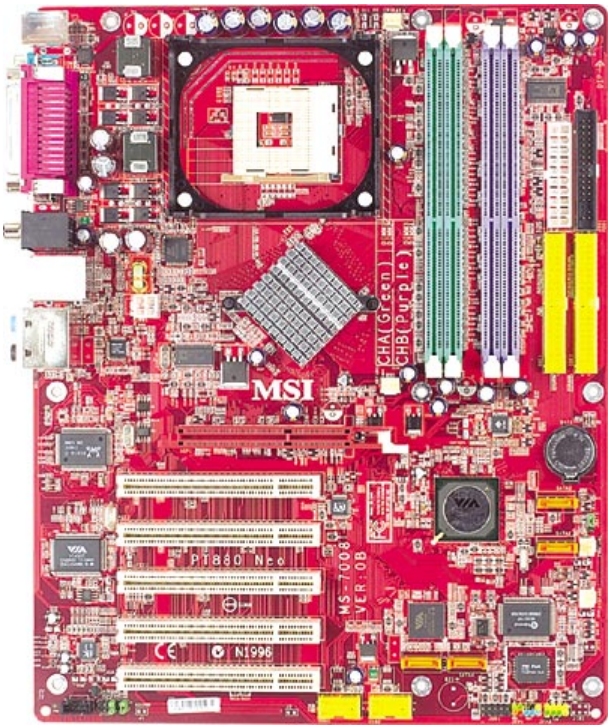
PT880 Neo Series

MS-7008 (v1.X) ATX Mainboard



Version 1.0
G52-M7008X1

Manual Revision: 1.0
Release Date: October 2003

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-7008

FC **Tested to comply with FCC Standard**

For Home or Office Use

Copyright Notice

Trademarks

Revision History

Revision	Revision History	Date
V1.0	First release for PCB 1.X	October 2003

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: **http://www.msi.com.tw/**
- Contact our technical staff at: **support@msi.com.tw**

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.
    - 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

Getting Started

Thank you for choosing the PT8 Neo Series (MS-7008 v1. X) ATX mainboard. The PT8 Neo is based on **VIA® PT880** & **VT8237** chipsets for optimal system efficiency. Designed to fit the advanced **Intel® Pentium® 4** processors in 478 pin package, the PT8 Neo delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

- Supports Intel® P4 Northwood/Prescott (Socket 478) processor.
- FSB @ 400/533/800 MHz.
- Supports up to 3.6GHz or higher speed.

Chipset

- VIA® PT880 chipset
  - Supports FSB 800/533/400MHz.
  - Supports AGP 8X interface.
  - Supports DDR 400/333/266 memory interface.
- VIA® VT8237 chipset
  - High Bandwidth V-link Client controller
  - Integrated Faster Ethernet LPC
  - Integrated Hardware Sound Blaster/Direct Sound AC97 audio
  - Ultra DMA 66/100/133 master mode PCI EIDE controller
  - ACPI
  - Supports Serial ATA
  - Supports USB2.0

Clock Generator

- 100/133/166/200 MHz clocks are supported

Main Memory

- Supports eight memory banks using four 184-pin DDR DIMMs
- Supports a Dual-channel memory
- Supports a maximum memory size up to 4GB
- Supports 2.5v DDR SDRAM DIMM

Slots

- One AGP (Accelerated Graphics Port) slot supports AGP 3.0 8x
- Five 32-bit Master PCI bus slots (support 3.3v/5v PCI bus interface).
- Supports 3.3V/5V PCI bus Interface

On-Board IDE

- An IDE controller integrated in the VIA® VT8237 chipset.
  - Supports IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 66/100/133 operation modes.
  - Can connect up to four Ultra ATA drives.

➤ Serial ATA/150 controller integrated in VIA® VT8237 chipset.
- Up to 150MB/sec transfer rate.
- Can connect up to two Serial ATA drives.

USB Interface

➤ 8 USB ports
- Controlled by VT8237 southbridge
- 4 ports in the rear I/O, 4 ports via the external bracket

On-Board Peripherals

➤ On-Board Peripherals include:
- 1 floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
- 1 serial ports (COM A)
- 1 parallel port supports SPP/EPP/ECP mode
- 8 USB 2.0 ports (Rear x 4 / Front x 4)
- 1 RJ45 LAN jack
- 1 D-Bracket2 pinheader
- 1 1394 port (Optional)
- 1 mini 1394 port (Optional)
- 1 Line-In / Line-Out /Mic
- 1 Coaxial SPDIF out (Optional)
- 1 Optical SPDIF out (Optional)
- 1 Rear Line-Out (Optional)
- 1 Center Line-Out (Optional)

Audio

➤ AC97 link controller integrated in VT8237

➤ 6-channel software audio codec Realtek 655
- Compliance with AC97 v2.2 Spec
- Meets PC2001 audio performance requirement

LAN

➤ VIA8237 integrated MAC + Realtek 8201BL PHY (Optional)

➤ Giga bit LAN supported by Realtek 8110S single chip(Optional)

BIOS

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

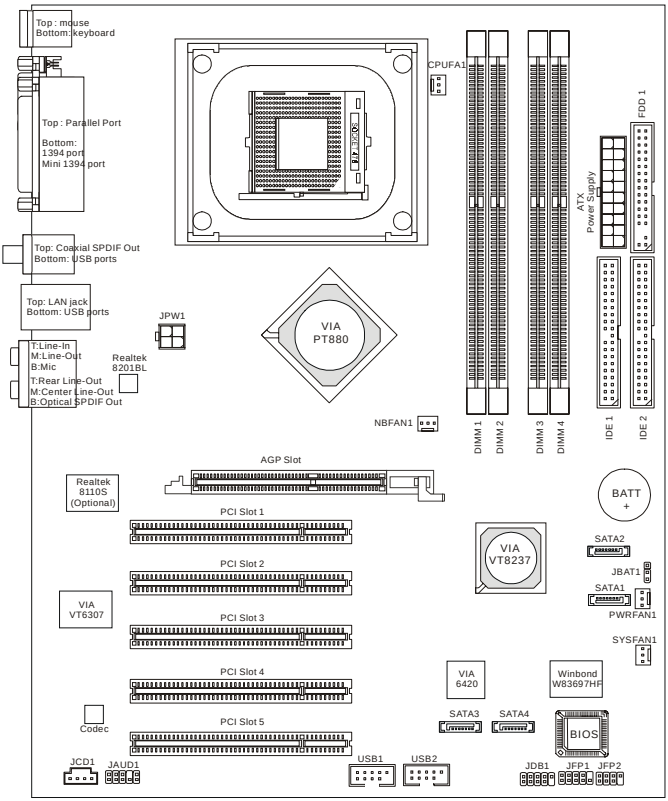
Dimension

- ATX Form Factor: 30.5cm x 24.3cm.

Mounting

- 9 standard mounting holes.

Mainboard Layout



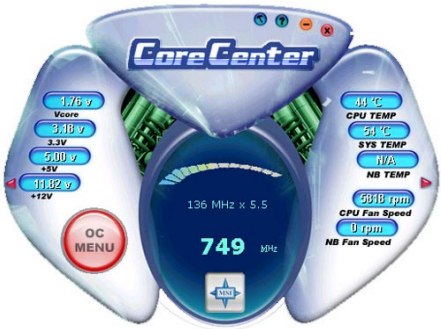
MS-7008 v1.X ATX Mainboard

MSI Special Features

CoreCenter

CoreCenter (TM)- contains OC Menu panel, wherein users can determine their processor and memory type to optimize its memory capacity. This all-in-one hardware console is advanced combination of the popular PC Alert and Fuzzy Logic. Including powerful function with hardware monitor, system alert and instinctive UI of overclocking, CoreCenter is just like your PC doctor that can detect, view and adjust the PC hardware and system status during real time operation.

In the left side it shows the current system status including the Vcore, 3. 3V, +5V and 12V. In the right side it shows the current PC hardware status such as the CPU & system temperatures and all fans speeds.



When you click the red triangles in the left and right sides, two sub-menus will open for users to overclock, overspec or to adjust the thresholds of system to send out the warning messages. If you click the ***Core Center*** button in the top, a screen pops up for you to choose the "***Auto mode***" or "***User mode***" of CPU fan.

Left-wing: Current system status

In the left sub-menu, you can configure the settings of FSB, Vcore, Memory Voltage and AGP Voltage by clicking the radio button in front of each item and make it available (the radio button will be lit as yellow when selected), use the "+" and "-" buttons to adjust, then click "***OK***" to apply the changes. Then you can click ***Save*** to save the desired FSB you just configured.

Also you may click ***Auto*** to start testing the maximum CPU overclocking value. The CPU FSB will automatically increase the testing value until the PC reboots. Or you may click ***Default*** to restore the default values.

Right-wing: PC hardware status during real time operation

In the right sub-menu, here you can configure the PC hardware status such as CPU & system temperatures and fan speeds. You may use the scroll bars to adjust each item, then click "***OK***" to apply the changes. The values you set for the temperatures are the maximum thresholds for the system for warnings, and the value for fan speeds are the minimum thresholds.

Top-side: User mode/Auto mode

Here you may adjust the CPU fan speed. If you choose ***User mode***, you may adjust the CPU fan speed in 8 different modes, from **Stop** to **Full speed**.

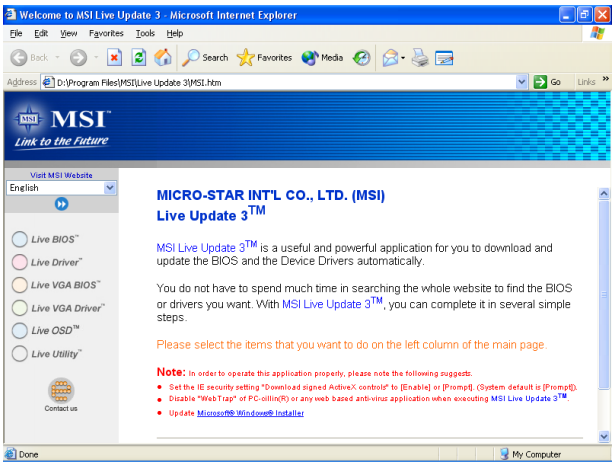
OC Menu

The exclusive OC Menu is fully developed to support DDR400+ memory modules. By comprehensive validation of over 67 DDR400+ memory modules, MSI concluded best parameters for DRAM voltage, Vio and other BIOS settings. You can select DDR433, DDR450, DDR466 and DDR500 from DRAM frequency in BIOS setting. Or you can just click on **OC Menu** button to configure in the OC Menu at CoreCenter. OC Menu will adjust the necessary parameters of voltage and frequency simultaneously. The only limitation will be the margin of processor from overclocking.

Live BIOS™/Live Driver™

The Live BIOS™/Live Driver™ is a tool used to detect and update your BIOS/drivers online so that you don't need to search for the correct BIOS/driver version throughout the whole Web site. To use the function, you need to install the "MSI Live Update 3" application. After the installation, the "MSI Live Update 3" icon (as shown on the right) will appear on the screen.

Double click the "MSI Live Update 3" icon, and the following screen will appear:



Five 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.
- **Live Driver** – Updates the drivers online.
- **Live VGA BIOS** – Updates the VGA BIOS online.
- **Live VGA Driver** – Updates the VGA driver online.
- **Live OSD** – Updates the firmware of the OSD products online.
- **Live Utility** – Updates the utilities online.

If the product you purchased does not support any of the functions listed above, a "sorry" message is displayed. For more information on the update instructions, insert the companion CD and refer to the "Live Update Guide" under the "Manual" Tab.

Live Monitor™

The Live Monitor™ is a tool used to schedule the search for the latest BIOS/drivers version on the MSI Web site. To use the function, you need to install the "MSI Live Update 3" application. After installation, the "MSI Live Monitor" icon (as shown on the right) will appear on the screen. Double click this icon to run the application.

Double click the "MSI Live Monitor" icon  at the lower-right corner of the taskbar, and the following dialog box will appear. You can specify how often the system will automatically search for the BIOS/drivers version, or change the LAN settings right from the dialog box.

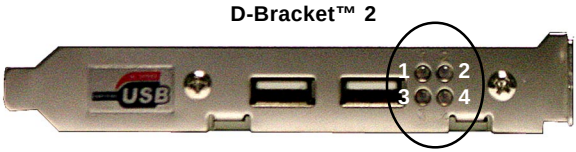
You can right-click the MSI Live Monitor icon  to perform the functions listed below:

- **Auto Search** – Searches for the BIOS/drivers version you need immediately.
- **View Last Result** – Allows you to view the last search result if there is any.
- **Preference** – Configures the Search function, including the Search schedule.
- **Exit** – Exits the Live Monitor™ application.
- **FAQ** – Provides a link to a database which contains various possible questions about MSI's products for users to inquire.

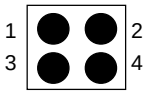
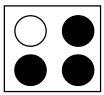
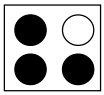
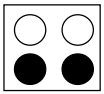
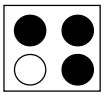
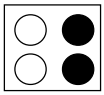
D-Bracket™ 2 (Optional)

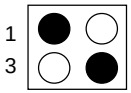
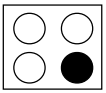
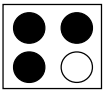
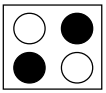
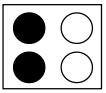
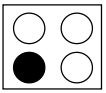
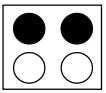
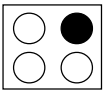
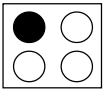
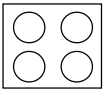
D-Bracket™ 2 is an external USB bracket integrating four Diagnostic LEDs, which use graphic signal display to help users understand their system. The LEDs provide up to 16 combinations of signals to debug the system. The 4 LEDs can debug all problems that fail the system, such as VGA, RAM or other failures. 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.

D-Bracket™ 2 supports both USB 1.1 & 2.0 spec.



● Red ○ Green

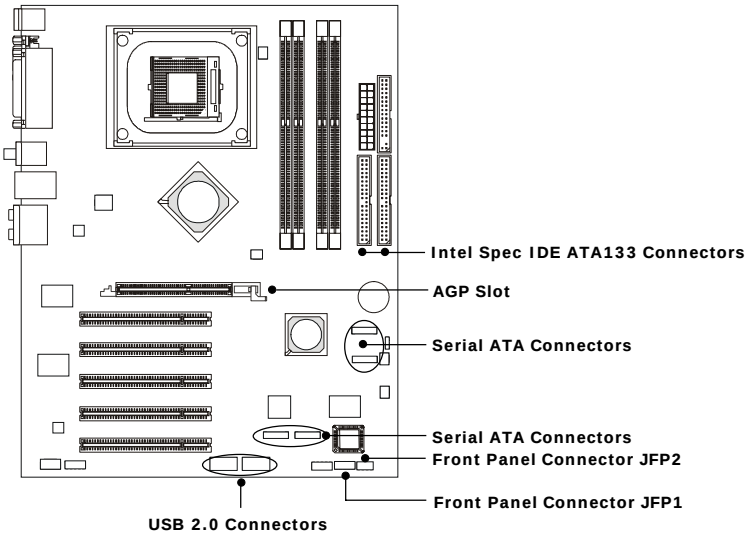
D-Bracket™ 2	Description
	System Power ON - The D-LED will hang here if the processor is damaged or not installed properly.
	Early Chipset Initialization
	Memory Detection Test - Testing onboard memory size. The D-LED will hang if the memory module is damaged or not installed properly.
	Decompressing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

D-Bracket™ 2	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 - Teting 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 initialize Floppy Drive and controller.
	Boot Attempt - Thi will set low stack and boot via INT 19h.
	Operating System Booting

Color Management

MSI has a unified color management rule for some connectors on the mainboards, which helps you to install the memory modules, expansion cards and other peripherals devices more easily and conveniently.

