MSI

MICRO-STAR INTERNATIONAL

MS-6377 ATX Mainboard

Version 1.0
G52-MA00282

Manual Rev: 1.0
Release Date: August 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-6377

FC

For Home or Office Use

Edition

August 2001

Copyright Notice

Trademarks

Revision History

Revision	Revision History	Date
1.0	First Release	August 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 60^0 C (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-6377 ATX mainboard is a high-performance computer mainboard based on **RCC/ServerWorks** chipset. The MS-6377 is designed for dual Intel® Pentium® III (FC-PGA) processor for cost-effective entry-level and mid-range server markets.

The mainboard consists of the North Bridge "CNB30 LE" and ServerWorks Open South Bridge™ "OSB4". CNB30 LE provides an integrated high-performance main memory sub-system, a dual channel PCI bus, and a 32-bit PCI Bus. The CNB30 LE filters all the unnecessary bus traffic going to the Processor bus and also performs packing and unpacking of data for PCI accesses, which in turn allows more Processor bus bandwidth for other processors in multiprocessor systems. As a main memory sub-system, the CNB30 LE provides an efficient interface between the Processor bus and memory with data integrity features such as ECC, memory scrubbing, and memory snarfing.

OSB4 primarily functions as a PCI to ISA bridge, but is also a source of numerous other integrated functions, including ISA bus controller, DMA33 support, ACPI, USB interface, etc.

This chapter includes the following topics:

Mainboard Specification

CPU

- Support Dual or Single Socket370 for Intel® Coppermine processors
- Support up to 1GHz at 133MHz FSB

Chipset

- ServerWorks CNB 30LE chipset
  - Extensive Data Buffering between all interfaces for high throughput and concurrence
  - Support 100/133MHz FSB

- ServerWorks OSB4 chipset
  - PCI to ISA bridge
  - Client Management support
  - ACPI power management

Main Memory

- Support four 3.3 volt, 168-pin registered DIMM (25-degree sockets) PC100 or PC133
- Support 16/64/128/256Mbit technology
- Up to 3 GB ECC registered SDRAM

Note: *Only registered ECC memory is supported. Non-ECC or unbuffered SDRAM is not supported.*

Slots

- Three 32-bit, 33MHz Primary PCI Bus Master slots
- Two 64-bit, 33/66MHz Secondary PCI Bus Master slots
- Support 3.3v/5v PCI bus Interface

On-Board IDE

- An IDE controller on the OSB4 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA33 operation modes.
- Can connect up to four fast IDE drives
- Two 64-bit, 66/33 MHz PCI bus mastering slots
- Three 32-bit PCI bus mastering slots

On-Board Peripherals

- On-Board Peripherals include:
  - 1 floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M or

2.88Mbytes
- 1 serial port (COM1)
- 1 parallel port supports SPP/EPP/ECP mode
- 4 USB ports (Rear * 2 / Front * 2)
- 1 VGA port
- 2 LAN RJ45 Jacks
- 2 SCSI connectors
- 1 COM2 pin header

Network
- Dual Intel® 82550 LAN Controllers
  - Integrated IEEE802.3 10-BaseT & 100-BaseTX PHY
  - Wake-On-LAN and WFM 2.0 supported (ET/EM)

Adaptec Ultra-160 SCSI
- Integrated Adaptec AIC-7899W Ultra-160 SCSI Adaptor
- Support dual channels

Video
- Integrated ATI Rage XL graphics controller
- Onboard 4MB Video SDRAM

BIOS
- Supports ACPI (Advanced Configuration and Power Interface) and APM (Advanced Power Management)
- Blinking LED for Sleep State indicator
- PC Health Monitoring protects your system from problems even before they occur
- DMI support
- BIOS protection
- 4 Mb flash ROM (AMI BIOS)
- BIOS rescure hot keys for rescuing BIOS chip from flash failure

Dimension
- ATX Form Factor: 12 in. x 10.5 in. (W x H)

Mounting
- 9 mounting holes

PC Health Monitoring
- 9 onboard voltage monitors for CPU core/s, 3.3V, -12V, -5V, 5V, 5VSB, VTT,

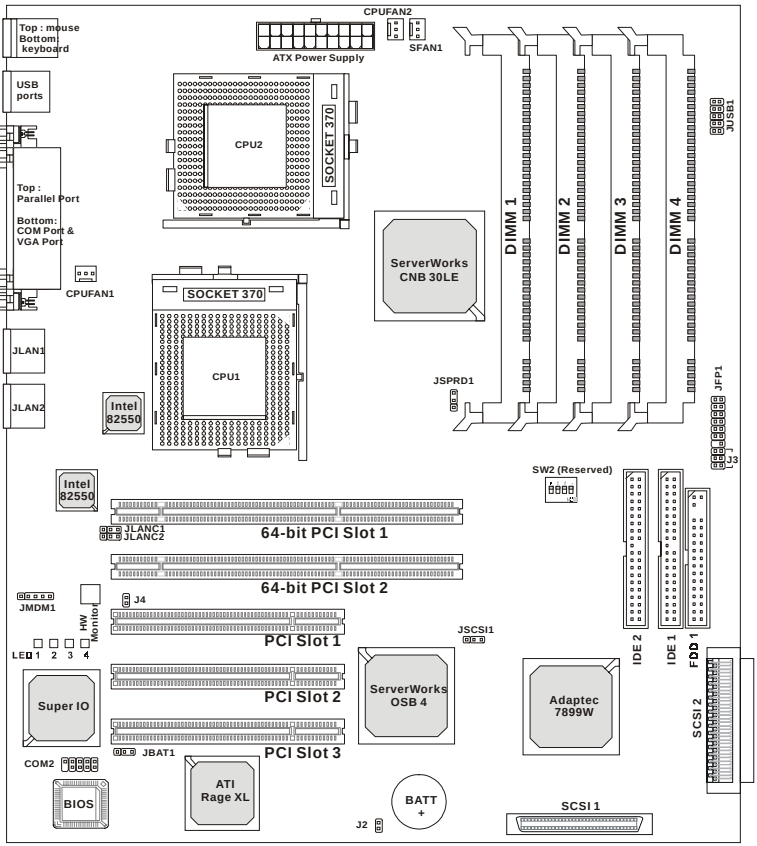
VBAT, Vcc status monitor
- CPU/chassis temperature monitoring
- Support for system management software
- FAN speed monitoring

Other Features
- ACPI/APM power management
- One chassis intrusion connector
- Control of power-on mode for recovery from AC power loss

Key Features

- ATX Form Factor
- CPU: Socket 370 for **Single/Dual** Intel® Pentium III
- Memory: 4 PC100/PC133 SDRAMs
- Slot: Three 32-bit, 33MHz Primary PCI slots & Two 64-bit, 33/66MHz Secondary PCI slots
- I/O: 1 serial port (COM1) & 1 COM2 pin header, 1 VGA port, 1 parallel port, 4 USB ports, 1 floppy port, 2 SCSI connectors, 2 LAN jacks
- LAN Wake up Function
- PC Alert™ III system hardware monitor
- D-LED™ -- 4 LEDs embedded in the mainboard

Mainboard Layout



MS-6377 ATX Mainboard

Quick Components Guide

Component	Function	Reference
DIMM1~4	Installing SDRAM modules	See p. 2-5~2-6
Socket 370	Installing CPU(s)	See p. 2-2~2-3
CPUFAN1/2	Connecting to CPU FANs	See p. 2-19
SFAN1	Connecting to SYSTEM FAN	See p. 2-19
ATX Power Supply	Installing power supply	See p. 2-7
IDE1& IDE2	Connecting to IDE drives	See p.2-14
FDD1	Connecting to floppy disk drive	See p.2-13
JUSB1	Connecting to USB interface	See p. 2-18
PCI Slot 1~3	Installing 32-bit PCI expansion cards	See p. 2-26
64-bit PCI Slot1~2	Installing 64-bit PCI expansion cards	See p. 2-26
JMDM1	Connecting to modem module	See p. 2-17
JBAT1	Clearing CMOS data	See p. 2-21
JFP1	Connecting to case	See p. 2-15
J4	Connecting to chassis intrusion switch	See p. 2-17
J3	Connecting to LAN LEDs backplane	See p. 2-18
JLANC1/2	Enabling onboard LAN function	See p. 2-22
JSCSI1	Enabling onboard SCSI function	See p. 2-23
J2	Enabling onboard VGA device	See p. 2-23
JSPRD1	Setting spread spectrum feature	See p. 2-23
SCSI 1/2	Connecting to SCSI interfaces	See p. 2-20
SW2	Setting CPU core/bus ratio	See p. 2-25

MSI Special Features

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.

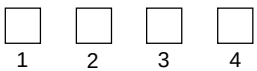
Note: *Items shown on PC Alert III vary depending on your system's status.*

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

D-LED™

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



Diagnostic LED

■ **Red** □ **Green**

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

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

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.

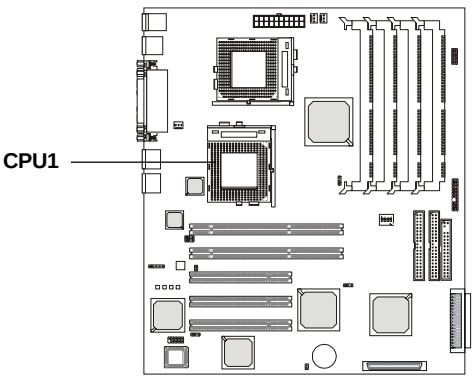
Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

This chapter contains the following topics:

Central Processing Unit: CPU

The mainboard supports **Single/Dual** Intel® Coppermine processor (s). The mainboard uses two CPU sockets called Socket 370 for easy CPU installation. You can install SINGLE or DUAL CPUs on the board to meet your own needs. Keep the following points in mind before installing CPU(s):

1. If **SINGLE** CPU is intended, always install the CPU on the **CPU1** socket.

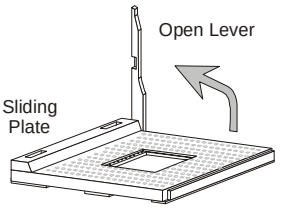


2. To install **DUAL** CPUs on the board, you must use **the same type of CPUs running at the same FSB frequency**.

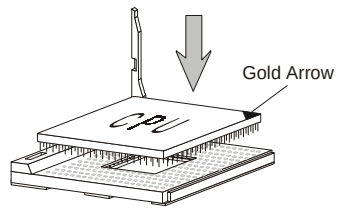
When you are installing the CPU, **make sure the CPU has a Heat Sink and a cooling fan attached on the top to prevent overheating.** If you do not find the Heat Sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Installation Procedures

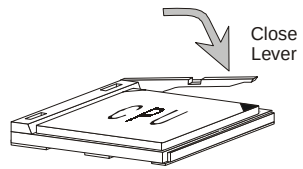
1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.



