MSI

MICRO-STAR INTERNATIONAL

K7T Turbo2

MS-6330 ATX Mainboard

Version 5.0

G52-MA00433

Manual Rev: 5.0
Release Date: September 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-6330

FC **Tested to comply with FCC Standard**

For Home or Office Use

Edition

September 2001

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Revision History

Revision	Revision History	Date
5.0	First release for PCB 5.X	September 2001

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - The power cord or plug is damaged
    - Liquid has penetrated into the equipment
    - The equipment has been exposed to moisture
    - The equipment has not work well or you can not get it work according to User's Manual.
    - The equipment has dropped and damaged
    - If the equipment has obvious sign of breakage
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60^0C (140^0F), IT MAY DAMAGE THE EQUIPMENT.

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

Contents

Introduction 1

Thank you for purchasing the K7T Turbo2 (MS-6330 v5.X) ATX motherboard. The mainboard, based on **VIA® KT133A (VT8363A & VT82C686B)** chipset, is a high-performance computer mainboard designed for AMD® Athlon™/Athlon XP/Duron™ processor in the 462 pin package that provides a cost-effective and professional desktop platform solution.

This chapter includes the following topics:

Mainboard Specification

CPU

- Socket A for AMD® Athlon™/Athlon XP/Duron™ processor
- Supports 600MHz, 650MHz, 700MHz up to 1800+ MHz processor

Chipset

- VIA® KT133A chipset (552 BGA)
  - FSB @266MHz
  - AGP 4x and PCI Advanced high performance memory controller
  - Supports PC100/133 SDRAM
- VIA® VT686B chipsets (352 BGA)
  - Enhanced Power Management Features
  - Integrated Super I/O (FDC, LPT, COM 1/2, and IR)
  - Dual bus Master IDE Ultra DMA 33/66/100 (686B)
  - Integrated Hardware Soundblaster
  - Direct Sound AC97 Audio
  - ACPI

Clock Generator

- 133Mhz clocks are supported.

Main Memory

- Supports six memory banks using three 168-pin unbuffered DIMM
- Supports a maximum memory size of 1.5GB (32M x 8)
- Supports 3.3v SDRAM DIMM

Slots

- One AGP(Accelerated Graphics Port) slot
  - AGP specification compliant
  - Supports AGP 2.0 1x/2x/4x
- One CNR (Communication Network Riser) slot
- Five 32-bit Master PCI Bus slots
- One ISA Bus slot (optional)
- Supports 3.3v/5v PCI bus Interface

On-Board IDE

- An IDE controller on the VIA® VT686B chipset provides IDE HDD/CD-

ROM with PIO, Bus Master and Ultra DMA 33/66/100 operation modes.
- Can connect up to four IDE devices

Audio
- Chip Integrated
  - Direct Sound AC97 Audio

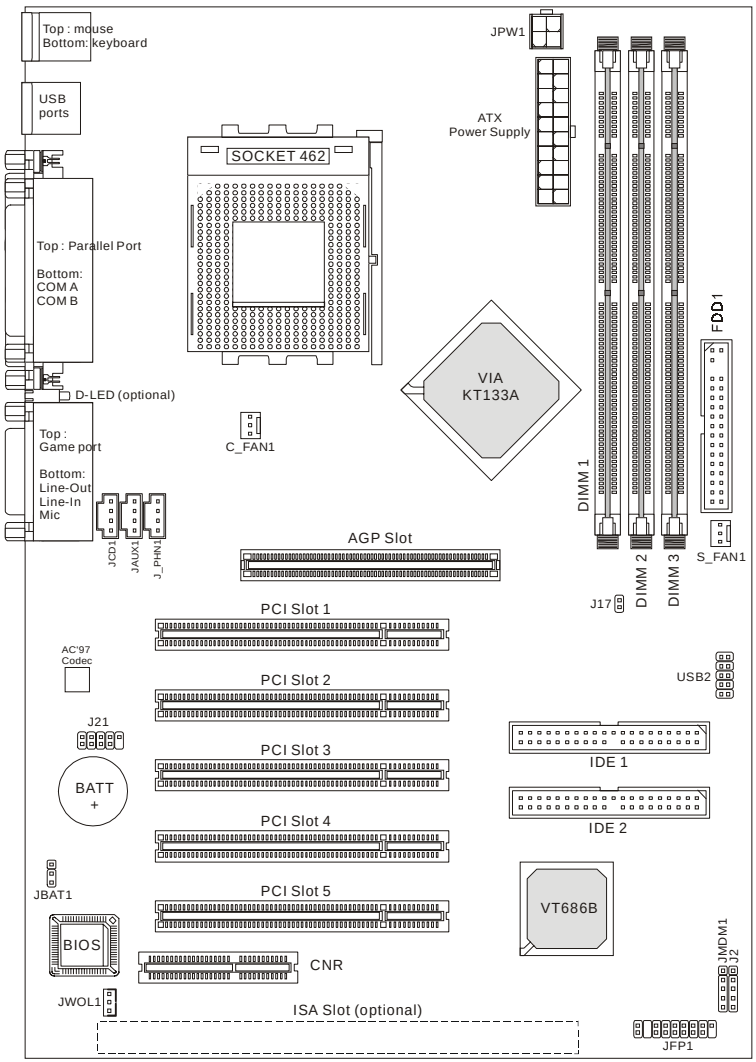
On-Board Peripherals
- On-Board Peripherals include:
  - 1 floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
  - 2 serial ports (COMA + COM B)
  - 1 parallel port supports SPP/EPP/ECP mode
  - 4 USB ports (2 Rear Connectors/USB Front Pin Header)
  - 1 IrDA connector for SIR/CIR/ASKIR/HPSIR
  - 1 Audio/Game port
  - D-Bracket™ pin header

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
- ATX Form Factor: 30.4cm x 21cm

Mounting
- 6 mounting holes

Mainboard Layout



K7T Turbo2 (MS-6330 v5.X) ATX Mainboard

Quick Components Guide

Component	Function	Reference
DIMM1~3	Installing DIMM modules	See p. 2-5~2-6
Socket 462	Installing CPU	See p. 2-2~2-4
C_FAN1	Connecting to CPU FAN	See p. 2-20
S_FAN1	Connecting to SYSTEM FAN	See p. 2-20
ATX Power Supply	Installing power supply	See p. 2-7
JPW1	Connecting to 12V ATX power supply	See p. 2-8
IDE1& IDE2	Connecting to IDE hard disk drives	See p. 2-14
FDD1	Connecting to floppy disk drive	See p. 2-13
USB2	Connecting to USB interfaces	See p. 2-18
PCI Slot 1~5	Installing PCI expansion cards	See p. 2-23
AGP Slot	Installing AGP cards	See p. 2-23
CNR Slot	Installing CNR cards	See p. 2-23
ISA Slot	Installing ISA cards	See p. 2-24
JMDM1	Connecting to modem module	See p. 2-17
JWOL1	Connecting to LAN module	See p. 2-17
JBAT1	Clearing CMOS data	See p. 2-22
JFP1	Connecting to case	See p. 2-15
J2	Connecting to IR modules	See p. 2-18
J21	Connecting to D-Bracket™	See p. 2-21
J17	Setting CPU FSB clock	See p. 2-4

Key Features

- ATX Form Factor
- CPU: Socket 462 for AMD® Duron™/Athlon™/Athlon XP Processors
- Memory: 3 SDRAM DIMMs
- Slot: 1 AGP slot, 1 CNR slot, 5 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
- Supports Duron processors at 200/266MHz system bus frequencies
- LAN Wake up Function
- Modem (External/Internal) Ring Wake up Function
- Supports PCI 2.2
- Fuzzy Logic™ III overclocking utility
- D-LED™ -- 4 LEDs embedded in the mainboard (Optional)
- PC Alert™ III system hardware monitor
- Live BIOS™ -- allows you to update BIOS online
- Supports D-Bracket™
- Audio: Chip integrated

MSI Special Features

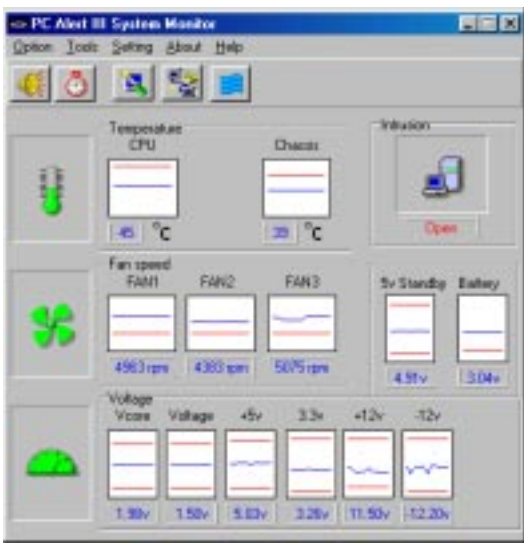
MSI special features are designed by MSI R&D and only available in MSI mainboards. The K7T Turbo2 mainboard is equipped with PC Alert™ III, Fuzzy Logic™ III, Live BIOS™ and optional D-LED™.

