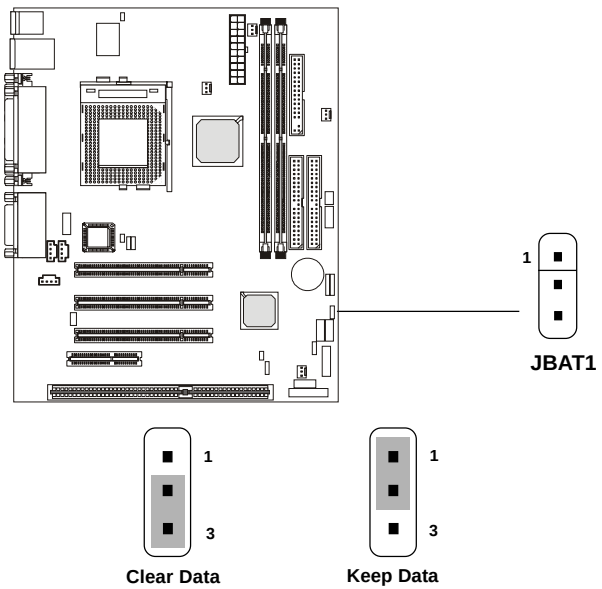


Jumpers

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. 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:



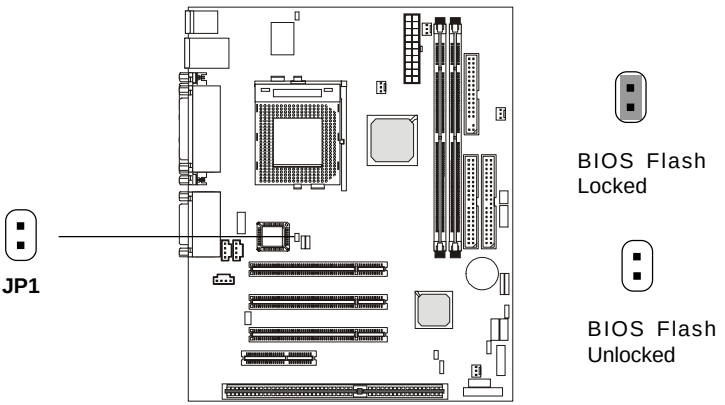
STOP

WARNING!

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

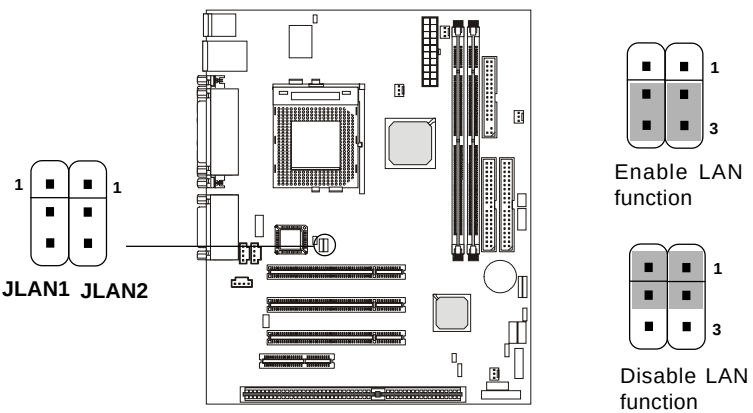
BIOS Flash Jumper: JP1

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



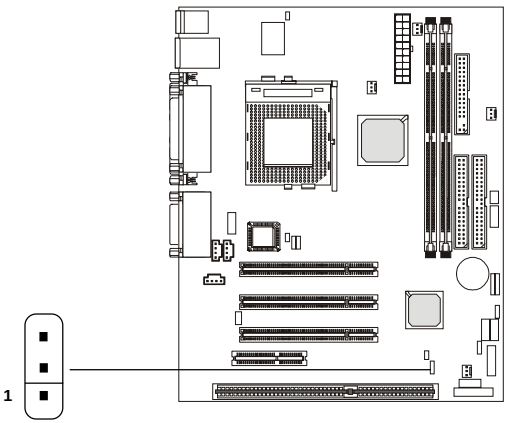
LAN Enable/Disable Jumpers: JLAN1 & JLAN2 (Optional)

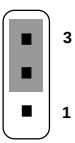
Use these jumpers to enable or disable the onboard LAN function.



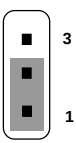
Onboard Audio Codec Jumper: JP2

The jumper is used to enable or disable the onboard software audio codec. When enabling the onboard audio codec, the system will use the onboard codec as the PRIMARY audio adapter and the installed CNR card as the SECONDARY one. But some types of CNR cards cannot be set to the secondary one, then the onboard audio codec must be disabled to resolve the system conflict.