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

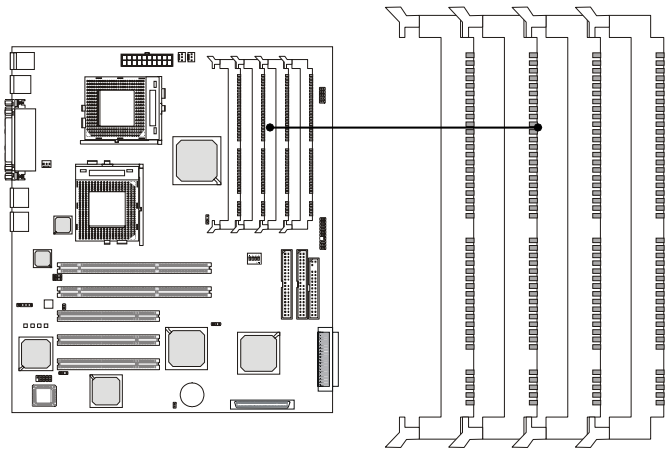
WARNING!

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 provides four 25° sockets for 168-pin, 3.3V SDRAM DIMM with 8 memory banks. To operate properly, at least one DIMM module must be installed.



SDRAM DIMM Slots (DIMM 1~4)

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

You can install memory modules in any order and in any combination as listed below:

DIMM Socket	Memory Module	Total Memory
Socket 1 (Bank 0 & Bank 1)	32MB, 64MB, 128MB, 256MB, 512MB, 1GB	32MB ~ 1GB
Socket 2 (Bank 2 & Bank 3)	32MB, 64MB, 128MB, 256MB, 512MB, 1GB	32MB ~ 1GB
Socket 3 (Bank 4 & Bank 5)	32MB, 64MB, 128MB, 256MB, 512MB, 1GB	32MB ~ 1GB
Socket 4 (Bank 6 & Bank 7)	32MB, 64MB, 128MB, 256MB, 512MB, 1GB	32MB ~ 1GB

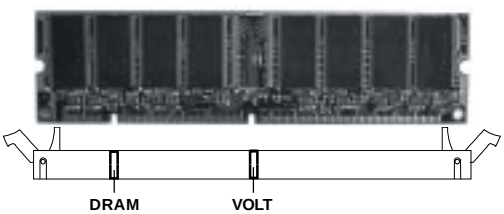
Note: *The total system memory cannot exceed* ***3GB.***

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.



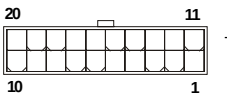
3. The plastic clip at each side of the DIMM slot will automatically close.

Power Supply

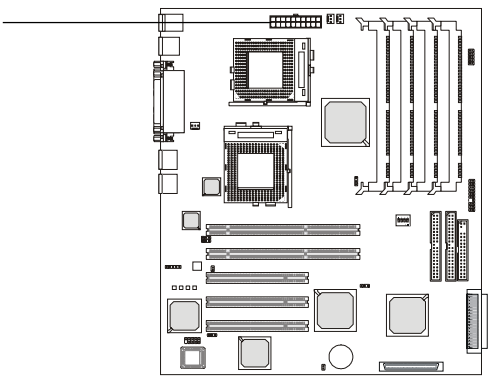
The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

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 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.



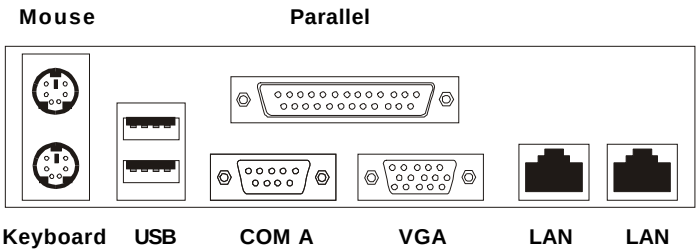
ATX
Power Connector



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

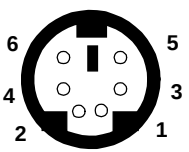
Back Panel

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.



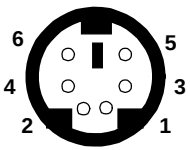
PS/2 Mouse (6-pin Female)

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.



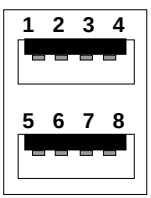
PS/2 Keyboard (6-pin Female)

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.



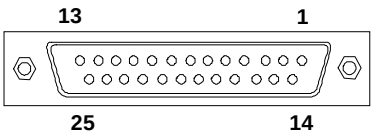
USB Ports

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.

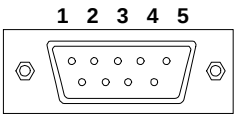


Pin Definition

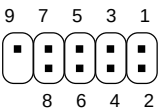
PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground1

Serial Port Connector: COM1 & COM2

The mainboard has one 9-pin male DIN connector serial port COM1 and one 9-pin COM2 pin header. You can attach a serial mouse or other serial devices to the connectors.



9-Pin Male DIN Connector



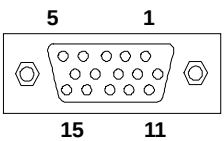
COM2

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.



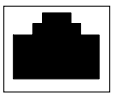
DB 15-Pin Female Connector

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

LAN Jacks (RJ-45)

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



LAN RJ-45 Jacks

Pin Definition

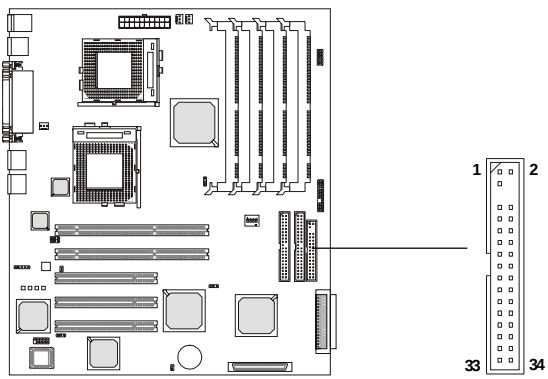
PIN	SIGNAL	DESCRIPTION
1	RDN	Receive Differential Pair
2	RDP	Receive Differential Pair
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	TDN	Transmit Differential Pair
8	TDP	Transmit Differential Pair

Connectors

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

Floppy Disk Drive Connector: FDD1

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



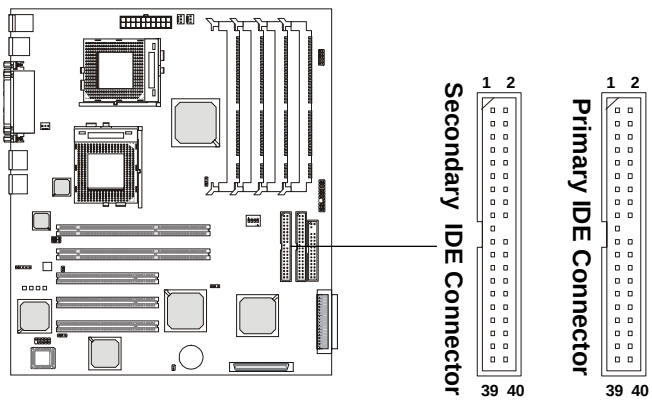
FDD1

Hard Disk Connectors: IDE1 & IDE2

The mainboard uses an IDE controller on the ServerWorks OSB4 chipset that provides PIO mode 0-4, Bus Master, and Ultra DMA 33 modes. It has two HDD connectors IDE1 (Primary) and IDE2 (Secondary). You can connect up to four hard disk drives, CD-ROM, 120MB Floppy or DOM (Disk on Module) 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.

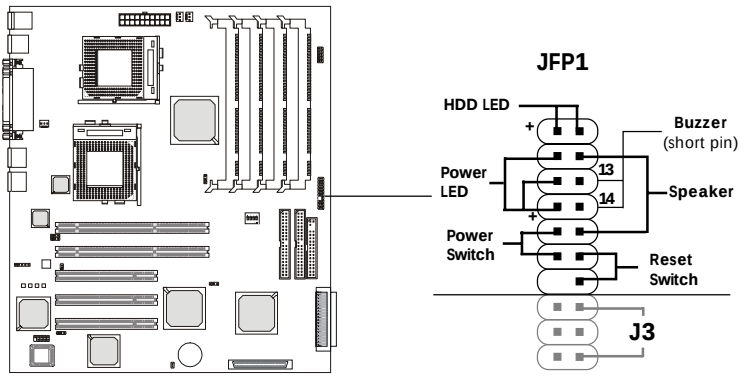


TIP

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 Connector: JFP1

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



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. There are three types of LEDs you can connect from the system case to the pin:

2-pin single color power LED: Connected to pin 3 & 4. When the system enters the suspend/sleep mode, the 2-pin power LED blinks.

2-pin dual color power LED: Connected to pin 3 & 4. The 2-pin

power LED changes its color to indicate different system states:
GREEN color indicates full-on mode.
ORANGE color indicates suspend/sleep mode.

3-pin dual color power LED: Connected to pin 2, 3 & 4. The 3-pin power LED changes its color to indicate different system states:
GREEN color indicates full-on mode.
ORANGE color indicates suspend/sleep mode.

Speaker

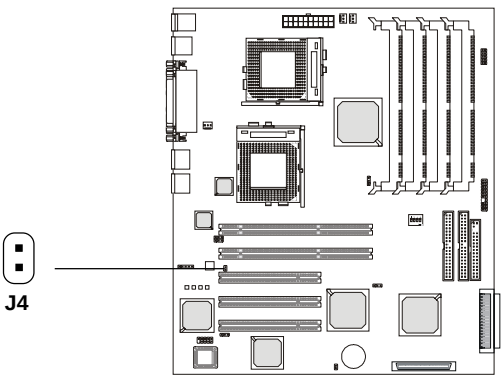
Speaker from the system case is connected to this pin.
If on-board Buzzer is available, then:
Short pin 13-14: On-board Buzzer Enabled.
Open pin 13-14: On-board Buzzer Disabled.