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 listed above is abnormal, the program main screen will be immediately shown on the screen, with the abnormal item highlighted in red. This screen 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

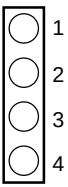
Fuzzy Logic™ III

The Fuzzy Logic™ III utility allows users to overclock the CPU FSB (Front Side Bus) frequency in the Windows environment. Select the CPU frequency you prefer and click Go to apply the frequency or click Save allowing the system to run at the specified frequency each time when the system is powered on.

Features:

- Displays Current System Status
  - CPU Fan
  - CPU Temp.
  - Vcore
  - Vio
  - Memory Clock
  - CPU Clock
  - AGP Clock
  - PCI Clock
- Adjusts CPU FSB Frequency

D-LED™ & D-Bracket™ (Optional)



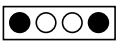
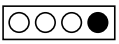
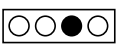
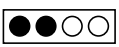
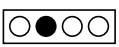
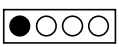
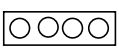
Diagnostic LED

The optional 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 D-Bracket™, which integrates four LEDs, is optional. The definitions of D-Bracket™ LED signals are the same as D-LED™.

● **Red** ○ **Green**

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

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

Live BIOS™

The Live BIOS™ is a tool used to detect and update your BIOS online so that you don't need to search for the correct BIOS version through the whole web site. To use the function, you need to install the "MSI Live Update Series" application. After installation, the "MSI Live Update Series" icon (as the right view) will appear on the screen.

Double click the "MSI Live Update Series" icon, and the following screen will appear.

Four buttons are placed on the left column of the screen. Click the desired button to start the update process.

- **Live BIOS** – Updates the BIOS online. If your motherboard does not support the function, the "sorry" message is displayed.
- **Live Driver** – Updates the drivers online. If your motherboard does not support the function, the "sorry" message is displayed.
- **Live VGA BIOS** – Updates the VGA BIOS online. If your VGA device does not support the function, the "sorry" message appears.
- **Live VGA Driver** – Updates the VGA driver online. If your VGA device does not support the function, the "sorry" message is displayed.

For more information on the update instructions, insert the companion CD and refer to the "Live Update Series Guide" under the "Manual" tab.

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.

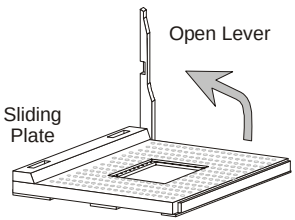
This chapter contains the following topics:

Central Processing Unit: CPU

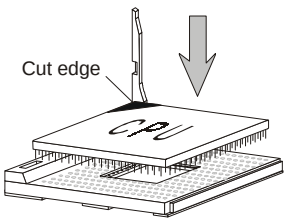
The mainboard supports AMD® Athlon™/Athlon XP/Duron™ processors. It uses a CPU socket called Socket A for easy CPU installation. **Make sure the CPU has a Heat Sink and a cooling fan attached on the top to prevent overheating.** If you do not find the Heat Sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Installation Procedures

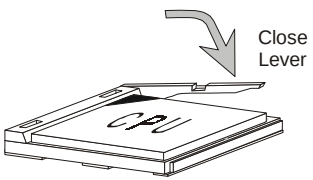
1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.



2. Look for the cut edge. The cut edge should point towards the lever pivot. 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! **Thermal Issue for CPU**

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly crucial when building computer systems. Maintaining the proper thermal environment is key to reliable operation. As such, the processor must be maintained in the specified thermal requirements. AMD recommends the use of high performance thermal interface material.

AMD Athlon™/Duron™ processor with a speed of **600MHz and above** requires LARGER heatsink and fan. You also need to add thermal grease between the CPU and heatsink to improve heat dissipation. Then, make sure that the CPU and heatsink are securely fastened and in good contact with each other. These are needed to prevent damaging the processor and ensuring reliable operation.

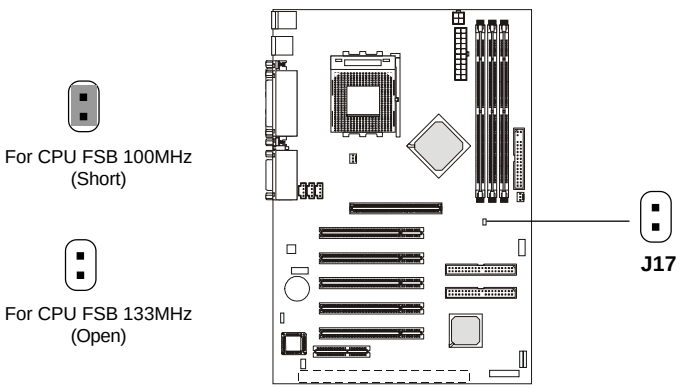
You can visit AMD's web site for more information on proper cooling: *http://www.amd.com/products/cpg/athlon/pdf/cooling_guide.pdf*

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

CPU Clock Frequency Selection Jumper: J17

The default hardware configuration for CPU Front Side Bus frequency is set at 100MHz. Therefore, to use a 133MHz CPU and have it run at 133MHz, you need to adjust the CPU clock up to 133MHz by changing the setting of J17.



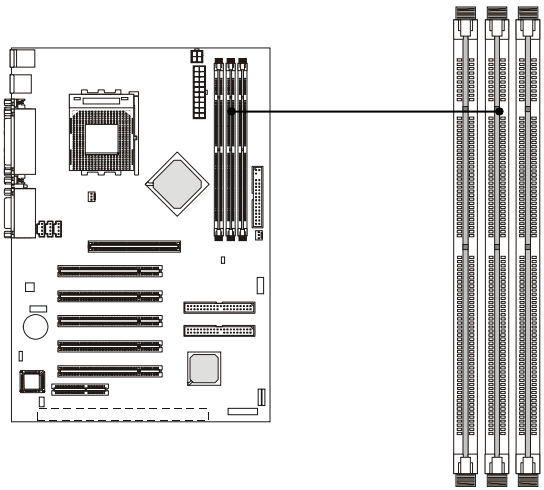
WARNING!

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 3 sockets for 168-pin **unbuffered** SDRAM DIMM (Double In-Line Memory Module) modules and supports a maximum memory size of 1.5GB.



DIMM Slots
(DIMM 1~3)

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 memory modules that each DIMM slot supports are listed as below:

S (Single Side): 32MB ~ 512MB
D (Double Side): 64MB ~ 512MB

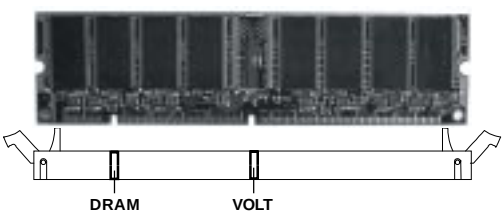
DIMM 1	DIMM 2	DIMM 3
S / D	S / D	S / D

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.



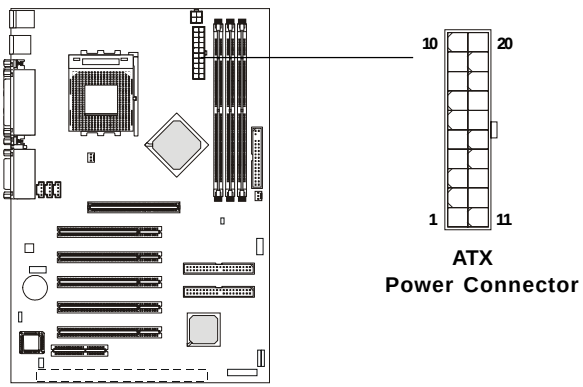
3. The plastic clip at each side of the DIMM slot will automatically close.

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.