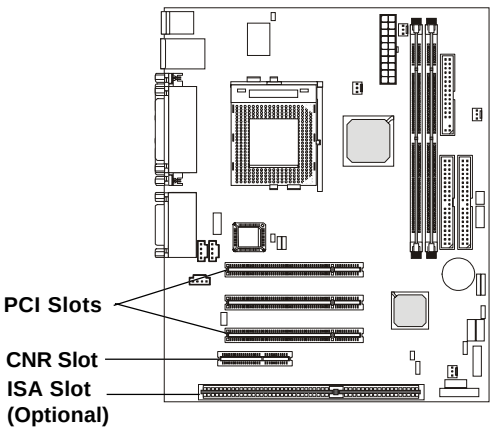
Disable onboard audio codec



Enable onboard audio codec

Slots

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



PCI Slots

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

CNR (Communication Network Riser) Slot

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

ISA Slot (Optional)

The ISA slot allows you to install the 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 INTA#-INTD# pins as follows:

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

PCI Slot 1~3: Bus Master.

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.

The chapter 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	3-9
Advanced Chipset Features	3-13
Integrated Peripherals	3-17
Power Management Setup	3-22
PnP/PCI Configurations	3-26
PC Health Status	3-28
Frequency/Voltage Control	3-30
Load Fail-Safe/Optimized Defaults	3-32
Set Supervisor/User Password	3-34
Save & Exit Setup	3-36
Exit Without Saving	3-37

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.

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

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, only for Option Page Setup Menu
<F10>	Save all the CMOS changes and exit

Getting Help

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

Main Menu

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

Sub-Menu

If you find a right pointer symbol appears to the left of certain fields (as shown in the right view), that means a sub-menu containing additional options for the field can be launched from this field. To enter the sub-menu, highlight the field and press <Enter>. Then you can use control keys to move between and change the settings of the sub-menu. To return to the main menu, 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 will appear on the screen. The Main Menu displays twelve configurable functions and two exit choices. Use arrow keys to move among the items and press <Enter> to enter the sub-menu.

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

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

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

Integrated Peripherals
Use this menu to specify your settings 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 displays the current status of your PC.

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 the minimal/stable performance of your PC.

Load Optimized Defaults
Use this menu to load the default factory settings for BIOS for optimal system performance.

Set Supervisor Password
Use this menu to set Supervisor Password.

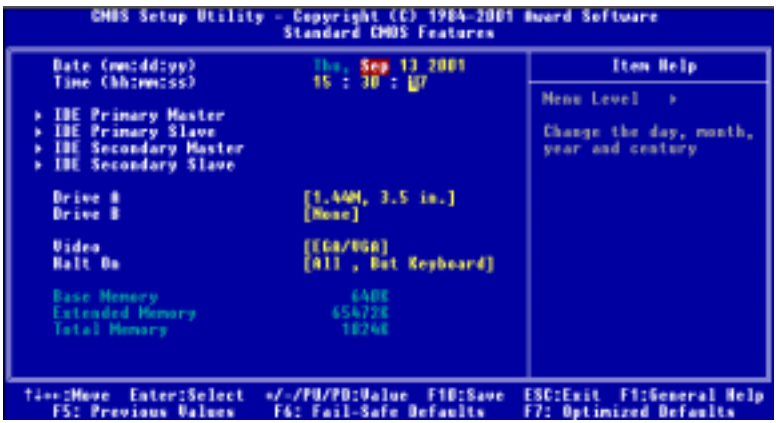
Set User Password
Use this menu to set User Password.

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

Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items inside Standard CMOS Features menu are divided into 13 categories. Each category includes none, one or more setup items. Use the arrow keys to highlight the item you want to modify and use the <PgUp> or <PgDn> keys to switch to the value you prefer.



Date

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

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

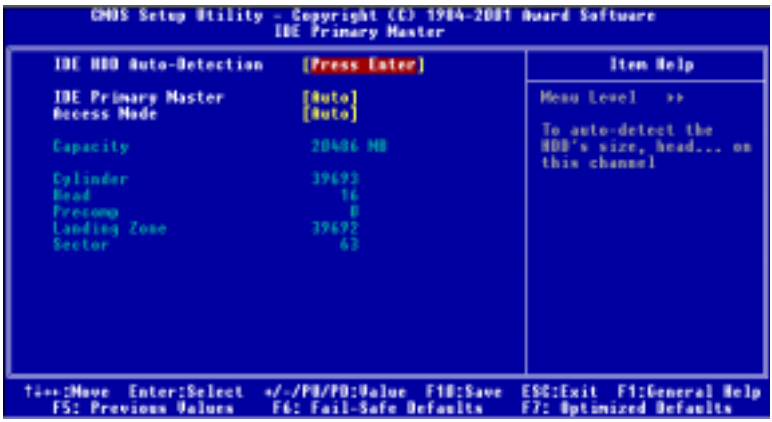
Time

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

IDE Primary Master/Primary Slave/Secondary Master/Secondary Slave

Press PgUp/<+> or PgDn/<-> to select the hard disk drive type. The

specification of hard disk drive will show up on the right hand according to your selection.