HDD LED

HDD LED shows the activity of a hard disk drive connected to the IDE1 or IDE2 connector. Avoid turning the power off while the HDD is working. You can connect the HDD LED from the system case to this pin.

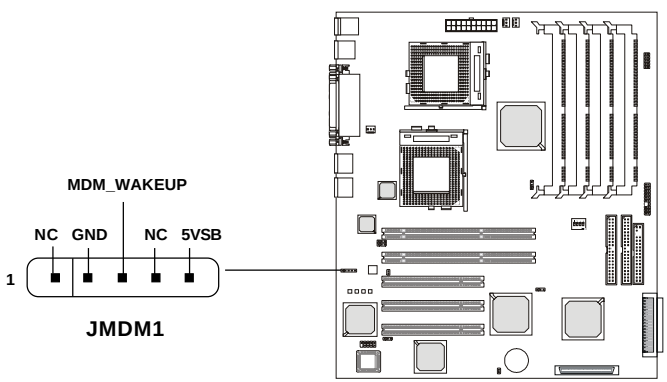
Chassis Intrusion Switch Connector: J4

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.



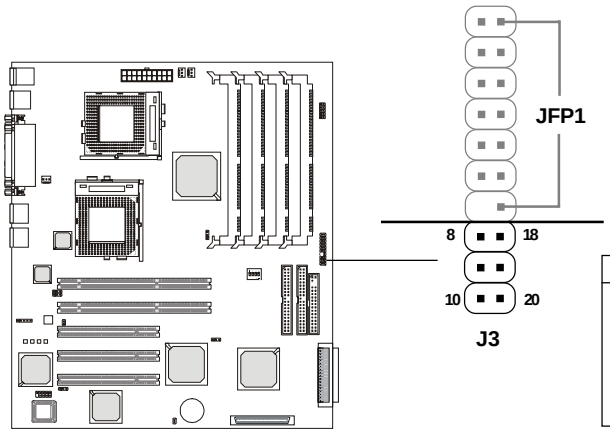
Wake On Ring Connector: JMDM1

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.



LAN LEDs Connector: J3

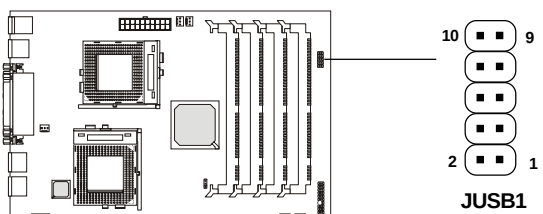
The connector is used to connect to a backplane with LAN LEDs for showing the activity of LAN (Local Area Network).



Pin	Signal
8	3VSB
18	1ACTLED
9	3VSB
19	2ACTLED
10	SCL
20	SDA

Front USB Connector: JUSB1

The mainboard provides one Front USB (Universal Serial Bus) pin header that allows you to connect optional USB ports for front panel.

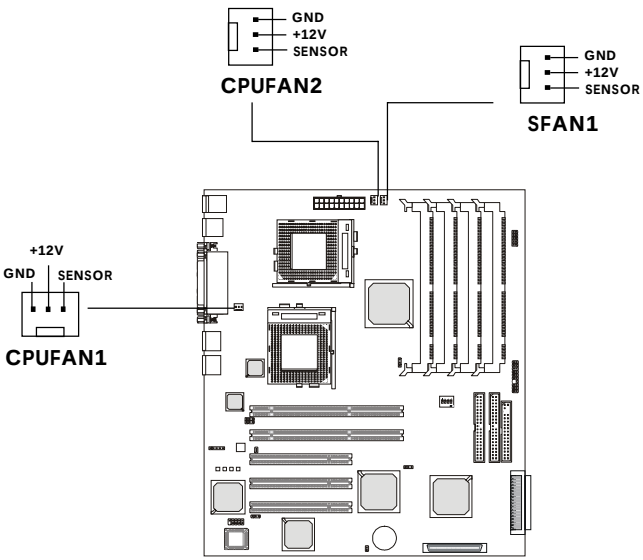


JUSB1 Pin Definition

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

Fan Power Connectors: CPUFAN1/CPUFAN2/SFAN1

The CPUFAN1/CPUFAN2 (processor fans) and SFAN1 (system fan) support system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

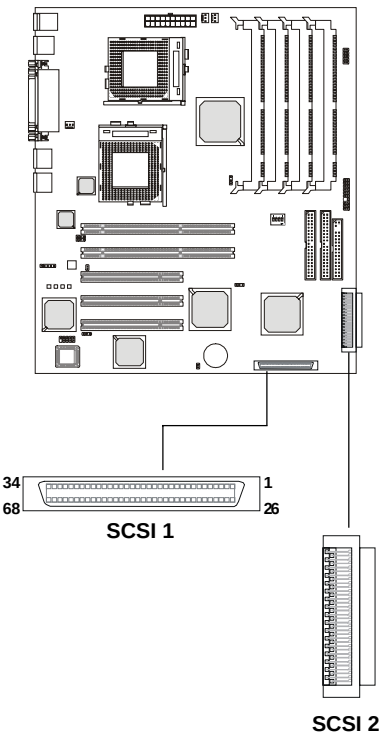


Note:

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 temeperature.

Ultra160 SCSI Connectors: SCSI 1/2

SCSI (Small Computer System Interface) is a hardware interface that allows for connection of up to 15 peripheral devices. The mainboard provides onboard dual SCSI channels (SCSI 1 & SCSI 2) for you to connect SCSI devices such as SCSI hard disks.



68-Pin Ultra160 SCSI Connector

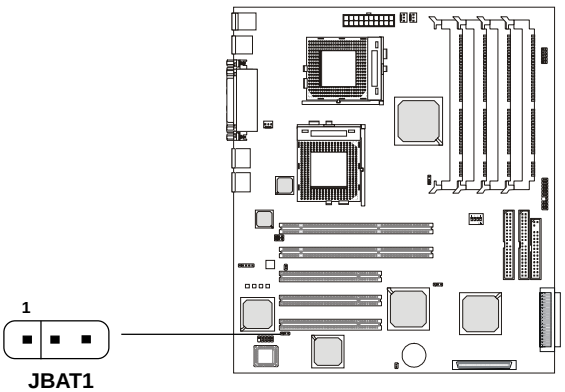
Pin	Description	Pin	Description
1	+DB(12)	35	-DB(12)
2	+DB(13)	36	-DB(13)
3	+DB(14)	37	-DB(14)
4	+DB(15)	38	-DB(15)
5	+DB(P1)	39	-DB(P1)
6	+DB(0)	40	-DB(0)
7	+DB(1)	41	-DB(1)
8	+DB(2)	42	-DB(2)
9	+DB(3)	43	-DB(3)
10	+DB(4)	44	-DB(4)
11	+DB(5)	45	-DB(5)
12	+DB(6)	46	-DB(6)
13	+DB(7)	47	-DB(7)
14	+DB(P)	48	-DB(P)
15	GROUND	49	GROUND
16	DIFFSENS	50	GROUND
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	RESERVED	53	RESERVED
20	GROUND	54	GROUND
21	+ATN	55	-ATN
22	GROUND	56	GROUND
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MST
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB(8)	65	-DB(8)
32	+DB(9)	66	-DB(9)
33	+DB(10)	67	-DB(10)
34	+DB(11)	68	-DB(11)

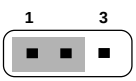
Jumpers

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

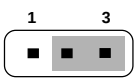
Clear CMOS Jumper: JBAT1

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





keep data



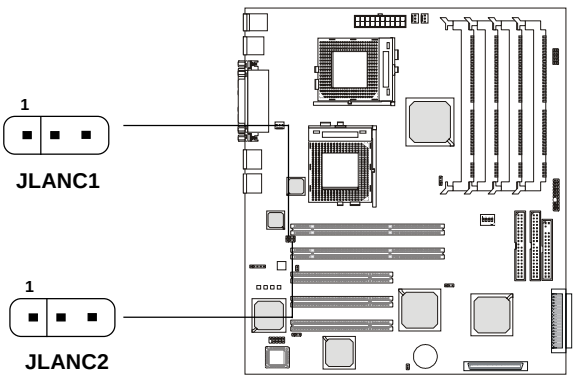
clear data

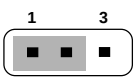
WARNING!

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.

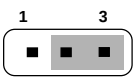
LAN Enable/Disable Jumpers: JLANC1 & JLANC2

The JLANC1/JLANC2 jumpers are used to enable or disable the onboard LAN1 & LAN2 controllers. (Please note JLANC1 controls the JLAN1, and JLANC2 controls the JLAN2.)





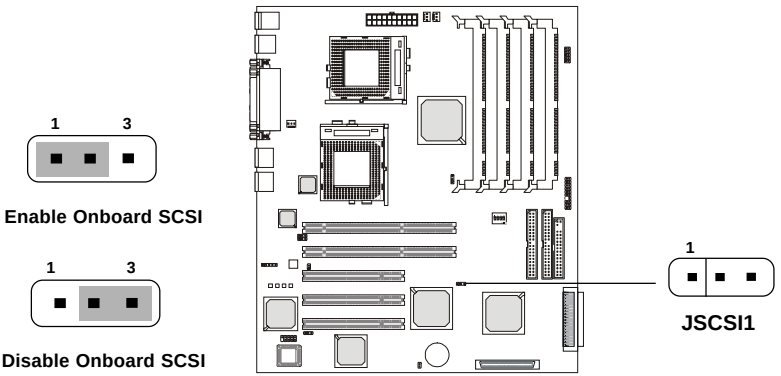
Enable Onboard LAN1/LAN2



Disable Onboard LAN1/LAN2

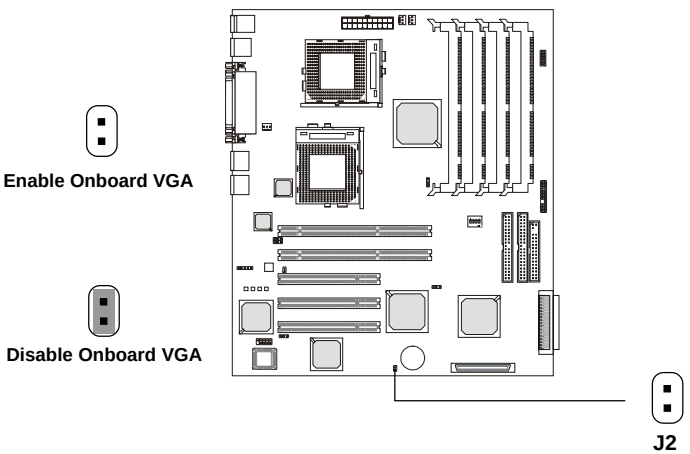
SCSI Enable/Disable Jumper: JSCSI1

The JSCSI1 jumper is used to enable or disable the onboard SCSI controller. It controls both SCSI 1 and SCSI 2 connectors.