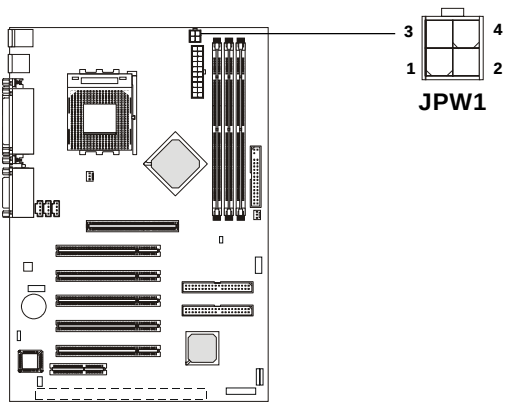


ATX
Power Connector

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

ATX 12V Power Connector: JPW1

Attach the ATX power supply to the connector and it will supply power to the installed CPU.

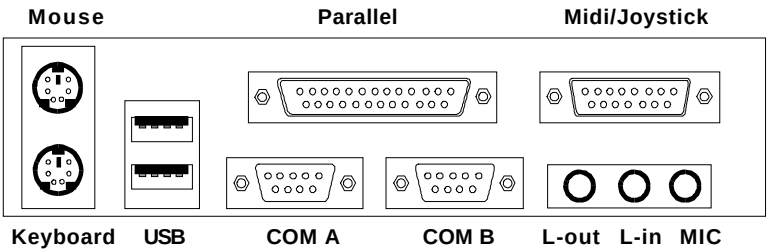


PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

Note: *Power current supplied via 12V power connector must* ***exceed 10A****.; otherwise, the system could have a stability issue.*

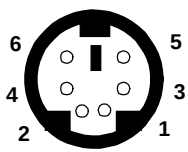
Back Panel

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.



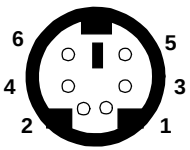
PS/2 Mouse (6-pin Female)

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.



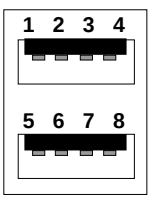
PS/2 Keyboard (6-pin Female)

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.



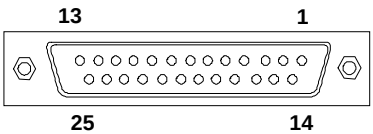
USB Ports

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.

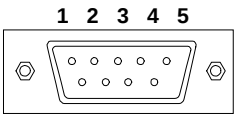


Pin Definition

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 male DIN connectors for serial port COM A and COM B. You can attach a serial mouse or other serial devices.



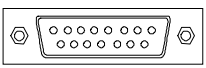
9-Pin Male DIN Connectors

Pin Definition

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

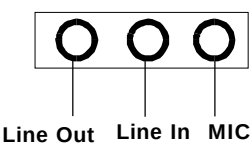
Joystick/Midi Connectors

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



Audio Port Connectors

Line Out is 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.

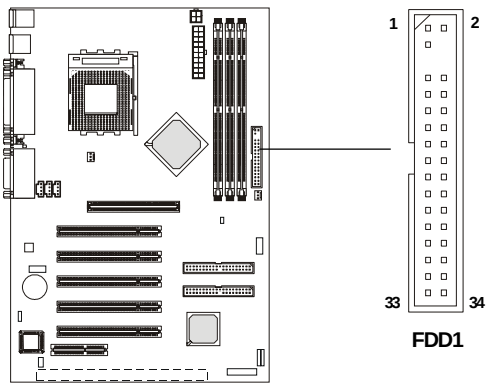


Connectors

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

Floppy Disk Drive Connector: 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

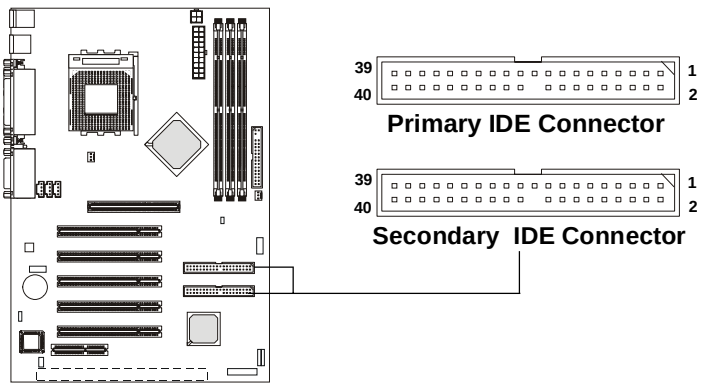
The mainboard uses an IDE controller on the VIA® VT82C686B chipset that provides PIO mode 0-4, Bus Master, and Ultra DMA 33/66/100 modes. It has two HDD connectors IDE1 (Primary) and IDE2 (Secondary). You can connect up to four hard disk drives, CD-ROM or 120MB Floppy to IDE1 and IDE2.

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.

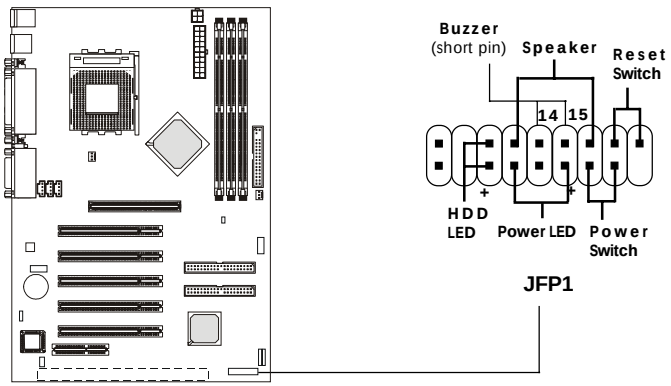


TIP

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 Connector: JFP1

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



Power Switch

Connect to a 2-pin push button switch.

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. Connect the Power LED from the system case to this pin.

Speaker

Speaker from the system case is connected to this pin.
If on-board Buzzer is available, then:
Short pin 14-15: On-board Buzzer Enabled.

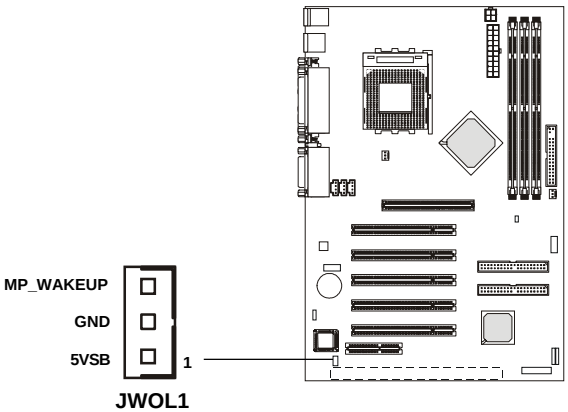
Open pin 14-15: On-board Buzzer Disabled

HDD LED

HDD LED shows the activity of a hard disk drive 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.

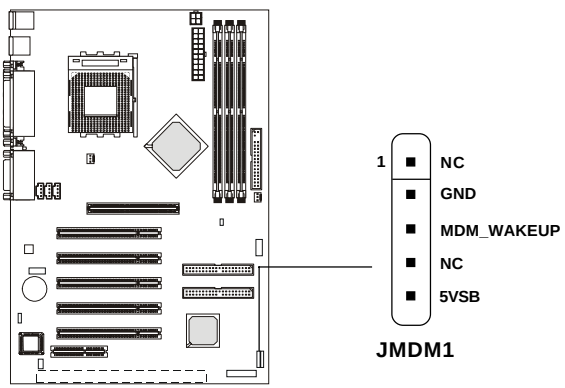
Wake On LAN Connector: JWOL1

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

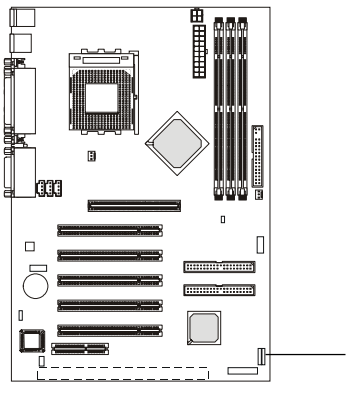
This connector allows you to connect to a modem card with Wake On Ring function. The connector will power up the system when a signal is received through the modem card.