Access Mode	The settings are Auto, CHS, LBA and Large.
Capacity	The formatted size of the storage device.
Cylinder	Number of cylinders.
Head	Number of heads.
Precomp	Write precompensation cylinder.
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: *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

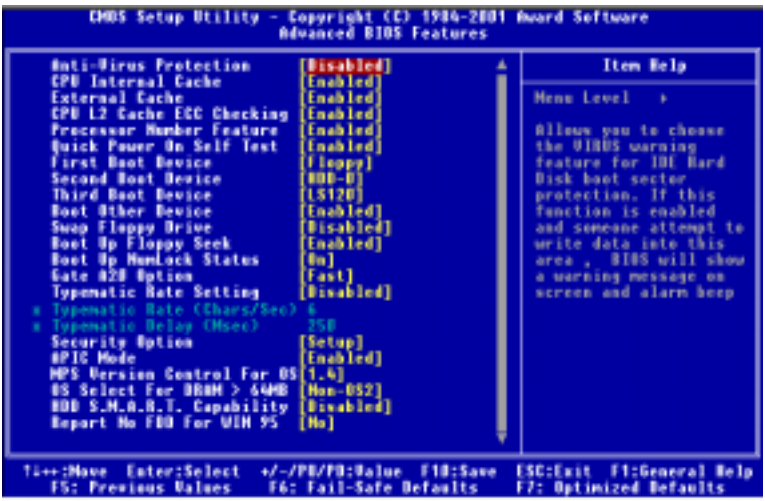
The item sets the type of video adapter used for the primary monitor of the system . Available options: *EGA/VGA , CGA 40, CGA 80* and *MONO*.

Halt On

The item 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 item 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. Settings: *Disabled* and *Enabled.*

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). Settings: *Enabled* and *Disabled*.

CPU L2 Cache ECC Checking

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

Processor Number Feature
This option is for Pentium® III processor only. When set to *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.
ZIP	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 1st/2nd/3rd boot device.

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

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. Settings:

Disabled and *Enabled*.

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

Gate A20 Option
This item is to set the Gate A20 status. A20 refers to the first 64KB of extended memory. When *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 item 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 to PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQs resources for the system. Settings: *Enabled* and *Disabled*.

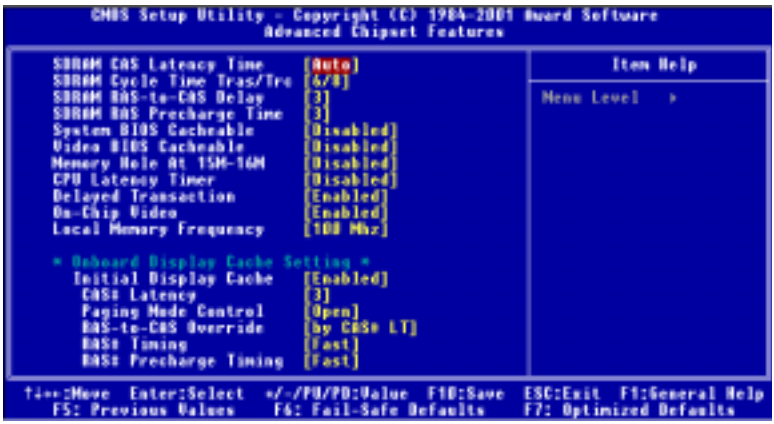
MPS Version Control For OS
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: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

OS Select For DRAM > 64MB
This allows you to run the OS/2® operating system with more than 64MB DRAM. When you choose *Non-OS2*, you cannot run the OS/2® operating system with more than 64MB DRAM. But it is possible if you choose *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*.

Report No FDD For WIN95
This function is used only when you are testing HCT for Windows® 95 Logo certification.

Advanced Chipset Features



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

SDRAM CAS Latency Time

The field controls the timing delay before SDRAM starts a read command after receiving it. Settings: *Auto*, *2* and *3*. *2* increases system performance while *3* provides more stable system performance.