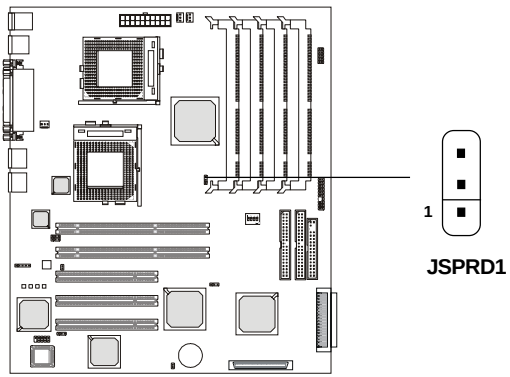
VGA Enable/Disable Jumper: J2

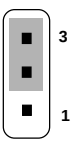
The J2 jumper is used to enable or disable the onboard VGA controller.



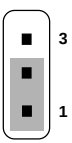
Spread Spectrum Jumper: JSPRD1

The JSPRD1 jumper is used to set the spread spectrum feature. The spread spectrum function is able to minimize emission interference to other devices, especially radio equipment.





Enable the Spread Spectrum function



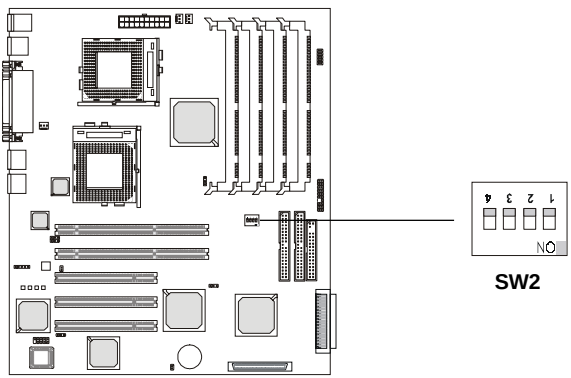
Disable the Spread Spectrum function

DIP Switches

The DIP switch, like a jumper, is also able to set the computer's function. This section describes the function of DIP switches that the mainboard provides.

Setting CPU Core/Bus Ratio: SW2 (Reserved)

This DIP switch is reserved for setting the CPU core/bus ratio (clock multiplier). However, since most Intel CPUs have a fixed ratio and will overwrite the setting of SW2, you only need to leave SW2 as set by the manufacturer.



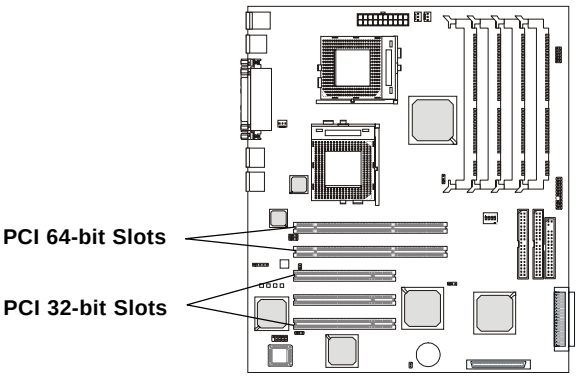
SW2

SW2 Default Setting

#1	#2	#3	#4
OFF	OFF	OFF	OFF

Slots

The motherboard provides three 32-bit Master PCI Bus slots and two 64-bit Master PCI Bus slots.



PCI Slots

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

Three of the PCI slots are conventional 32-bit PCI slots at 33MHz and the other two are 64-bit PCI slots at 33/66MHz. The 32-bit PCI bus running at 33MHz produces a peak bandwidth at 133MB/sec. With twice the PCI clock speed and data lines, the 64-bit PCI slots can produce up to 532MB/sec throughput. Therefore, 64-bit PCI slots are great for high performance adapters and help to increase the overall system performance.

Throughput

	32-bit	**64-bit**
33MHz	133MB/sec	266MB/sec
66MHz	266MB/sec	532MB/sec

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/S.B./LAN/VGA/SCSI" IRQ pins are typically connected to the PCI bus INTA#-INTD# pins as follows:

	INT A#	INT B#	INT C#	INT D#
32-bit PCI Slot 1	0	1	2	3
32-bit PCI Slot 2	1	2	3	0
32-bit PCI Slot 3	2	3	0	1
S.B.	0	1	2	3
LAN1	3			
LAN2	4			
VGA	5			
SCSI1	8			
SCSI2	9			
64-bit PCI Slot 1	6	7	8	9
64-bit PCI Slot 2	10	11	12	13

32-bit PCI Slot 1~3: BUS MASTER
64-bit PCI Slot 1~2: BUS MASTER

AMI® BIOS Setup 3

The mainboard uses AMI® 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 run 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

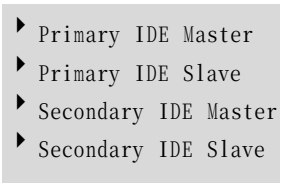
<← >	Move to the menu in the left hand
<→>	Move to the menu in the right hand
<↑>	Move to the previous item
<↓>	Move to the next item
<Tab>	Move between the fields of an item
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the earlier menu screen from a submenu screen
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<Page Up>	Previous page
<Page Down>	Next page
<F7>	Restore the previous CMOS value from CMOS
<F8>	Load the default CMOS value from Fail-Safe default table
<F9>	Load Optimized defaults
<F10>	Save all the CMOS changes and exit

Getting Help

After entering the Setup utility, the first screen you see is the Main Menu. The on-line description for the selected item is displayed on right side of the screen.

Sub-Menu & Prompt

If you find a right pointer symbol appears to the left of certain items (as shown in the right view), that means a prompt or a sub-menu containing additional options for the item can be accessed. To enter the sub-menu screen or trigger the prompt, highlight the field and press <Enter>. Then you can use control keys to move between and change the settings of the sub-menu or respond to the prompt. To return to earlier menu screen, press <Esc>.



General Help <F1>

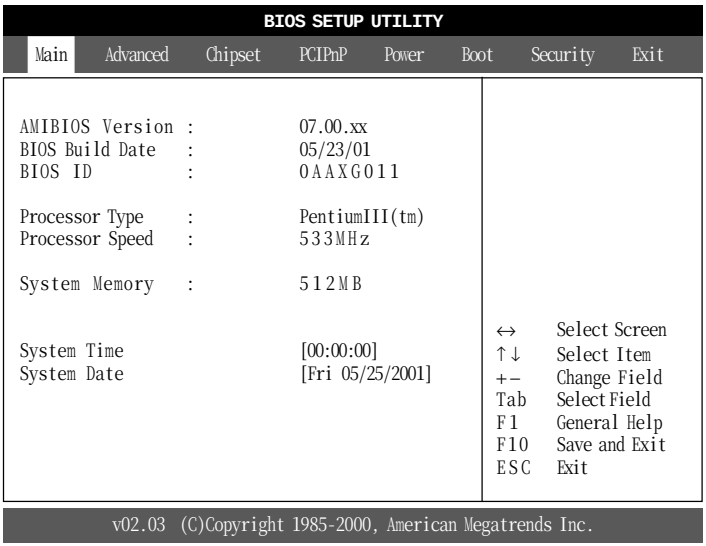
The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use. To exit the Help screen, press <Esc>.

Default Settings

The BIOS setup program contains two kinds of default settings: the Optimal and Failsafe defaults. Optimal defaults provide optimum performance settings for all devices and the system. (The “default” value described in the chapter usually refers to the Optimal defaults unless otherwise specified.) Failsafe defaults provide the safest set of parameters instead of the optimal system performance for the system.

The Setup Categories

Once you enter AMI BIOS SETUP UTILITY, the Main Menu will appear on the screen. On the Main Menu screen, you will see basic CMOS settings including system time & date, and the setup categories the BIOS supplies. Use Arrow keys to move among the items and menus, and make changes to the settings.



Main Menu
Use this menu for basic system configurations, such as time, date etc.

Advanced Menu
Use this menu to setup the items of AMI® special enhanced features, such as the power-on state, storage devices configuration and system hardware monitoring... etc.

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

PCIPnP Menu
This menu allows you to configure the PnP (Plug & Play) devices in your system and assign the system resources like IRQs & DMAs.

Power Menu
Use this menu to specify your settings for power management.

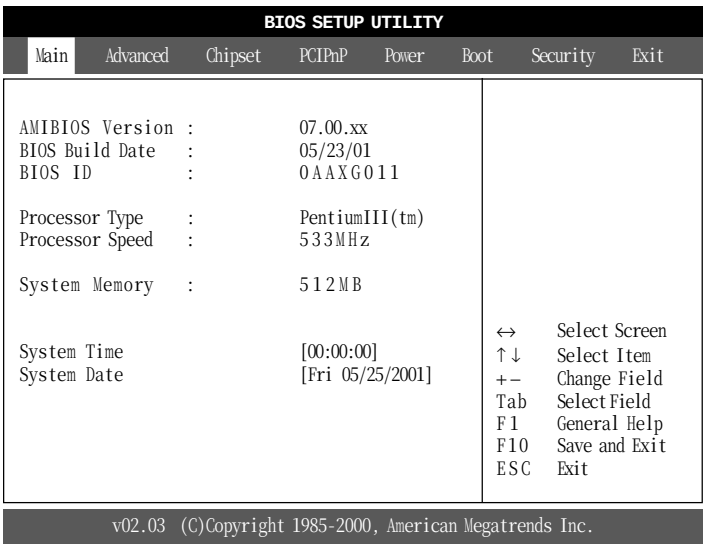
Boot Menu
Use this menu to specify the priority of boot devices.

Security Menu
Use this menu to set Supervisor and User Password.

Exit Menu
This menu allows you to load the Optimal default values or Failsafe default settings into the BIOS. Besides, under this menu, you can choose to exit the BIOS setup utility with or without saving changes.