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

IrDA Infrared Module Connector: J2

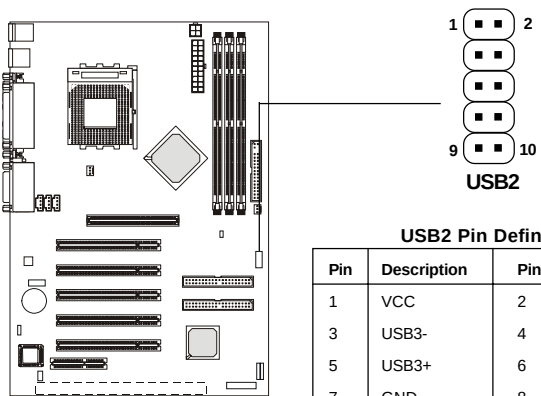
This connector allows you to connect to an IrDA Infrared module. You must configure the setting through the BIOS setup to use the IR function.



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

USB Front Panel Connector: USB2

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

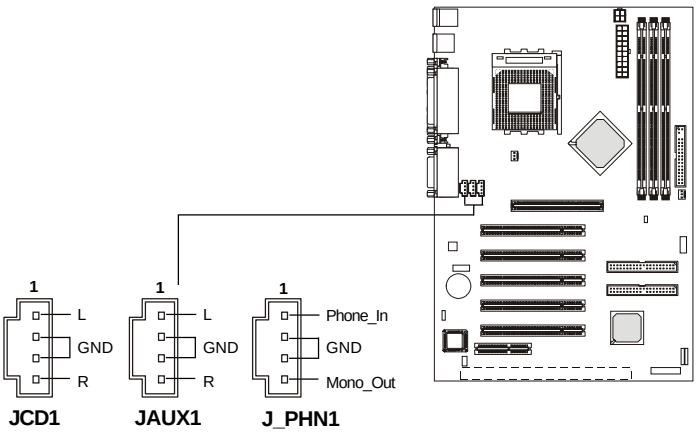


USB2 Pin Definition

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

CD-In/Aux Line-In/Modem-In Connector: JCD1/JAUX1/ J_PHN1

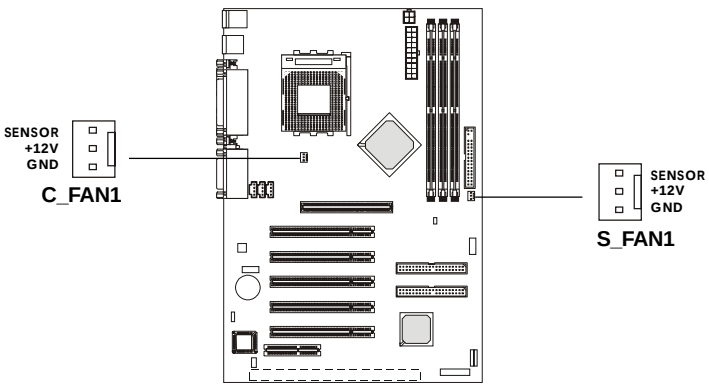
JCD1 connector is for CD-ROM audio connector.
JAUX1 connector is for DVD add-on card with Line-in connector.
J_PHN1 connector is for modem with internal audio connector.



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

Fan Power Connectors: C_FAN1/S_FAN1

The C_FAN1 (processor fan) and S_FAN1 (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.



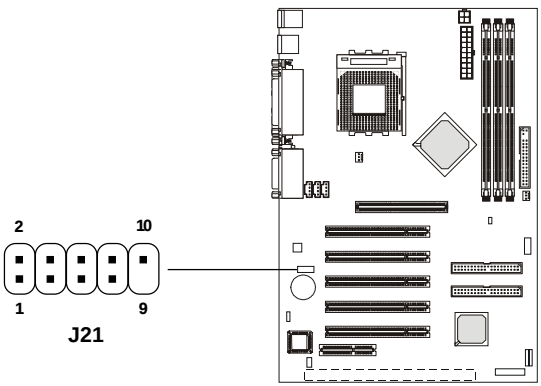
Note:

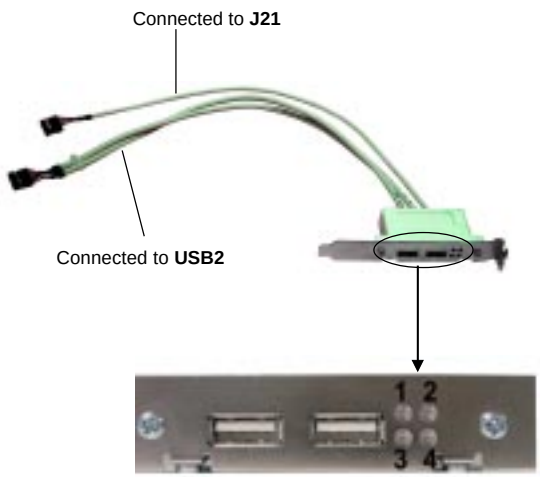
1. Always consult the vendor for proper CPU cooling fan.

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 temperature.

D-Bracket™ Connector: J21

The motherboard comes with J21 connector and you can connect a D-Bracket™ to J21. D-Bracket™ is a USB Bracket integrating four LEDs whose functions are similar to D-LED™ and allows users to identify system problems through 16 various combinations of LED signals. For definitions of 16 signal combinations, refer to page 1-10 *D-LED™ & D-Bracket™ (Optional)*.



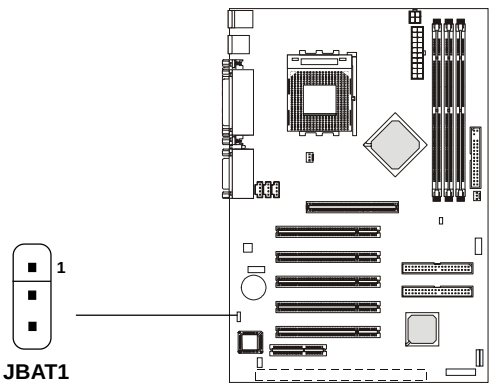


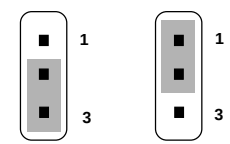
Jumpers

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:



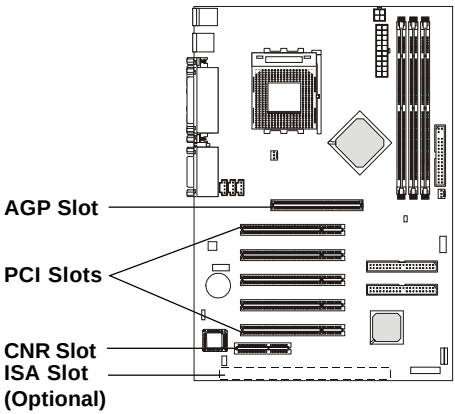


WARNING!

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.

Slots

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



AGP (Accelerated Graphics Port) Slot

The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory and provides three levels of throughputs: 1x (266Mbps), 2x (533Mbps) and 4x (1.07Gbps).

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.

CNR (Communication Network Riser) Slot

The CNR specification is an open industry-standard specification that defines a hardware scalable Original Equipment Manufacturer (OEM) mainboard riser board and interface, which **supports audio and modem only**.

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 "AGP/PCI/USB/AC97" IRQ pins are typically connected to the PCI bus INTA#-INTD# pins as follows:

	Order 1	Order 2	Order 3	Order 4
AGP	INT A#	INT B#	INT C#	INT D#
PCI Slot 1	INT B#	INT C#	INT D#	INT A#
PCI Slot 2	INT C#	INT D#	INT A#	INT B#
PCI Slot 3	INT D#	INT A#	INT B#	INT C#
PCI Slot 4	INT B#	INT C#	INT D#	INT A#
PCI Slot 5	INT C#	INT D#	INT A#	INT B#
USB-1	INT C#			
USB-2	INT C#			
AC97	INT B#			

PCI Slot 1 & PCI Slot 4 & AC97 shared.
PCI Slot 2 & PCI Slot 5 & USB-1 & USB-2 shared.

PCI Slot 1~5: 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

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

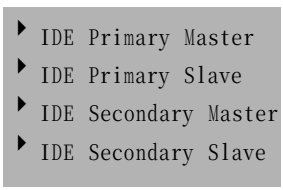
<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric 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.

