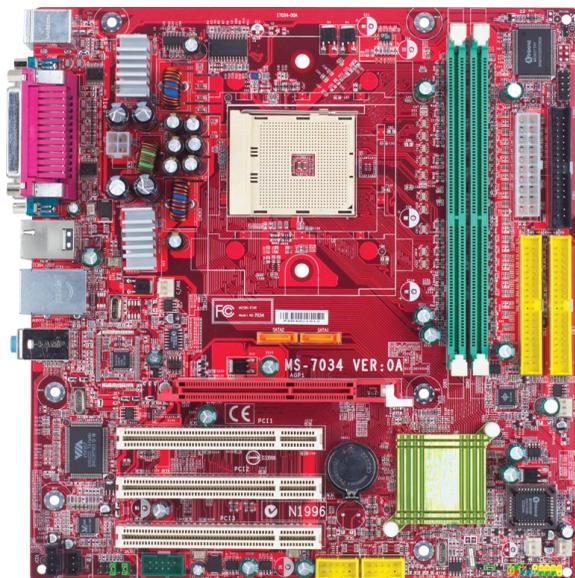




K8NM Series
MS-7034 (v1.X) M-ATX Mainboard



G52-M7034X3

Manual Rev: 1.2

Release Date: July 2004



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.

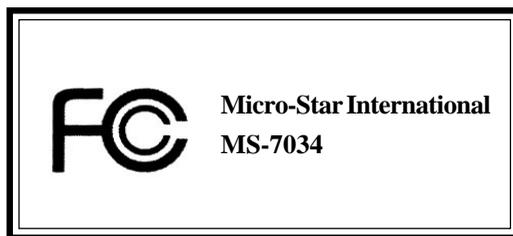
Notice 1

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.



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation

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Revision History

Revision	Revision History	Date
V1.0	First release for PCB 1.X with NVIDIA nForce3 250 Gb	June 2004
V1.1	Multi language (English/French/Germany)	July 2004
V1.2	Update chipset contents	July 2004

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 homepage & FAQ site for technical guide, BIOS updates, driver updates, and other information: <http://www.msi.com.tw> & http://www.msi.com.tw/program/service/faq/faq_esc_faq_list.php
- 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°C (140°F), it may damage the equipment.**



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

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Getting Started

Thank you for choosing the **K8NM** (MS-7034) v1.X Micro ATX mainboard. The **K8NM** mainboard is based on **NVIDIA® nForce™3 250** chipset for optimal system efficiency. Designed to fit the advanced **AMD® K8 Athlon 64** processor, the **K8NM** mainboard delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

- Supports 64-bit Athlon64 (Socket-754) for AMD K8 Athlon™ processor up to 3700+.

(For the latest information about CPU, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_cpu_support.php)

Chipset

- NVIDIA nForce3 250
 - HyperTransport link to the AMD Athlon 64 CPU
 - HyperTransport @ 800MHz, running at up to 6400MB/s
 - AGP3.0 8X interface at 533 MT/s (million transfers per second)
 - Two independent SATA controllers
 - Dual Fast ATA-133 IDE controllers

Main Memory

- Supports 266/333/400 DDR, using two 184-pin DDR DIMMs
- Supports a maximum memory size up to 2GB
- Supports 2.5v DDR SDRAM DIMM

(For the updated supporting memory modules, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_trp_list.php.)

Slots

- One AGP (Accelerated Graphics Port) slot
 - AGP specification compliant
 - Supports AGP 3.0 8x
- Three 32-bit Master PCI Bus slots
- Support 3.3V/5V PCI bus Interface

On-Board IDE

- An IDE controller on the nVIDIA® nForce3 250 MCP chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 66/100/133 operation modes
- Can connect up to 4 IDE devices
- One SATA controller, supporting 2 drives in master mode

USB Interface

- 8 USB ports
 - Controlled by nForce3 250
 - 4 ports in the rear I/O, 4 ports via the external bracket

Ethernet

- Integrated NVIDIA MAC for 10/100BASE-T Ethernet via Realtek 8201 CL PHY
- Realtek 8110S single chip for Gigabit Ethernet (Optional)

IEEE 1394 (Optional)

- On-Board Peripherals include:
 - Supports up to 2 * 1394 ports (Realx1/ Frontx1) via VIA6307 single chip.

Audio

- Chip integrated (5.1 ch H/W AC97 audio) via Realtek ALC655 Codec

On-Board Peripherals

- On-Board Peripherals include:
 - 1 floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
 - 2 serial ports
 - PS2 K/B and Mouse
 - Line-In/ Line-Out/ Mic-In
 - 8 USB 2.0/1.1 ports (Rearx4/ Frontx4)
 - 1 RJ45 connector (10/100 MHz LAN or Gigabit LAN, optional)
 - 2 1394 ports (Rearx1/ Frontx1) (Optional)
 - 2 S-ATA connectors

BIOS

- The mainboard BIOS provides “Plug & Play” BIOS which detects the peripheral devices and expansion cards of the board automatically.

Mounting and Dimension

- Micro-ATX Form Factor: 24.5 cm (L) x 24.5 cm (W)
- 9 mounting holes

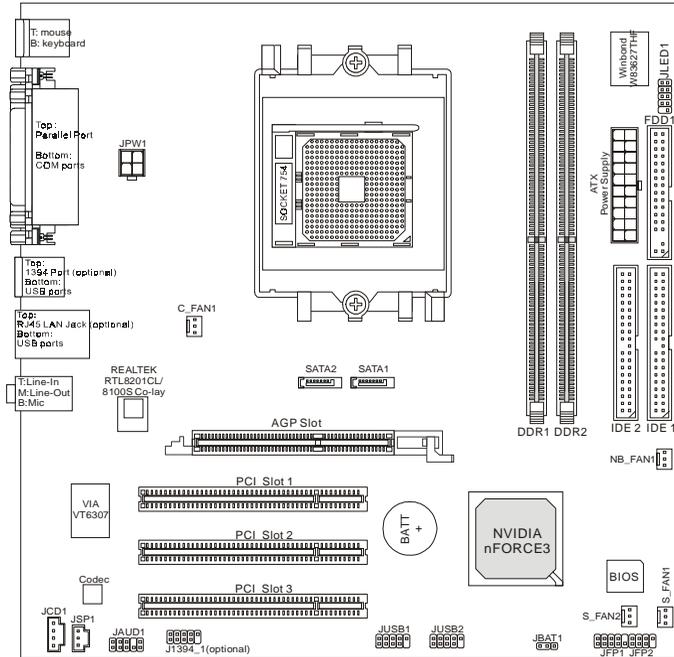


MSI Reminds You...

1. Please note that users cannot install OS, either WinME or Win98, in their SATA hard drive. Under these two OSs, SATA can only be used as a normal storage device.
2. To create a bootable RAID volume for a Windows 2000 environment, Microsoft's Windows 2000 Service Pack 4 (SP4) is required. As the end user cannot boot without SP4, a combination installation CD must be created before attempting to install the operating system onto the bootable RAID volume. To create the combination installation CD, please refer to the following website:

<http://www.microsoft.com/windows2000/downloads/servicepacks/sp4/HFdeploy.htm>

Mainboard Layout



K8NM (MS-7034) v1.X M-ATX Mainboard

Packing Contents



MSI motherboard



MSI Driver/Utility CD



SATA Cable



Power Cable



D-Bracket 2 (optional)



Round Cable of
IDE Devices



User's Guide



Back IO Shield



Round Cable of
Floppy Disk

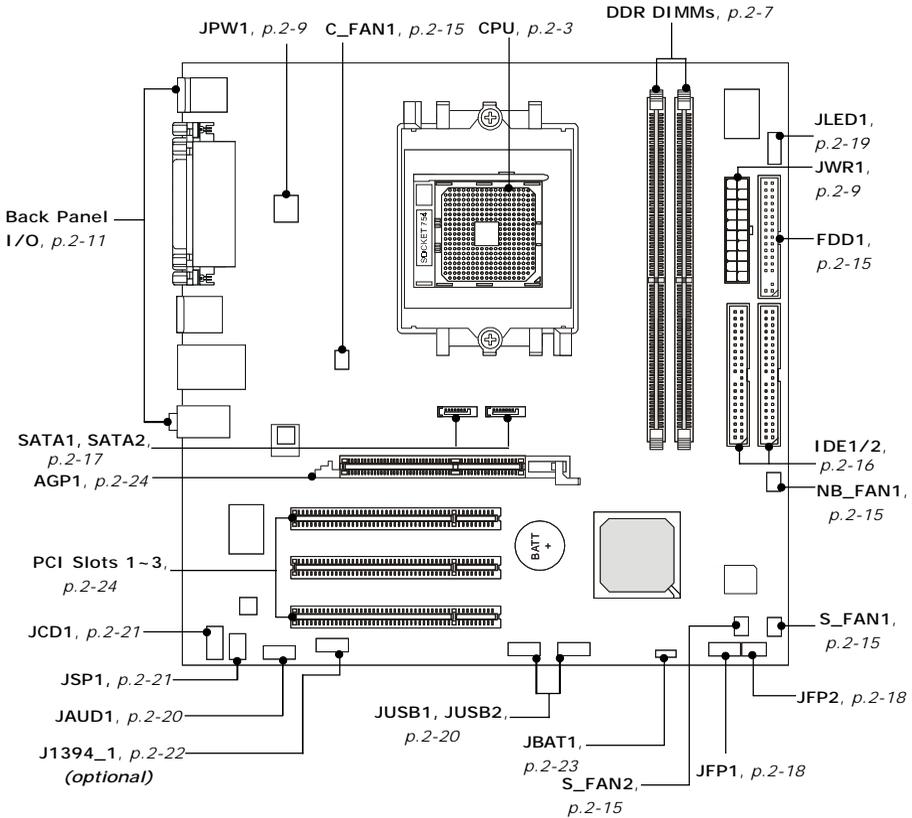
2

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 AMD® Athlon64 processor. The mainboard uses a CPU socket called Socket-754 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 have the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

For the latest information about CPU, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_cpu_support.php.



MSI Reminds You...