The Main Menu

The items inside the Main menu are for basic system information and configuration. Each item includes none, one or more setup items. Use the Up/Down arrow keys or <Tab> to highlight the item or field you want to modify and use the <+> or <-> key to switch to the value you prefer.



AMIBIOS Version/BIOS Build Date/BIOS ID
These items display basic information about this BIOS utility.

Processor Type/Processor Speed
These items display basic micro-processor information.

System Memory
These items display the total size of the installed memory modules.

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

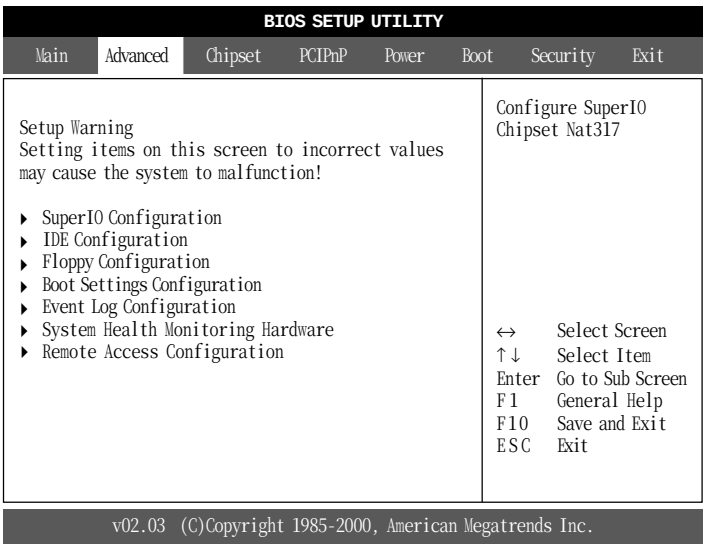
System Date

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 go from 01 through 12.
date	The date from 01 to 31 can be keyed by numeric function keys.
year	The year depends on the year of the BIOS.

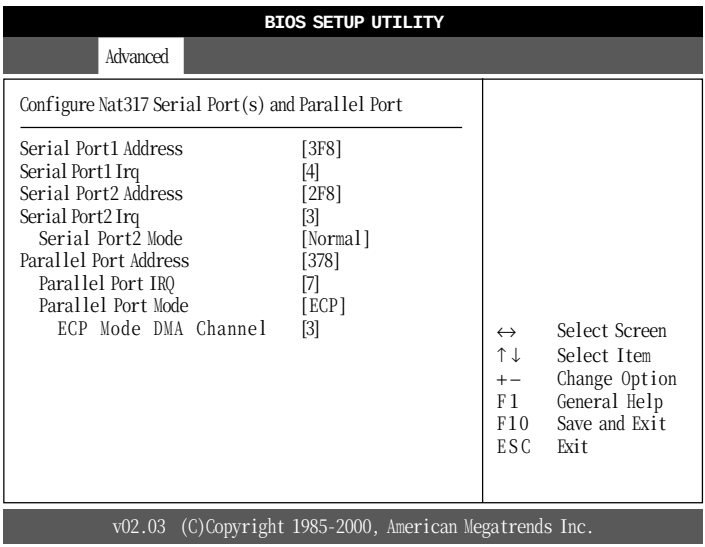
The Advanced Menu

Items in the menu are divided into 7 sub-menus. Each sub-menu provides more settings. To enter the sub-menu, highligh the sub-menu you want to configure and press <Enter>.



SuperIO Configuration

The sub-menu is used to configure serial and parallel ports.



Serial Port1 Address/Irq, Serial Port2 Address/Irq

These items specify the base I/O port addresses and IRQs of the onboard Serial Port 1 (COM 1)/Serial Port 2 (COM 2). Available settings for I/O port address are *Disabled*, *3F8*, *2F8*, *3E8* and *2E8*, and those for IRQ are *Disabled*, *4* and *3*.

Serial Port2 Mode

This item sets the operation mode for Serial Port 2 (COM 2). Settings are *Normal*, *Sharp-IR*, *SIR* and *Consumer*.

Parallel Port Address

This item specifies the base I/O port address of the onboard parallel port. Settings are *378*, *278*, *3BC* and *Disabled*.

Parallel Port IRQ
The item specifies the IRQ for the onboard parallel port. Settings are *7* and *5*.

Parallel Port Mode
This item selects the operation mode for the onboard parallel port: *Normal*, *Bi-Directional*, *EPP* (Enhanced Parallel Port), or *ECP* (Extended Capability Port).

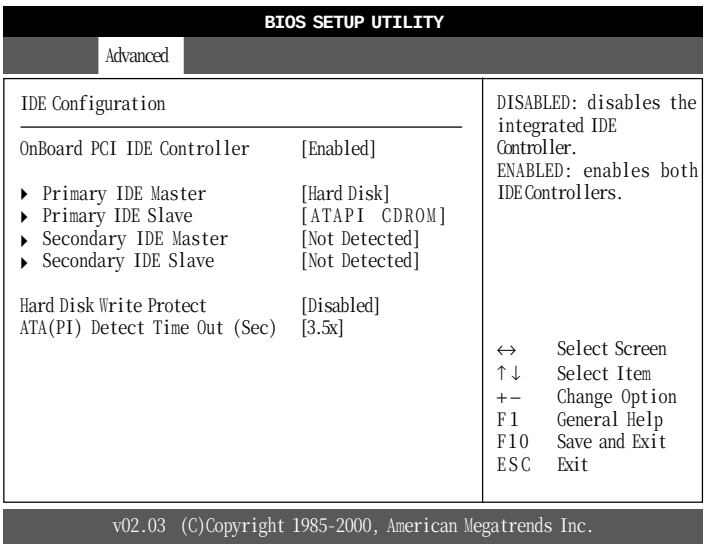
ECP Mode DMA Channel
This feature appears only when **Parallel Port Mode** is set to the *ECP* mode. The item is used to determine the DMA channel for the parallel port. Settings are from *0* to *3*.

Note:

Parallel Port I/O port address "3BC" does not support EPP mode. Therefore, when you select 3BC, EPP is not available in the Parallel Port Mode. When you set the parallel port to EPP mode, 3BC will not be available.

IDE Configuration

The sub-menu configures the attached IDE devices.

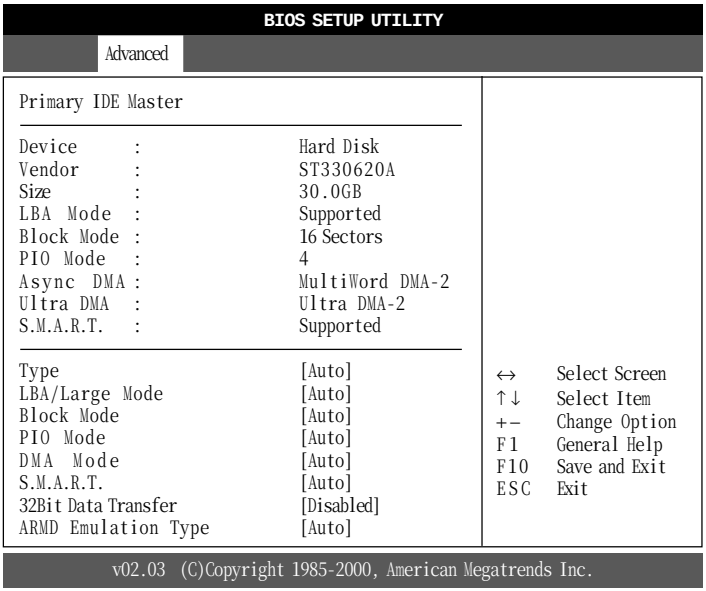


OnBoard PCI IDE Controller

This allows you to enable or disable the onboard IDE controller. Settings are *Disabled* and *Enabled*.

Primary/Secondary IDE Master/Slave

The items allow you to configure each IDE device individually. Press <Enter> to go to the sub-menu, and a sub-menu screen similar to the following picture will appear. Depending on what devices you install, some options may or may not be available.



Device, Vendor, Size, LBA/Block/PIO Mode, Async/Ultra DMA, S.M.A.R.T.
These items display basic information and specification of the detected IDE device.

Type
The item is to determine the type of the IDE device: *Auto*, *CDROM*, *ARMD* or *Not Installed*. The value, *Auto*, allows BIOS to detect the attached IDE device and automatically determine its type.

LBA/Large Mode
The item is used to enable or disable the LBA (Logical Block Addressing) or Large access mode. Selecting *Auto* allows BIOS to detect the attached IDE device and automatically enable the LBA/Large mode if the detected drive supports the mode or disable the LBA/Large mode if the drive does not support it. Settings are *Auto* and *Disabled*.

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. *Auto* allows BIOS to automatically detect the optimal number of block read/write per section that the attached IDE device supports; *Disabled* makes the controller always use standard mode.

PIO Mode
This item is used to determine the PIO (Programming Input/Output) mode used by the IDE drive. Selecting *Auto* allows BIOS to automatically determine the optimal PIO mode supported by the device. Settings are *Auto, 0, 1, 2, 3* and *4.*

DMA Mode
This item is used to determine the DMA (Direct Memory Access) mode used by the IDE drive. Selecting *Auto* allows BIOS to automatically determine the optimal DMA mode supported by the device. Setting options include *Auto, SWDMA 0~2, MWDMA 0~2,* and *UDMA 0~4.*

S.M.A.R.T.
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline. Settings are *Auto, Enabled* and *Disabled*.

32Bit Data Transfer
Enabling this setting allows for 32-bit data transfers between the processor and the PCI bus. Actual transfers to the disk are always done 16 bits at a time, but enabling this option will cause a small performance improvement on the transfer from the bus to the processor. Settings are *Disabled* and *Enabled*.