SDRAM Cycle Time Tras/Trc

This item allows you to control the number of SDRAM clocks used for SDRAM parameters Tras and Trc. Tras specifies the minimum clocks required between active command and prechange command. Trc specifies the minimum clocks required between active command and re-active command. Settings: *5/7* and *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. Settings: *3* and *2*.

SDRAM 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. Settings: *3* and *2*.

System BIOS Cacheable
System BIOS ROM at F0000h-FFFFFh is always copied to RAM for faster execution. Selecting *Enabled* allows the contents of F0000h RAM memory segment to be written to and read from cache memory, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Settings: *Enabled* and *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 memory access error may result. Settings: *Enabled* and *Disabled*.

Memory Hole At 15M-16M
In order to improve performance, certain space in memory can be reserved for ISA peripherals. This memory must be mapped into the memory space below 16MB. When this area is reserved, it cannot be cached. Settings: *Enabled* and *Disabled*.

CPU Latency Timer
This item allows you to control the GMCH's response to CPU deferrable cycles. Settings: *Disabled* and *Enabled*.

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. Settings: *Enabled* and *Disabled*.

On-Chip Video
This item allows you to enable or disable the on-chip video window size for VGA driver use. Video window is the amount of system memory that can be used by the on-chip VGA controller. Settings: *Enabled* and *Disabled*.

Local Memory Frequency
This item allows you to set the Onboard Display Cache frequency. Settings: *100Mhz* and *133Mhz*.

Onboard Display Cache Setting

Initial Display Cache
This item allows you to enable or disable Onboard Display Cache. Settings: *Enabled* and *Disabled*.

CAS# Latency
The number of clock cycles of CAS# Latency depends on the Onboard Display cache timing. Settings: *2* and *3*.

Paging Mode Control
This item allows you to select the paging mode control. Settings: *Open* and *Close*.

RAS-to-CAS Override
This items allows you to insert a timing delay between the CAS and RAS strobe signals, used when Onboard Display Cache is written to, read from, or refreshed. When set to *by CAS# LT*, it will depend on the CAS# Latency setting in Onboard Display Cache; when set to *Override (2)*, the RAS-to-CAS time is 2.

RAS# Timing
This item controls RAS# active to Precharge, and refresh to RAS# active delay (in local memory clocks).

Slow RAS# to precharge (t_{RAS}) =7, refresh to RAS# act (t_{RC}) = 10
Fast RAS# to precharge (t_{RAS}) =5, refresh to RAS# act (t_{RC}) = 8

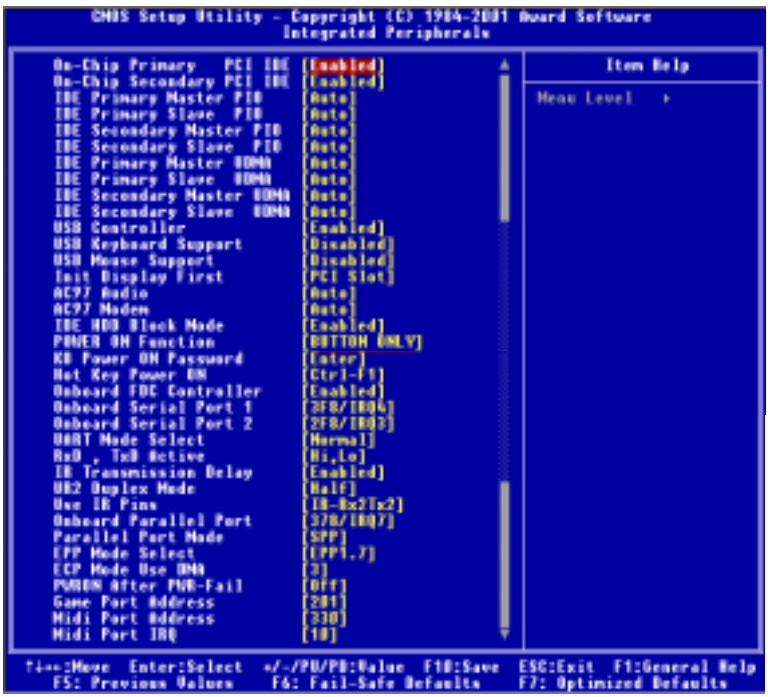
RAS# Precharge Timing

This item controls RAS# precharge (in local memory clocks) timing.

Slow RAS# Precharge Time=3

Fast RAS# Precharge Time=2

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
The item enables or disables the USB (Universal Serial Bus) Ports. Settings: *Enabled* and *Disabled*.