Overheating

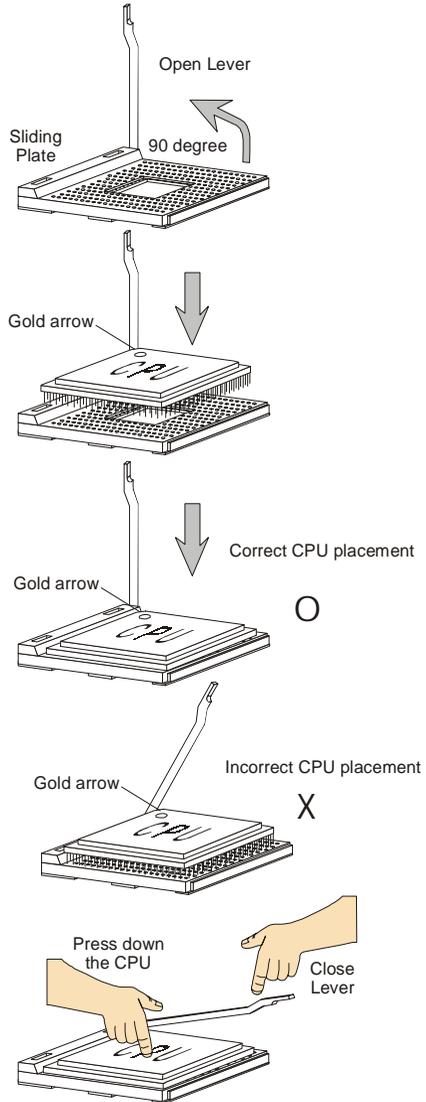
Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.

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.

CPU Installation Procedures for Socket 754

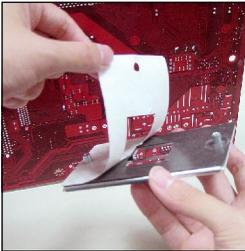
1. Please turn off the power and unplug the power cord before installing the CPU.
2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.
3. Look for the gold arrow. The gold arrow should point towards the lever pivot. The CPU can only fit in the correct 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 AMD Athlon64 CPU Cooler Set

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 have the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

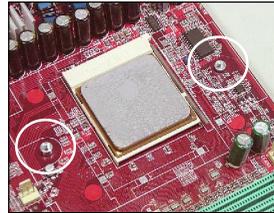
1. Detach the shield of the backplate's paster.



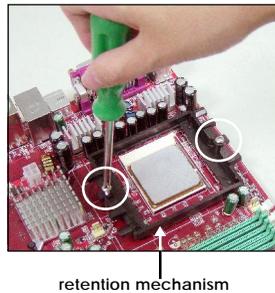
2. Turn over the mainboard, and install the backplate to the proper position.



3. Turn over the mainboard again and place the mainboard on the flat surface. Locate the two screw holes of the mainboard.



4. Align the retention mechanism and the backplate. Fix the retention mechanism and the backplate with two screws.



5. Position the cooling set onto the retention mechanism. Hook one end of the clip to hook first.



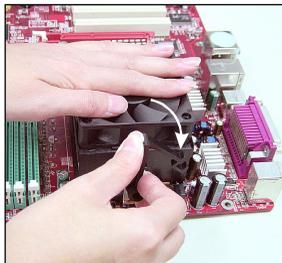
6. Press down the other end of the clip to fasten the cooling set on the top of the retention mechanism.



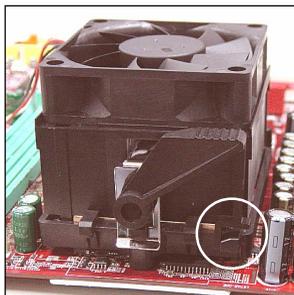
7. Locate the Fix Lever, Safety Hook and the Fixed Bolt. Lift up the intensive fixed lever.



8. Fasten down the lever.



9. Make sure the safety hook completely clasps the fixed bolt of the retention mechanism.



MSI Reminds You...

While disconnecting the Safety Hook from the fixed bolt, it is necessary to keep an eye on your fingers, because once the Safety Hook is disconnected from the fixed bolt, the fixed lever will spring back instantly.

Memory

The mainboard provides two 184-pin unbuffered DDR266/DDR333/DDR400 DDR SDRAM, and supports the memory size up to 2GB without ECC. To operate properly, at least one DIMM module must be installed.

For the updated supporting memory modules, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_trp_list.php.



**DDR DIMM Slots
(DDR 1~2)**

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.

DDR Module Combination

Install at least one DIMM module on the slots. Memory modules can be installed on the slots in any order. You can install either single- or double-sided modules to meet your own needs.

Memory modules can be installed in any combination as follows:

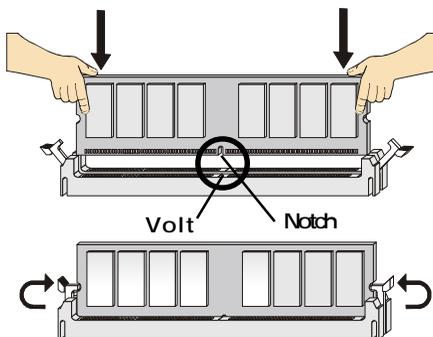
Slot	Memory Module	Total Memory
DDR 1 (Bank 0 & 1)	S/D	64MB~1GB
DDR 2 (Bank 2 & 3)	S/D	64MB~1GB
Maximum System Memory Supported		64MB~2GB

S: Single Side

D: Double Side

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 into the socket.

Power Supply

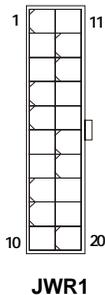
The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: JWR1

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.

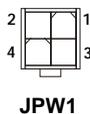
ATX 12V Power Connector: JPW1

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



JWR1 Pin Definition

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



JPW1 Pin Definition

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



MSI Reminds You...

1. These two connectors connect to the ATX power supply and have to work together to ensure stable operation of the mainboard.
2. Power supply of 300 watts (and above) is highly recommended for system stability.

Important Notification about Power Issue

NForce chipset is very sensitive to ESD (Electrostatic Discharge), therefore this issue mostly happens while the users intensively swap memory modules under S5 (power-off) states, and the power code is plugged while installing modules. Due to several pins are very sensitive to ESD, so this kind of memory-replacement actions might cause chipset system unable to boot. Please follow the following solution to avoid this situation.

Unplug the AC power cable (shown in figure 1) or unplug the JWR1 & JPW1 power connectors (shown in figure 2 & figure 3) before the 1st installation or during system upgrade procedure.

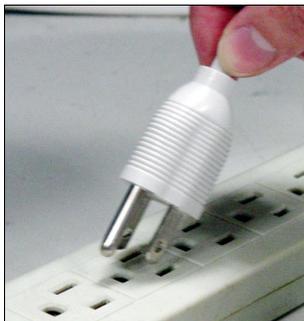


Figure 1:
Unplug the AC power cable



Figure 2:
Unplug the JWR1 power connector

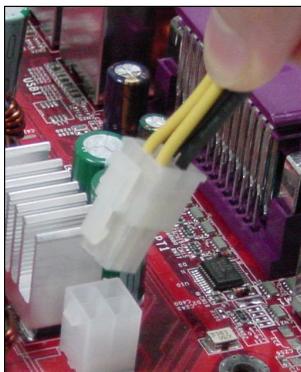
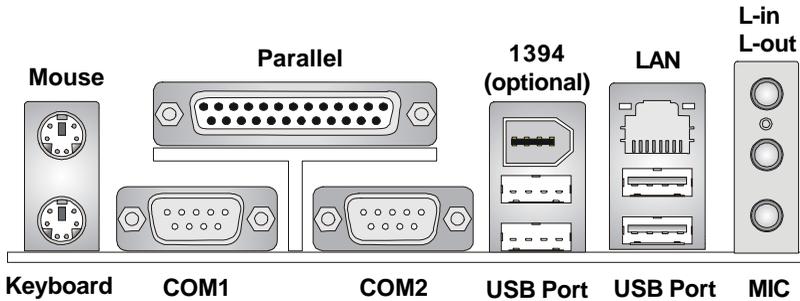


Figure 3:
Unplug the JPW1 power connector

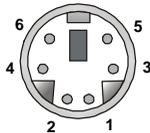
Back Panel

The back panel provides the following connectors:



Mouse/Keyboard Connector

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



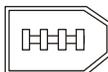
**PS/2 Mouse / Keyboard
(6-pin Female)**

Pin Definition

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

IEEE 1394 Port (optional)

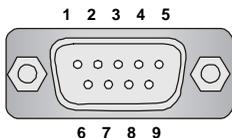
The back panel provides one standard IEEE 1394 port. The standard IEEE1394 port connects to IEEE1394 devices without external power. The IEEE1394 high-speed serial bus complements USB by providing enhanced PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs, and portable devices.



IEEE1394 Port

Serial Port Connector: COM ports

The mainboard offers two 9-pin male DIN connectors as the serial ports. The ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connectors.



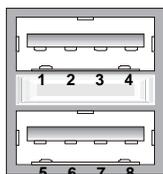
9-Pin Male DIN Connector

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

USB Connectors

The mainboard provides an OHCI (Open 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.



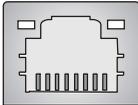
USB Ports

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

LAN (RJ-45) Jack (optional)

The mainboard provides 1 standard RJ-45 jack for connection to single Local Area Network (LAN). This Giga-bit LAN enables data to be transferred at 1000, 100 or 10Mbps. You can connect a network cable to this LAN jack.



RJ-45 LAN Jack

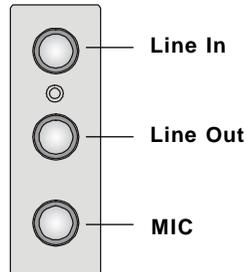
Giga-bit LAN Pin Definition

PIN	SIGNAL	DESCRIPTION
1	D0P	Differential Pair 0+
2	D0N	Differential Pair 0-
3	D1P	Differential Pair 1+
4	D2P	Differential Pair 2+
5	D2N	Differential Pair 2-
6	D1N	Differential Pair 1-
7	D3P	Differential Pair 3+
8	D3N	Differential Pair 3-

Audio Port Connectors

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

1/8" Stereo Audio Connectors

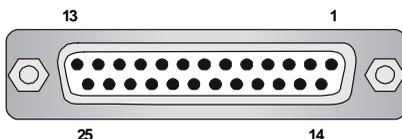


MSI Reminds You...