- Intel spec IDE ATA133 connector: yellow
- Serial ATA150 connector: orange
- AGP 8X slot: red
- USB 2.0 connector: yellow
- Front panel connector JFP1: HDD LED in red, Reset Switch in blue, Power Switch in black, Power LED in light green.
- Front panel connector JFP2: Power LED in light green.

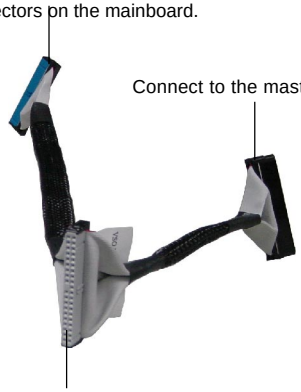


Round Cable (Optional)

Round cable is an enhanced cable for PCI IDE and Ultra DMA controller. It has the following benefits:

- ➤ Data transfer rate started by 133MB/s
- ➤ Backward compatibility (ATA33/66/100/133)
- ➤ Higher performance than traditional Flat cable (data rate)
- ➤ Improved data robustness
- ➤ Better airflow due to thinner ATA/133 cable

Connect one end to the floopy disk drive connector (FDD1) and the other end to the standard flooy disk.



Connect to the system connectors on the mainboard.

Connect to the master drive.

Connect to the slave drive.

CPU Thermal Protection

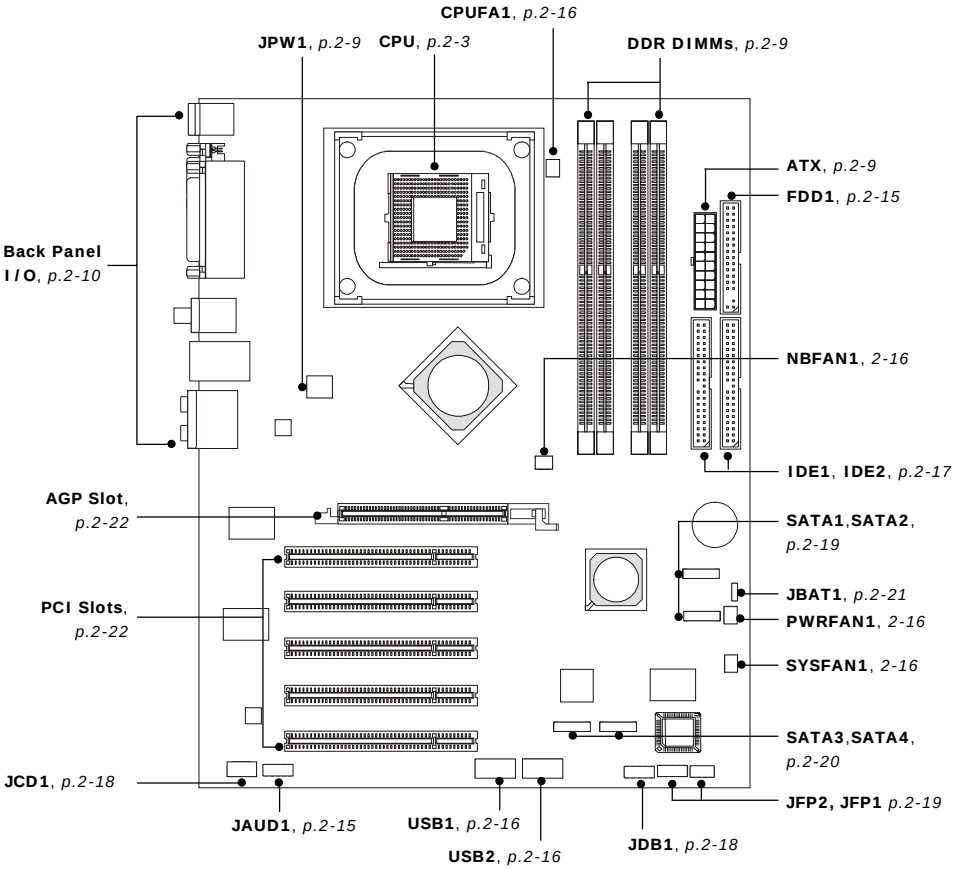
Aimed to prevent the CPU from overheating, MSI has developed a CPU Thermal Protection mechanism for Intel® CPU platform. This CPU Thermal Protection mechanism works on a thermal signal sensor. If the mechanism senses an abnormal temperature rise, it will automatically shut down the system and the CPU temperature will then drop down and resume normal. With this unique feature, users can better protect their CPU. Please note that this feature is for Intel® Pentium CPU only.

Hardware Setup

This chapter tells you how to install the CPU, memory modules, and expansion cards, as well as how to setup the jumpers on the mainboard. Also, it provides the instructions on connecting the peripheral devices, such as the mouse, keyboard, etc.

While doing the installation, be careful in holding the components and follow the installation procedures.

Quick Components Guide



Central Processing Unit: CPU

The mainboard supports Intel® Pentium® 4/Celeron Northwood/Prescott processor in the 478 pin package. The mainboard uses a CPU socket called PGA478 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Core Speed Derivation Procedure

CPU Clock multiplied by **Core/Bus ratio** equals the CPU core speed.

For example:

If	CPU Clock	=	100MHz
	Core/Bus ratio	=	14
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 14
		=	1.4 GHz

Memory Speed/CPU Clock Support Matrix

	DDR 266	DDR 333	DDR 400
FSB400	○	X	X
FSB533	○	○	X
FSB800	X	○	○

○ : Yes X : Not available .

CPU Installation Procedures for Socket 478

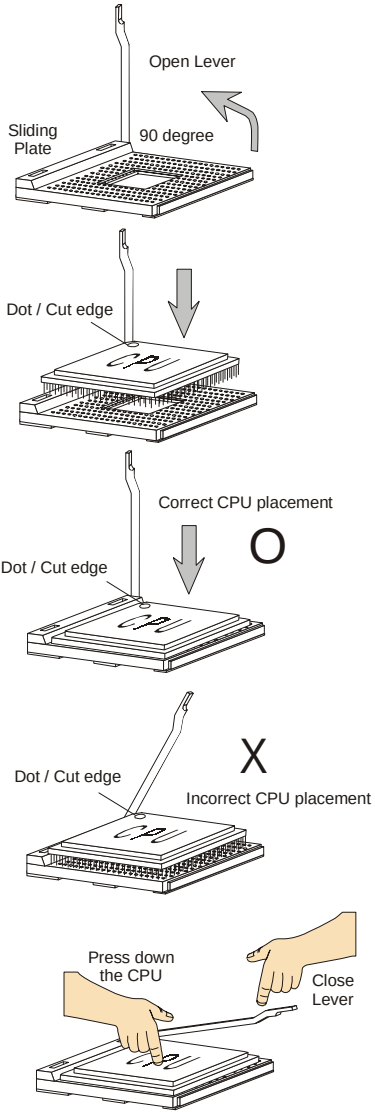
1. Please turn off the power and unplug the power cord before installing the CPU.

2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.

3. Look for the cut edge. The cut edge should point towards the lever pivot. The CPU can only fit in the correct orientation.

4. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.

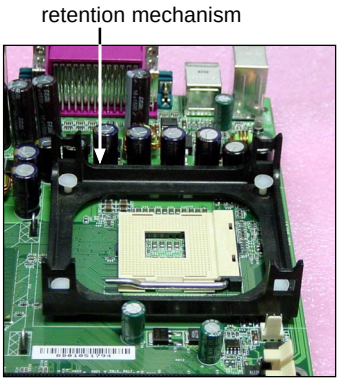
5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



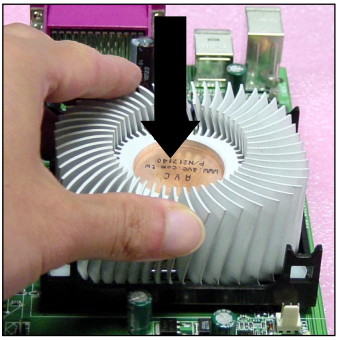
Installing the CPU Fan

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly important. To dissipate heat, you need to attach the CPU cooling fan and heatsink on top of the CPU. Follow the instructions below to install the Heatsink/Fan:

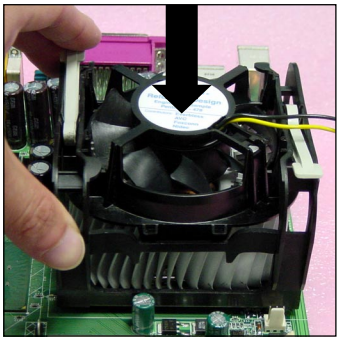
1. Locate the CPU and its retention mechanism on the motherboard.



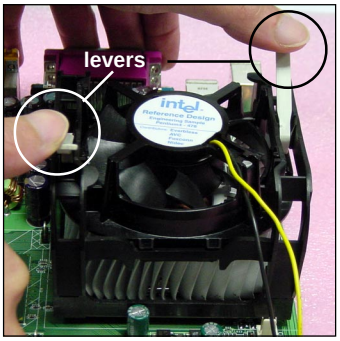
2. Position the heatsink onto the retention mechanism.



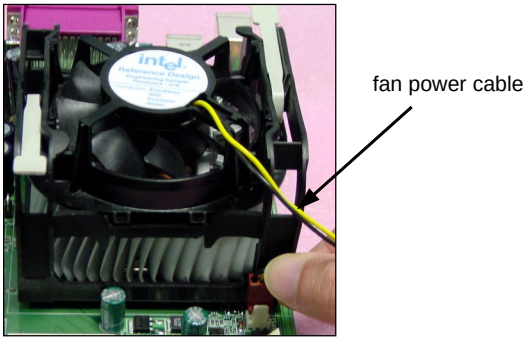
3. Mount the fan on top of the heatsink. Press down the fan until its four clips get wedged in the holes of the retention mechanism.



4. Press the two levers down to fasten the fan. Each lever can be pressed down in only ONE direction.



5. Connect the fan power cable from the mounted fan to the 3-pin fan power connector on the board.



MSI Reminds You...

Overheating

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

Replacing the CPU

While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

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 4 slots for 184-pin DDR SDRAM DIMM (Double In-Line Memory Module) modules and supports the memory size up to 4GB. You can install DDR400/DDR333/DDR266 modules on the DDR DIMM slots (DDR 1~4).

DDR DIMM Slots
DIMM 1~4

Introduction to DDR SDRAM

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate by transferring data twice per cycle. It uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. Please note that the DDR SDRAM does not support ECC (error correcting code) and registered DIMM.

DDR Population Rules

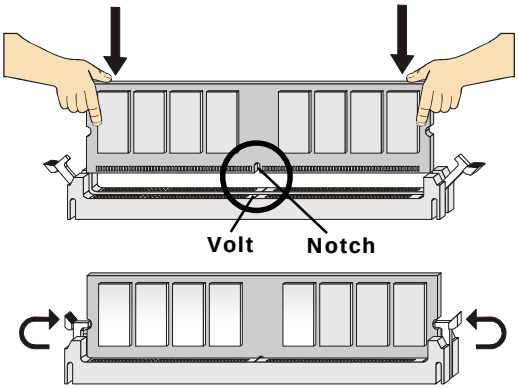
Install at least one DIMM module on the slots. Each DIMM slot supports up to a maximum size of 1GB. Users can install either single- or double-sided modules to meet their own needs. Please note that ***each DIMM can work respectively for single-channel DDR, but there are some rules while using dual-channel DDR*** (Please refer to the suggested DDR population table on p. 2-8)**.**Users may install memory modules of different type and density on different-channel DDR DIMMs. However, the ***same type and density memory modules*** are necessary while using dual-channel DDR, or unstability may happen.

Please refer to the following table for detailed dual-channel DDR. Other combination not listed below will function as single-channel DDR.

DIMM1 (Ch A)	DIMM2 (Ch A)	DIMM3 (Ch B)	DIMM4 (Ch B)	System Density
128MB~1GB		128MB~1GB		256MB~2GB
	128MB~1GB		128MB~1GB	256MB~2GB
128MB~1GB	128MB~1GB	128MB~1GB	128MB~1GB	512MB~4GB

Installing DDR Modules

1. The DDR DIMM has only one notch on the center of module. The module will only fit in the right orientation.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the socket.
3. The plastic clip at each side of the DIMM slot will automatically close.



MSI Reminds You...

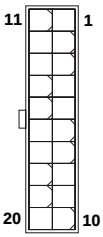
You can barely see the golden finger if the module is properly inserted in the socket.

Power Supply

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

ATX 20-Pin Power Connector: ATX

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.



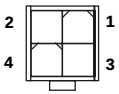
ATX

ATX Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

ATX 12V Power Connector: JPW1

This 12V power connector is used to provide power to the CPU.



JPW1

JPW1 Pin Definition

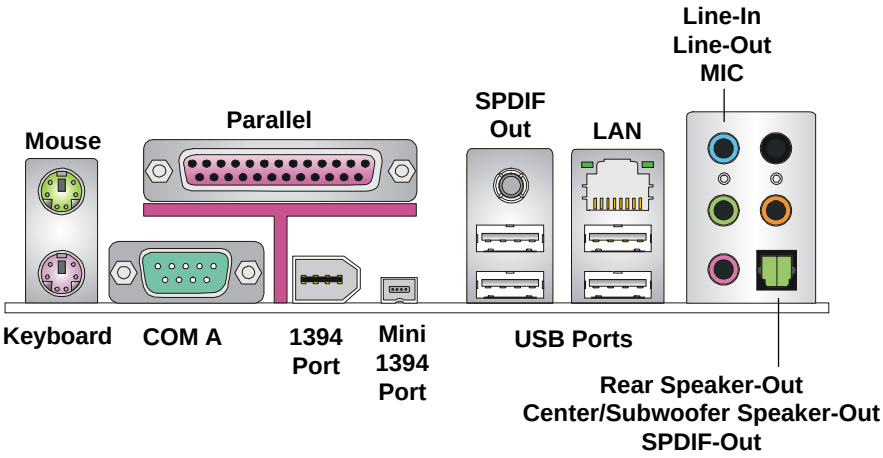
PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

MSI Reminds You...

Power supply of 300 (and up) watt is highly recommended for system stability.

Back Panel

The back panel provides the following connectors:

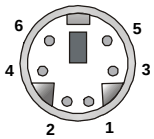


Mouse Connector

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.

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.



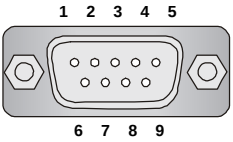
PS/2 Mouse (6-pin Female)
PS/2 Keyboard (6-pin Female)

Pin Definition

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

Serial Port Connector: COM A

This mainboard offers one 9-pin male DIN connector as serial port COM A. It is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.



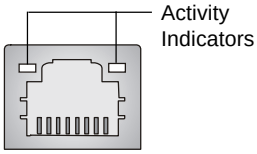
9-Pin Male DIN Connector

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

RJ-45 LAN Jack (Optional)

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



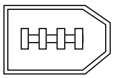
RJ-45 LAN Jack

Pin Definition

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

IEEE1394 Ports (Optional)

The mainboard provides two IEEE 1394 ports. The mini IEEE1394 port is designed for you to connect the IEEE1394 device with external power. The standard IEEE1394 port connects to IEEE1394 devices without external power. The IEEE1394 high-speed serial bus components provide the enhanced PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs, and portable devices.

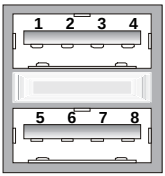


IEEE1394 Port (Standard)

IEEE1394 Port (Mini)

USB 2.0 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 the connector.