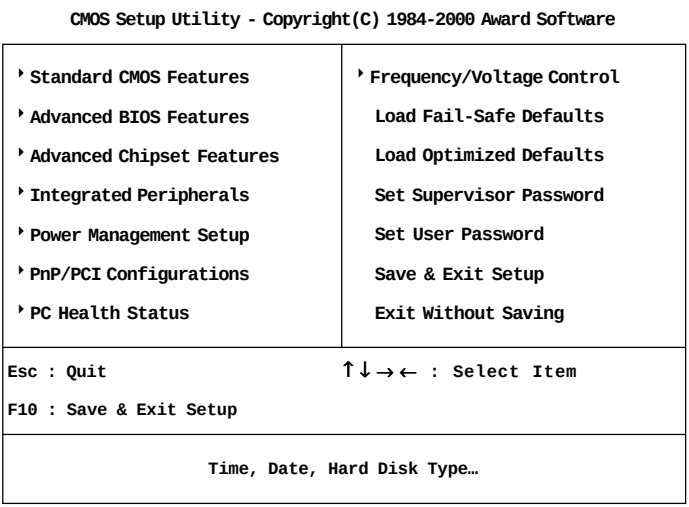
Sub-Menu
If you find a right pointer symbol appears to the left of certain fields (as shown in the right view), that means a sub-menu containing additional options for the field can be launched from this field. To enter the sub-menu, highlight the field and press <Enter>. Then you can use control keys 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.

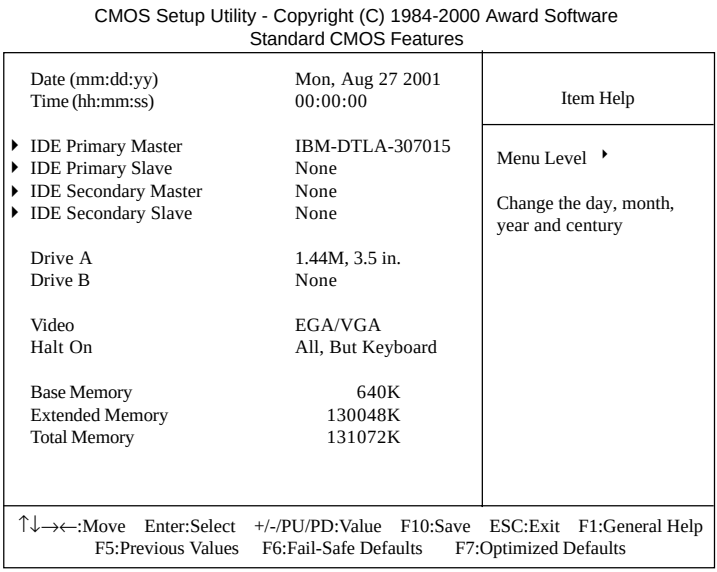
Set User Password
Use this menu to set User Password.

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 by 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.

IDE Primary Master

IDE HDD Auto-Detection	Press Enter	Item Help
IDE Primary Master	Auto	
Access Mode	Auto	Menu Level ▸▸
Capacity	15362MB	To auto-detect the HDD's size, head...on this channel
Cylinder	29765	
Head	16	
Precomp	0	
Landing Zone	29764	
Sector	63	

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 are *None*, *360K, 5.25 in.*, *1.2M, 5.25 in.*, *720K*, 3.5 in., *1.44M, 3.5 in.*, *2.88M, 3.5 in.*.

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

Halt On

The 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

CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
Advanced BIOS Features

Anti-Virus Protection	Disabled	Item Help
CPU Internal Cache	Enabled	
External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	Menu Level ‣
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Second Boot Device	HDD-0	
Third Boot Device	LS120	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Enabled	
Boot Up NumLock Status	On	
Gate A20 Option	Normal	
Typematic Rate Setting	Disabled	
x Typematic Rate (Chars/Sec)	6	
x Typematic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Enabled	
MPS Version Control For OS	1.4	

- Next Page -

OS Select For DRAM > 64MB	Non-OS2	Item Help
Video BIOS Shadow	Enabled	
C8000-CBFFF Shadow	Disabled	
CC000-CFFFF Shadow	Disabled	Menu Level ‣
D0000-C3FFF Shadow	Disabled	
D4000-C7FFF Shadow	Disabled	
D8000-DBFFF Shadow	Disabled	
DC000-DFFFF Shadow	Disabled	
Full Screen LOGO Show	Enabled	

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

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 to check the data when it passes through L2 cache memory. Settings: *Enabled* and *Disabled.*

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*.

Video BIOS Shadow
This items sets if the Video BIOS will be copied to RAM and increase video speed accordingly. Settings: *Enabled* and *Disabled*.

C8000-CBFFF/CC000-CFFFF/D0000-D3FFF/D4000-C7FFF/D8000-DBFFF/DC000-DFFFF Shadow
These items specify whether the contents of the adapter ROM named in the items will be copied into RAM to improve the performance of ROM firmware for adapters. You need to know the address of each adapter ROM occupies

to shadow (copy) it into the correct area of RAM. Settings: *Enabled* and *Disabled*.

Full Screen LOGO Show

This item enables you to show the company logo on the bootup screen. Settings are:

Disabled	Shows the POST messages at boot.
Enabled	Shows a still image (logo) on the full screen at boot.

Advanced Chipset Features

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Advanced Chipset Features

Bank Interleave	Enabled	Item Help
DRAM Timing by SPD	Yes	
x SDRAM CAS Latency	Auto	
Memory Hole	Disabled	Menu Level ▸
P2C/C2P Concurrency	Enabled	
Fast R-W Turn Around	Disabled	
System BIOS Cacheable	Disabled	
Video RAM Cacheable	Disabled	
AGP Aperture Size	64M	
AGP-4X Mode	Enabled	
AGP Driving Control	Auto	
x AGP Driving Value	DA	
OnChip USB	Enabled	
USB Keyboard Support	Disabled	
USB Mouse Support	Disabled	
OnChip Sound	Auto	
OnChip Modem	Auto	
CPU to PCI Write Buffer	Enabled	
PCI Dynamic Bursting	Enabled	

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

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PCI Master 0 WS Write	Enabled	Item Help
PCI Delay Transaction	Enabled	
PCI#2 Access #1 Retry	Disabled	
AGP Master 1 WS Write	Enabled	Menu Level ▸
AGP Master 1 WS Read	Enabled	
Memory Parity/ECC Check	Disabled	

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

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

Bank Interleave
The field is used to enable or disable memory bank interleave feature. Settings: *Enabled* and *Disabled*.

DRAM Timing by SPD
Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to *Yes* enables SDRAM

CAS# Latency automatically to be determined by BIOS based on the configurations on the SPD. Selecting *No* allows users to configure the field manually.

SDRAM CAS Latency
This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it. Settings: *Auto*, *3* and *2* (clocks). *2* (clocks) increases the system performance the most while *3* (clocks) provides the most stable performance.

Memory Hole
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: *15M-16M* and *Disabled*.

P2C/C2P Concurrency
This field enables or disables the PCI to CPU and CPU to PCI concurrency feature, which allows synchronous data transmission from PCI to CPU and vice versa. Selecting *Enabled* will increase system performance.

Fast R-W Turn Around
This is used to control the fast read/write turn around feature for DRAM timing. Settings: *Enabled* and *Disabled*. *Enabled* improves system performance while *Disabled* provides stability.

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: *Enabled* and *Disabled*.

Video RAM Cacheable
Selecting *Enabled* allows caching of the video memory (RAM) at A0000h to AFFFFh, resulting in better video performance. However, if any program writes to this memory area, a memory access error may result. Settings:

Enabled and *Disabled*.

AGP Aperture Size
The item is used to select the size of Accelerated Graphics Port (AGP) aperture. Aperture is a portion of PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to AGP without any translation. Settings: *4M*, *8M*, *16M*, *32M*, *64M*, *128M* and *256M*.

AGP-4X Mode
The item enables or disables 4X mode for the installed AGP card. Settngs: *Enabled* and *Disabled*. Enable 4X mode only if your AGP card supports it.

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

AGP Driving Value
This item specifies an AGP driving force.

OnChip USB
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 mouse/keyboard in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix.

OnChip Sound
Auto allows the mainboard to detect whether an audio device is used. If the device is detected, the onboard audio controller will be enabled; if not, the controller is disabled. Disable the controller if you want to use other controller cards to connect an audio device. Settings: *Auto* and *Disable*.

OnChipModem
Auto allows the mainboard to detect whether a modem is used. If a modem is detected, the onboard modem controller will be enabled; if not, the controller is disabled. Disable the controller if you want to use other controller cards to connect modems. Settings: *Auto* and *Disable*.