ARMD Emulation Type
The item tells BIOS which type of emulation is used for the ARMD device connected to the IDE connectors. ARMD device includes ZIP drive, LS-120

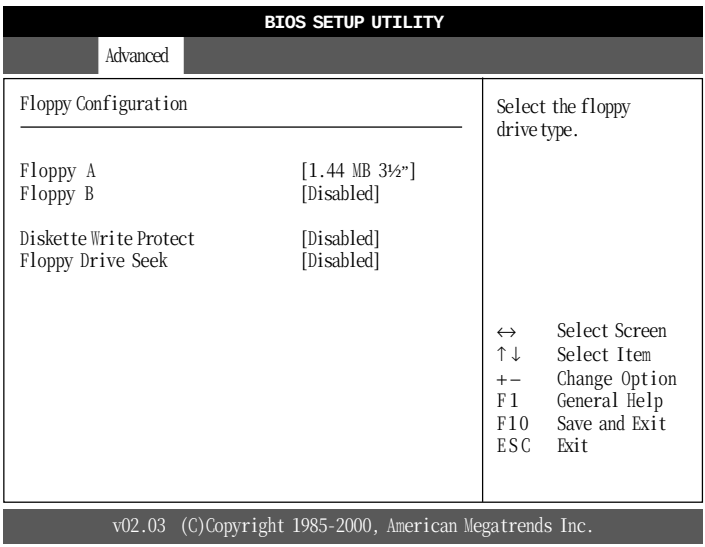
and so on. Settings are *Auto*, *Floppy*, and *Hard Disk.*

Hard Disk Write Protect
The item enables or disables the write protection function for IDE hard disk drive(s). Setting options are *Disabled* and *Enabled*.

ATA(PI) Detect Time Out (Sec)
The item specifies the period of time in seconds allowing BIOS to detect the ATA(PI) device before it continues to the next stage of bootup. Settings are *2.0x*, *2.5x*, *3.0x*, *3.5x*, *0*, *5*, *10* and *15.*

Floppy Configuration

The sub-menu is used to configure the installed floppy disk drive.



Floppy A/B

The items allow you to set the type of floppy drives installed. Available options are *Disabled*, *360 KB 5¼"*, *1.2 MB 5¼"*, *720 KB 3½"*, *1.44 MB 3½"*, or *2.88 MB 3½"*.

Diskette Write Protect

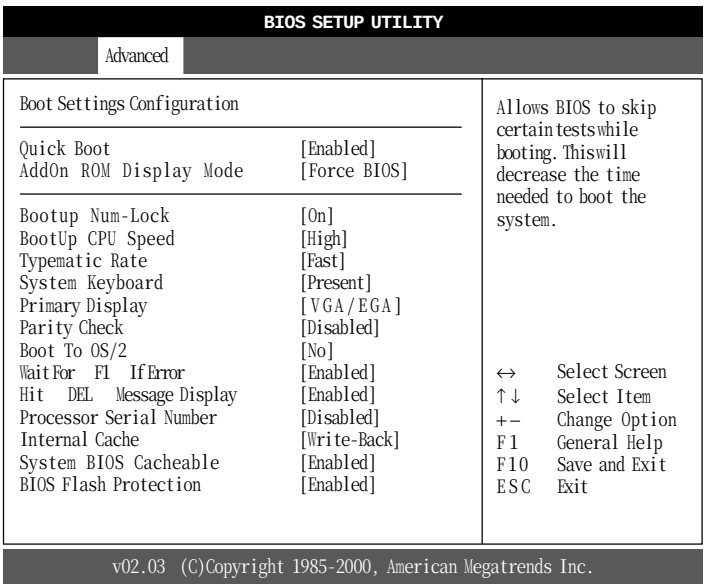
This enables or disables the write protection for floppy drive.

Floppy Drive Seek

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

Boot Settings Configuration

The sub-menu is used to configure the power-on state when the system boots up.



Quick Boot

The item 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 are *Enabled* and *Disabled.*

AddOn ROM Display Mode

This item is used to determine the display mode when an optional ROM is initialized during POST. When set to *Force BIOS*, the display mode used by AMI BIOS is used. Select *Keep Current* if you want to use the display mode of optional ROM.

Bootup Num-Lock

This item is to set the Num Lock status when the system is powered on.

Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow end users to use the arrow keys on the numeric keypad. Setting options are *On* and *Off*.

BootUp CPU Speed
This item specifies the CPU speed during bootup. Selecting *High* will have the CPU run at the default speed; selecing *Low* will reduce the CPU speed. Some peripherals or old software may require a slow CPU speed.

Typematic Rate
This item allows you to set the rate at which the keys are accelerated. Settings are *Fast* and *Slow*.

System Keyboard
This determines whether the system will check the presence of the keyboard at boot. Select *Absent* when the system is not attached with a keyboard and you don't want the system to show the keyboard error message. Settings are *Present* and *Absent*.

Primary Display
The item sets the type of video adapter used for the primary monitor of the system . Available settings are *VGA/EGA*, *Color 40x25*, *Color 80x25* and *Monochrome*.

Parity Check
Parity checking is an error detection technique. You can enable the PC to perform a parity check to test the memory each time when the system is powered on. Settings are *Enabled* and *Disabled*.

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

Wait For 'F1' If Error
When the boot sequence encounters an error it asks you to press F1. Only at 'non-fatal' errors. If disabled, the system prints a warning and continues

to boot without waiting for you to press any keys. *Disabled* if you want the system to operate as a server without a keyboard. Settings are *Enabled* and *Disabled*.

Hit 'DEL' Message Display
This item enables the system to display the **DEL** message ("Press DEL to run Setup") during the POST (Power On Self Test). Settings are *Enabled* and *Disabled*.

Processor Serial Number
This feature is for Pentium® !!! only. When set to *Enabled*, the system will check CPU Serial Number. Set to *Disabled* if you don't want the system to know the CPU Serial Number.

Internal Cache
The item sets the type of caching algorithm used by BIOS and CPU on the L1 (internal) cache memory. The L1 cache is used to speed up the system performance. Settings are:

Write-Back	A write-back algothrithm is used.
Write-Thru	A write-through algothrithm is used.
Disabled	Internal cache is disabled.

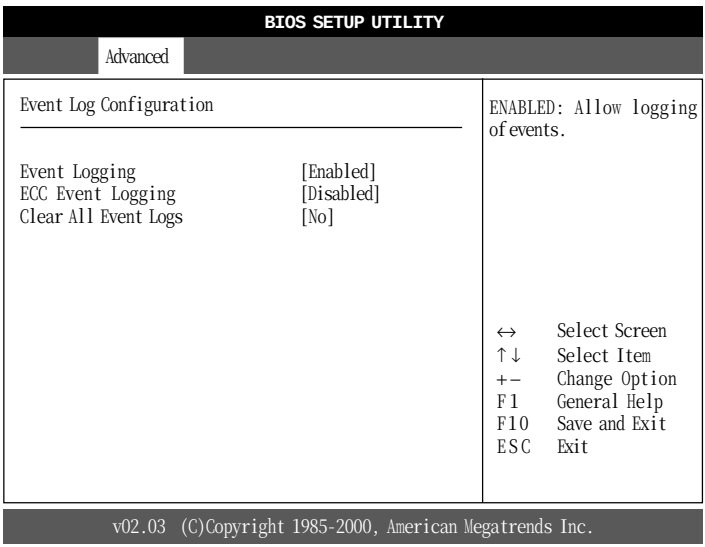
Note: *The L1 cache is built inside the processor.*

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. The settings are *Enabled* and *Disabled*.

BIOS Flash Protection
The item is used to enable or disable the BIOS Flash Protection. Select *Disabled* when performing BIOS update with the flash utility.

Event Log Configuration

The sub-menu is used to configure the event logging function. The log is created when bootup errors occur and help you troubleshoot the configuration problems.



Event Logging

Select *Enabled* to record bootup error events. Settings are *Enabled* and *Disabled*.

ECC Event Logging

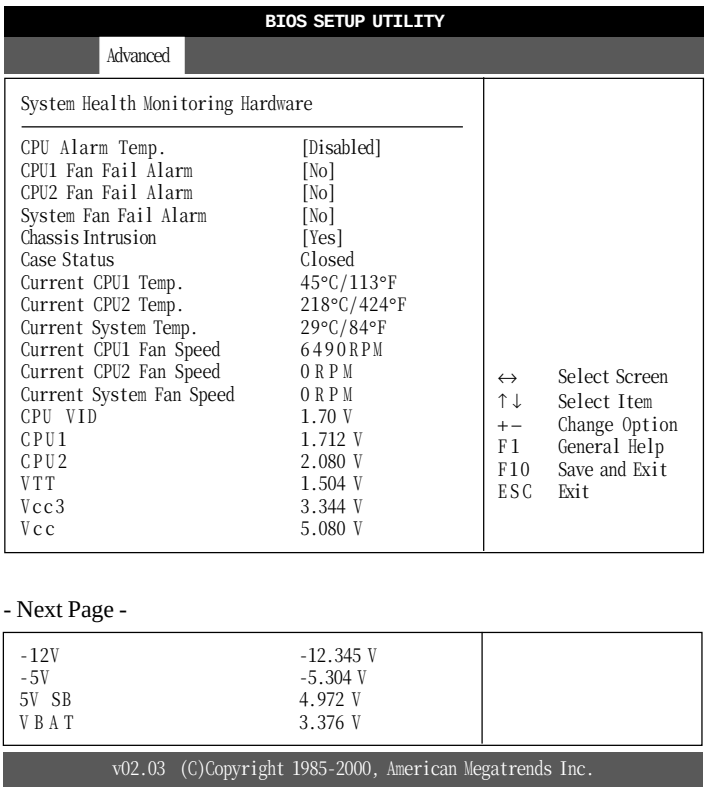
The item is used to record the ECC (Error Correcting Code) events for data communications on the fly. Settings are *Enabled* and *Disabled*.

Clear All Event Logs

Selecting *Yes* will enable the BIOS to clear event log area on next boot. Settings are *Yes* and *No*.

System Health Monitoring Hardware

The sub-menu is used to configure system hardware monitoring features and display the current status of the system, such as system temperature and all fans' speeds, etc..



CPU Alarm Temp.

If the CPU temperature reaches the upper limit preset in the item, the warning mechanism will be activated. This help you to prevent the CPU overheat problem. You can also disable the feature. Available settings are *Disabled, 60°C/140°F, 70°C/158°F, 80°C/176°F* and *90°/194°F*.