USB Ports

USB Port Description

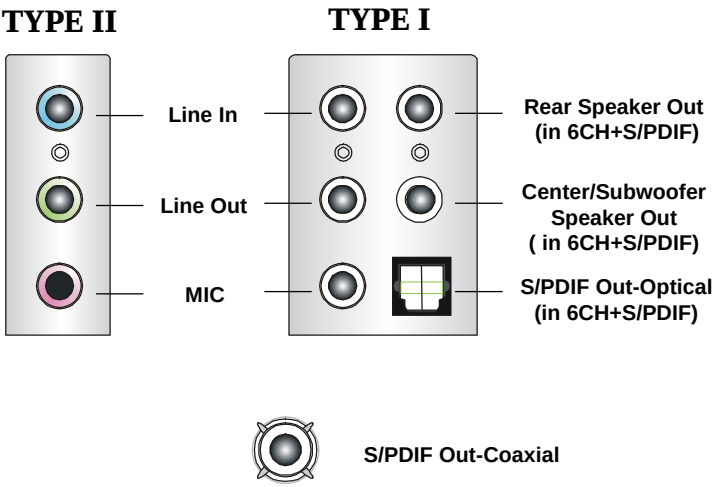
PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

Audio Port Connectors (Optional)

This mainboard may provide two different combinations of Audio Port Connectors: TYPE I and TYPE II. Find the correct type according to the mainboard you have with you.

Both TYPE I and TYPE II integrate three audio jacks for 2-channel mode stereo speaker output: **Line In** is used for external CD player, Tape player, or other audio devices. **Line Out** is a connector for Speakers or Headphones. **Mic** is a connector for microphones.

However, TYPE I also integrates an advanced audio application which is provided by Realtek ALC655 to offer support for **6-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/6-channel audio. For more information on **6-channel audio operation**, please refer to *Appendix A: Using 4- or 6-Channel Audio Function.*

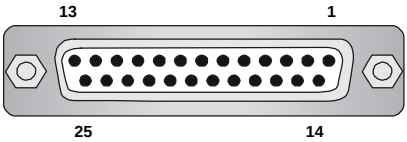


MSI Reminds You...

*For advanced audio application, Realtek ALC655 audio chip is provided to offer support for **6-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/6-channel audio.*

Parallel Port Connector: LPT1

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



Pin Definition

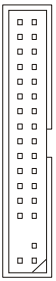
PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select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

Connectors

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

Front Panel Audio Connector: JAUD1

The JAUD1 front panel audio connector allows you to connect to the front panel audio and is compliant with Intel® Front Panel I/O Connectivity Design Guide.

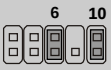
JAUD1

Pin Definition

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

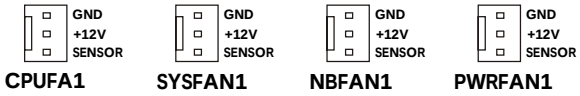
MSI Reminds You...

If you don't want to connect to the front audio header, pins 5 & 6, 9 & 10 have to be jumpered in order to have signal output directed to the rear audio ports. Otherwise, the Line-Out connector on the back panel will not function.



Fan Power Connectors: CPUFA1 / SYSFAN1 / NBFAN1 (Optional) / PWRFAN1 (Optional)

The CPUFA1 (processor fan), SYSFAN1 (system fan), NBFAN1 (north bridge fan) and PWRFAN1 (power supply fan) support system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. This mainboard has a System Hardware Monitor chipset on-board, so that you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

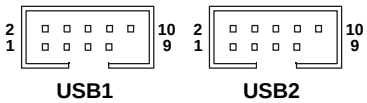


MSI Reminds You...

1. *Always consult the vendors for proper CPU cooling fan.*
2. *CPUFAN1 supports the fan control.* ***You can install Core Center utility that will automatically control the CPU fan speed according to the actual CPU temperature.***

Front USB Connectors: USB1 / USB2

The mainboard provides two USB 2.0 pin headers *USB1* & *USB2* that are compliant with Intel® I/O Connectivity Design Guide. USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.

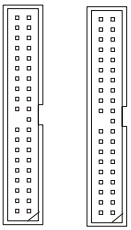


Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key	10	USBOC

Hard Disk Connectors: IDE1 / IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 66/100/133 controller that provides PIO mode 0~5, Bus Master, and Ultra DMA 66/100/133 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices.



IDE1 (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2 (Secondary IDE Connector)

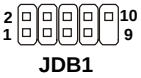
IDE2 can also connect a Master and a Slave drive.

MSI Reminds You...

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.

D-Bracket™ 2 Connector: JDB1 (Optional)

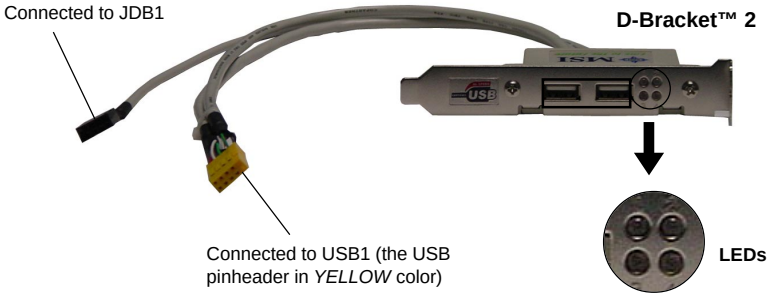
The mainboard comes with a JDB1 connector for you to connect to D-Bracket™ 2. D-Bracket™ 2 is a USB Bracket that supports both USB1.1 & 2. 0 spec. It integrates four LEDs and allows users to identify system problem through 16 various combinations of LED signals. For definitions of 16 signal combinations, please refer to *D-Bracket™ 2* in *Chapter 1*.



JDB1

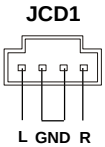
Pin Definition

Pin	Signal
1	DBG1 (high for green color)
2	DBR1 (high for red color)
3	DBG2 (high for green color)
4	DBR2 (high for red color)
5	DBG3 (high for green color)
6	DBR3 (high for red color)
7	DBG4 (high for green color)
8	DBR4 (high for red color)
9	Key
10	NC



CD-In Connector: JCD1

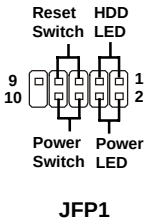
The connector is for CD-ROM audio connector.



JCD1

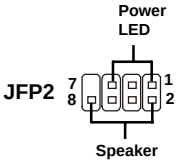
Front Panel Connectors: JFP1 / JFP2

The mainboard provides two front panel connectors for electrical connection to the front panel switches and LEDs. JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



JFP1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down to GND
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.



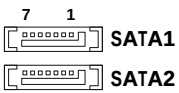
JFP2 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	SPK-
3	SLED	4	BUZ+
5	PLED	6	BUZ-
7	NC	8	SPK+

Serial ATA/Serial ATA RAID Connectors controlled by VT8237: SATA1 / SATA2

The Southbridge of this mainboard is VT8237 which supports two serial connectors SATA1 and SATA2.

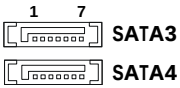
SATA1, SATA2 are high-speed Serial ATA interface ports. Each supports 1st generation serial ATA data rates of 150 MB/s. Both connectors are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk device. Please refer to *Serial ATA/Serial ATA Raid* manual for detail software installation procedure.



Serial ATA/Serial ATA RAID Connectors controlled by VT6420: SATA3 / SATA4 (Optional)

The chipset supports two serial connectors SATA3& SATA4 which are dual high-speed Serial ATA interface ports.

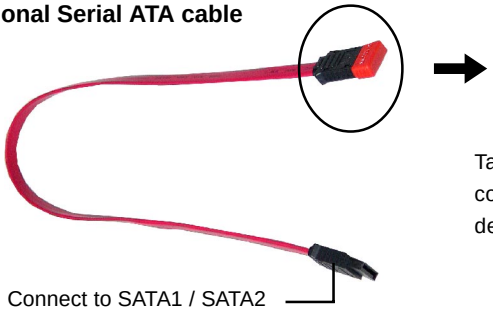
Each supports 1st generation serial ATA data rates of 150 MB/s. Both connectors are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk device. Please refer to *Serial ATA/ Serial ATA Raid* manual for detail software installation procedure.

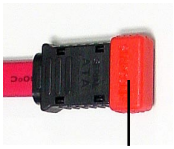


Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	TXP
3	TXN	4	GND
5	RXN	6	RXP
7	GND		

Optional Serial ATA cable





Take out the dust cover and connect to the hard disk devices

MSI Reminds You...

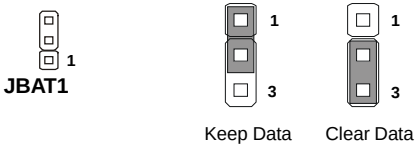
Please do not fold the serial ATA cable in a 90-degree angle, since this will cause the loss of data during the transmission.

Jumper

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

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. 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:



MSI Reminds You...

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, and five 32-bit PCI bus slots.

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. The slot supports 8x/4x/2x/1x AGP card.

PCI (Peripheral Component Interconnect) Slots

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

PCI Interrupt Request Routing

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

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT A#	INT B#	INT C#	INT D#
PCI Slot 2	INT B#	INT C#	INT D#	INT A#
PCI Slot 3	INT C#	INT D#	INT A#	INT B#
PCI Slot 4	INT D#	INT A#	INT B#	INT C#
PCI Slot 5	INT B#	INT C#	INT D#	INT A#

3

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use. You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

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.

DEL: Setup F11: Boot Menu F12: Network boot TAB:Logo
F10: Flash Recovery

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.

Selecting the First Boot Device

You are allowed to select the 1st boot device without entering the BIOS setup utility by pressing <F11>. When the same message as listed above appears on the screen, press <F11> to trigger the boot menu.

The POST messages might pass by too quickly for you to respond in time. If so, restart the system and press <F11> after around 2 or 3 seconds to activate the boot menu similar to the following.

Select First Boot Device		
Floppy	: 1st Floppy	
IDE-0	: IBM-DTLA-307038	
CDROM	: ATAPI CD-ROM DRIVE 40X M	
[Up / Dn] Select	[RETURN] Boot	[ESC] cancel

The boot menu will list all the bootable devices. Select the one you want to boot from by using arrow keys and then pressing <Enter>. The system will boot from the selected device. The selection will not make changes to the settings in the BIOS setup utility, so next time when you power on the system, it will still use the original first boot device to boot up.

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
<F6>	Load High Performance Defaults
<F7>	Load Optimal 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.

Main Menu

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

Default Settings

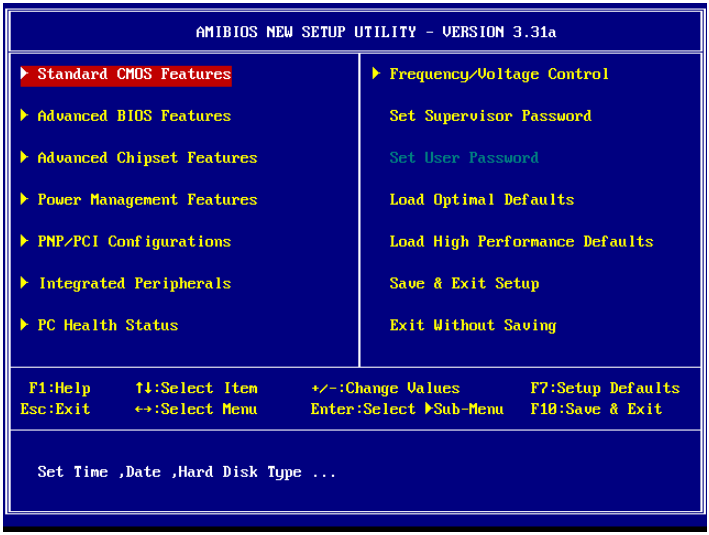
The preset Optimal Defaults of the BIOS setup program provide optimal performance settings for all devices and the system.

MSI Reminds You...

The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

The Main Menu

Once you enter AMIBIOS NEW SETUP UTILITY, the Main Menu will appear on the screen. 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 AMI® special enhanced features.

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

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

PNP/PCI Configurations
This entry appears if your system supports PnP/PCI.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

PC Health Status
This entry shows the status of your CPU, fan, warning for overall system status.

Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control.

Set Supervisor Password
Use this menu to set Supervisor Password.

Set User Password
Use this menu to set User Password.

Load Optimal Defaults
Use this menu to load the factory default settings for optimal & stable system performance.

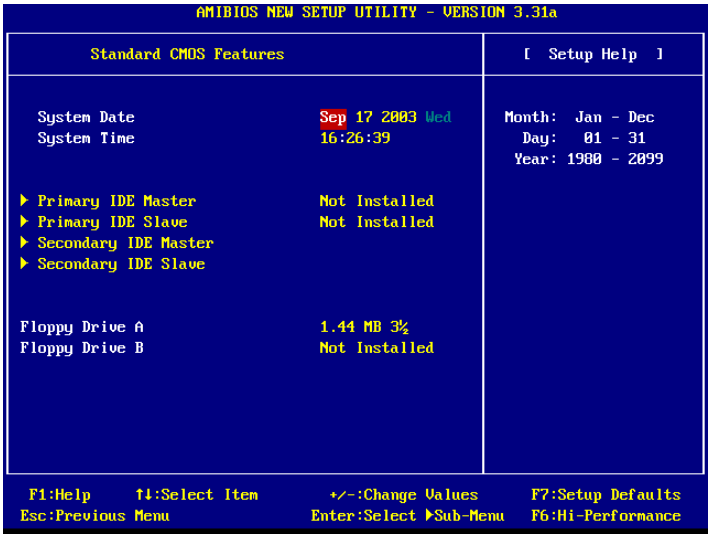
Load High Performance Defaults
Use this menu to load the BIOS values for the best system performance, but the system stability may be affected.

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 SETUP menu are divided into 9 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.



System Date

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

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

System Time

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

Primary/Secondary IDE Master/Slave

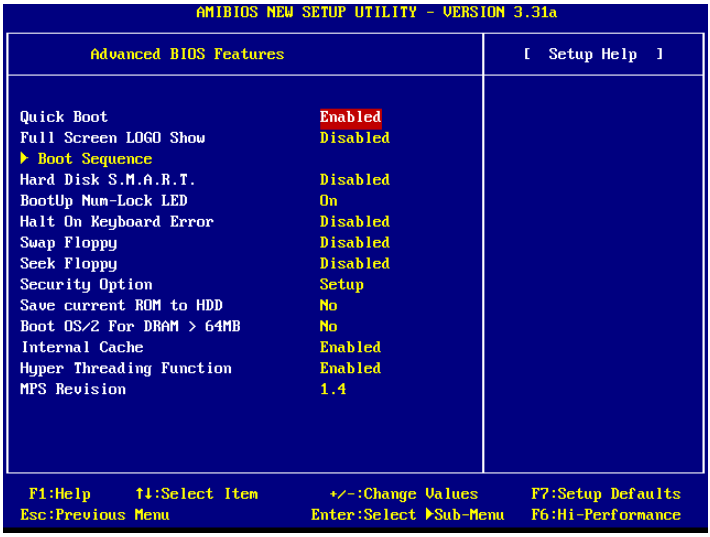
Press PgUp/<+> or PgDn/<-> to select the hard disk drive type. The specification of hard disk drive will show up on the right hand according to your selection.

Type	Select how to define the HDD parameters
Cylinders	Enter cylinder number
Heads	Enter head number
Write Precompensation	Enter write precomp cylinder
Sectors	Enter sector number
Maximum Capacity	Read the maximal HDD capacity
LBA Mode	Select *Auto* for a hard disk > 512 MB under Windows and DOS, or *Disabled* under Netware and UNIX
Block Mode	Select *Auto* to enhance the hard disk performance
Fast Programmed I/O Modes	Select Auto to enhance hard disk performance by optimizing the hard disk timing
32 Bit Transfer Mode	Enable 32 bit to maximize the IDE hard disk data transfer rate

Floppy Drive A/B

This item allows you to set the type of floppy drives installed. Available options: *Not Installed, 1.2 MB 5¼, 720 KB 3½, 1.44 MB 3½* and *2.88 MB 3½.*

Advanced BIOS Features



Quick Boot

Setting the item to *Enabled* allows the system to boot within 5 seconds since it will skip some check items. Available options: *Enabled, Disabled*.