CPU to PCI Write Buffer
When *Enabled*, CPU can write up to four words of data into the PCI write buffer before the CPU must wait for PCI bus cycles to finish. When *Disabled*, the CPU must wait after each write cycle until the PCI bus signals that it is ready to receive more data.

PCI Dynamic Bursting
When *Enabled*, every write transaction goes to the write buffer. Then burstable transactions burst on the PCI bus and nonburstable transactions do not.

PCI Master 0 WS Write
When *Enabled*, writes to the PCI bus are executed with zero wait state.

PCI Delay 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*.

PCI #2 Access #1 Retry
When *Disabled*, PCI#2 will not be disconnected until access finishes. When *Enabled*, PCI#2 will be disconnected if max retries are attempted without success.

AGP Master 1 WS Write
When *Enabled*, writes to the AGP bus are executed with one wait state inserted.

AGP Master 1 WS Read
When *Enabled*, one wait state is inserted in the AGP read cycle.

Memory Parity/ECC Check
Users can set the field to *Enabled* for memory checking if the type of DRAM installed in your system is Parity or ECC (Error-Correcting Code) DRAM.

Integrated Peripherals

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Integrated Peripherals

	OnChip IDE Channel0	Enabled	Item Help
	OnChip IDE Channel1	Enabled	
	IDE Prefetch Mode	Enabled	
	Primary Master PIO	Auto	Menu Level ▸
	Primary Slave PIO	Auto	
	Secondary Master PIO	Auto	
	Secondary Slave PIO	Auto	
	Primary Master UDMA	Auto	
	Primary Slave UDMA	Auto	
	Secondary Master UDMA	Auto	
	Secondary Slave UDMA	Auto	
	Init Display First	PCI Slot	
	IDE HDD Block Mode	Enabled	
	Onboard FDD Controller	Enabled	
	Onboard Serial Port 1	Auto	
	Onboard Serial Port 2	Auto	
	UART 2 Mode	Standard	
X	IR Function Duplex	Half	
X	TX, RX inverting enable	No, Yes	

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	Onboard Parallel Port	378/IRQ7	Item Help
	Onboard Parallel Mode	Normal	
X	ECP Mode Use DMA	3	
X	Parallel Port EPP Type	EPP1.9	Menu Level ▸
	Onboard Legacy Audio	Enabled	
	Sound Blaster	Disabled	
	SB I/O Base Address	220H	
	SB IRQ Select	IRQ 5	
	SB DMA Select	DMA 1	
	MPU-401	Disabled	
	MPU-401 I/O Address	330-333H	
	Game Port (200-207H)	Enabled	

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

OnChip IDE Channel0/1

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

IDE Prefetch Mode
The onboard IDE drive interfaces supports prefetching, for faster drive accesses. Set to *Disabled* if your primary and/or secondary add-in IDE interface does not support prefetching.

Primary/Secondary Master/Slave PIO
The four 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.

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.

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

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.

Onboard FDD 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*.

UART2Mode
The field allows you to specify the operation mode for serial port "COM B". Settings are:

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

IR Function Duplex
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*.

TX, RX inverting enable
This item allows you to enable the TX, RX inverting which depends on different H/W requirement. This field is not recommended to change its default setting for avoiding any error in your system. Settings: "*No, No*", "*No, Yes*", "*Yes, No*" and "*Yes, Yes*."

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*.

Onboard Parallel Mode
This item selects the operating mode for the parallel port: *Normal*, *EPP*, *ECP* or *ECP/EPP*.

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.

Parallel Port EPP Type
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*.

Onboard Legacy Audio
The item enables or disables the onboard audio features of the mainbaord and the following audio options in the BIOS.

Sound Blaster
The item turns on/off the Sound Blaster feature of the board. If you want to play the Sound Blaster compatible games, you need to set the field to *Enabled*.

SB I/O Base Address
This item specifies the I/O Base Address for the Sound Blaster. Settings: *220H*, *240H*, *260H* and *280H*.

SB IRQ Select
This item specifies the IRQ for the Sound Blaster. Settings: *IRQ 5, IRQ 9* and *IRQ 10*.

SB DMA Select
This item specifies the DMA channel for the Sound Blaster. Settings: *DMA 1*, *DMA 2*, *DMA 3* and *DMA 0*.

MPU-401
The field enables or disables the MPU-401 interface (the Yamaha Sound Blaster mode).

MPU-401 I/O Address
This item selects the base I/O port address for the MPU-401 interface. Settings: *300-303H, 310-313H, 320-323H* and *330-333H*.

Game Port (200-207H)
The item enables or disables the Joystick/Game port.

Power Management Setup

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Power Management Setup

IPCA function	Enabled	Item Help
▸ Power Management	Press Enter	
ACPI Sleep Type	S1(POS)	Menu Level ▸
PM Control by APM	Yes	
Video Off Option	Suspend --> Off	
Video Off Method	V/H SYNC+Blank	
MODEM Use IRQ	3	
Soft-Off by PWRBTN	Instant-Off	
State After Power Failure	Auto	
LED In Suspend	Blink	
▸ Wake Up Events	Press Enter	

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

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*.

Power Management
Press <Enter> and the following sub-menu screen will appear:

Power Management

Power Management	User Define	Item Help
HDD Power Down	Disable	
Doze Mode	Disable	Menu Level ▸▸
Suspend Mode	Disable	

Power Management
This item is used to select the degree (or type) of power saving and is related to these modes: HDD Power Down, Doze Mode and Suspend

Mode. There are three options for power management:

Min Saving	Minimum Power Management. Doze Mode = 1 Hour, Suspend Mode = 1 Hour, and HDD Power Down = Disable.
Max Saving	Maximum Power Management. Doze Mode = 1 Min, Suspend Mode = 1 Min, and HDD Power Down = Disable.
User Define	Allows end users to configure each mode separately. Each of the ranges are from *1 Min* to *1 Hour* except for HDD Power Down which ranges from *1 Min* to *15 Min.*

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: *Disable* and *1 through 15 Min*.

Doze Mode
After the selected period of system inactivity, the CPU clock runs at slower speed while all other devices still operate at full speed. Settings: *Disable, 1 Min, 2 Min, 4 Min, 6 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min* and *1 Hour*.

Suspend Mode
After the selected period of system inactivity, all devices except the CPU shut off. Settings: *Disable, 1 Min, 2 Min, 4 Min, 6 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min* and *1 Hour.*

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

S1(POS)	The S1 sleep mode is a low power state. In this state, no system context (CPU or chipset) is lost and hardware maintains all system context.
S3(STR)	The S3 sleep mode is a power-down state in which power is supplied only to essential components such

as main memory and wake-capable devices and all system 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.

PM Control by APM
Setting to *Yes* will activate an Advanced Power Management (APM) device to enhance Max Saving mode and stop CPU internal clock. Setting: *Yes* and *No*.

Video Off Option
The settings are *Always On*, *Suspend --> Off* and *All Modes --> Off*. This option is for choosing the setting in which the monitor will turn off.

Always On	Always turn on.
Suspend --> Off	During Suspend mode, the monitor will be turned off.
All Modes --> Off	The monitor is turned off during Doze, Standby or Suspend mode.

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

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

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

Soft-Off by PWRBTN
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.

State After Power Failure

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.
Auto	Restores the system to the previous status before power failure or interrupt occurred.

LED In Suspend

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

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

Wake Up Events

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

Wake Up Events

VGA	OFF	Item Help
LPT & COM I/O Access	LPT/COM	
HDD & FDD I/O Access	ON	Menu Level ▸▸
PCI Master	OFF	
PowerOn by PCI Card	Disabled	
Wake Up On LAN/Ring	Disabled	
RTC Alarm Resume	Disabled	
x Date (of Month)	0	
x Resume Time (hh:mm:ss)	0 0 0	
IRQs Wake Up Event	ON	
▸ IRQs Activity Monitoring	Press Enter	

VGA, LPT & COM I/O Access, HDD & FDD I/O Access, PCI Master, PowerOn by PCI Card, Wake Up On LAN/Ring, IRQ Wake Up Event
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 "Wake Up On LAN/Ring", you need to install a modem/LAN card supporting power on function.*

RTC Alarm Resume
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)
Specifies the date for **RTC Alarm Resume**. Settings: *0~31*.