USB Keyboard/Mouse Support
Set to *Enabled* if your need to use an USB keyboard/mouse 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 device is your primary graphics adapter. Settings: *PCI Slot* and *Onboard*.

AC97 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 function if you want to use other controller cards to connect an audio device. Settings: *Auto* and *Disabled*.

AC97 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* and *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 how 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** is set to *Password*, then you can set a password in the field for the PS/2 keyboard to power on the system.

Hot Key Power ON
If **POWER ON Function** is set to *Hot KEY*, you can assign a hot key combination in the field for the PS/2 keyboard to power on the system. Settings: *Ctrl-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 1 (COM A)/Serial Port 2 (COM 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:

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

RxD, TxD Active
The item determines the active of RxD, TxD. Settings are "*Hi, Hi*", "*Hi, Lo*", "*Lo, Hi*" and "*Lo, Lo*".

IR Transmission Delay
The field enables or disables IR transmission delay function. Settings: *Enabled* and *Disabled*.

UR2 Duplex Mode
The field specifies a duplex value for the IR device connected to COM B. Full Duplex mode permits silmutaneous two-direction transmission. Half Duplex mode permits transmission in one direction only at a time. Settings: *Half* and *Full*.

Use IR Pins
Consult your IR peripheral documentation to select the correct setting of TxD and RxD signals. Settings: *IR-Rx2Tx2* and *RxD2, TxD2*.

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

Parallel Port Mode
This item selects the operating mode for the parallel port: *SPP*, *EPP*, *ECP* or *ECP+EPP*.

EPP Mode Select
The item selects the EPP version used by the parallel port if it is set to *EPP* or *ECP+EPP* mode. Settings: *EPP1.7* and *EPP1.9*.

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

PWRON After PWR-Fail
This item specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

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

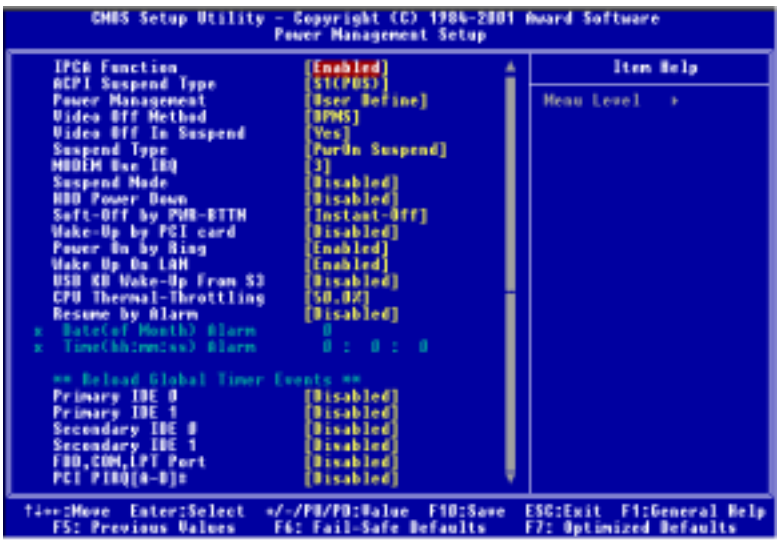
Game Port Address
The item disables the Joystick/Game port or sets its I/O port address.

Settings: *Disabled*, *201* and *209*.

Midi Port Address
The item disables the Midi port or sets its I/O port address. Settings: *Disabled*, *330*, *300* and *290*.

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

Power Management Setup



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*. Settings: *Enabled* and *Disabled*.

ACPI Suspend Type
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows 2000 and Windows ME, you can choose to enter the Standby mode in S1(POS) or S3(STR) fashion through the setting of this field. 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 context 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 the modes: Suspend Mode and HDD Power Down. There are three options for power management:

Min Saving	Minimum Power Management. Suspend Mode = 1 Hour. HDD Power Down = 15 Min.
Max Saving	Maximum Power Management. Suspend Mode = 1 Min. HDD Power Down = 1 Min.
User Define	Allows end users to configure each mode separately.

Video Off Method
This item determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This option 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 video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend
This item allows you to determine whether you want your monitor blanked for power management when entering suspend mode. Settings: *Yes* and *No*.

Suspend Type
This item allows you to select the suspend type for system power management. Settings: *Stop Grant* and *PwrOn Suspend*.

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: *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: *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: *Disabled* and *1 Min* 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 items specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected.

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 percentage of CPU speed to which it will slow down when the CPU temperature reaches the predetermined overheating limit. Settings range from 12.5% to 87.5% at 12.5% increment.