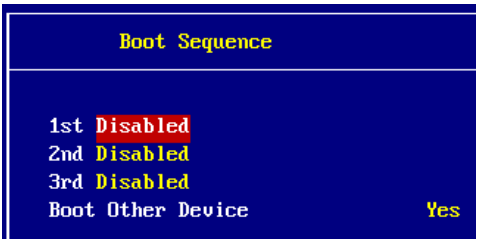
Full Screen LOGO Show

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

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

Boot Sequency

Press <Enter> and the following sub-menu appears.



1st/2nd/3rd
These items allow you to set the sequence of boot devices where AMIBIOS attempts to load the operating system.

Boot Other Devices
Setting the option to *Yes* allows the system to try to boot from other devices if the system fails to boot from the 1st/2nd/3rd boot device.

Hard Disk 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: *Enabled*, *Disabled*.

Boot Up 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: *On*, *Off*.

Halt On Keyboard Error
This setting determines whether the system will stop if an error is detected at keyboard. Settings: ***Enabled, Disabled.***

Swap Floppy Drive
This field is effective only in systems with two floppy drives. Selecting *Enabled* assigns physical drive B to logical drive A, and physical drive A to logical drive B.

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

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.
Always	A password prompt appears every time when the computer is powered on or when end users try to run Setup.

Save Current ROM to HDD
This allows you to save the BIOS to your hard disk drive. Setting options: *No, Yes*.

Boot OS/2 For DRAM > 64MB
This allows you to run the OS/2® operating system with DRAM greater than 64MB. Setting options: *No, Yes*.

Internal 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 setting controls the internal cache (also known as L1 or level 1 cache). Setting options: *Disabled, Enabled.*

Hyper-Threading Function
The processor uses Hyper-Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. Settings: *Enabled, Disabled.* Note that this function only available when the CPU installed supports Hyper-Threading function.

MSI Reminds You...

Enabling the functionality of Hyper-Threading Technology for your computer system requires ALL of the following platform Components:

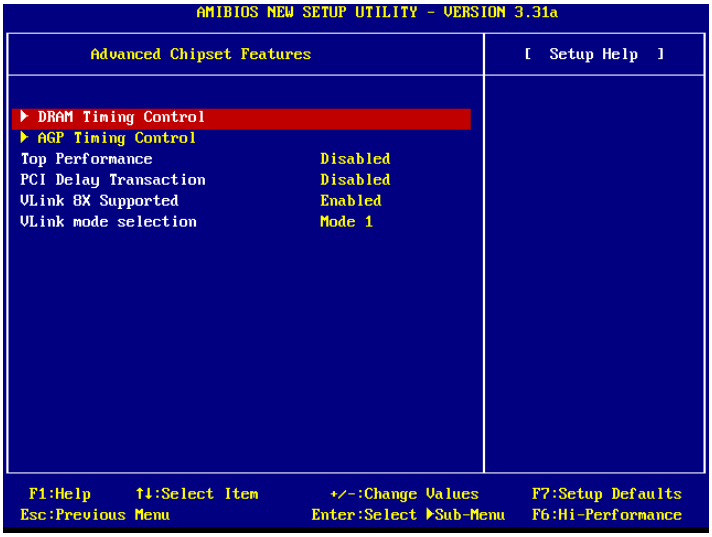
* ***CPU:*** *An Intel® Pentium® 4 Processor with HT Technology;*
* ***Chipset:*** *A Chipset that supports HT Technology;*
* ***BIOS:*** *A BIOS that supports HT Technology and has it enabled;*
* ***OS:*** *An operating system that supports HT Technology.*

For more information on Hyper-threading Technology, go to: www.intel.com/info/hyperthreading

MPS Revision

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*, *1.1*.

Advanced Chipset Features

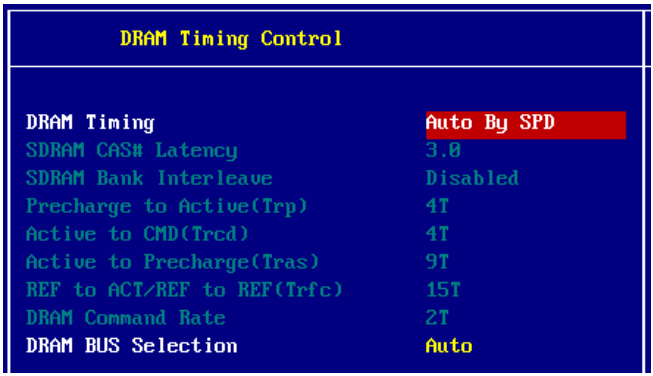


MSI Reminds You...

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

DRAM Timing Control

Press <Enter> and the following sub-menu appears.



DRAM Timing
The value in this field depends on performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unless you install new memory that has a different performance rating than the original DRAMs.

SDRAM CAS# Latency
The field controls the CAS latency, which determines the timing delay before SDRAM starts a read command after receiving it. Setting options: *1.5, 2.0, 2.5, 3.0*. *1.5* (clocks) increases system performance while *3.0* (clocks) provides more stable system performance.

SDRAM Bank Interleave
This field selects 2-bank or 4-bank interleave for the installed DRAM. Disable the function if 16MB DRAM is installed. Setting options: *Disabled, Enabled*.

Precharge to Active (Trp)
This setting controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Setting options: *2T* to *5T*.

Active to CMD (Trcd)
When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance. Settings: *2T* to *5T*. Setting options: *2T* to *5T*.

Active to Precharge (Tras)
This setting determines the time RAS takes to read from and write to a memory cell. Setting options: *6T* to *9T*.

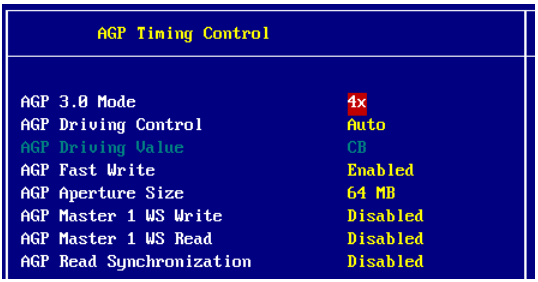
REF to ACT / REF to REF (Trfc)
This setting determines the time RFC takes to read from and write to a memory cell. Setting options: *12T* to *15T*.

DRAM Command Rate
This setting controls the DRAM command rate. Selecting *1T Command* allows DRAM signal controller to run at 1T (T=clock cycles) rate. Selecting *2T Command* makes DRAM signal controller run at 2T rate. *1T* is faster than *2T*. Setting options: *1T, 2T.*

DRAM Bus Selection
This setting determines the module type of DRAM Bus. Setting options: *Auto, Single Channel,* and *Dual Channel.*

AGP Timing Control

Press <Enter> and the following sub-menu appears.



AGP 3.0 Mode / AGP 2.0 Mode
AGP 3.0 Mode or AGP 2.0 Mode appears depending on the AGP card installed on the mainboard. This item sets an appropriate mode for the installed AGP card. Setting options for AGP 2.0 Mode: *1X, 2X, 4X*. Setting options for AGP 3.0 Mode: *4X, 8X*.

AGP Driving Control
This item 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 recommended to select *Auto* to avoid any system error caused.

AGP Driving Value
This item specifies an AGP driving force.

AGP Fast Write
The field enables or disables the AGP Fast Write feature. The Fast Write technology allows CPU to write directly to the graphics card without passing anything through the system memory and improves the

AGP 4X speed. Select *Enabled* only when the installed AGP card supports the function.

AGP Aperture Size (MB)
This setting controls just how much system RAM can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The option allows the selection of an aperture size of *32MB, 64MB, 128MB, and 256 MB.* Two extra options of *512MB* and *1GB* will be available when AGP 3.0 card is installed.

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

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

AGP Read Synchronization
The field allows you to enable or disable the AGP Read Synchronization feature.

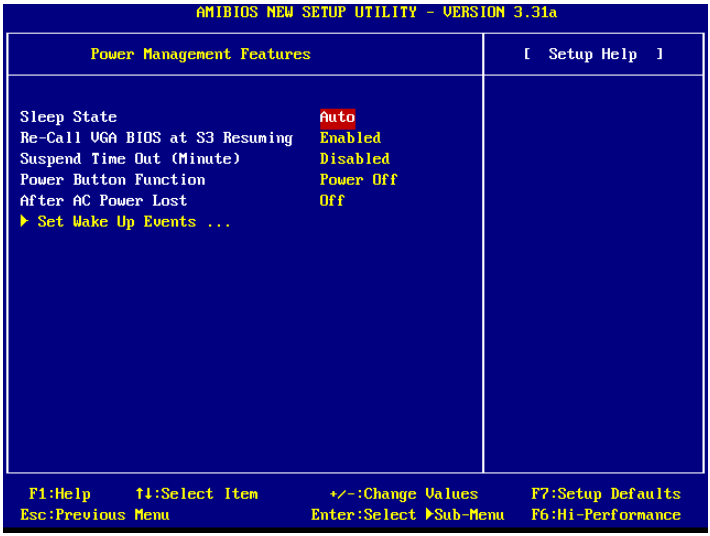
Top Performance
Set this item to *Enabled* to increase the system performance. Setting options: *Enabled, Disabled.*

PCI Delayed Transaction
The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

VLink 8X Supported
This item enables or disables the 8X VLink Data Rate. Setting options: *Enabled, Disabled.*

VLink Mode Selection
This item selects the mode of VLink. Setting options: *Auto, Mode 1, Mode 2, Mode 3, Mode 4.*

Power Management Features



MSI Reminds You...

S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

Sleep State

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 is lost (CPU or chipset) and hardware maintains all system context.
S3/STR	The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a “wake up” event occurs.
Auto	BIOS determines the best mode automatically.

MSI Reminds You...
S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

Recall VGA BIOS at S3 Resuming
Selecting *Enabled* allows BIOS to call VGA BIOS to initialize the VGA card when system wakes up (resumes) from S3 sleep state. The system resume time is shortened when you disable the function, but system will need an AGP driver to initialize the VGA card. Therefore, if the AGP driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3.

Suspend Time Out (Minute)
If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off. Settings: *Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, 50 Min, 60 Min.*

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

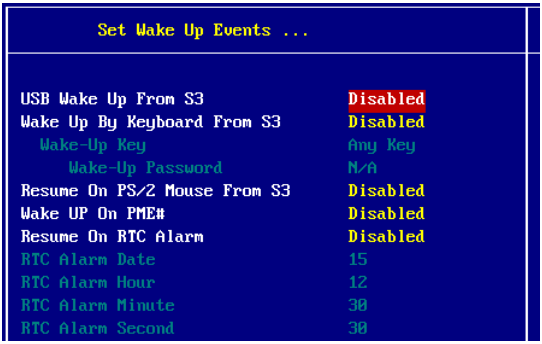
Power Off	The power button functions as normal power off button.
Suspend	When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

After AC Power Lost
This setting 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	Leaves the computer in the power on state.
Last State	Restores the system to the previous status before power failure or interrupt occurred.

Set WakeUp Events

Press <Enter> and the following sub-menu appears.



USB Wake-Up from S3

This item allows the activity of the USB device to wake up the system from S3 (Suspend to RAM) sleep state. Settings: *Enabled*, *Disabled*.

Wake Up By Keyboard From S3

The item specifies how the system will be awakened from power saving mode when input signal of the keyboard is detected. Setting: *Disabled*, *Enabled.*

Wake-Up Key

This setting only works When Wake Up By Keyboard From S3 is set to *Enabled.* This setting specifies how the system will be awakened from power saving mode when input signal of the keyboard is detected. Setting options: *Any Key*, *Specific Key*.

Wake-Up Password

This setting specifies the keyboard wake-up *Password* and works only when the *Wake-Up Key* setting is set to *Specific Key*.

Resume On PS/2 Mouse From S3

The setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 mouse is detected. Setting options: *Disabled*, *Enabled.*

Wake Up On PME#
When setting to *Enabled*, this setting allows your system to be awakened from the power saving modes through any event on PME (Power Management Event). Setting options: *Enabled, Disabled*.

Resume On RTC Alarm
This is used to enable or disable the feature of booting up the system on a scheduled time/date from the S3, S4, and S5 state. Setting options: *Enabled, Disabled*.

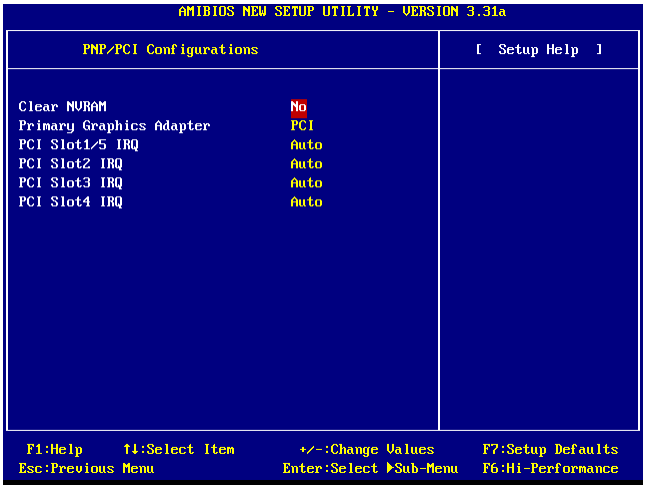
Alarm Date/Hour/Minute/Second
If *Resume By Alarm* is set to *Enabled*, the system will automatically resume (boot up) on a specific date/hour/minute/second specified in these fields. Available settings for each item are:

Alarm Date	*01 ~ 31, Every Day*
Alarm Hour	*00 ~ 23*
Alarm Minute	*00 ~ 59*
Alarm Second	*00 ~ 59*

MSI Reminds You...
If you have changed this setting, you must let the system boot up until it enters the operating system, before this function will work.

PNP/PCI Configurations

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



Clear NVRAM

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 wil reset ESCD NVRAM right after the system is booted up and then set the setting of the item back to *No* automatically.

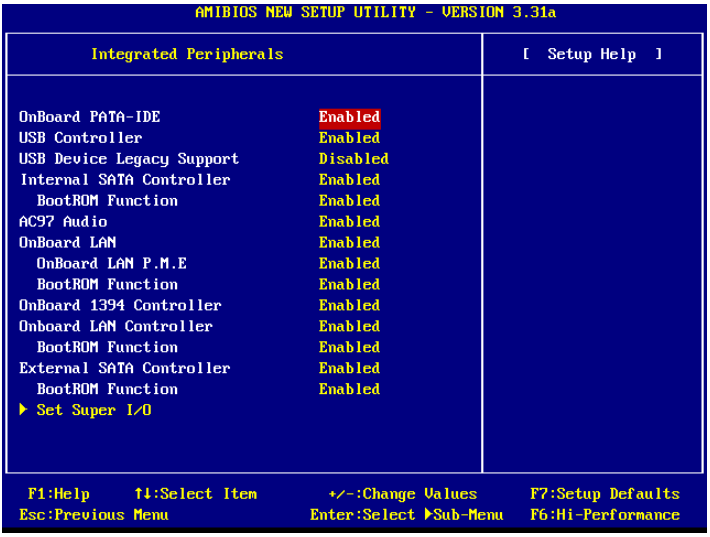
Primary Graphics Adapter

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

PCI Slot1/5 IRQ, PCI Slot2 IRQ, PCI Slot3 IRQ, PCI Slot4 IRQ

These items specify the IRQ line for each PCI slot. Setting options: *3*, *4*, *5*, *7*, *9*, *10*, *11*, *Auto*. Selecting *Auto* allows BIOS to automatically determine the IRQ line for each PCI slot.