For advanced audio application, Realtek ALC 655 is provided 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. Using 4- or 6-Channel Audio Function.

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

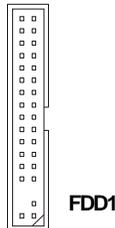
PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	PaperEnd
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select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

Floppy Disk Drive Connector: FDD1

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



Fan Power Connectors: C_FAN1/S_FAN1/S_FAN2/NB_FAN1

The C_FAN1 (processor fan), S_FAN1 (system fan 1), S_FAN2 (system fan 2) and NB_FAN1 (NorthBridge Chipset fan) support system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

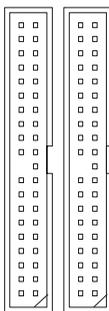


MSI Reminds You...

1. Always consult the vendors for proper CPU cooling fan.
2. C_FAN1 supports the fan control. You can install **Core Center** utility that will automatically control the CPU fan speed according to the actual CPU temperature.
3. Please refer to the recommended CPU fans at AMD® official website.

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 0~4, 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.



IDE2 IDE1

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.

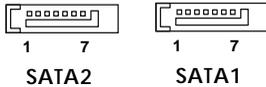


MSI Reminds You...

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.

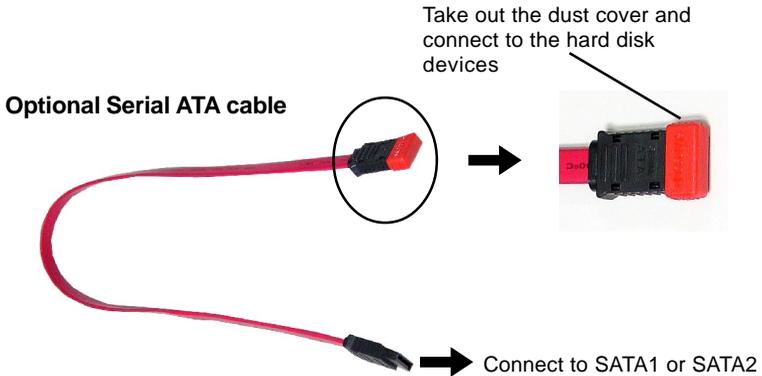
Serial ATA HDD Connectors: SATA1/SATA2

The mainboard provides dual high-speed Serial ATA interface ports. The ports support 1st generation Serial ATA data rates of 150MB/s and are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk drive.



Pin Definition

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

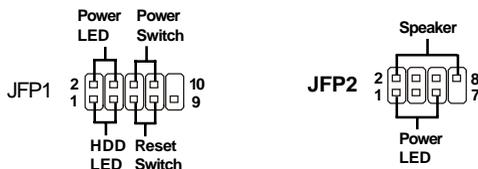


MSI Reminds You...

Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, the loss of data may occur during transmission.

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

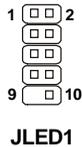
PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down to GND
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N	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+

D-Bracket™ 2 Connector: JLED1

The mainboard comes with a JLED1 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.



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



Front USB Connectors: JUSB1/JUSB2

The mainboard provides two USB 2.0 pin headers *JUSB1/JUSB2* 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.**

JUSB1/JUSB2 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



JUSB1/JUSB2
(USB 2.0/Intel spec)

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



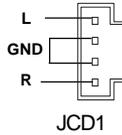
MSI Reminds You...

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.



CD-In Connector: JCD1

The connector is for CD-ROM audio connector.



SPDIF Connector: JSP1

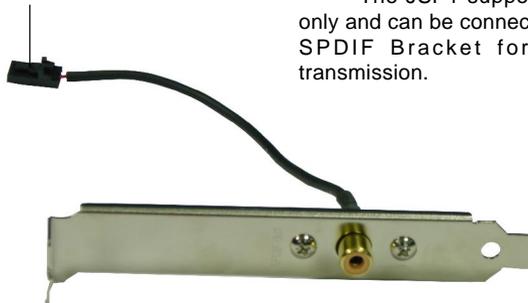
The connector is used to connect SPDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.



JSP1 Pin Definition

PIN	SIGNAL
1	VCCS
2	SPDIF0
3	GND

Connected to JSP1



SPDIF Bracket (Optional)

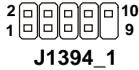
The JSP1 supports SPDIF output only and can be connected to an external SPDIF Bracket for digital audio transmission.

IEEE 1394 Connector: J1394_1 (optional)

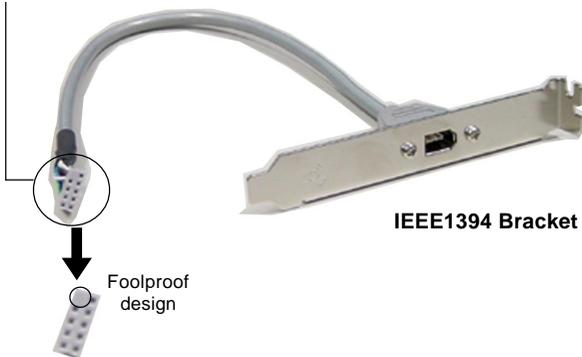
The mainboard provides one IEEE1394 pin header that allows you to connect IEEE 1394 ports via an external IEEE1394 bracket (optional).

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	TPA+	2	TPA-
3	Ground	4	Ground
5	TPB+	6	TPB-
7	Cable power	8	Cable power
9	Key (no pin)	10	Ground



Connected to J1394_1



IEEE1394 Bracket (Optional)

Jumpers

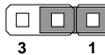
The motherboard provides the following jumpers for you to set the computer's function. This section will explain how to change your motherboard's function through the use of jumpers.

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the system configuration data. 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:



JBAT1



Keep Data



Clear Data



MSI Reminds You...

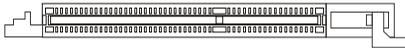
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slots

The mainboard provides one AGP slot and three 32-bit PCI bus slots.

AGP (Accelerated Graphics Port) Slot

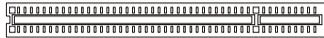
The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory. The slot supports 8x/4x AGP card.



AGP Slot

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 Slots

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#

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 system boot up, and requests you to run SETUP.
- ◆ You want to change the default settings for customized features.



MSI Reminds You...

1. *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.*
2. *While booting up, the BIOS version is shown in the 1st line appearing after the memory count. It is usually in the format: example: W7030MS V1.1 040104*

where:

1st digit refers to BIOS maker as A=AMI(R); W=AWARD(R)

2nd - 5th digit refers to the model number.

6th - 7th digit refers to the customer, MS=all standard customers.

V2.0 refers to the BIOS version.

040104 refers to the date this BIOS is released.

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 key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

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, then press <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
<F5>	Previous Value
<F6>	Load Fail-Safe defaults
<F7>	Load Optimized defaults

Getting Help

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

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields, that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (-->) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

```

▶ IDE Primary Master
▶ IDE Primary Slave
▶ IDE Secondary Master
▶ IDE Secondary Slave

```

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Main Menu

Once you enter Phoenix-Award® BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from twelve setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



Standard CMOS Features

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

Advanced BIOS Features

Use this menu to setup the items of AWARD® special enhanced features.

Advanced Chipset Features

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

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Power Management Setup

Use this menu to specify your settings for power management.

PNP/PCI Configurations

This entry appears if your system supports PnP/PCI.

H/W Monitor

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

Cell Menu

Use this menu to specify your settings for CPU/AGP frequency/voltage control and overclocking.

Load Fail-Safe Defaults

Use this menu to load factory default settings into the BIOS for stable system performance operations.

Load Optimized Defaults

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

Set Supervisor Password

Use this menu to set Supervisor Password.

Set User Password

Use this menu to set User Password.

Save & Exit Setup

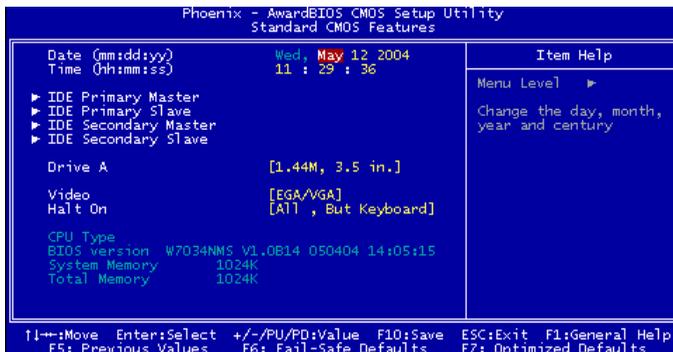
Save changes to CMOS and exit setup.

Exit Without Saving

Abandon all changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu includes some basic setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



Date

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

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

Time

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

IDE Primary/Secondary Master/Slave

Press PgUp/<+> or PgDn/<-> to select [Manual], [None] or [Auto] type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use [Manual] to define your own drive type manually.

If you select [Manual], related information is asked to be entered to the following items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

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

Landing Zone Cylinder location of the landing zone.
Sector Number of sectors.

Drive A

This item allows you to set the type of floppy drive installed. Available options: [None], [360K, 5.25 in.], [1.2M, 5.25 in.], [720K, 3.5 in.], [1.44M, 3.5 in.], [2.88M, 3.5 in.].

Video

The setting controls the type of video adapter used for the primary monitor of the system. Available options are [EGA/VGA], [CGA 40], [CGA 80] and [Mono].

Halt On

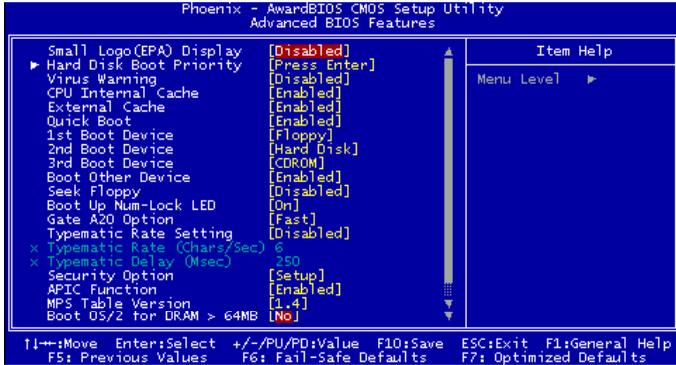
The setting determines whether the system will stop if an error is detected at boot. Available options are:

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

CPU Type/BIOS Version/Video Memory/System Memory/Total Memory

The items show the CPU type, BIOS version and memory status of your system (read only).