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

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

IRQs Activity Monitoring

IRQ3 (COM 2)	Enabled	Item Help
IRQ4 (COM 1)	Enabled	
IRQ5 (LPT 2)	Enabled	
IRQ6 (Floppy Disk)	Enabled	Menu Level ▸▸▸
IRQ7 (LPT 1)	Enabled	
IRQ8 (RTC Alarm)	Disabled	
IRQ9 (IRQ2 Redir)	Disabled	
IRQ10 (Reserved)	Disabled	
IRQ11 (Reserved)	Disabled	
IRQ12 (PS/2 Mouse)	Enabled	
IRQ13 (Coprocessor)	Enabled	
IRQ14 (Hard Disk)	Enabled	
IRQ15 (Reserved)	Disabled	

IRQ3~IRQ15
Enables or disables the monitoring of the specified IRQ line. If set to *Enabled*, the activity of the specified IRQ line will prevent the system from entering power saving modes or awaken it from power saving modes.

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

PnP/PCI Configurations

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PnP/PCI Configurations

PNP OS Installed	No	Item Help
Reset Configuration Data	Disabled	
Resources Controlled By	Auto(ESCD)	Menu Level ▸
x IRQ Resources	Press Enter	
x DMA Resources	Press Enter	Select Yes if you are using a Plug and Play capable operating system Select No if you need to BIOS to configure non-boot devices
PCI/VGA Palette Snoop	Disabled	
Assign IRQ For VGA	Enabled	
Assign IRQ For USB	Enabled	
INT Pin 1 Assignment	Auto	
INT Pin 2 Assignment	Auto	
INT Pin 3 Assignment	Auto	
INT Pin 4 Assignment	Auto	

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

PNP OS Installed
When set to *YES*, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows® 98. When set to *NO*, BIOS will initialize all the PnP cards. So, select *Yes* if 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 IRQ 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** & **DMA Resources** list IRQ 3/4/5/7/9/10/11/12/14/15 and DMA 0/1/3/5/6/7 for users to set each IRQ/DMA a type depending on the type of device using the IRQ/DMA. Settings are:

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

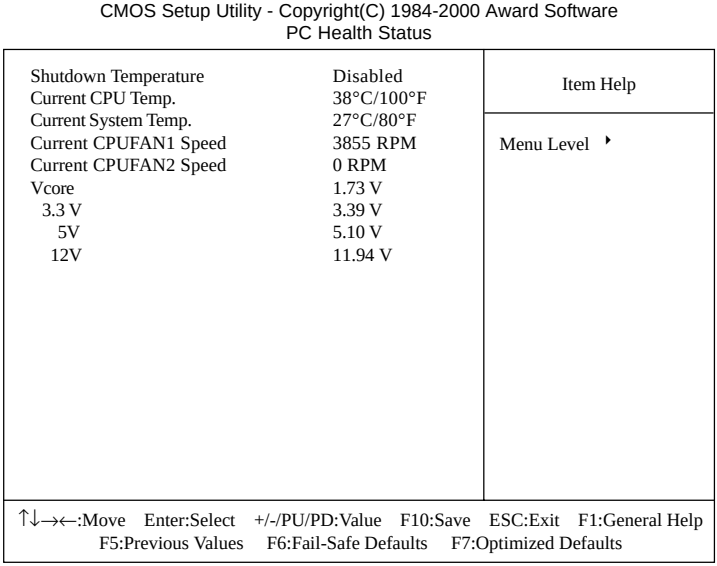
PCI/VGA Palette Snoop
PCI VGA palette is the set of colors currently used by the video device. Some special VGA cards may not show colors correctly and need to look into the video device's VGA palette to determine what colors are in use. Then you have to turn on the palette "snoop", permitting the palette 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.

Assign IRQ For VGA/USB
Set to *Enabled* allows BIOS to assign an IRQ to VGA card/USB device. Choose *Disabled* if you want to release the IRQ.

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.



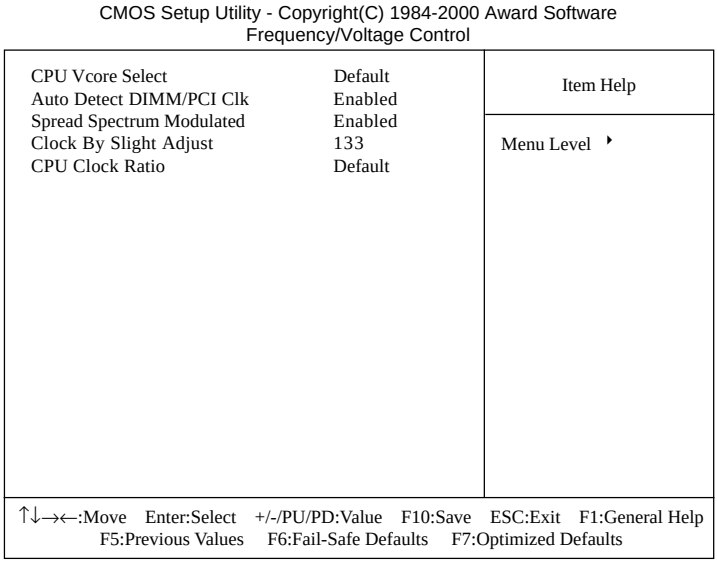
Shutdown Temperature

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*, *70°C/158°F*, *75°C/167°F*, *80°C/176°F* and *85°C/185°F*.

Current CPU Temp., Current System Temp., Current CPUFAN1/CPUFAN2 Speed, Vcore, 3.3 V/5V/12V

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

Frequency/Voltage Control



CPU Vcore Select
End users can adjust the CPU core voltage through the field. Settings: *Default*, and a range from *1.550V* to *1.850V* at 0.025V increment.

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 Modulated
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 *En-*

abled 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.

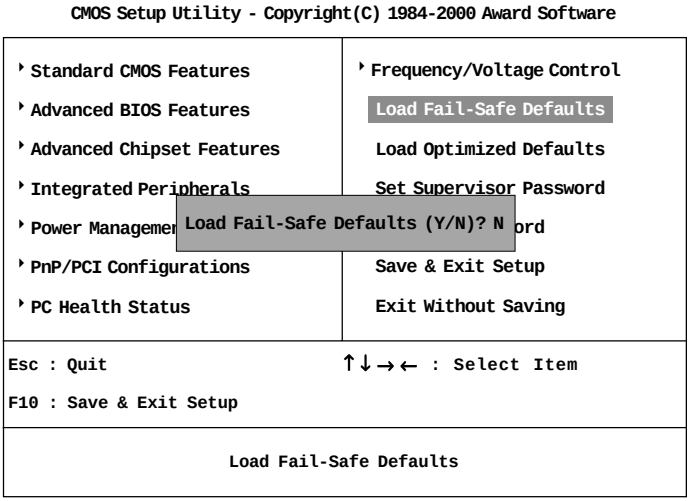
Clock By Slight Adjust
This item specifies the CPU host bus (FSB). It provides end users an overclocking method.

CPU Clock Ratio
End users can overclock the processor by specifying the CPU ratio (clock multiplier) in this field. Settings: *Default* and from *x 7.5* to *x 15*.