Integrated Peripherals



OnBoard PATA-IDE
This setting controls the onboard Parallel ATA IDE controller. Setting options: *Disabled, Enabled.*

USB Controller
This setting is used to enable/disable the onboard USB controller. Setting options: *Disabled*, *Enabled*.

USB Device Legacy Support
Set to *Enabled* if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix. Set to *Disabled* only if you want to use any USB device other than the USB mouse. Setting options: *Disabled, Enabled.*

Internal SATA Controller
This item is used to enable/disable the Internal SATA controllers. Settings: Disabled, Enabled. *Enabled, Disabled.*

Boot ROM Function
This item enables or disables the initialization of the onboard RAID Boot ROMs during bootup. Selecting *Disabled* will speed up the boot process.

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

OnBoard LAN
(Available only when VIA LAN chipset is intergrated)
This setting is used to enable/disable the onboard LAN controller. Setting options: *Disabled*, *Enabled*.

OnBoard LAN P.M.E.
This setting is used to enable/disable the onboard LAN PME (Power Management Event). Setting options: *Disabled*, *Enabled*.

Boot ROM Function
This item enables or disables the initialization of the onboard LAN Boot ROMs during bootup. Selecting *Disabled* will speed up the boot process.

OnBoard 1394 Controller
This setting is used to enable/disable the onboard IEEE 1394 controller. Setting options: *Disabled*, *Enabled*.

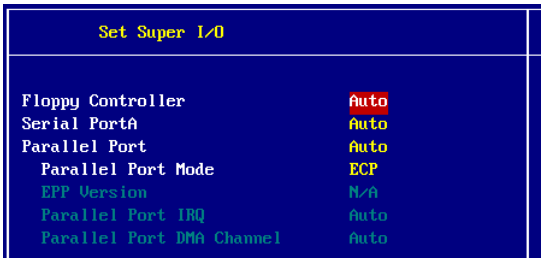
Onboard LAN Controller
(Available only when Realtek LAN chipset is intergrated)
This setting controls the onboard LAN controller. Setting options: *Disabled*, *Enabled*.

Boot ROM Function
This item enables or disables the initialization of the onboard LAN Boot ROMs during bootup. Selecting *Disabled* will speed up the boot process.

External SATA Controller
This item is used to enable/disable the External SATA controllers. Settings: Disabled, Enabled. *Enabled, Disabled*.

Boot ROM Function
This item enables or disables the initialization of the onboard RAID Boot ROMs during bootup. Selecting *Disabled* will speed up the boot process.

Set Super I/O
Press <Enter> and the following sub-menu appears.



Floopy 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. Options: *Auto, Enabled, Disabled*.

Serial PortA
The items specify the base I/O port address and IRQ for the onboard Serial Port A. Selecting *Auto* allows BIOS to automatically determine the correct base I/O port address. Settings: *Auto, Disabled, 3F8/COM1, 2F8/COM2, 3E8/COM3, 2E8/COM4.*

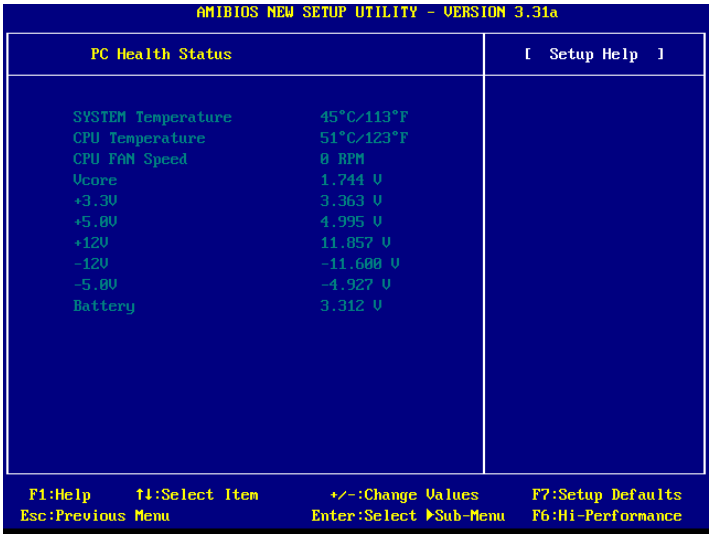
Parallel Port
These items specify the base I/O port addresses of the onboard parallel port. Selecting *Auto* allows AMIBIOS to automatically determine the correct base I/O port address. Settings: *Auto, Disabled, 378, 278, 3BC.*

Parallel Port Mode

Select an operating mode for the onboard parallel (printer) port.
EPP: Enhanced Parallel Port
ECP: Extended Capability Port
Bi-Dir: Extended Capability Port + Enhanced Parallel Port
Note that to operate the onboard parallel port as Standard Parallel Port only, choose "EPP." To operate the onboard parallel port in the EPP mode simultaneously, choose "EPP." By choosing "ECP", the onboard parallel port will operate in ECP mode only. Choosing "Bi-Dir" will allow the onboard parallel port to support both the ECP and EPP modes simultaneously.

PC Health Status

This section shows the status of your CPU, fan, overall system status, etc. Monitor function is available only if there is hardware monitoring mechanism onboard.

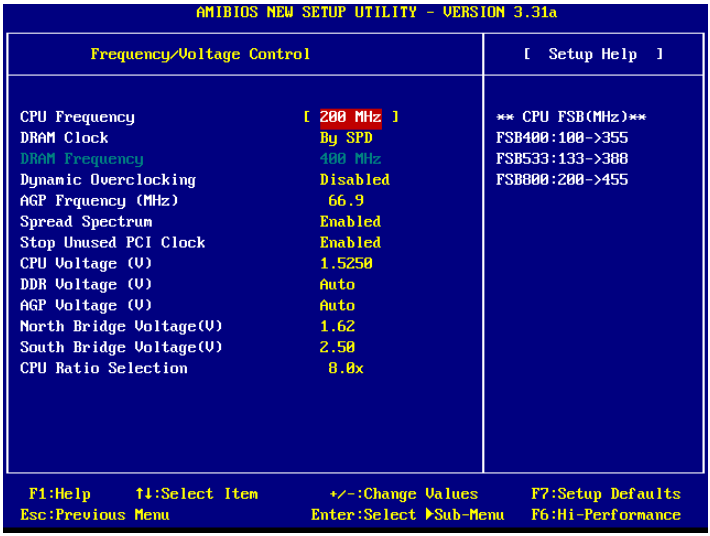


System/CPU Temperature, CPU Fan Speed, Vcore, +3.3V, +5.0V, +12V, -12V, -5.0V, Battery

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

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control.



CPU Frequency

This setting shows the current CPU Front Side Bus clock frequency.

DRAM Clock

Use this field to configure the clock frequency of the installed DRAM. Settings: *By SPD, DDR 266 [3:2], DDR 333 [6:5], DDR 400 [1:1], DDR 433, DDR 450, DDR 466, DDR 500, DDR 533.*

MSI Reminds You...

The value plus a ratio (CPU: DDR) with parentheses means the non-synchronous overclocking.

DRAM Frequency

This setting shows the current frequency of DDR DRAM (read only).

Dynamic OverClocking

Dynamic Overclocking Technology is the automatic overclocking function, included in the MSI™'s newly developed CoreCell™ Technology. It is designed to detect the load balance of CPU while running programs, and to adjust the best CPU frequency automatically. When the motherboard detects that the CPU is running programs, it will speed up CPU automatically to make the program run smoothly and faster. When the CPU is temporarily suspending or staying in the low load balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC need to run huge amount of data like 3D games or the video process, and the CPU frequency need to be boosted up to enhance the overall performance. Setting options:

Disabled	Disable Dynamic Overclocking.
Private	1st level of overclocking.
Sergeant	2nd level of overclocking.
Captain	3rd level of overclocking, also the default value of "Load High Performance Defaults".
Colonel	4th level of overclocking.
General	5th level of overclocking.
Commander	6th level of overclocking.

MSI Reminds You...

1. *Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclocking regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to disable the Dynamic Overclocking or to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, you also need to disable the Dynamic OverClocking first.*
2. *Meanwhile, there are two functions to protect user's system from crash.*
   - *There is a safe key "Ins" in BIOS. In case the overclocking fails, you can press "Ins" key while system rebooting to restore to the BIOS defaults.*
   - *If the system incidentally reboot for four times, the BIOS will also be restored to the defaults.*

AGP Frequency
This item is used to configure the AGP frequency. Settings: From *66.9* to *100.9* at 1 increment.

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

Stop Unused PCI Clock
This item enables or disables the PCI slot clock. Setting options: *Disabled, Enabled.*

CPU Voltage (V)
The setting allows you to adjust the CPU Vcore voltage, which depends on the CPU. Setting options: From minimum *By CPU Default* to maximum*1.6000* at 0.0125 increment.

DDR Voltage(V)
This setting is used to adjust the DRAM core voltage (Vcore), making overclocking possible. Setting options: *Auto, 2.5V* to *2.9V* at 0.05 increment, *2.9V* to *3.3V* at 0.1 increment.

AGP Voltage (V)
AGP voltage is adjustable in the field, allowing you to increase the performance of your AGP display card when overclocking, but the stability may be affected. Setting options: *Auto, 1.5V* to *1.9V* at 0.05 increment, *1.9V* to *2.2V* at 0.1 increment.

North Bridge/South Bridge Voltage (V)
These two items specifie the voltage of North Bridge Voltage and South Bridge Voltage. Settings for North Bridge: *1.62V* to *1.80V at 0.6 increment.* Settings for South Bridge: *2.50V* to *3.00V at 0.5 increment.*

MSI Reminds You...
The settings shown in different color in CPU Voltage, DDR Voltage, AGP Voltage, and North Bridge/South Bridge Voltage help to verify if your setting is proper for your system.

White: Safe setting.
Yellow: High performance setting.
Red: Not recommended setting and the system may be unstable.

*Changing CPU/DDR/AGP/North Bridge/South Bridge Voltage may result in the instability of the system; therefore, it is **NOT** recommended to change the default setting for long-term usage.*

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

Set Supervisor/User Password

When you select this 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.

Additionally, when a password is enabled, you can also have AMIBIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the *Password Check* of the ADVANCED BIOS FEATURES menu. If the *Password Check* is set to *Always*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when you try to enter Setup.

MSI Reminds You...

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.*

Load Optimal/High Performance Defaults

The two options on the main menu allow users to restore all of the BIOS settings to Optimal defaults or High Performance defaults. The Optimal Defaults are the default values also set by the mainboard manufacturer for optimal performance of the mainboard. The High Performance Defaults are the default values set by the mainboard manufacturer for the best system performance but probably will cause a stability issue.

When you select Optimal Performance Defaults, a message as below appears:

Pressing 'Enter' loads the default values that are factory settings for stable system performance.

MSI Reminds You...

The option is for power or overclocking users only*. Use of high performance defaults will tighten most timings to increase the system performance. Therefore, a high-end system configuration is a must, which means you need high-quality VGA adapter, RAM and so on.* ***We don't recommend that users should apply the high performance defaults in their regular systems.*** *Otherwise, the system may become unstable or even crash. If the system crashes or hangs after enabling the feature, please CLEAR CMOS DATA to resolve the problem. For more information, refer to "Clear CMOS Jumper: JBAT1" in Chapter 2.*

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

Pressing 'Enter' loads the default values that enable the best system performance but may lead to a stability issue.

Appendix A:Using 2-, 4- or 6-Channel Audio Function

The mainboard is equipped with Realtek ALC655 chip, which provides support for 6-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC655 allows the board to attach 4 or 6 speakers for better surround sound effect. The section will tell you how to install and use 4-/6-channel audio function on the board.

Installing the Audio Driver

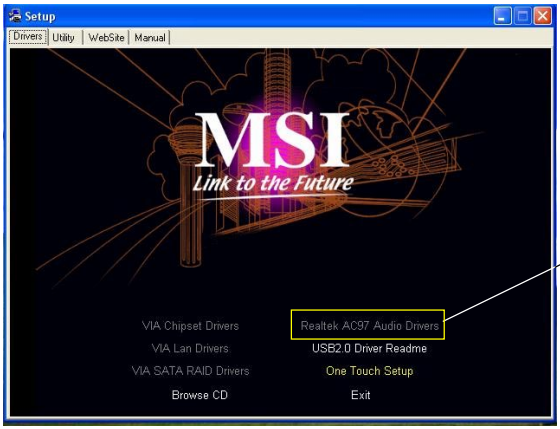
You need to install the driver for Realtek ALC655 chip to function properly before you can get access to 4-/6-channel audio operations. Follow the procedures described below to install the drivers for different operating systems.

Installation for Windows 98SE/ME/2000/XP

For Windows® 2000, you must install Windows® 2000 Service Pack2 or later before installing the driver.

The following illustrations are based on Windows® XP environment and could look slightly different if you install the drivers in different operating systems.

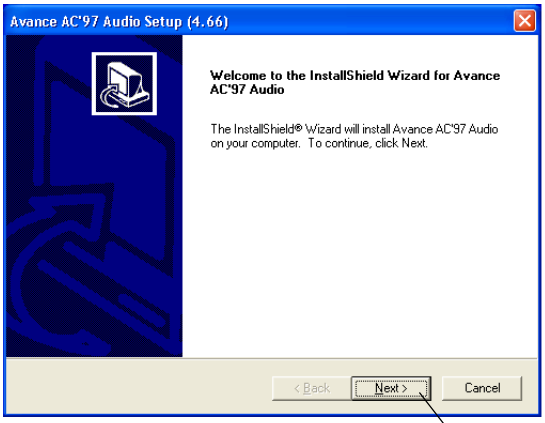
1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click **Realtek AC97 Audio Drivers**.



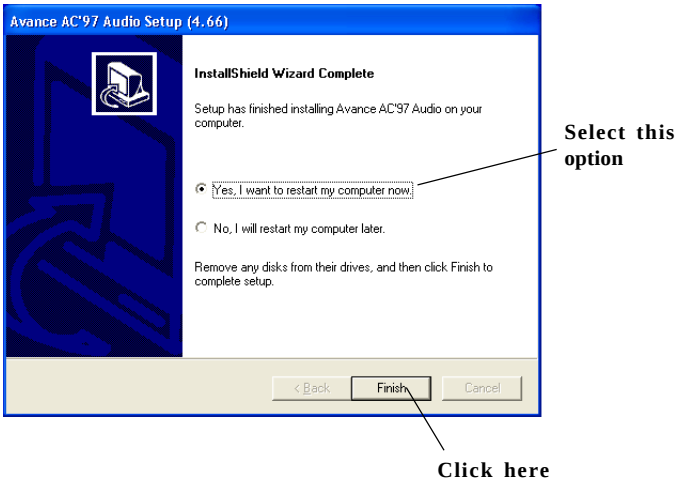
MSI Reminds You...

*The **AC97 Audio Configuration** software utility is under continuous update to enhance audio applications. Hence, the program screens shown here in this appendix may be slightly different from the latest software utility and shall be held for reference only.*

3 Click Next to install the AC'97 Audio software.



4 Click Finish to restart the system.

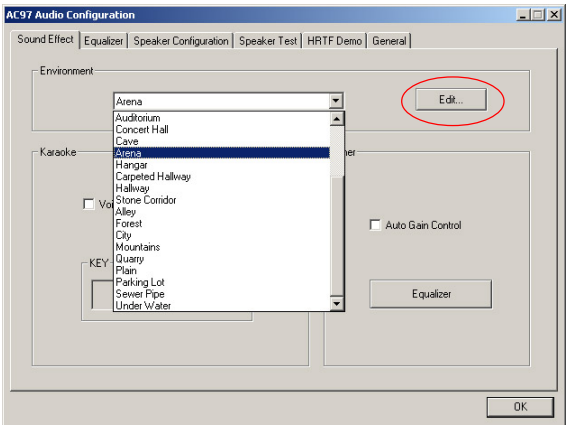


Software Configuration

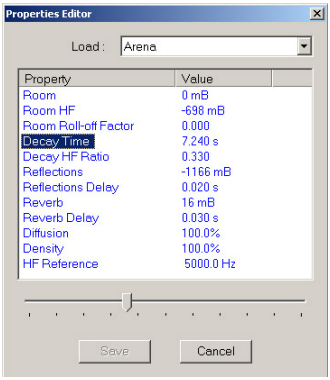
After installing the audio driver, you are able to use the 4-/6-channel audio feature now. Click the audio icon from the window tray at the lower-right corner of the screen to activate the **AC97 Audio Configuration**.