Advanced BIOS Features



Small Logo(EPA) Display

This item enables you to show the EPA logo (brand specific graphics) on the bootup screen. Settings are:

- [Disabled] Shows the normal POST screen at boot.
- [Enabled] Shows a still image (EPA logo) on the screen at boot.

Hard Disk Boot Priority

Press <Enter> to enter the sub-menu. Then you may use the arrow keys ($\uparrow\downarrow$) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in this hard disk boot priority list.

Virus Warning

The item is to set the Virus Warning feature for IDE Hard Disk boot sector protection. If the function is enabled and any attempt to write data into this area is made, BIOS will display a warning message on screen and beep. Settings: [Disabled] and [Enabled].

CPU Internal Cache

The item allows you to turn on or off CPU's internal (L1) cache. Settings: [Enabled] and [Disabled].

External Cache

The item allows you to turn on or off CPU's external (L2) cache. Settings: [Enabled] and [Disabled].

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] and [Disabled].

1st/2nd/3rd Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.



MSI Reminds You...

Available settings for "1st/2nd/3rd Boot Device" vary depending on the bootable devices you have installed. For example, if you did not install a floppy drive, the setting "Floppy" does not show up.

Boot Other Device

Setting the option to [Enabled] allows the system to try to boot from other device if the system fails to boot from the 1st/2nd/3rd boot device.

Seek Floppy

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

Boot Up Num-Lock LED

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad. Setting options: [On] and [Off].

Gate A20 Option

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

Typematic Rate Setting

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

Typematic Rate (Chars/Sec)

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

Typematic Delay (Msec)

This item allows you to select the delay between when the key was first pressed and when the acceleration begins. Settings: [250], [500], [750] and [1000].

Security Option

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

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

APIC Function

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

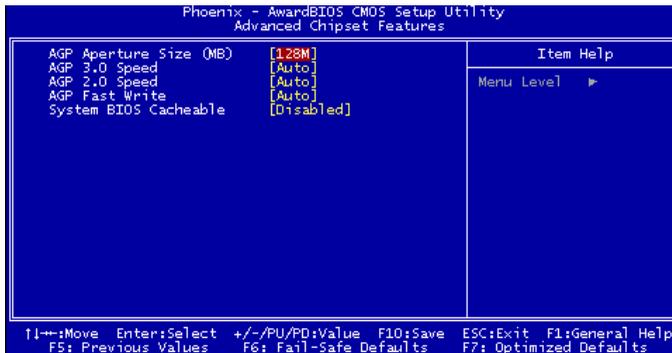
MPS Table Version

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

Boot OS/2 for DRAM > 64MB

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

Advanced Chipset Features



AGP Aperture Size

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], [256MB] and [512MB].

AGP 3.0 Speed / AGP 2.0 Speed

AGP 3.0 Speed or AGP 2.0 Speed appears depending on the AGP card installed on the mainboard. This item sets an appropriate speed for the installed AGP card. Setting options for AGP 2.0 Speed: [1x], [1x2x], [1x2x4x]. Setting options for AGP 3.0 Speed: [4x] and [4x8x].

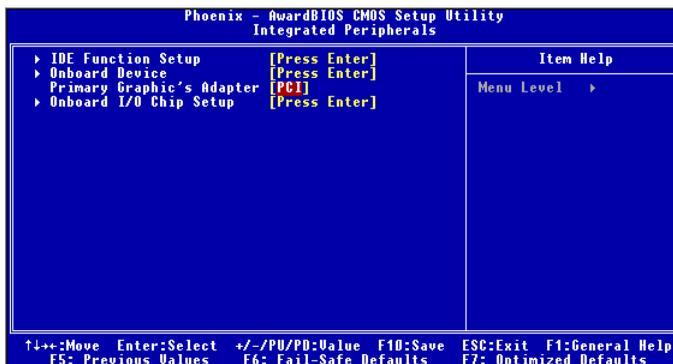
AGP Fast Write

The item enables or disables the AGP Fast Write feature. The Fast Write technology allows CPU to write directly into the graphics controller without passing anything through system memory and improves 8x speed accordingly. Select [Auto] only when your AGP card supports the feature. Options: [Disabled] and [Auto].

System BIOS Cacheable

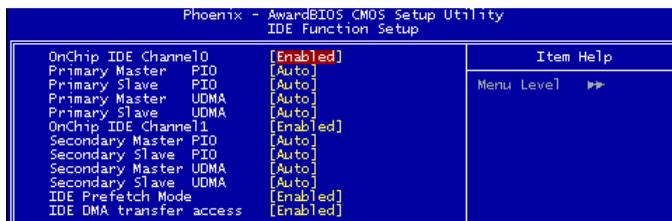
Selecting [Enabled] allows caching of the system BIOS ROM at F0000h-FFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Setting options: [Enabled] and [Disabled].

Integrated Peripherals



IDE Function Setup

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



OnChip IDE Channel 0/1

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Choose [Enabled] to activate each channel separately. Settings: [Enabled] and [Disabled].

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In [Auto] mode, the system automatically determines the best mode for each device. The settings are: [Auto], [Mode 0], [Mode 1], [Mode 2], [Mode 3] and [Mode 4].

Primary/Secondary Master/Slave UltraDMA

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, Ultra DMA/66 and Ultra DMA/100, select [Auto] to enable BIOS support. The settings are: [Auto] and [Disabled].

IDE Prefetch Mode

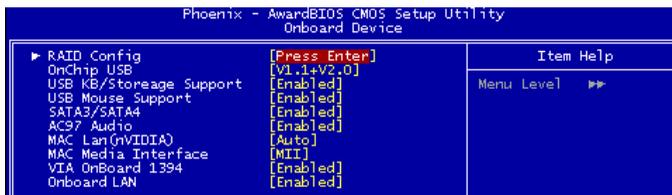
The onboard IDE drive interfaces support IDE prefetching, for faster drive accesses. When you install a primary and/or secondary add-in IDE interface, set this option to [Disabled] if the interface does not support prefetching. The settings are: [Enabled] and [Disabled].

IDE DMA Transfer Access

This item is used to enable or disable the DMA transfer function of the IDE Hard Drive. The settings are: [Enabled] and [Disabled].

Onboard Device

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



RAID Config

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



IDE RAID

This item is available for you to enable/disable the onboard IDE RAID function. Setting options: [Enabled] and [Disabled].

IDE Primary/Secndry Master/Slave RAID

This feature allows users to enable or disable the RAID function for each IDE hard disk drive. Settings: [Enabled] and [Disabled].

SATA1/SATA2 RAID

This feature allows users to enable or disable the RAID function for each SATA hard disk drive. The settings are: [Enabled] and [Disabled].

OnChip USB

This setting allows you to enable/disable the onboard USB controller. Selecting [V1.1+V2.0] enables the system to support both USB 1.1 and 2.0 spec. Setting options: [Disabled], [V1.1] and [V1.1+V2.0].

USB KB/Storage Support

Select [Enabled] if you need to use a USB-interfaced keyboard or storage device in the operating system. Setting options: [Enabled] and [Disabled].

USB Mouse Support

Select [Enabled] if you need to use a USB-interfaced mouse in the operating system. The settings are: [Enabled] and [Disabled].

SATA1/SATA2

This allows you to enable or disable onchip Serial-ATA controller. Settings: [Enabled] and [Disabled].

AC97 Audio

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

MAC LAN (nVIDIA)

Setting to [Auto] allows the BIOS to auto-detect the nVIDIA LAN controller and enable it. Setting options: [Auto] and [Disabled].

VIA OnBoard 1394 (For K8NM-ILS only)

This item allows you to enable/disable the onboard IEEE1394 controller. The settings are: [Enabled] and [Disabled].

Onboard LAN

This setting controls the onboard LAN controller. Setting options: [Enabled] and [Disabled].

Onboard I/O Chip Setup

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

**Onboard FDC Controller**

Select [Enabled] if your system has a floppy disk controller (FDD) installed on the system board and you wish to use it. If you install add-on FDC or the system has no floppy drive, select [Disabled] in this field. The settings are: [Enabled] and [Disabled].

Onboard Serial Port 1/2

Select an address and corresponding interrupt for the first/second serial port. The settings are: [3F8/IRQ4], [2E8/IRQ3], [3E8/IRQ4], [2F8/IRQ3], [Disabled] and [Auto].

Onboard Parallel Port

There is a built-in parallel port on the on-board Super I/O chipset that provides Standard, ECP, and EPP features. It has the following options:

[Disabled]	
[3BC/IRQ7]	Line Printer port 0
[278/IRQ5]	Line Printer port 2
[378/IRQ7]	Line Printer port 1

Parallel Port Mode

SPP : Standard Parallel Port

EPP : Enhanced Parallel Port

ECP : Extended Capability Port

ECP + EPP: Extended Capability Port + Enhanced Parallel Port

Normal

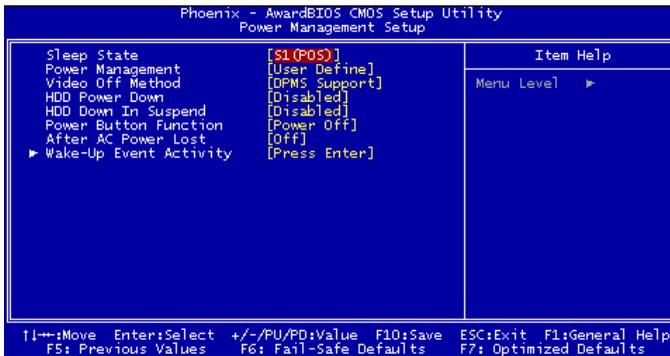
EPP Mode Select

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

ECP Mode Use DMA

The ECP mode has to use the DMA channel, so choose the onboard parallel port with the ECP feature. After selecting it, the following message will appear: "ECP Mode Use DMA." At this time, the user can choose between DMA channel [3] or [1].