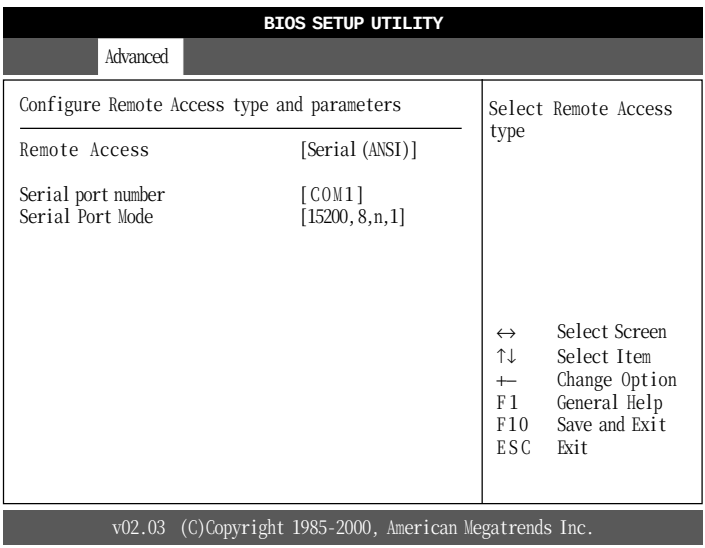
System/CPU1/CPU2 Fan Fail Alarm
The items are used to indicate whether the system and CPU fans work when the system is turned on. If any of them fail to work properly, the alarm sound will be activated. You can disable each fan's fail alarm function separately. Settings are *Yes* and *No*.

Chassis Intrusion
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is opened. To clear the warning message, set the field to *Reset*. The setting of the field will automatically return to *Yes* later on. Settings are *Yes*, *Reset* and *No*.

Case Status, Current CPU1/CPU2/System Temp., Current CPU1/CPU2/System Fan Speed, CPU VID, CPU1, CPU2, VTT, Vcc3, Vcc, -12V, -5V, 5V SB, VBAT
These items display the current status of the system, including system & CPU temperatures, fans speeds, and CPU voltages etc.

Remote Access Configuration

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



Remote Access

The item enables or disables the operation of console redirection. With console redirection is enabled, BIOS redirects and sends all contents that should be displayed on the screen to the serial port for display on the terminal screen. Besides, all data received from the serial port is interpreted as keystrokes from a local keyboard. Settings are *Disabled* and *Serial (ANSI)*.

Serial port number

The field is used to select the serial port where the null modem cable is connected. Settings are *COM1* and *COM2*.

Serial Port Mode

The field configures the following options for Console Redirection:

- Transfer rate (bps): 115200, 57600, 19200 or 9600
- Data bits: 8
- Parity: n (n stands for “None”)
- Stop bits: 1

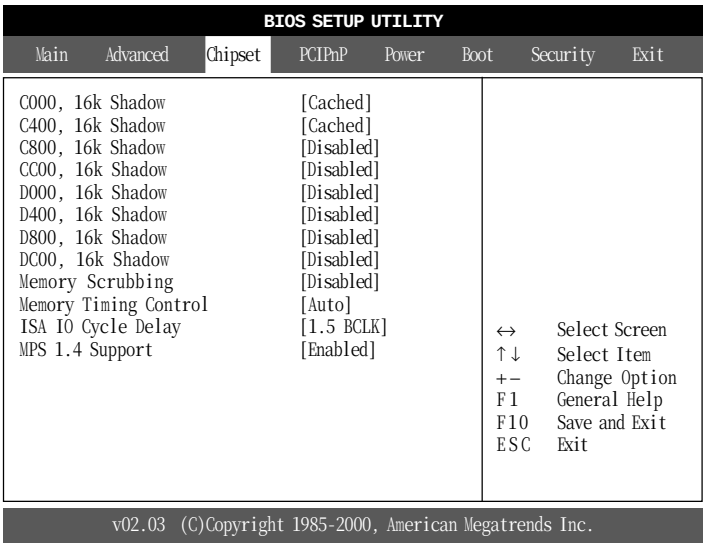
To enter the AMIBIOS setup utility from the terminal:

To enter the AMIBIOS setup utility from the terminal, you should use the <F4> key instead of the regular <DEL> key.

The Chipset Menu

Items in the menu manage the chipset registers and can optimize the system performance.

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



C000/C400/C800/CC00/D000/D400/D800/DC00, 16k Shadow
The items specify how the contents of the adapter ROMs named in the items are handled. Settings are described below:

Option	Description
Disabled	The specified ROM is not copied to RAM.
Enabled	The contents of specified ROM are copied to RAM for faster system performance.
Cached	The contents of specified ROM are not only copied to RAM, the contents of the ROM area can be written to and read from cache memory.

Memory Scrubbing
You can use this item to let the chipset scrub the error bit(s) on the memory modules if any error is found during data transfer. Settings are *Disabled* and *Enabled*.

Memory Timing Control
Sets whether DRAM timing is controlled by the SPD (Serial Presence Detect) EPROM on the DRAM module. Selecting *Auto* enables memory timings such as RAS Precharge Time, RAS Cycle Time and SDRAM CAS Latency to be automatically determined by BIOS based on the configurations on the SPD. Selecting *Manual* allows users to configure these memory timings manually.

ISA IO Cycle Delay
The CPU and local bus are much faster than industry standard architecture (ISA) input/output (I/O) bus. Add bus clock (BCLK) delays to ISA I/O cycles to allow additional time for I/O devices to respond to the system. Otherwise, data could be lost. Settings include *Full Delay*, *1.5 BCLK*, *2.5 BCLK*, *3.5 BCLK*.

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

The PCIPnP Menu

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

BIOS SETUP UTILITY

Main | Advanced | Chipset | PCIPnP | Power | Boot | Security | Exit

Plug & Play O/S	[No]	NO: lets the BIOS configure all the devices in the system. YES: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
Reset Config Data	[No]	
PCI Latency Timer	[64]	
Allocate IRQ to PCI VGA	[Yes]	
Palette Snooping	[Disabled]	
PCI IDE BusMaster	[Disabled]	
USB Function	[Enabled]	↔ Select Screen
Legacy USB Support	[Auto]	↑↓ Select Item
ARMD Emulation Type	[Hard Disk]	+− Change Option
IRQ3	[Available]	F1 General Help
IRQ4	[Available]	F10 Save and Exit
IRQ5	[Available]	ESC Exit
IRQ7	[Available]	
IRQ9	[Available]	
IRQ10	[Available]	
IRQ11	[Available]	
IRQ14	[Available]	

- Next Page -

IRQ15	[Available]	
DMA Channel 0	[Available]	
DMA Channel 1	[Available]	
DMA Channel 3	[Available]	
DMA Channel 5	[Available]	
DMA Channel 6	[Available]	
DMA Channel 7	[Available]	

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

Reset Config Data
The ESCD (Extended System Configuration Data) NVRAM (Non-volatile Random Access Memory) is where the BIOS stores resource information for both PNP and non-PNP devices in a bit string format. When the item is set to *Yes*, the system will reset ESCD NVRAM right after the system is booted up and then change the setting of the item back to *No* automatically.

PCI Latency Timer
This specifies latency timings for PCI devices. Settings are *32*, *64*, *96*, *128*, *160*, *192*, *224* and *248*.

Allocate IRQ to PCI VGA
The item is used to determine whether BIOS will assign an IRQ to the installed PCI VGA device. Settings are *Yes* and *No*. Select *No* to release the IRQ.

Palette Snooping
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.

PCI IDE BusMaster
This item is used to enable the bus mastering capability for the IDE controller on the PCI bus. Settings are *Enabled* and *Disabled*.

USB Function
The item is used to enable or disable the USB ports. Settings are *Enabled* and *Disabled*.

Legacy USB Support
Set to *Enabled* if your need to use an USB device in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix. Selecting *Auto* allows BIOS to automatically detect the presence of USB device and enable it.

ARMD Emulation Type
The item tells BIOS which type of emulation is used for the ARMD device connected to the USB connectors. ARMD device includes ZIP drive and LS-120 and so on. Settings are *Auto*, *Floppy*, and *Hard Disk.*

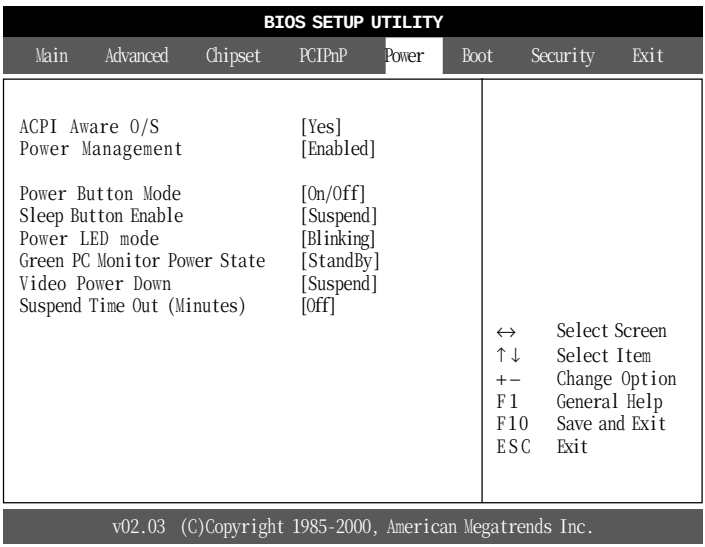
IRQ3/4/5/7/9/10/11/14/15, DMA Channel 0/1/3/5/6/7
These IRQ & DMA resources allow users to set each IRQ/DMA depending on the type of device using the IRQ/DMA. The settings determine if BIOS should remove a DMA or IRQ from the available DMAs/IRQs passed to devices that are configurable by the system BIOS. The available DMA/IRQ pool is determined by reading the ESCD NVRAM. End users can reserve the DMA or IRQ by assigning an *Reserved* setting to it. Settings are as below:

Available	Resources will be allocated to Plug & Play compatible devices by BIOS.
Reserved	Resources will be reserved for devices compliant with the PC AT bus specification, requiring a specific interrupt.

Reserved Memory Size
The item determines how much memory will be reserved for legacy ISA adapter. Settings are *Disabled, 16k, 32k* and *64k*.

The Power Menu

The Power menu is used to set the power management options for saving more system power.



ACPI Aware O/S
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 *Yes*. Settings are *Yes* and *No*.

Power Management
Setting to *Enabled* will activate the Power Management features and the following power management options will appear on the screen. Settings are *Enabled* and *Disabled*.

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

On/Off The power button functions as normal on/off button.

After perssing the button, the **non-ACPI** system will require four seconds before it shuts down.

Suspend 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.

Sleep Button Enable

This feature sets the function of the sleep button (power saving switch). Settings are:

Disabled The sleep button does not function.

Suspend When you press the sleep button, the computer enters the suspend/sleep mode. To wake up the system, hit any key on the keyboard.