Sound Effect

Here you can select a sound effect you like from the **Environment** list.

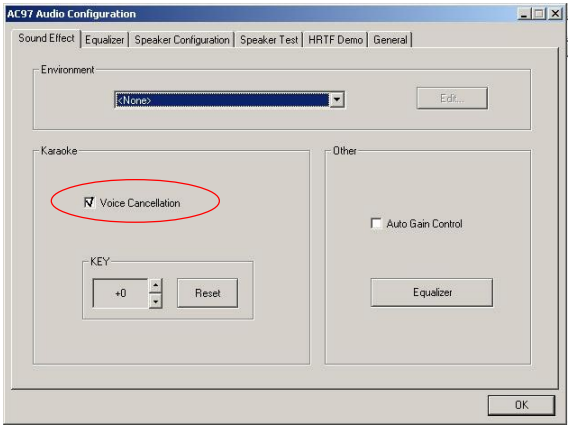


You may also edit the properties for an environment as you wish by clicking the **Edit** button, then just scroll the bar in the bottom for each property to adjust.



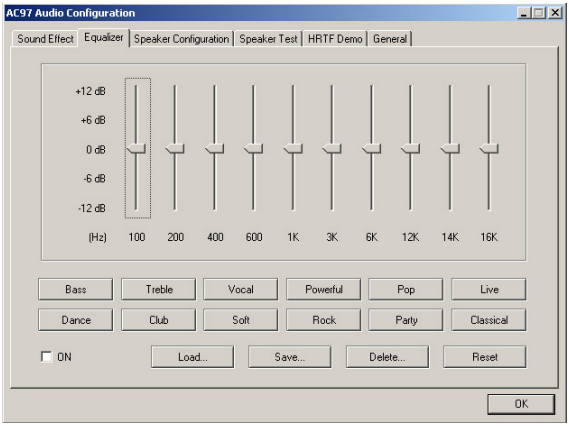
Here it provides the Karaoke function which will automatically remove human voice (lyrics) and leave melody for you to sing the song. Note that this function applies only for 2-channel audio operation.

Just check the **Voice Cancellation** box and then click **OK** to activate the Karaoke function.

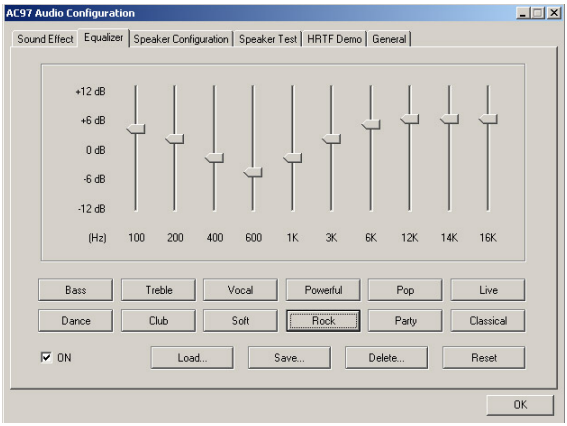


Equalizer

Here you regulate each equalizer for current playing digital sound sources.



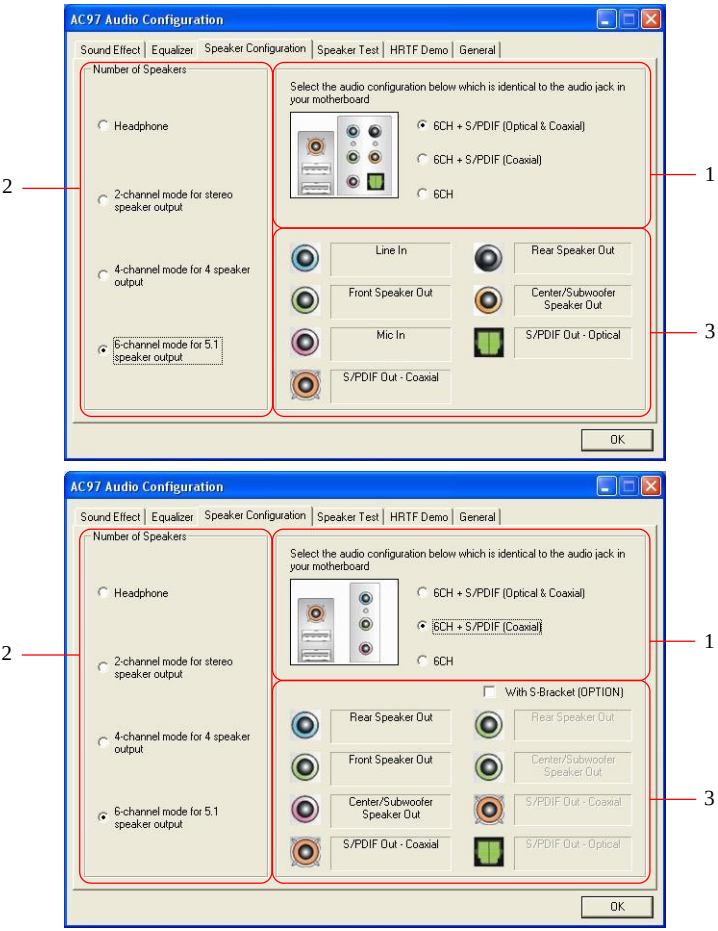
You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as an new one by using the buttons **Load** and **Save**. Or you may click **Reset** to use the default value.



Speaker Configuration

In this tab, you can easily configure your multi-channel audio function and speakers.

1. This mainboard provide two different kinds of audio jacks combination. According to the mainboard to select the proper audio configuration below which is identical to the audio jack in your mainboard. For this K8T Neo mainboard, you will have to choose **6CH + S/PDIF (Optical & Coaxial)** or **6CH + S/PDIF (Coaxial)**.



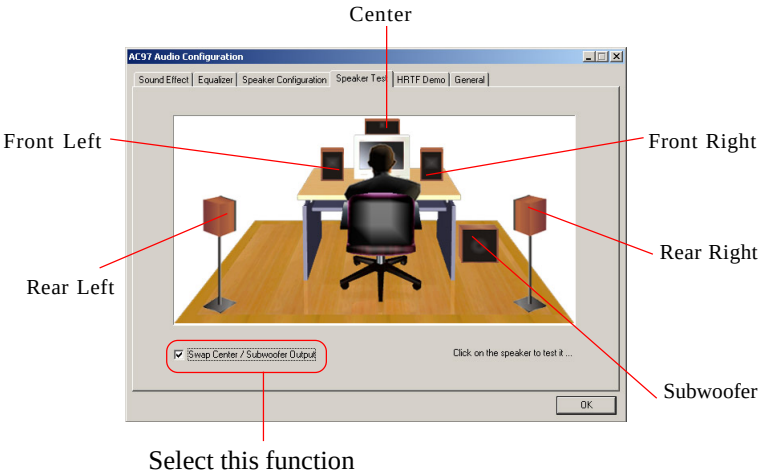
2. Select a desired multi-channel operation from ***Number of Speaker***.
   a. Headphone for the common headphone
   b. 2-Channel Mode for Stereo-Speaker Output
   c. 4-Channel Mode for 4-Speaker Output
   d. 6-Channel Mode for 5.1-Speaker Output

3. Here it shows the multi-channel setting for the audio jack. Please connect your speakers to the correct phone jack in accordance with the setting displayed here.

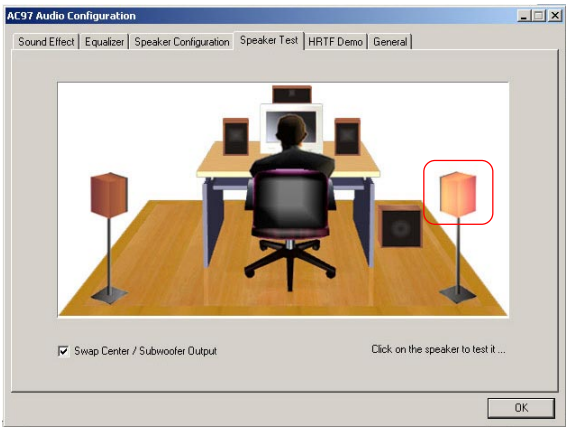
4. Then click **OK** to apply the configuration.

Speaker Test

You can use this tab to test each connected speaker to ensure if 4- or 6-channel audio operation works properly. If any speaker fails to make sound, then check whether the cable is inserted firmly to the connector or replace the bad speakers with good ones.



Select the speaker by clicking it to test its functionality. The one you select will light up and make testing sound.

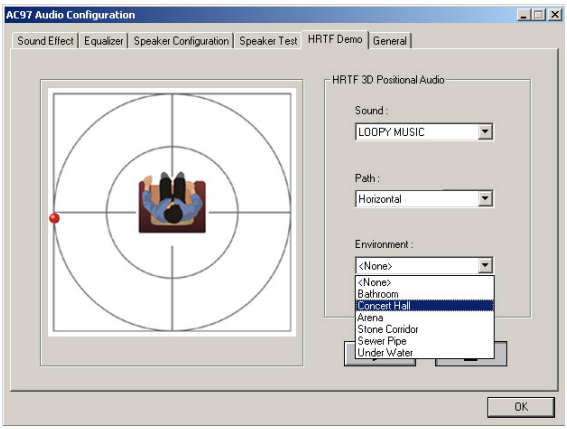


MSI Reminds You...

1. *6 speakers appear on the "Speaker Test" tab only when you select "**6-Channel Mode**" in the "Number of Speakers" column in "Speaker Configuration" tab. If you select "4-Channel Mode", only 4 speakers appear on the window.*
2. *While you are testing the speakers in 6-Channel Mode, if the sound coming from the center speaker and subwoofer is swapped, you should select **Swap Center/Subwoofer Output** to readjust these two channels.*

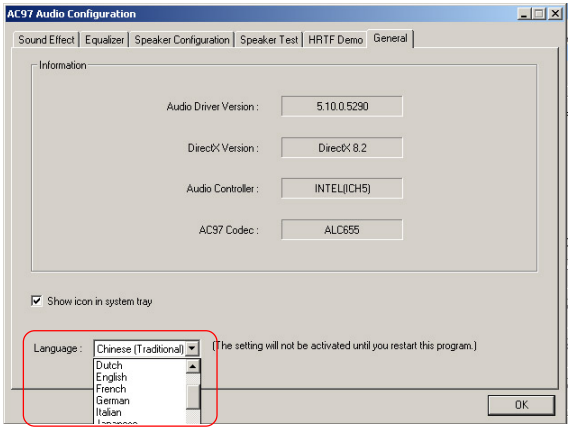
HRTF Demo

In this tab you may adjust your HRTF (Head Related Transfer Functions) 3D positional audio before playing 3D audio applications like gaming. You may also select different environment to choose the most suitable environment you like.



General

In this tab it provides some information about this AC97 Audio Configuration utility, including Audio Driver Version, DirectX Version, Audio Controller & AC97 Codec. You may also select the language of this utility by choosing from the **Language** list.



Using 2-, 4- & 6- Channel Audio Function

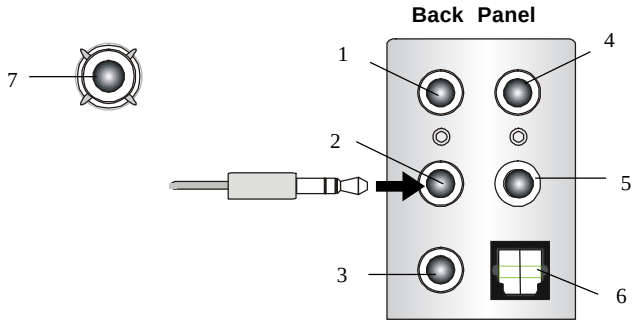
MSI Reminds You...
This mainboard provide two different kinds of audio jacks combination. According to the mainboard to select the proper audio configuration below.

6CH + S/PDIF (Optical & Coaxial)

Connecting the Speakers

When you have set the Multi-Channel Audio Function mode properly in the software utility, connect your speakers to the correct phone jacks in accordance with the setting in software utility.

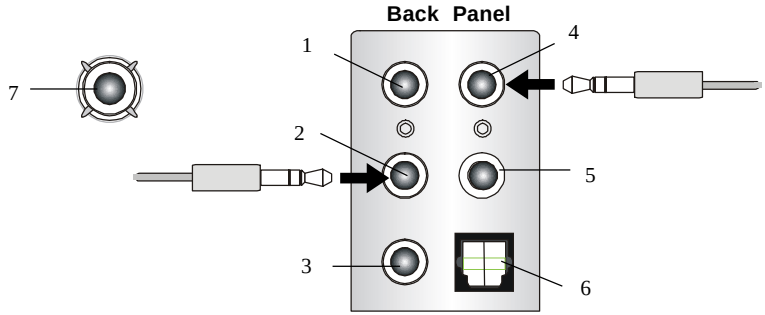
- **2-Channel Mode for Stereo-Speaker Output**
  Refer to the following diagram and caption for the function of each phone jack on the back panel when 2-Channel Mode is selected.



1 Line In
2 Line Out *(Front channels)*
3 MIC
4 Line Out *(Rear channels, but no functioning in this mode)*
5 Line Out *(Center and Subwoofer channel, but no functioning in this mode)*
6 SPDIF Out Optical jack
7 SPDIF Out Coaxial jack

■ **4-Channel Mode for 4-Speaker Output**

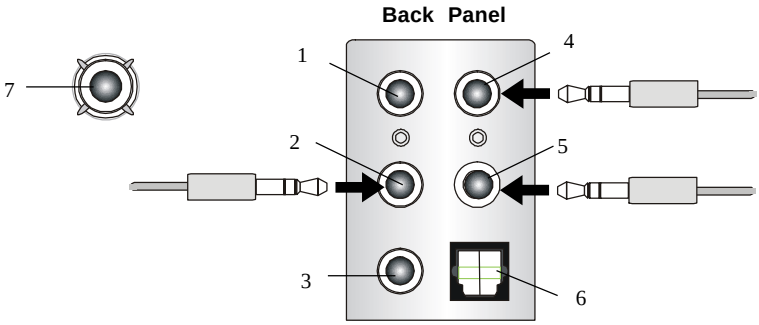
Refer to the following diagram and caption for the function of each phone jack on the back panel when 4-Channel Mode is selected.



1 Line In
2 Line Out *(Front channels)*
3 MIC
4 Line Out *(Rear channels)*
5 Line Out *(Center and Subwoofer channel, but no functioning in this mode)*
6 SPDIF Out Optical jack
7 SPDIF Out Coaxial jack

■ **6-Channel Mode for 4-Speaker Output**

Refer to the following diagram and caption for the function of each phone jack on the back panel when 6-Channel Mode is selected.