Power Management Setup



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. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000/XP, you can choose to enter the Standby mode in S1(POS) or S3(STR) fashion through the setting of this field. Options are:

- [S1 (POS)] The S1 sleep mode is a low power state. In this state, no system context 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.

Power Management

This item is used to select the degree (or type) of power saving and is related to the **HDD Power Down** item. There are three options for power management:

- [Min Saving] Minimum Power Management. Suspend Mode=1 Hour
- [Max Saving] Maximum Power Management. Suspend Mode=1 Min
- [User Define] Allows end users to configure each mode separately.

Video Off Method

This determines the manner in which the monitor is blanked.

- [V/H SYNC+Blank] This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
- [Blank Screen] This option only writes blanks to the video buffer.

[DPMS Support] Initial display power management signalling.

HDD Power Down

If HDD activity is not detected for the length of time specified in this field, the hard disk drive will be powered down while all other devices remain active. Settings are [Disabled] and [1] through [15] Min.

HDD Down In Suspend

This item determines whether the hard disk drive will be turned off during suspend mode. Settings: [Disabled] and [Enabled].

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 item specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

- [Off] Leaves the computer in the power off state.
- [On] Leaves the computer in the power on state.
- [Last State] Restores the system to the status before power failure or interrupt occurred.

Wake-Up Event Activity

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



WOL (PME#) From Soft-Off

When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PME (Power Management Event). Settings: [Enabled] and [Disabled].

Power-On by Alarm

The field is used to enable or disable the feature of booting up the system on a scheduled time/date. Settings: [Enabled] and [Disabled].

Day of Month Alarm

The field specifies the date for **Power-On by Alarm**. Settings: [0]-[31].

Time(hh:mm:ss) Alarm

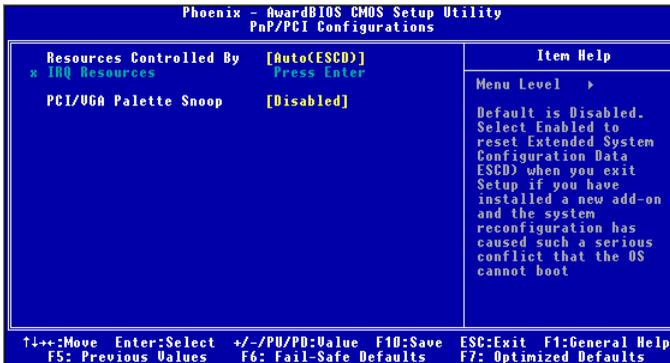
The field specifies the time for **Power-On by Alarm**. Format is <hour><minute><second>.

S3 wake up by PS2/Keyboard, S3 wake up by PS2/Mouse

These fields allow the activity of the PS2 (keyboard and mouse) to wake up the system from S3 sleep state. Settings: [Enabled] and [Disabled].

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.

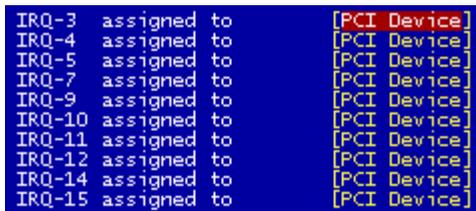


Resource Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95/98/2000/XP. If you set this field to [Manual], choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a “*”). The settings are: [Auto (ESCD)] and [Manual].

IRQ Resources

The items are adjustable only when **Resources Controlled By** is set to [Manual]. Press <Enter> and you will enter the sub-menu of the items. IRQ Resources list IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ. Settings are:



- [PCI Device] For Plug & Play compatible devices designed for PCI bus architecture.
- [Reserved] The IRQ will be reserved for further request.

**MSI Reminds You...**

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

PCI/VGA Palette Snoop

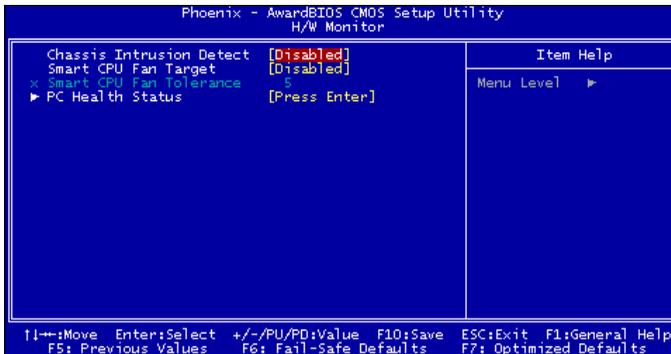
When set to [Enabled], multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two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

VGA Palette Snoop Bit Setting	Action
[Disabled]	Data read or written by the CPU is only directed to the PCI VGA device's palette registers.
[Enabled]	Data read or written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device's palette registers, permitting the palette registers of both VGA devices to be identical.

The setting must be set to [Enabled] if any ISA bus adapter in the system requires VGA palette snooping.

H/W Monitor

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.



Chassis Intrusion Detect

The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to [Enabled] later. Setting options: [Enabled], [Reset] and [Disabled].

Smart CPU Fan Target

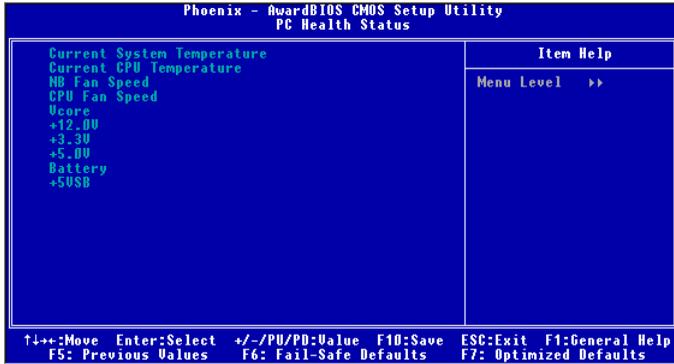
W83627THF provides the Smart Fan system which can control the fan speed automatically depending on the current temperature to keep it within a specific range. Settings: [Disabled], [40°C/104°F], [50°C/122°F] and [60°C/140°F].

CPU Fan Tolerance (°C)

You can select a fan tolerance value here for the specific range for the **Smart CPU Fan Target** items. If the current temperature of the fan reach the maximum threshold (the temperatures set in the **Smart CPU Fan Target** plus the tolerance value you set here), the fan will speed up for cooling down. On the contrary if the current temperature reach the minimum threshold (the set temperature minus the tolerance value), the fan will slow down to keep the temperature stable.

PC Health Status

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

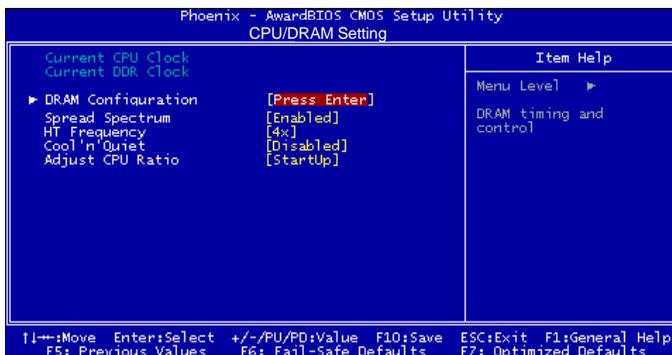


Current System/CPU Temperature, NB/CPU Fan Speed, Vcore, +12V, +3.3V, +5.0V, Battery, +5VSB

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

CPU/DRAM Setting

The items in CPU/DRAM Setting Menu includes some important settings of CPU, AGP and DRAM functions.

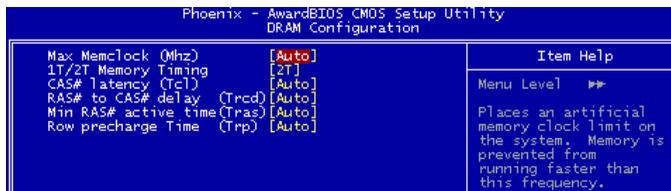


Current CPU Clock, Current DDR Clock

These two items show the current clocks of CPU & DDR memory frequency. Read-only.

DRAM Configuration

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



Max Memclock (Mhz) automatically to be determined by SPD. Selecting [Manual] allows users to configure these fields manually.

1T/2T Memory Timing

This setting controls the SDRAM command rate. Selecting [Auto] allows SDRAM signal controller to run at 1T (T=clock cycles) rate. Selecting [1T] makes SDRAM signal controller run at 2T rate. 1T is faster than 2T. Setting options: [1T], [2T] and [Auto].

CAS# Latency (Tcl)

This controls the CAS latency, which determines the timing delay (in clock cycles) before SDRAM starts a read command after receiving it. Settings: [Auto], [2.0], [2.5] and [3.0]. [2.0] increases the system performance the most while [3.0] provides the most stable performance.

RAS# to CAS# delay (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. Setting options: [Auto], [2], [3], [4], [5], [6] and [7].

Min RAS# Active Time (tRAS)

This setting determines the time RAS takes to read from and write to a memory cell. Setting options: [Auto], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14] and [15].

Row Precharge Time (tRP)

This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refreshing may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Available settings: [Auto], [2], [3], [4], [5] and [6].

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.



MSI Reminds You...

- 1. 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, select the value of Spread Spectrum for EMI reduction.*
- 2. The greater the Spread Spectrum value is, the greater the EMI is reduced, and the system will become less stable. For the most suitable Spread Spectrum value, please consult your local EMI regulation.*
- 3. 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.*

HT Frequency

This setting specifies the maximum operating frequency of the link's transmitter clock. Setting options: [1x], [2x], [3x], and [4x].

Cool'n'Quiet control

This feature is especially designed for AMD Athlon processor, which provides a CPU temperature detecting function to prevent your CPU's from overheating due to the heavy working loading. Setting options: [Disabled] and [Auto].

Adjust CPU Ratio

This item lets you to adjust the CPU ratio. Setting to [Startup] enables the CPU running at the fastest speed which is detected by system. Setting options are: [Startup], [x4] ~[x20].

Load Fail-Safe/Optimized Defaults

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

When you select Load Fail-Safe Defaults, a message as below appears:



Load Fail-Safe Defaults (Y/N)? N

Pressing Y loads the BIOS default values for the most stable, minimal system performance.

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



Load Optimized Defaults (Y/N)? N

Pressing Y loads the default factory settings for optimal system performance.