Resume by Alarm
This is to enable or disable the feature of booting up the system on a scheduled time/date. Settings: *Enabled* and *Disabled.*

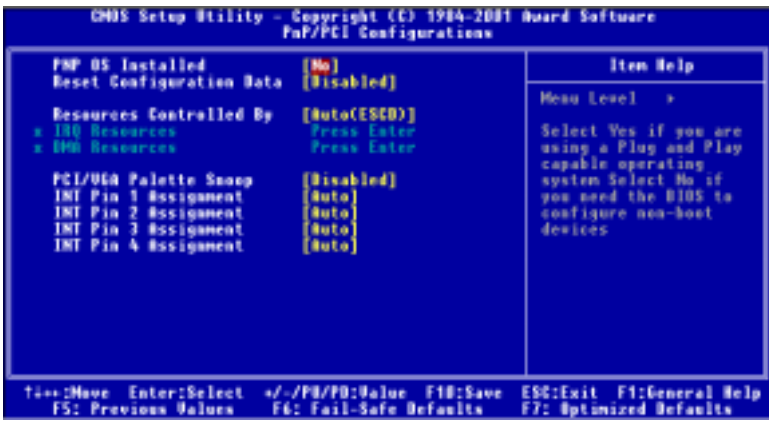
Date(of Month) Alarm
The field specifies the date for **Resume by Alarm**. Settings: 0~31.

Time(hh:mm:ss) Alarm
Specifies the time for **Resume by Alarm**. Format is <hour><minute> <second>.

****Reload Global Timer Events****

Primary/Secondary IDE 0/1, FDD,COM,LPT Port, PCI PIRQ[A-D]#
The global timer is the hardware timer that counts down to the power saving modes. If monitoring of the selected hardware peripherals or components is enabled, they will awaken the system from, or reload the original count of global timer for, suspend/sleep mode when they are accessed.

PnP/PCI Configurations



PNP OS Installed
When set to *YES*, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows® 98. When set to *NO*, BIOS will initialize all the PnP cards. So, select *Yes* if the operating system is Plug & Play aware.

Reset Configuration Data
The ESCD (Extended System Configuration Data) is a method that the BIOS uses to store resource information for both PNP and non PNP devices in a bit string format. When *Enabled*, the system will rebuild ESCD and you will see the message "ESCD Update Successfully" on boot up.

Resources Controlled By
When selecting *Auto(ESCD)*, BIOS will automatically configure all the boot and PnP (Plug & Play) compatible devices and assigns system resources like IRQs to these devices. However, this feature means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 98. If you want to configure the system by yourself, select *Manaul*.

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** list IRQ-3/4/5/7/9/10/11/12/14/15 and **DMA Resources** list 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.

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

PCI/VGA Palette Snoop

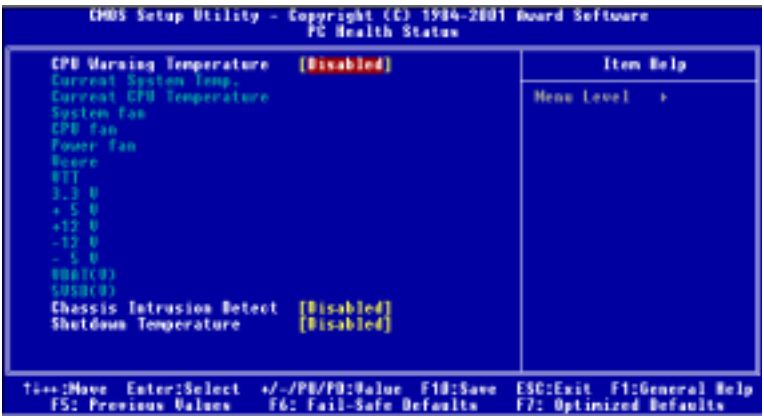
PCI VGA palette is the set of colors currently used by the video device. Some special VGA cards may not show colors correctly and need to look into the video device's VGA palette to determine what colors are in use. Then you have to turn on the palette "snoop", permitting the palette registers of both VGA devices to be identical. The setting must be set to *Enabled* if any non-standard VGA adapter card, such as MPEG card, installed in the system requires VGA palette snooping.

INT Pin 1/2/3/4 Assignment

The items let you assign an IRQ line to INT Pin#1~4 separately. Selecting *Auto* allows BIOS to determine the appropriate IRQ for each INT Pin.

PC Health Status

This section is to monitor the current hardware status including CPU temperature, CPU Fan speed, Vcore etc. This is available only if there is hardware monitoring mechanism onboard.