Load Fail-Safe/Optimized Defaults

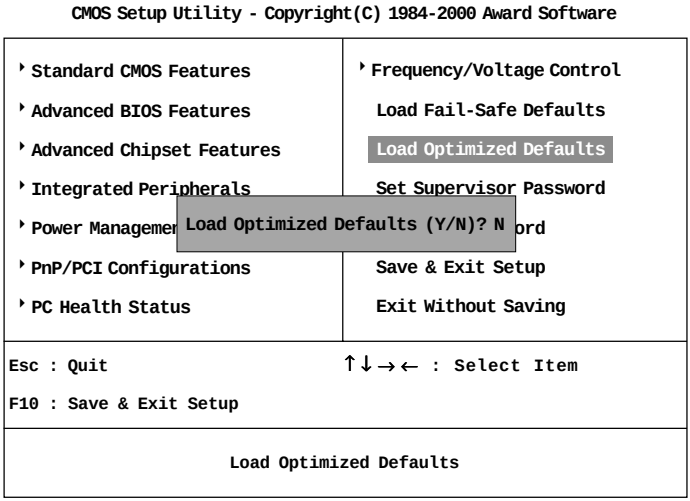
The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for the optimal performance of the mainboard. The Fail-Safe Defaults are the default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

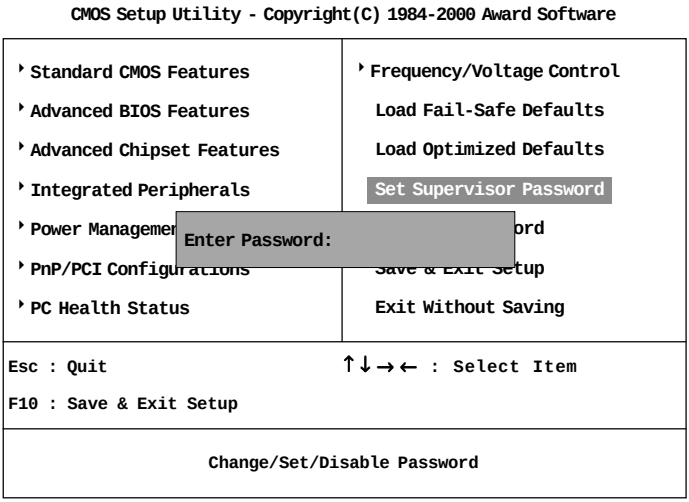
When you select Load Optimized Defaults, a message as below appears:



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

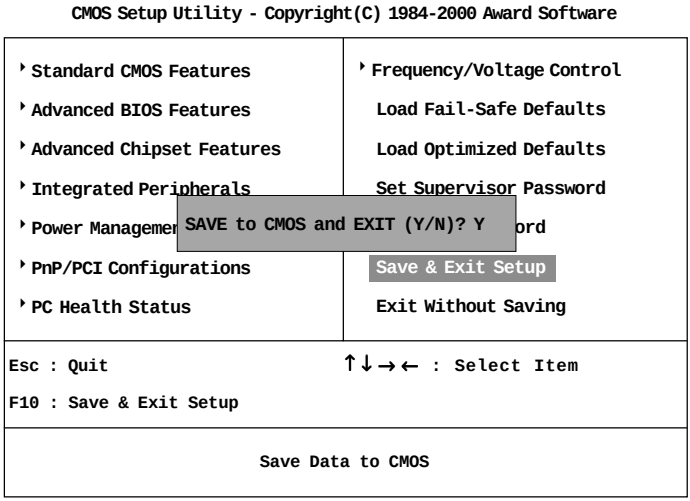
use of your computer. The setting to determine when the password prompt is required is the Security Option in the Advanced BIOS Features menu. If the Security Option is set to *System*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when trying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

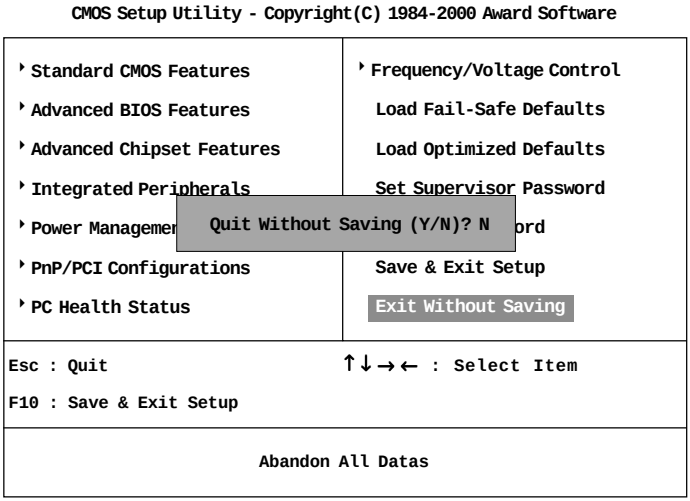


Typing *Y* will allow you to quit the Setup Utility and save the user setup changes to RTC CMOS.

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.

4 Installing Drivers

The chapter describes how to install the VIA® chipset and AC97 audio drivers in different Windows® operating systems. When you do the installation, you should always **install VIA® chipset driver prior to VIA® AC97 audio driver**.

This chapter includes the following topics:

Driver Installation for Windows® 98SE

Installing VIA® Chipset Driver

1. Insert the supplied CD disk into the CD-ROM drive.
2. The CD will auto-run and the setup screen will appear.
3. Click on **Via Chipset Drivers** and follow the on-screen instructions to complete the installation.
4. Restart the system for the new chipset driver.

Installing VIA® AC97 PCI Sound Driver

1. Make sure the supplied CD disk is in the CD-ROM drive.
2. Go to **My Computer** and double click the CD-ROM icon. The setup screen will appear again.
3. Click on **VIA AC97 PCI Sound Drivers** and follow the on-screen instructions to complete the installation.
4. Restart the system.

Driver Installation for Windows® 2000

Note: *Before installation of VIA chipset driver, you should install Windows 2000 Service Pack2 or the latest version.*

Installing VIA® Chipset Driver

1. Insert the supplied CD disk into the CD-ROM drive.
2. The CD will auto-run and the setup screen will appear.
3. Click on **Via Chipset Drivers** and follow the on-screen instructions to complete the installation.
4. Restart the system for the new chipset driver.

Installing VIA® AC97 PCI Sound Driver

1. Make sure the supplied CD disk is in the CD-ROM drive.
2. Go to **My Computer** and double click the CD-ROM icon. The setup screen will appear again.
3. Click on **VIA AC97 PCI Sound Drivers** and follow the on-screen instructions to complete the installation.
4. Restart the system.

One Touch Setup:
In Windows 2000, you may see the ***One Touch Setup*** *button appear on the setup screen. Choosing the button will help you to install more than one driver into the system without going through the installation process step by step and save a lot of time accordingly. After clicking on One Touch Setup, a window will show up indicating what drivers will be installed. Install other drivers not included by One Touch Setup manually if any.*

Driver Installation for Windows® ME

Installing VIA® Chipset Driver

1. Insert the supplied CD disk into the CD-ROM drive.
2. The CD will auto-run and the setup screen will appear.
3. Click on **Via Chipset Drivers** follow the on-screen instructions to complete the installation.
4. Restart the system for the new chipset driver.

Installing VIA® AC97 PCI Sound Driver

1. Make sure the supplied CD disk is in the CD-ROM drive.
2. Go to **My Computer** and double click the CD-ROM icon. The setup screen will appear again.
3. Click on **VIA AC97 PCI Sound Drivers** and follow the on-screen instructions to complete the installation.
4. Restart the system.

One Touch Setup:
*In Windows ME, you may see the **One Touch Setup** button appear on the setup screen. Choosing the button will help you to install more than one driver into the system without going through the installation process step by step and save a lot of time accordingly. After clicking on One Touch Setup, a window will show up indicating what drivers will be installed. Install other drivers not included by One Touch Setup manually if any.*

Driver Installation for Windows® NT4.0

Note: *Install Windows® NT4.0 Service Pack 6 or above before installing the VIA drivers into Windows® NT.*

Installing VIA® Chipset Driver

1. Insert the provided CD disk into the CD-ROM drive.
2. The CD will auto-run and the setup screen will appear.
3. Click on **Via Chipset Drivers** follow the on-screen instructions to complete the installation.
4. Restart the system for the new chipset driver.

Installing VIA® AC97 PCI Sound Driver

1. Make sure the supplied CD disk is in the CD-ROM drive.
2. Go to **My Computer** and double click the CD-ROM icon. The setup screen will appear again.
3. Click on **VIA AC97 PCI Sound Drivers** and follow the on-screen instructions to complete the installation.
4. Restart the system.

Uninstalling AGP Card

A

The motherboard comes with one AGP retention module installed. The retention module is used to secure the AGP card. This chapter describes how to remove the AGP card from the AGP slot with AGP retention module.

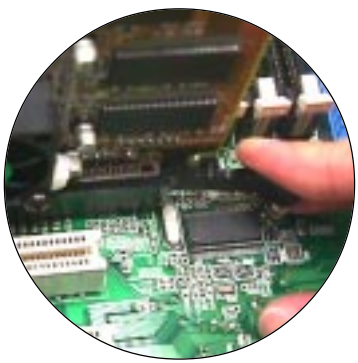
This chapter includes the following topics:

Uninstalling AGP Card

The motherboard uses the AGP retention module to fasten the installed AGP card. The AGP retention module along with the AGP slot are shown below:

To uninstall the AGP card, follow the instructions:

Step 1 – Pull the Level to release the AGP card.



Step 2 – Remove the AGP card from the AGP slot.