Set Supervisor/User Password

When you select this function, a message as below will appear on the screen:

Enter Password:

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 Award BIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the *Security Option* of the *ADVANCED BIOS FEATURES* menu. If the *Security Option* is set to *System*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when 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.

A thick, horizontal blue brushstroke graphic that spans across the width of the page, positioned below the number '4' and above the title.

NVIDIA RAID Introduction

NVIDIA brings Redundant Array of Independent Disks (RAID) technology—which is used by the world's leading businesses—to the common PC desktop. This technology uses multiple drives to either increase total disk space or to offer data protection. For all levels, RAID techniques optimize storage solutions by using multiple disks grouped together and treating them as a single storage resource.

Introduction

System Requirement

Operating System Support

NVRAID supports the following operating systems:

- Windows XP Home Edition
- Windows XP Professional Edition
- Windows 2000 Professional

RAID Arrays

NVRAID supports the following types of RAID arrays described in this section:

RAID 0: RAID 0 defines a disk striping scheme that improves the disk read and write times for many applications.

RAID 1: RAID 1 defines techniques for mirroring data.

RAID 0+1: RAID 0+1 combines the techniques used in RAID 0 and RAID 1 arrays.

Spanning (JBOD): JBOD provides a method for combining drives of different sizes into one large disk.

Summary of RAID Configurations

Array	Uses	Advantages	Drawbacks	# Hard Disks	Fault Tolerance
RAID 0	Non-critical data requiring high performance.	High data throughput.	No fault tolerance.	multiple	None
RAID 1	Small databases or any other small capacity environment requiring fault tolerance.	100% data redundancy.	Requires 2 drives for the storage space of 1 drive.	2	Yes
RAID 0+1	Critical data requiring high performance.	Optimized for both 100% data redundancy and performance. Allows spare disks.	Requires 2 drives for the storage space of 1 drive—the same as RAID level 1.	4+	Yes
JBOD	Combining odd size drives into one big drive	Combines and uses the capacity of odd size drives.	Decreases performance because of the difficulty in using drives concurrently or to optimize drives for different uses.	Multiple	No



MSI Reminds You...

Please note that users cannot install OS, either WinME or Win98, in their SATA hard drive. Under these two OSs, SATA can only be used as a normal storage device.

RAID Configuration

Basic Configuration Instructions

The following are the basic steps for configuring NVRAID:

Non-Bootable RAID Array

1. Choose the hard disks that are to be RAID enabled in the system BIOS. (Check p. 3-13 for details.)
2. Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Striping and Mirroring (RAID 0+1), or Spanning (JBOD) and create the desired RAID array.
3. Enter the Windows OS, run the Windows nForce Setup application and install the RAID software.
4. Initialize the NVRAID Array Disks.

Bootable RAID Array

1. Choose the hard disks that are to be RAID enabled in the system BIOS. (Check p. 3-13 for details.)
2. Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Striping and Mirroring (RAID 0+1), or Spanning (JBOD) and create the desired RAID array.
3. Boot from the Windows CD, use the floppy disk that has the RAID driver to copy and install the nForce RAID software.
4. Initialize the NVRAID Array Disks.

Setting Up the NVRAID BIOS

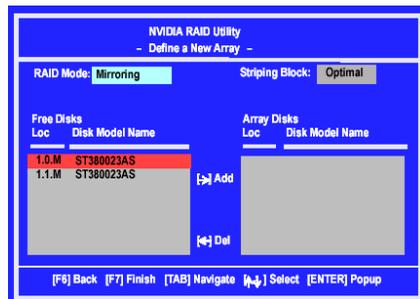
Be sure to enable the **SATA1/SATA2/SATA3/SATA4 RAID** items in **RAID Config of Integrated Peripherals/Onboard Devices** in BIOS (refer to p.3-13 for details) before configuring the NVRAID BIOS. After that press F10 to save the configuration and exit. The PC will reboot right away. Then enter the RAID BIOS Setup by pressing **F10** when prompted, and follow the procedures described below to set up the NVRAID BIOS.

NVRAID BIOS setup lets you choose the RAID array type and which hard drives you want to make part of the array.

Entering the RAID BIOS Setup

1. After rebooting your PC, wait until you see the RAID software prompting you to press **F10**. The RAID prompt appears as part of the system POST and boot process prior to loading the OS.
2. Press **F10**, and the NVIDIA RAID Utility --- **Define a New Array** window will appear.

The default **RAID Mode** is set to **Mirroring** and **Striping Block** is set to **Optimal**.



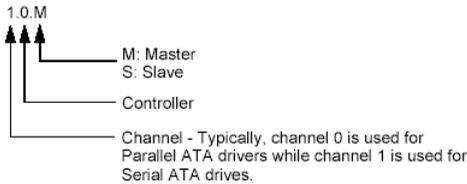
Understanding the “Define a New Array” Window

Use the Define a New Array window to

- Select the RAID Mode
- Set up the Striping Block
- Specify which disks to use for the RAID Array

Depending on the platform used, the system can have one or more channels. In a typical system there is usually one controller and multiple channels, and each channel has a slave and a master.

The channel/controller/master/slave status of each hard disk is given in the Loc (location) columns of the Free Disks and Array Disks lists.



In the example above, 1.0.M means the hard drive is attached to Channel 1, Controller 0, and the drive is set to Master. The following is a list of all possible combinations:

Parallel ATA

- 0.0.M Channel 0, controller 0, Master
- 0.0.S Channel 0, controller 0, Slave
- 0.1.M Channel 0, controller 1, Master
- 0.1.S Channel 0, controller 1, Slave

Serial ATA

- 1.0.M Channel 1, controller 0, Master
- 1.1.M Channel 1, controller 1, Slave



MSI Reminds You...

There is no such thing as Slave drive in Serial ATA. All drives are considered to be Master since there is a one to one connection between the drive and the controller.

Using the Define a New Array Window

If necessary, press the tab key to move from field to field until the appropriate field is highlighted.

- **Selecting the RAID Mode**

By default, this is set to [Mirroring]. To change to a different RAID mode, press the down arrow key until the mode that you want appears in the RAID Mode box—either [Mirroring], [Striping], [Spanning], or [Stripe Mirroring].

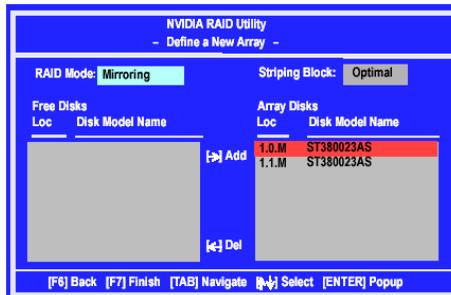
- **Selecting the Striping Block Size**

Striping Block size is given in kilobytes, and affects how data is arranged on the disk. It is recommended to leave this value at the default [Optimal], which is 32KB, but the values can be between [4 KB] and [128 KB].

- **Assigning the Disks**

The disks that you enabled from the RAID Config BIOS setup page appear in the **Free Disks** block. These are the drives that are available for use as RAID array disks. To designate a free disk to be used as a RAID array disk,

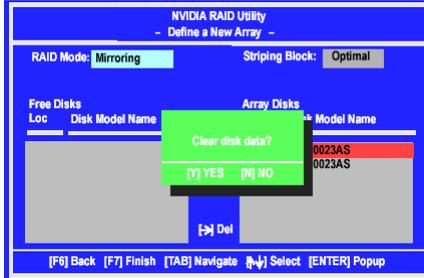
1. Tab to the **Free Disks** section. The first disk in the list is selected.
2. Move it from the Free Disks block to the Array Disks block by pressing the right arrow key (-->). The first disk in the list is moved, and the next disk in the list is selected and ready to be moved.
3. Continue pressing the right-arrow key (<--) until all the disks that you want to use as RAID array disks appear in the **Array Disks** block.



It shows that two disks have been assigned as RAID1 array disks in the figure above.

Completing the RAID BIOS Setup

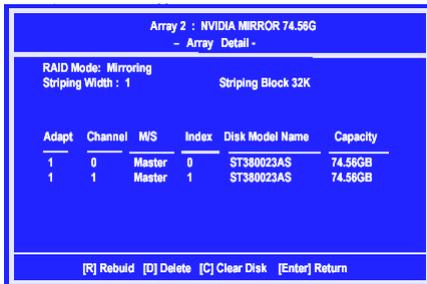
1. After assigning your RAID array disks, press **F7**. The Clear disk data prompt appears.



2. Press **Y** if you want to wipe out all the data from the RAID array, otherwise press **N**. You must choose **Yes** if the drives were previously used as RAID drives. The **Array List** window appears, where you can review the RAID arrays that you have set up.



3. Use the arrow keys to select the array that you want to set up, then press **Enter**. The **Array Detail** window appears.



4. If you want to mark this disk as empty and wipe out all its contents then press **C**.
5. At the prompt, press **Y** to wipe out all the data, otherwise press **N**.
6. Press **Enter** again to go back to the previous window and then press **F10** to exit the RAID setup. Now that the RAID setup has been configured from the RAID BIOS, the next step is to configure and load NVRAID drivers under Windows, as explained in "Installing the NVIDIA RAID Software Under Windows" on p5-7.

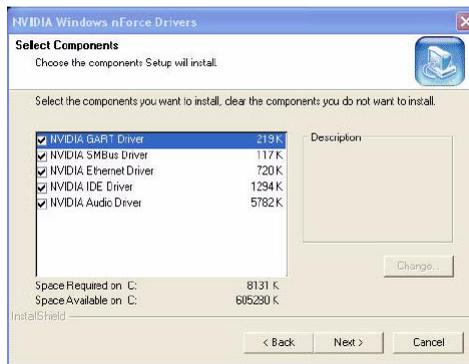
NVIDIA RAID Utility Installation

Installing the NVIDIA RAID Software Under Windows (for Non-bootable RAID Array)

The existing Windows IDE Parallel ATA driver (as well as the Serial ATA driver if SATA is enabled) must be upgraded to use the NVIDIA IDE Parallel ATA driver (as well as the NV Serial ATA driver if SATA is enabled).

This section describes how to run the setup application and install the RAID software which will upgrade the Windows IDE driver and install the RAID software.