1 Line In
2 Line Out *(Front channels)*
3 MIC
4 Line Out *(Rear channels)*
5 Line Out *(Center and Subwoofer channel)*
6 SPDIF-Out Optical jack
7 SPDIF-Out Coaxial jack

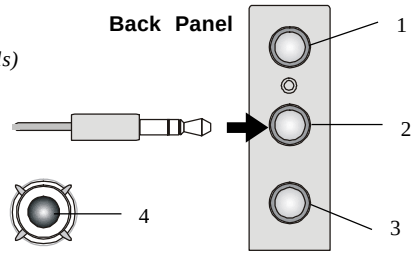
6CH + S/PDIF (Coaxial)

Connecting the Speakers

When you have set the Multi-Channel Audio Function mode properly in the software utility, connect your speakers to the correct phone jacks in accordance with the setting in software utility.

- **2-Channel Mode for Stereo-Speaker Output**
  Refer to the following diagram and caption for the function of each phone jack on the back panel when 2-Channel Mode is selected.

1 Line In
2 Line Out *(Front channels)*
3 MIC
4 SPDIF Coaxial jack

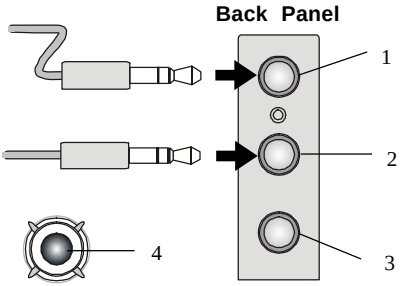


- **4-Channel Mode for 4-Speaker Output**
  The audio jacks on the back panel always provide 2-channel analog audio output function, however these audio jacks can be transformed to 4- or 6-channel analog audio jacks by selecting the corresponding multi-channel operation from **No. of Speakers**.

  Refer to the following diagram and caption for the function of each jack on the back panel when 4-Channel Mode is selected.

1 *Line Out *(Rear channels)*
2 Line Out *(Front channels)*
3 MIC
4 SPDIF Coaxial jack

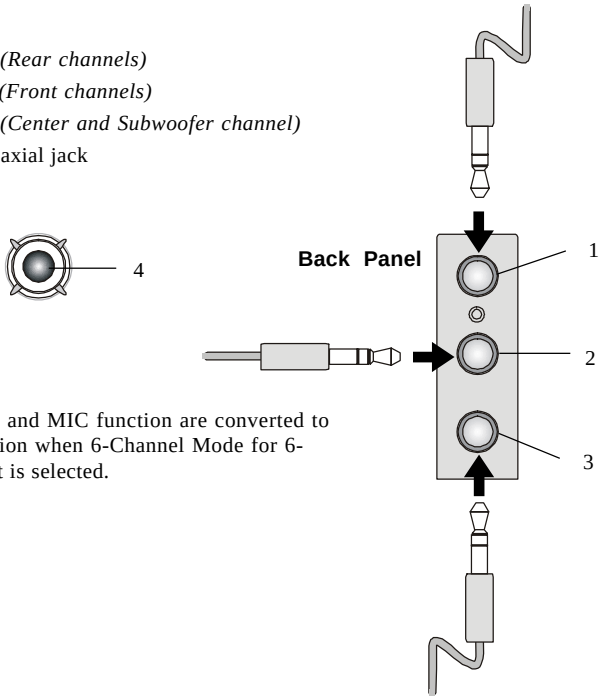
* Line In function is converted to Line Out function when 4-Channel Mode for 4-Speaker Output is selected.



■ 6-Channel Mode for 6-Speaker Output

Refer to the following diagram and caption for the function of each jack on the back panel when 6-Channel Mode is selected.

1 * Line Out *(Rear channels)*
2 Line Out *(Front channels)*
3 * Line Out *(Center and Subwoofer channel)*
4 SPDIF Coaxial jack



* Both Line In and MIC function are converted to Line Out function when 6-Channel Mode for 6-Speaker Output is selected.

MSI Reminds You...

If the audio signals coming from the Center and Subwoofer speaker are swapped when you play video or music on the computer, a converter may be required to exchange center and subwoofer audio signals. The converter can be purchased from a speaker store.

Appendix B: VIA VT8237 Serial ATA RAID Introduction

The Southbridge VT8237 provides a hybrid solution that combines two independent SATA ports for support of up to two Serial ATA (Serial ATA RAID) drives.

Serial ATA (SATA) is the latest generation of the ATA interface. SATA hard drives deliver blistering transfer speeds of up to 150MB/sec. Serial ATA uses long, thin cables, making it easier to connect your drive and improving the airflow inside your PC.

The key features of VT8237 SATA RAID are:

1. Support two SATA + two PATA hard disk drives.
2. Only SATA supports RAID.
3. Supports ATA 133 high performance hard disk drive.
4. Dual independent ATA channels and maximum connection of four hard disk drives allowed.
5. Supports Ultra DMA mode 6/5/4/3/2/1/0, DMA mode 2/1/0, and PIO mode 4/3/2/1/0.
6. Supports RAID 0 and RAID 1.
7. 4 KB to 64 KB striping block size support.
8. Bootable disk or disk array support.
9. Windows-based RAID configure and management software tool. (Compatible with BIOS)
10. Supports hot-swap failed disk drive in RAID 1 array.
11. ATA SMART function support.
12. Microsoft Windows 98, Me, NT4.0, 2000, XP operating systems support.
13. Event log for easy troubleshooting.

Introduction

This section gives a brief introduction on the RAID-related background knowledge and a brief introduction on VIA SATA RAID Host Controller. For users wishing to install their VIA SATA RAID driver and RAID software, proceed to **Driver and RAID Software Installation** section.

RAID Basics

RAID (Redundant Array of Independent Disks) is a method of combining two or more hard disk drives into one logical unit. The advantage of an Array is to provide better performance or data fault tolerance. Fault tolerance is achieved through data redundant operation, where if one drives fails, a mirrored copy of the data can be found on another drive. This can prevent data loss if the operating system fails or hangs. The individual disk drives in an array are called “members”. The configuration information of each member is recorded in the “reserved sector” that identifies the drive as a member. All disk members in a formed disk array are recognized as a single physical drive to the operating system.

Hard disk drives can be combined together through a few different methods. The different methods are referred to as different RAID levels. Different RAID levels represent different performance levels, security levels and implementation costs. The RAID levels which the VIA VT8237 SATA RAID Host Controller supports are RAID 0 and RAID 1. The table below briefly introduced these RAID levels.

RAID Level	No. of Drives	Capacity	Benefits
RAID 0 (Striping)	2	Number drives * 2	Highest performance without data protection
RAID 1 (Mirroring)	2	Smallest size	Data protection

RAID 0 (Striping)

RAID 0 reads and writes sectors of data interleaved between multiple drives. If any disk member fails, it affects the entire array. The disk array data capacity is equal to the number of drive members times the capacity of the smallest member. The striping block size can be set from 4KB to 64KB. RAID 0 does not support fault tolerance.

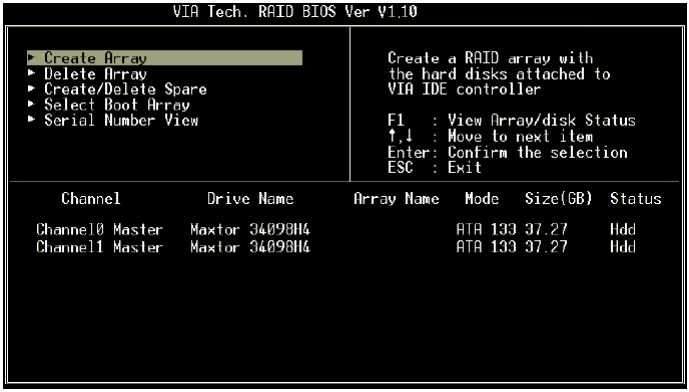
RAID 1 (Mirroring)

RAID 1 writes duplicate data onto a pair of drives and reads both sets of data in parallel. If one of the mirrored drives suffers a mechanical failure or does not respond, the remaining drive will continue to function. Due to redundancy, the drive capacity of the array is the capacity of the smallest drive. Under a RAID 1 setup, an extra drive called the .spare drive. can be attached. Such a drive will be activated to replace a failed drive that is part of a mirrored array. Due to the fault tolerance, if any RAID 1 drive fails, data access will not be affected as long as there are other working drives in the array.

BIOS Configuration

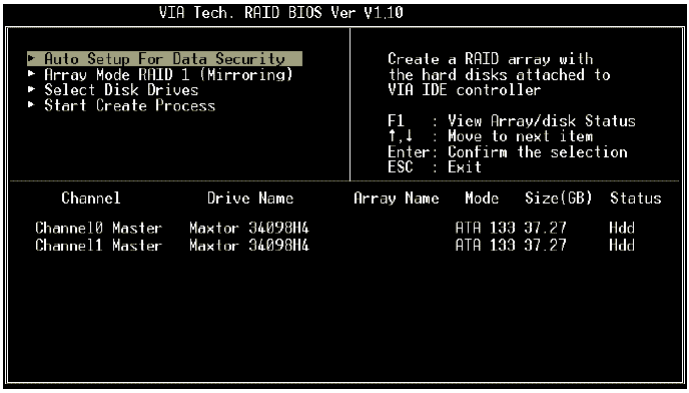
When the system powers on during the POST (Power-On Self Test) process, press <Tab> key to enter the BIOS configuration.

The Serial ATA RAID volume may be configured using the VIA Tech. RAID BIOS. Always use the arrow keys to navigate the main menu, use up and down arrow key to select the each item and press <Enter> to call out the list of creation steps. The main interface of BIOS configuration utility is as below:



Create Disk Array

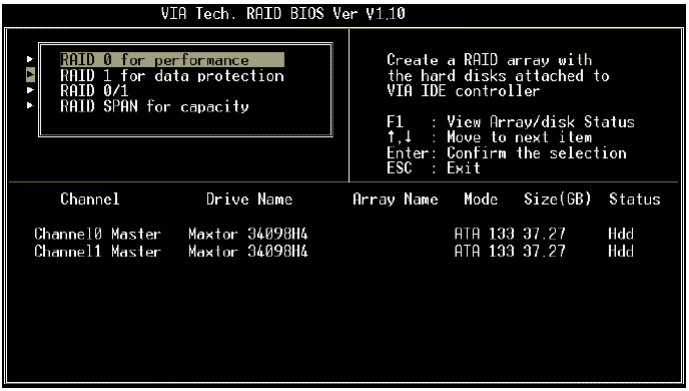
Use the up and down arrow keys to select the **Create Array** command and press <Enter>.



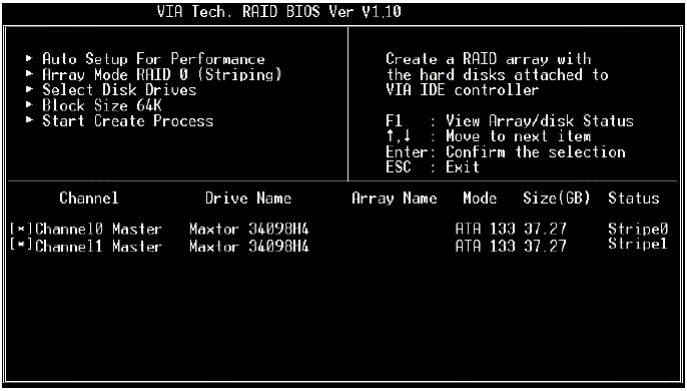
MSI Reminds You...

The "Channel", "Drive Name", "Mode" and "Size (GB)" in the following example might be different from your system.

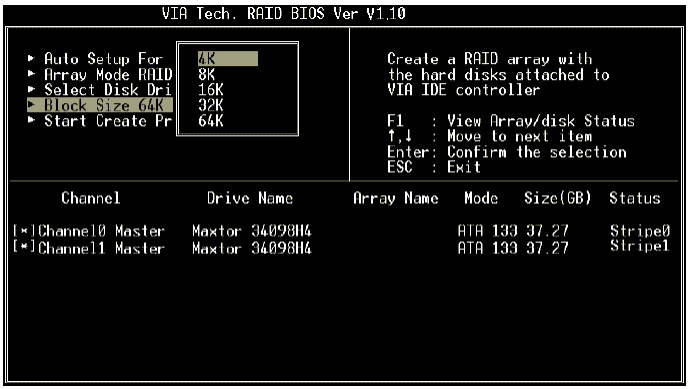
Select **Array Mode** and press <Enter>, a list of array modes will appear. Highlight the target array mode that you want to create, and press <Enter> to confirm the selection. If RAID 1 or RAID 0/1 is selected, an option list will popup and enable the users to select **Create only** or **Create and duplicate**. **Create only** will allow BIOS to only create an array. The data on the mirroring drive may be different from the source drive. **Create and duplicate** lets BIOS copy the data from the source to the mirroring drive.



After array mode is selected, there are two methods to create a disk array. One method is "**Auto Setup"** and the other one is "**Select Disk Drives"**. **Auto Setup** allows BIOS to select the disk drives and create arrays automatically, but it does not duplicate the mirroring drives even if the user selected **Create and duplicate** for RAID 1. It is recommended all disk drives are new ones when wanting to create an array. **Select Disk Drives** lets the user select the array drives by their requirements. When using **Select Disk Drives**, the channel column will be activated. Highlight the target drives that you want to use and press <Enter> to select them. After all drives have been selected, press <Esc> to go back to the creation steps menu.



If user selects a RAID 0 array in step 2, the block size of the array can also be selected. Use the arrow key to highlight **Block Size** and press <Enter>, then select a block size from the popup menu. The block size can be 4KB to 64KB.



MSI Reminds You...

Even though 64KB is the recommended setting for most users, you should choose the block size value which is best suited to your specific RAID usage model.

***4KB**: For specialized usage models requiring 4KB blocks*
***8KB**: For specialized usage models requiring 8KB blocks*
***16KB**: Best for sequential transfers*
***32KB**: Good for sequential transfers*
***64KB**: Optimal setting*

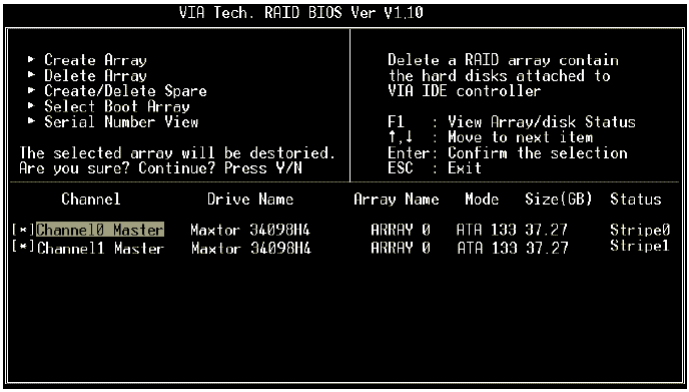
Use the arrow key to highlight **Start Create Process** and press <Enter>. A warning message will appear, Press **Y** to finish the creation, or press **N** to cancel the creation.

Important note: All existing content in the hard drive will be destroyed after array creation.

Delete Disk Array

A RAID can be deleted after it has been created. To delete a RAID, use the following steps:

1. Select **Delete Array** in the main menu and press <Enter>. The channel column will be activated.
2. Select the member of an array that is to be deleted and press <Enter>. A warning message will show up, press Y to delete or press N to cancel.



Deleting a disk array will destroy all the data on the disk array except RAID 1 arrays. When a RAID is deleted, the data on these two hard disk drives will be reserved and become two normal disk drives.

Create and Delete Spare Hard Drive

If a RAID 1 array is created and there are drives that do not belong to other arrays, the one that has a capacity which is equal to or greater than the array capacity can be selected as a spare drive for the RAID 1 array. Select **Create/Delete Spare** and press <Enter>, the channel column will then be activated. Select the drive that you want to use as a spare drive and press <Enter>, the selected drive will be marked as **Spare**. The spare drive cannot be accessed in an OS.

To delete a spare drive, highlight **Create/Delete Spare** and press <Enter>. The spare drive will be highlighted, press <Enter> to delete the spare drive.