Power LED mode

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

Blinking The Power LED blinks to indicate the suspend/sleep state.

Single The Power LED remains the same color.

Dual The Power LED changes its color to indicate the suspend/sleep state.

The power LED will function differently in various operating systems as described below:

-- *In Windows 98, Windows ME & Windows 2000*

	Single		Blinking		Dual	
	S0	S1	S0	S1	S0	S1
Power LED	ON	ON	ON	Blinking	Color1	Color2
Green LED	OFF	ON	OFF	ON		

Therefore, when you use the SINGLE color LED, you can select *Single* or *Blinking* for the Power LED mode. When you use the DUAL color LED, you can only select *Dual*.

-- In Windows XP

	S0	S1
Power LED	ON	Blinking
Green LED	OFF	OFF

In Windows XP, the Power LED always blinks to indicate the suspend/sleep mode.

Green PC Monitor Power State
Use the item to determine the manner in which the Green PC compatible monitor conserves power. The Green PC monitor is compliant to DPMS (Display Power Management Signaling) specification and uses the Horizontal and Vertical sync signals to control the power state of the monitor. Settings are:

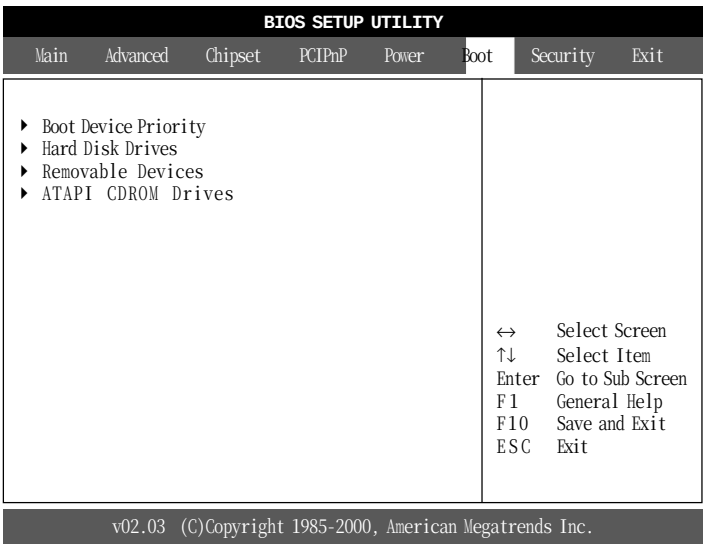
Horiz	Vert	Mode
OFF	ON	*StandBy* --- RGB guns off, power supply on, tube filaments energized.
ON	OFF	*Suspend* --- RGB guns off, power supply off, tube filaments energized.
OFF	OFF	*Off* ---- Power off. Only small auxiliary circuit stays on to monitor the Horizontal/Vertical Sync signals to enable power on when data needs to be displayed on the screen.

Video Power Down
This option is to set when the monitor will enter low-power state to save energy. Settings are *StandBy*, *Suspend*, *Sleep* and *Disabled*.

Suspend Time Out (Minutes)
The item specifies the length of the period of system inactivity before the system enters the suspend mode. Nearly all power use is reduced in the suspend mode. Settings range from *1Minute* to *10 Minutes*, and *Off*.

The Boot Menu

The Boot menu is used to set the boot sequence of boot devices. To go to each item's sub-menu screen, highlight the item and press <Enter>.



Boot Device Priority
The sub-menu assigns the boot priority of boot devices by TYPE. There are three settings available for each item on the screen: *Removable Device*, *Hard Drive* and *ATAPI CDROM*. *Removable Device* refers to REMOVABLE tape devices such as floppy drives and ZIP drives etc. *Hard Dirve* refers to any hard disk drive. *ATAPI CDROM* represents ATAPI CD-ROM drives.

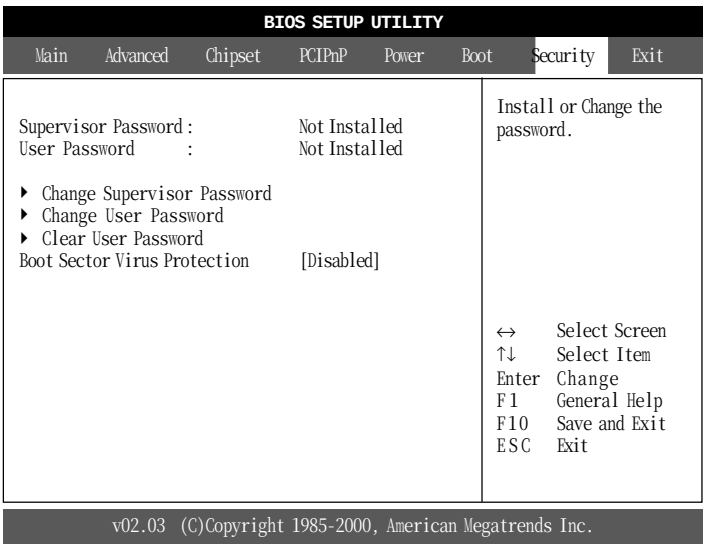
Hard Disk Drive
The sub-menu assigns the boot priority of all hard disk drives installed in the system. If more than one hard disk drive are installed in the system, you will see more than one item appear on the screen, such as **2nd Hard Drive**, **3rd Hard Drive** etc. Then you can arrange the boot sequence of these hard disk drives.

Removable Devices
The sub-menu assigns the boot priority of all removable devices installed in the system. If more than one removable devices are installed in the system, you will see more than one item appear on the screen, such as **2nd Removable Dev**, **3rd Removable Dev** etc. Then you can arrange the boot sequence of these removable devices.

ATAPI CDROM Drives
The sub-menu assigns the boot priority of all ATAPI CD-ROM drives installed in the system. If more than one ATAPI CD-ROM drives are installed in the system, you will see more than one item appear on the screen, such as **2nd ATAPI CDROM**, **3rd ATAPI CDROM** etc. Then you can arrange the boot order of these ATAPI CD-ROM drives.

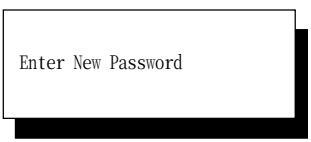
The Security Menu

The menu handles the supervisor and user password. To trigger each item's prompt message, highlight the item and press <Enter>.



Change Supervisor/User Password

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



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

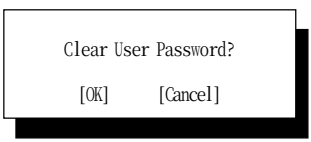
To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

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

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.*

Clear User Password
Select the function and a message as below will appear on the screen:



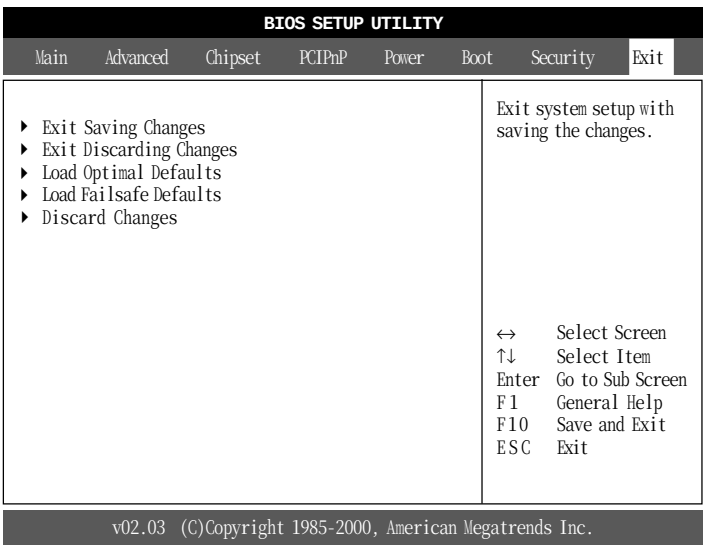
Select OK to clear the user password or select Cancel to keep the user password.

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

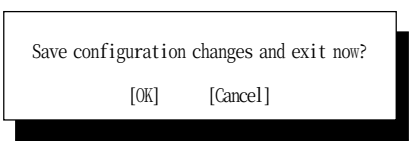
Note: *This feature only protects the boot sector, not the whole hard disk.*

The Exit Menu

The items in the menu are divided into two categories. One is used to load default or previous values into the BIOS setup utility, and the other is used to quit the BIOS setup utility. To trigger each item's prompt message, highlight the item and press <Enter>.

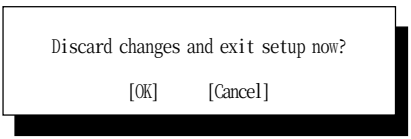


Exit Saving Changes
When you want to quit the Setup menu, you can select this option to save the changes and quit. A message as below will appear on the screen.



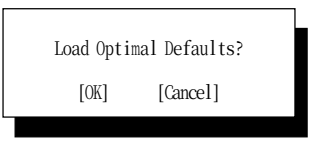
Selecting *OK* will allow you to quit the Setup Utility and save the user setup changes to RTC CMOS. Selecting *Cancel* will return to the Setup Utility.

Exit Discarding Changes
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:



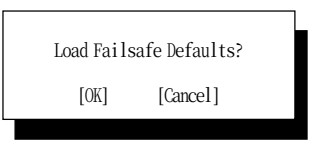
Selecting *OK* will allow you to quit the Setup Utility without saving any changes to RTC CMOS. Selecting *Cancel* will return to the Setup Utility.

Load Optimal Defaults
The option allows users to restore all of the BIOS settings to the Optimal Defaults. The Optimal Defaults are the default values set by the mainboard manufacturer specifically for the optimized performance of the mainboard. When you select the function, a message as below will appear on the screen:



Selecting *OK* loads the default factory settings for optimal system performance.

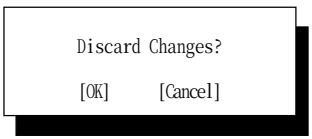
Load Failsafe Defaults
The option allows users to restore all of the BIOS settings to the Failsafe Defaults. The Failsafe Defaults are the default values set by the BIOS vendor for the most stable system performance. When you select the function, a message as below will appear on the screen:



Selecting *OK* loads the BIOS default values for the most stable, minimal system performance.

Discard Changes

The option allows users to restore all of the BIOS settings to previous values. When you select the function, a message as below will appear on the screen:



Selecting *OK* loads the previous BIOS values into the Setup utility.