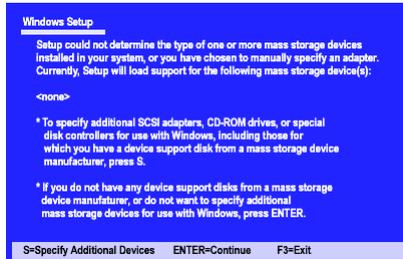
1. Start the nForce Setup program to open the NVIDIA Windows nForce Drivers page.



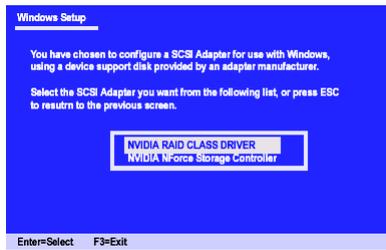
2. Select the modules that you want to install. Make sure that the "NVIDIA IDE Driver" is selected.
3. Click **Next** and then follow the instructions.
4. After the installation is completed, be sure to reboot the PC.
5. After the reboot, initialize the newly created array.

Installing the RAID Driver (for bootable RAID Array)

1. After you complete the RAID BIOS setup, boot from the Windows CD, and the Windows Setup program starts.
2. Press **F6** and wait for the Windows Setup screen to appear.



3. Specify the NVIDIA drivers:
 - (1) Insert the floppy that has the RAID driver, press S, then press Enter. The Windows Setup screen appears as below:

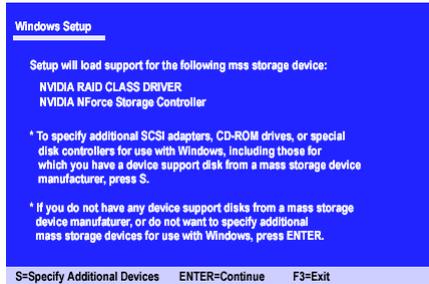


MSI Reminds You...

Please follow the instruction below to make an nVIDIA Serial ATA RAID driver for yourself.

1. *Insert the MSI CD into the CD-ROM drive.*
2. *Ignore the Setup screen and use "Explorer" to browse the CD.*
3. *Copy all the contents (including the sub-folders) in the \\nVidia\System\CK8S\Win2k-XP\IDE\WinXP to a formatted floppy disk.*
4. *The driver disk for nVIDIA Serial ATA driver is done.*

- (2) Select "NVIDIA RAID CLASS DRIVER" and then press **Enter**.
- (3) Press **S** again at the Specify Devices screen, then press **Enter**.
- (4) Select "NVIDIA NForce Storage Controller" and then press **Enter**. The following Windows Setup screen appears listing both drivers:



4. Press **Enter** to continue with Windows XP Installation. Be sure to leave the floppy disk inserted in the floppy drive until the blue screen portion of Windows XP installation is completed, then take out the floppy.
5. Follow the instructions on how to install Windows XP. During the GUI portion of the install you might be prompted to click **Yes** to install the RAID driver. Click **Yes** as many times as needed in order to finish the installation. This will not be an issue with a signed driver.



MSI Reminds You...

Each time you add a new hard drive to a RAID array, the RAID driver will have to be installed under Windows once for that hard drive. After that, the driver will not have to be installed

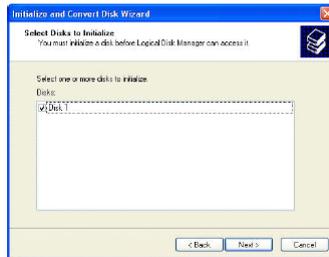
Initializing and Using the Disk Array

The RAID array is now ready to be initialized under Windows.

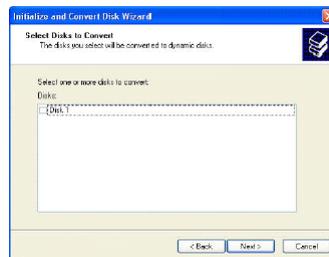
1. Launch Computer Management by clicking “Start” --> “Settings” --> “Control Panel” then open the “Administrative Tools” folder and double click on “Computer Management”.
2. Click “Disk Management” (under the “Storage” section). The Initialize and Convert Disk Wizards appears.



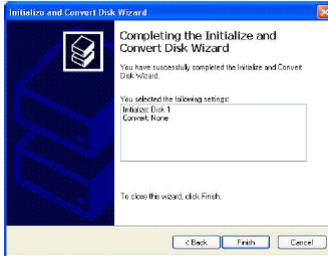
3. Click **Next**. The Select Disks to Initialize window appears. The disks listed depend on how many arrays you have configured.



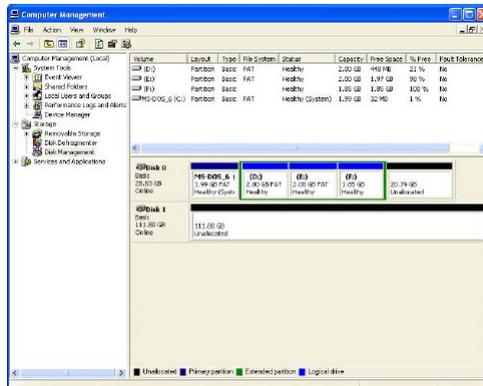
4. Click **Next**. The Select Disks to Convert window appears.



5. Check the disk in the list if you want to make the array a dynamic disk, then click **Next**. The Completing the Initialize and Convert Disk Wizard window appears.



6. Click **Finish**. The “Computer Management” window appears.



The actual disks listed will depend on your system, and the unallocated partition is the total combined storage of two hard disks. You must format the unallocated disk space in order to use it.

7. Format the unallocated disk space. Right click “Unallocated space”, select “New Partition...” and follow the wizard. After the drive has been formatted, it is ready for use.

RAID Drives Management

There is an application called NVRAIDMAN which helps you perform the following tasks of nVIDIA RAID.

- **Viewing RAID Array Configurations**
View an array configuration (mirrored, striped, mirror-striped, JBOD, or any supported combination)
- **Setting Up a Spare RAID Disk**
 - View free and/or dedicated free disks
 - Designate a free disk to a particular array
- **Rebuilding a RAID Mirrored Array**
 - Rebuild a broken mirrored array
 - Watch the progress of rebuilding an array

Viewing RAID Array Configurations

To view your RAID configuration from Windows, launch the NVRAID Management utility by double-clicking `NvRaidMan.exe` (the default location of `NvRaidMan.exe` is in `\\nVidia\System\CK8S\Win2k-XP\IDE\WinXP` of the setup CD accompanied with your mainboard).

The RAID configuration information appears in the right-side pane, as shown below.



MSI Reminds You...

The information in the figures in this part may vary from what it is shown in your system.

NVRAID Mirrored Array

The figure below shows an example of a two hard drive mirrored array using identical 55.90 GB IDE hard drives (ST360015A), where one drive is configured as Master and the other drive is configured as Slave. The total hard disk space used is 55.90 GB. (1.1 GB = 1,073,741,824 bytes)

Name	Status	Capacity	Channel	Device
Mirroring	Healthy	55.90 GB		
ST360015A	Healthy	55.90 GB	Secondary	Master
ST360015A	Healthy	55.90 GB	Secondary	Slave

NVRAID Striped Array

The figure below shows an example of a two hard drive striped array using identical 55.90 GB IDE hard drives (ST360015A), where one drive is configured as Master and the other drive is configured as Slave. The total disk space used is 111.80 GB.

Name	Status	Capacity	Channel	Device
Striping	Healthy	111.80 GB		
ST360015A	Healthy	55.90 GB	Secondary	Master
ST360015A	Healthy	55.90 GB	Secondary	Slave

NVRAID Striped Mirror Array

The figure below shows an example of a four hard drive stripe-mirrored array. The total disk space used is 111.80 GB.

Name	Status	Capacity	Channel	Device
Stripe Mirroring	Healthy	111.80 GB		
ST360015A	Healthy	55.90 GB	Secondary	Master
ST360015A	Healthy	55.90 GB	Secondary	Slave
ST380023AS	Healthy	74.53 GB	Primary	Master
ST380023AS	Healthy	74.53 GB	Secondary	Master

NVRAID Spanning (JBOD) Array

The figure below shows an example of a two hard drive spanning array. The total disk space used is 111.80 GB.

Name	Status	Capacity	Channel	Device
Spanning	Healthy	111.80 GB		
ST360015A	Healthy	55.90 GB	Secondary	Master
ST360015A	Healthy	55.90 GB	Secondary	Slave

NVRAID Mirrored Array and a Striped Array

The figure below shows an example of a two hard drive mirrored array as well as a two hard drive striped array.

The screenshot shows the nvidia_nvraid utility window with a sidebar on the left containing 'System Tasks' and 'Details'. The main area displays a table of RAID configurations:

Name	Status	Capacity	Channel	Device
Mirroring	Healthy	34.48 GB		
WDC WD3600D-00P1D0	Healthy	34.48 GB	Primary	Master
WDC WD3600D-00P1R0	Healthy	34.48 GB	Secondary	Master
Striping	Healthy	111.80 GB		
ST360015A	Healthy	55.90 GB	Secondary	Slave
ST360015A	Healthy	55.90 GB	Secondary	Master

The 'Details' section on the left shows a warning: 'Parity: F1. This array type cannot be rebuilt or have a spare disk allocated.'

Setting Up a Spare RAID Disk

You can designate a hard drive to be used as a spare drive for a RAID 1 or RAID 0+1 array². The spare drive can take over for a failed disk. NVRAID supports two types of spare drives:

• Free Disk

A free disk is a disk that is not part of any RAID array, but can be used by any available RAID 1 or RAID 0+1 array that requires a particular disk when one of its disks crashes or becomes unusable. The process is automatic and doesn't require any user interaction.

For example, if you have a system with four hard disks where one disk is used to boot the OS, two hard drives are set up in a mirrored array, and a fourth hard disk is set up as a free disk, then if one of the mirrored array drives fails, the free disk will be automatically assigned to the mirrored array to be used instead of the failed disk.