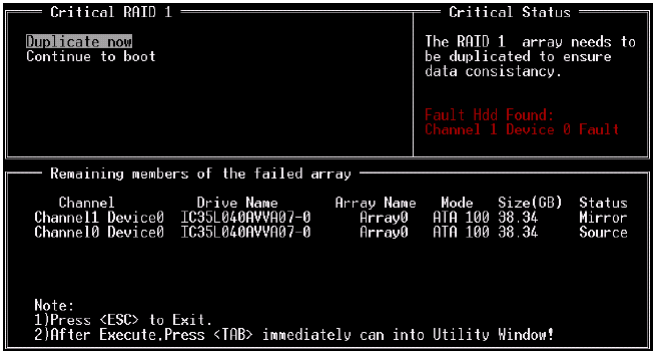
View Serial Number of Hard Drive

Highlight **Serial Number View** and press <Enter>. Use arrow key to select a drive, the selected drive's serial number can be viewed in the last column. The serial number is assigned by the disk drive manufacturer.

Press the **F1** key to show the array status on the lower screen. If there are no disk arrays then nothing will be displayed on the screen.

Duplicate Critical RAID 1 Array

When booting up the system, BIOS will detect if the RAID 1 array has any inconsistencies between user data and backup data. If BIOS detects any inconsistencies, the status of the disk array will be marked as critical, and BIOS will prompt the user to duplicate the RAID 1 in order to ensure the backup data consistency with the user data.



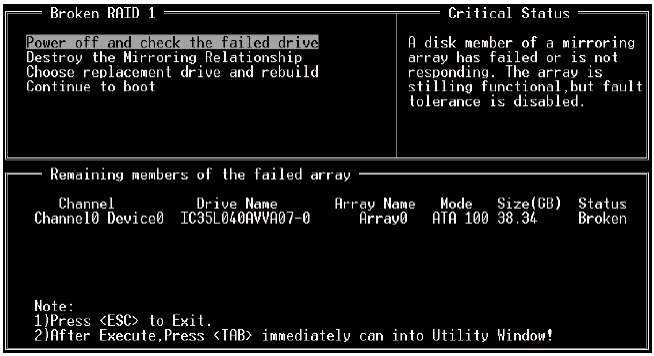
If user selects **Continue to boot,** it will enable duplicating the array after booting into OS.

Rebuild Broken RAID 1 Array

When booting up the system, BIOS will detect if any member disk drives of RAID has failed or is absent. If BIOS detects any disk drive failures or missing disk drives, the status of the array will be marked as broken.

If BIOS detects a broken RAID 1 array but there is a spare hard drive available for rebuilding the broken array, the spare hard drive will automatically become the mirroring drive. BIOS will show a main interface just like a duplicated RAID 1. Selecting **Continue to boot** enables the user to duplicate the array after booting into operating system.

If BIOS detects a broken RAID 1 array but there is no spare hard drive available for rebuilding the array, BIOS will provide several operations to solve such problem.



1. Power off and Check the Failed Drive:

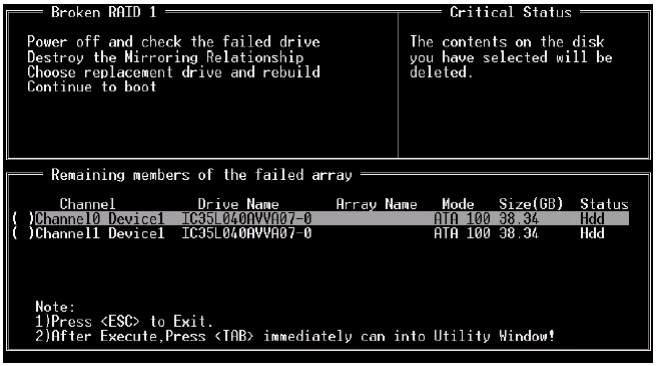
This item turns off the computer and replaces the failed hard drive with a good one. If your computer does not support APM, you must turn off your computer manually. After replacing the hard drive, boot into BIOS and select **Choose replacement drive and rebuild** to rebuild the broken array.

2. Destroy the Mirroring Relationship:

This item cancels the data mirroring relationship of the broken array. For broken RAID 1 arrays, the data on the surviving disk will remain after the destroy operation. However, **Destroy the Mirroring Relationship** is not recommend because the data on the remaining disk will be lost when the hard drive is used to create another RAID 1 array.

3. Choose Replacement Drive and Rebuild:

This item enables users to select an already-connected hard drive to rebuild the broken array. After choosing a hard drive, the channel column will be activated.



Highlight the target hard drive and press <Enter>, a warning message will appear. Press **Y** to use that hard drive to rebuild, or press **N** to cancel. Please note selecting option **Y** will destroy all the data on the selected hard drive.

4. Continue to boot:

This item enables BIOS to skip the problem and continue booting into OS.

Installing RAID Software & Drivers

Install Driver in Windows OS

➤ **New Windows OS (2000/XP/NT4) Installation**

The following details the installation of the drivers while installing Windows XP.

1. Start the installation:
Boot from the CD-ROM. Press **F6** when the message "Press F6 if you need to install third party SCSI or RAID driver" appears.

2. When the Windows Setup window is generated, press **S** to specify an Additional Device(s).

3. Insert the driver diskette ***VIA VT6420/VT8237 Disk Driver*** into drive A: and press <Enter>.

4. Depending on your operation system, choose ***VIA Serial ATA RAID Controller(Windows XP)***, ***VIA Serial ATA RAID Controller(Windows 2000)*** or ***VIA Serial ATA RAID Controller(Windows NT4)*** from the list that appears on Windows XP Setup screen, press the <Enter> key.

5. Press <Enter> to continue with installation or if you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, press <Enter> to continue with installation.

6. From the Windows XP Setup screen, press the <Enter> key. Setup will now load all device files and then continue the Windows XP installation

➤ **Existing Windows XP Driver Installation**

1. Insert the MSI CD into the CD-ROM drive.
2. The CD will auto-run and the setup screen will appear.
3. Under the Driver tab, click on ***VIA SATA RAID Utility***.
4. The drivers will be automatically installed.

➤ **Confirming Windows XP Driver Installation**

1. From Windows XP, open the **Control Panel** from **My Computer** followed by the System icon.

2. Choose the **Hardware** tab, then click the **Device Manager** tab.

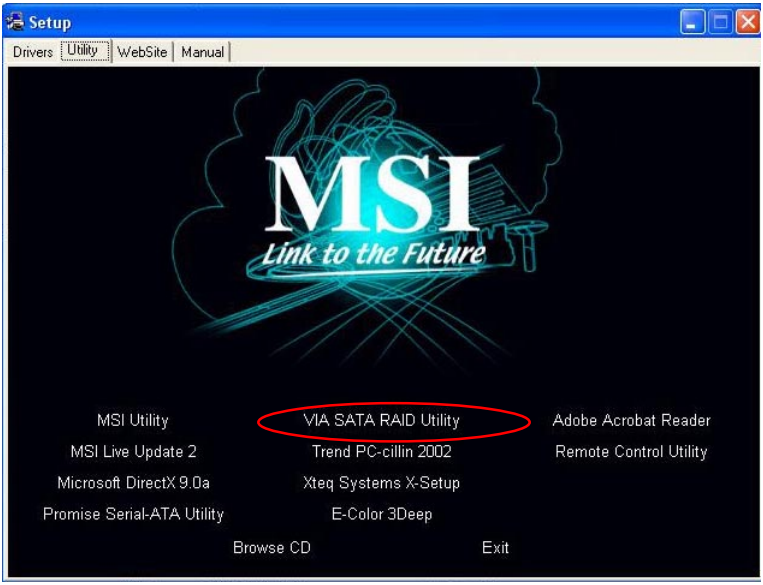
3. Click the "+" in front of the **SCSI and RAID Controllers** hardware type. The driver ***VIA IDE RAID Host Controller*** should appear.

Installation of VIA SATA RAID Utility

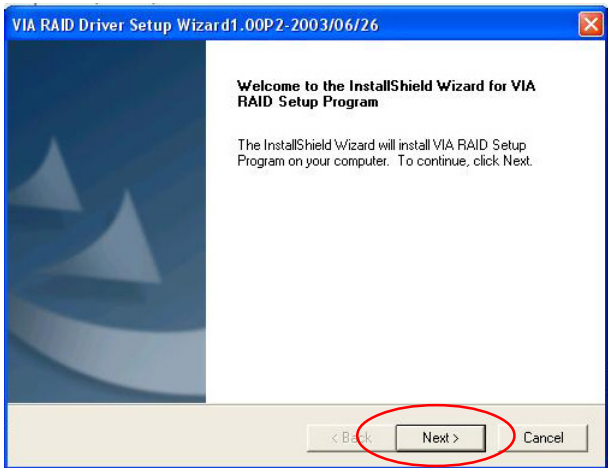
The VIA SATA RAID Utility is the software package that enables high-performance RAID 0 arrays in the Windows* XP operating system. This version of VIA SATA RAID Utility contains the following key features:

- ➤ Serial ATA RAID driver for Windows XP
- ➤ VIA SATA RAID utility
- ➤ RAID0 and RAID1 functions

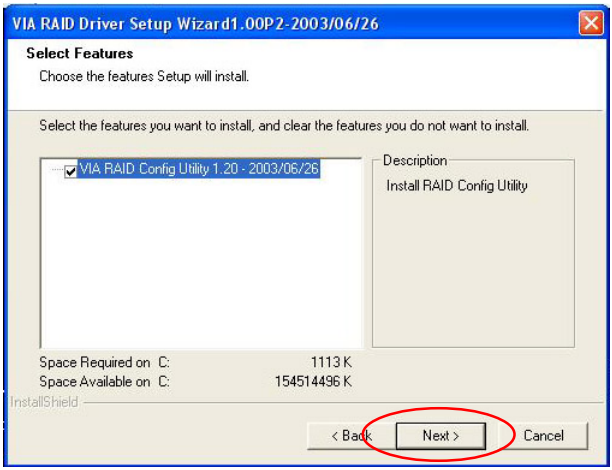
Insert the MSI CD and click on the **VIA SATA RAID Utility** to install the software.



The **InstallShield Wizard** will begin automatically for installation. Click on the **Next** button to proceed the installation in the welcoming window.

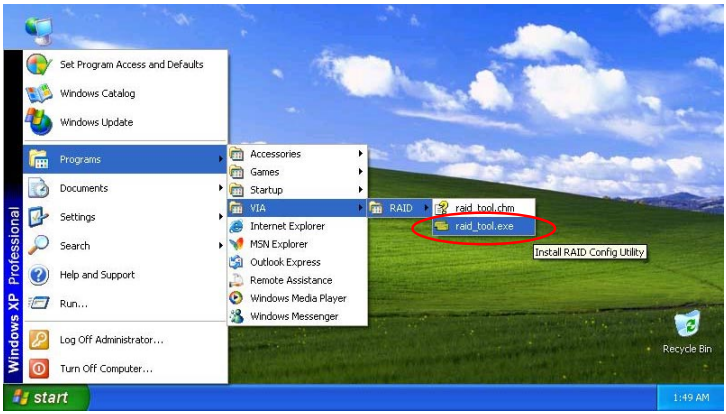


Put a check mark in the check box to install the feature you want. Then click **Next** button to proceed the installation.



Using VIA RAID Tool

Once the installation is complete, go to **Start** ---> **Programs** --->**VIA** ---->**raid_tool.exe** to enable **VIA RAID Tool**.



After the software is finished installation, it will automatically started every time Windows is initiated. You may double-click on the icon shown in the system tray of the tool bar to launch the **VIA RAID Tool** utility.

The main interface is divided into two windows and the toolbar above contain the main functions. Click on these toolbar buttons to execute their specific functions. The left windowpane displays the controller and disk drives and the right windowpane displays the details of the controller or disk drives. The available features are as following:


View by Controller

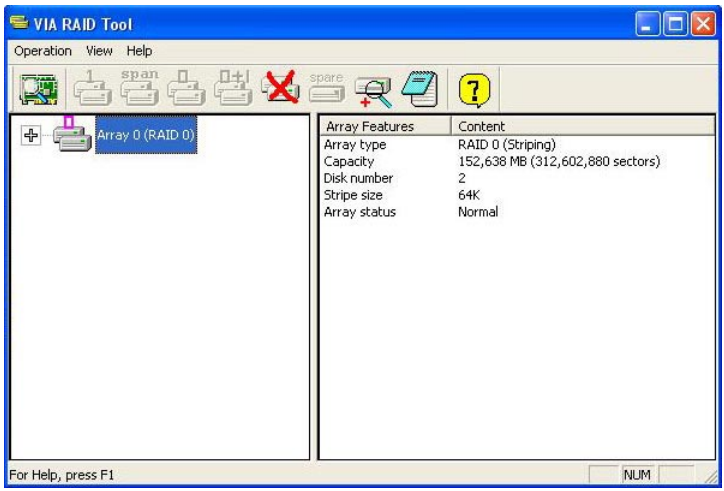

View by Devices


View Event log

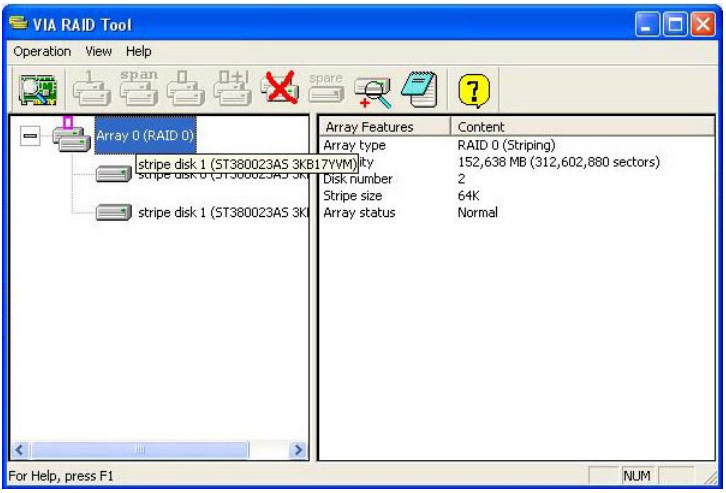

Help Topics

It means that VT8237 SATA RAID only has the feature of monitoring the statuses of RAID 0 and RAID 1.

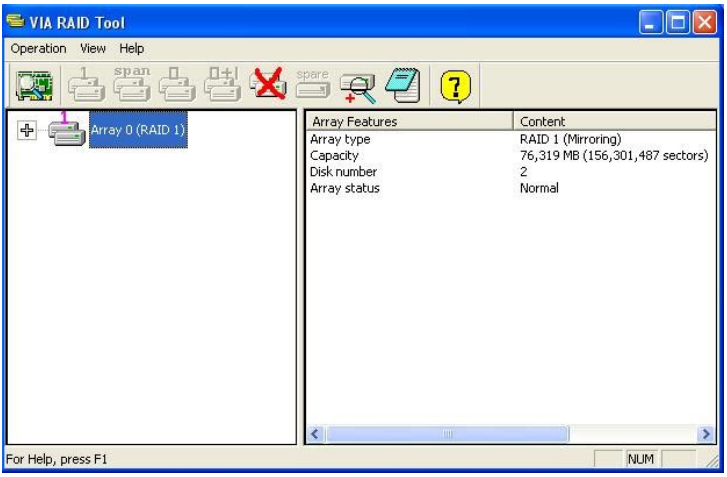
Click on  o r  button to determine the viewing type of left window pane. There are two viewing types: By controllers and by device. Click on the object in the left window pane to display the status of the object in the right windowpane. The following screen shows the status of Array 0---RAID 0.



Click on the plus (+) symbol next to Array 0---RAID 0 to see the details of each disk.



You may also use the same  o r  button to view the statuses of Array 0---RAID 1.



Click on the plus (+) symbol next to Array 0---RAID 1 to see the details of each disk.