CPU Warning Temperature

This item is used to specify a thermal limit for CPU. If CPU temperature reaches the specified limit, the system will issue a warning and allows you to prevent the CPU overheat problem. Settings: *Disabled*, *50°C/122°F*, *53°C/127°F*, *56°C/133°F*, *60°C/140°F*, *63°C/145°F*, *66°C/151°F* and *70°C/158°F*.

Current System Temp., Current CPU Temperature, System/CPU/Power fan, Vcore, VTT, 3.3 V/+ 5 V/+12 V/-12 V/- 5 V, VBAT(V), 5VSB(V)

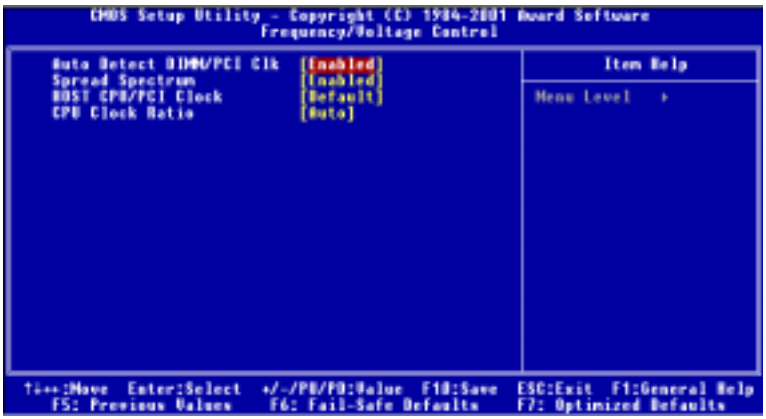
These items display the current status of all monitored hardware devices/components such as CPU voltages, temperatures and all fans' speeds.

Chassis Intrusion Detect

The item enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis was once opened. To clear the warning message, you must set the item to *Reset*. The setting of the item will automatically return to *Enabled* later. Settings: *Enabled*, *Reset* and *Disabled*.

Shutdown Temperature
The item allows the ACPI-aware system to automatically shutdown if the system temperature reaches a thermal level preset here. This can prevent the system components from being damaged due to overheating. Settings: *Disabled, 80°C/176°F, 85°C/185°F* and *90°C/194°F*.

Frequency/Voltage Control



Auto Detect DIMM/PCI Clk
This item is used to auto detect the DIMM/PCI slots. When set to *Enabled*, the system will remove (turn off) clocks from empty DIMM/PCI slots to minimize the electromagnetic interference (EMI). Settings: *Enabled* and *Disabled*.

Spread Spectrum
When the motherboard clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at *Disabled* for optimal system stability and performance. But if you are plagued by EMI, setting to *Enabled* for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a 0.25% jitter can introduce a temporary boost in clock speed of 25MHz (with a 1GHz CPU) which may just cause your overclocked processor to lock up.

HOST CPU/PCI Clock
This item allows you to specify the combination of CPU FSB clock and PCI clock. It provides end users an overclocking method. Settings: *66/33 MHz*,

68/34 MHz, *75/37 MHz*, *100/33MHz*, *112/37MHz*, *117/39MHz*, *124/41MHz*, *129/43MHz*, *133/44MHz*, *138/46MHz*, *140/46MHz*, *133/33MHz*, *140/35MHz*, *150/50MHz* and *150/37MHz.*

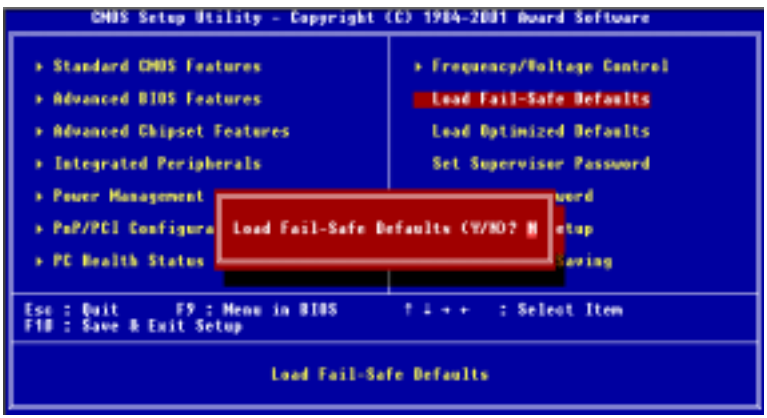
CPU Clock Ratio

This item is used to specify the CPU ratio (clock multiplier) and provides a tool for users to overclock the processor. Settings: *Auto* and *X 3.5* to *X 8*.

Load Fail-Safe/Optimized Defaults

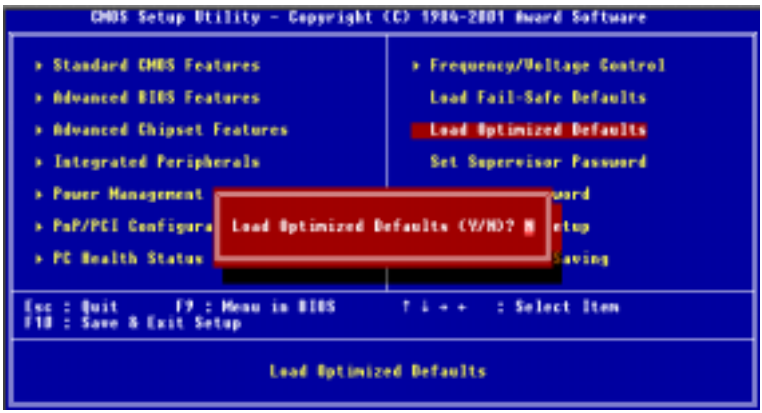
The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for the optimal performance of the mainboard. The Fail-Safe Defaults are the default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

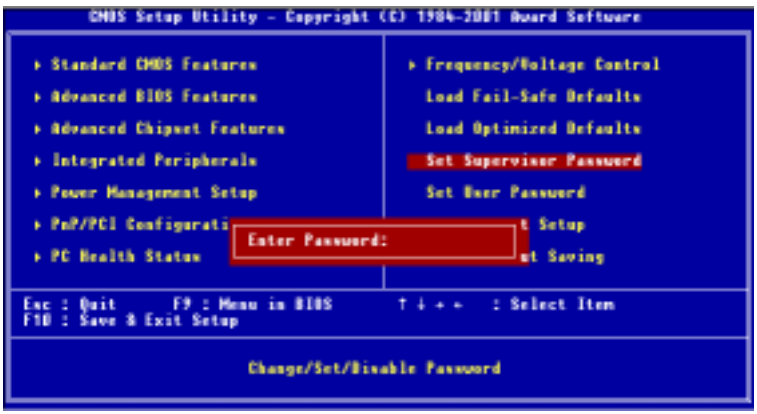
When you select Load Optimized Defaults, a message as below appears:



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 replace 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

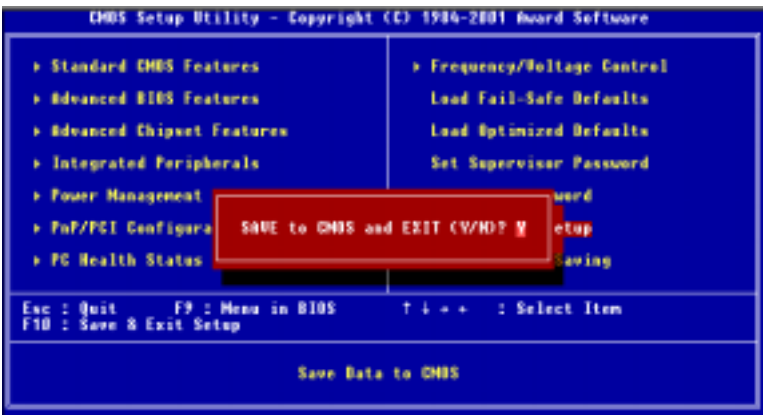
use of your computer. The setting to determine when the password prompt is required is the Security Option in the Advanced BIOS Features menu. If the Security Option is set to *System*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when trying to enter Setup.

About Supervisor Password & User Password:

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

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:

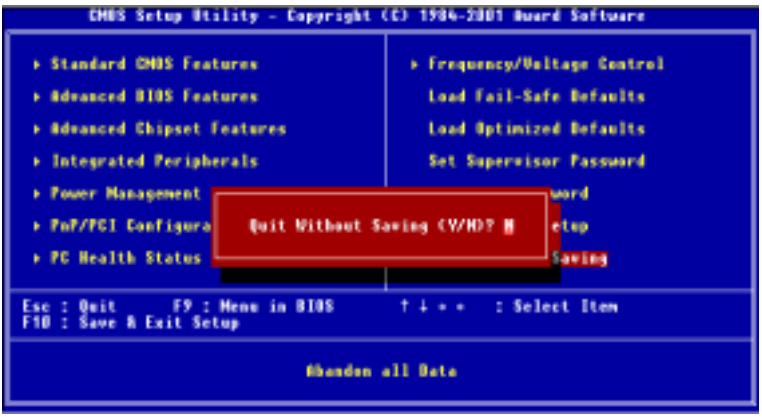


Typing *Y* will allow you to quit the Setup Utility and save the user setup changes to RTC CMOS.

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.