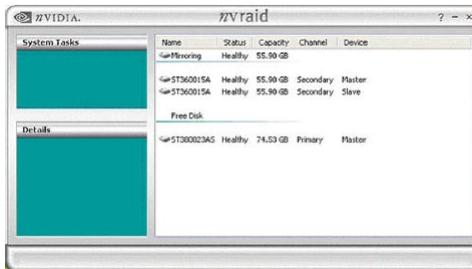
• Dedicated Disk

A dedicated free disk is a disk that is assigned to a RAID 1 or RAID 0+1 array and that disk is used by that array only when needed, for example during a system crash where a RAID mirrored drive is broken. The dedicated disk can be used only by the array that it is assigned to and not by any other array, unlike a free disk which can be used by any available RAID 1 or RAID 0+1 array.

Assigning a Free Disk

To mark a disk as free, or not a part of any array,

1. Enter the system BIOS setup and make sure that the drive that you want to mark as free is RAID enabled.
2. Enter the RAID BIOS and make sure that the drive is not part of any array (if one exists).
3. Boot into Windows and run the NVRAIDMAN program. The drive appears under the Free Disk section. The figure below shows an example of the NVRAIDMAN display if you have a mirror array and one free disk.



Assigning a Dedicated Disk

To mark a disk as dedicated, or reserve it for use by a specific array,

Step 1: Mark the Disk as a Free Disk

1. Enter the system BIOS setup and make sure that the drive that you want to mark as free is RAID enabled.
2. Enter the RAID BIOS and make sure that the drive is not part of any array (if one exists).
3. Boot into Windows and run the NVRAIDMAN program. The drive appears under the Free Disk section.

Step 2: Dedicate the Free Disk to an Array

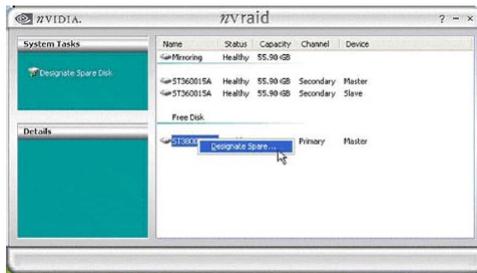
While running NVRAIDMAN, dedicate the free disk to an array using one of the following two methods:

- Method 1: Select a free disk and then assign it to an array.
- Method 2: Select an array and then assign a free disk to it.

Both methods are equally simple ways of accomplishing the same task.

Method 1: Select a free disk and then assign it to an array.

1. Right click one of the available disks under the Free Disk section. The pop-up menu appears.

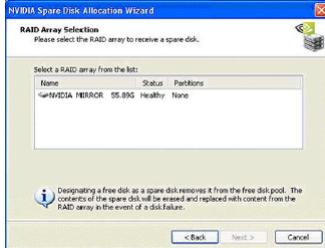


2. Select **Designate Spare** from the menu to launch the Spare Disk Allocation Wizard.



3. Click **Next**.

The RAID Array Selection page appears.



4. From the RAID Array Selection page, select one of the arrays from the list. This is the array to which you want to allocate the dedicated free disk.

5. Click **Next**.

The Completing the NVIDIA Spare Disk Allocation page appears.



6. Click **Finish**.

As shown in figure below, the ST380023AS drive is now a dedicated free disk in the mirrored array. If a system crash occurs that causes any of the two ST360015A drives to fail, the ST380023AS hard drive will take over and be used in the newly formed mirrored array.



Once a dedicated disk has been assigned to a particular array, it can be removed at any time. To remove the disk, right click on the dedicated disk and select the option to remove it.

Method 2: Select an array and then assign a free disk to it.

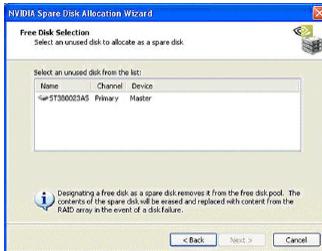
1. Right click on the array to which you want to assign a dedicated free disk. The pop-up menu appears.



2. Select **Designate Spare** from the menu to launch the Spare Disk Allocation Wizard.



3. Click **Next**. The Free Disk Selection page appears.



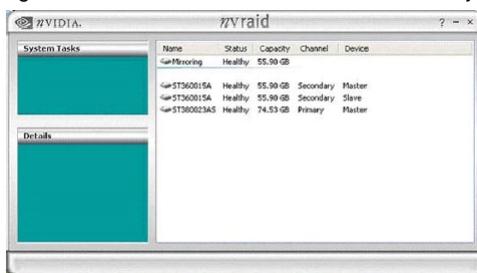
4. From the Free Disk Selection page, select one of the disks from the list. Please note that there can be more than one disk to choose from.

5. Click **Next**. The Completing the NVIDIA Spare Disk Allocation page appears.



6. Click **Finish**.

You have now assigned a dedicated free disk to a mirrored array.

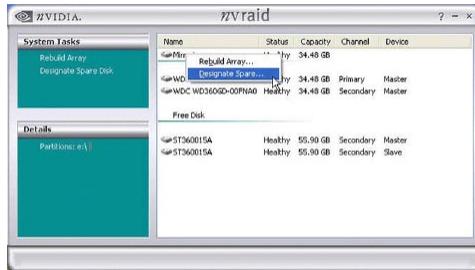


Once a dedicated disk has been assigned to a particular array, it can be removed at any time. To remove the disk, right click on the dedicated disk and select the option to remove it.

Example of Dedicating a Free Disk in a RAID 1 or RAID 0+1 Array

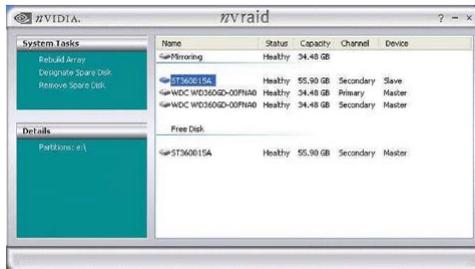
You can also assign a dedicated free disk to a RAID 1 or a RAID 0+1 array, using the same process.

1. Right-click either the free disk that you want to dedicate to an array, the array type, or the array drives as shown in the figure below. Then click Designate Spare to launch the Spare Disk Allocation Wizard.



2. Click **Designate Spare** and then follow the instructions in the Wizard. The figure below shows an example of a RAID 1 array that has one spare disk dedicated to it.

Once a dedicated disk has been assigned to a particular array, it can be removed at any time. To remove the disk, right click on the dedicated disk and select the option to remove it.



Rebuilding a RAID Mirrored Array

Rebuilding is the process of recovering data from one hard drive to another. All data is copied from one hard drive to another and then the data is synchronized between the two hard drives. This only applies to RAID 1 array as well as a RAID 0+1 array.

Rebuilding Instructions

After creating a mirrored array, you can rebuild the array using the following steps:

1. Go to Windows and run the NVRAID Management utility. The figure below shows an example of a system with one mirrored array.



2. Right-click on Mirroring. The popup menu appears.



3. From the popup menu, click **Rebuild Array**. The NVIDIA Rebuild Array Wizard appears.



4. Click **Next**. The Disk Selection page appears.



5. Select the drive that you want to rebuild by clicking it from the list, then click **Next**. The Completing the NVIDIA Rebuild Array page appears.



6. Click **Finish**. The array rebuilding starts after a few seconds, and a small pop-up message appears towards the bottom right corner of the screen as shown in the figure below.



During the rebuilding process, the NVRAID Management utility screen shows the status under the System Tasks and Details sections.

More About Rebuilding Arrays

- **Rebuilding Occurs in the Background**

The rebuilding process is very slow (it can take up to a day) and occurs in the background so as not to affect the performance of the system.

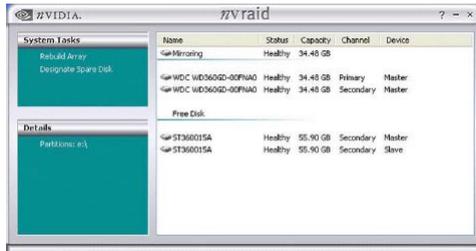
- **Rebuilding Applies Only to RAID 1 or RAID 0+1 Arrays**

Rebuilding an array works only when using RAID1 and/or RAID 0+1. Rebuilding does not apply to RAID 0 and JBOD arrays.

- **You Can Use Any Available Free Disk**

You can rebuild a mirrored array using any available Free Disk or Dedicated Disk.

For example, the figure below shows a mirrored array using 34.48 GB HD while having two Free Disks each 55.90 GB large.



To use one of these available free disks to rebuild your array, follow the same steps as explained in “Rebuilding a RAID Mirrored Array” on p.5-20, except when prompted to select a disk, choose one of the two available free disks.

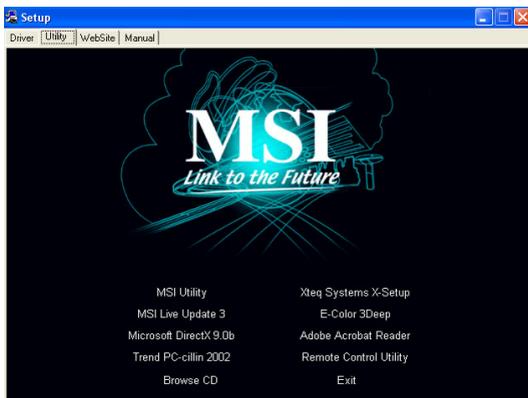
A thick, horizontal blue brushstroke graphic that spans across the width of the page, located below the number '5' and above the title.

Installation of Driver & Utility

MSI provides a setup CD along with your mainboard, which contains the required drivers for your system, and many other useful and powerful utility to bring you the best experience for your office professional working and for your home leisure entertainment.

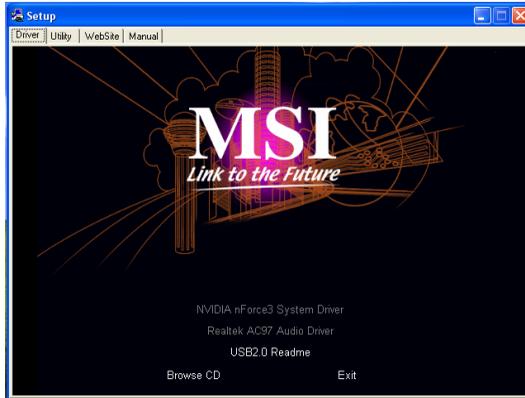
Utility Installation

Click on the **Utility** tab and the screen below will display. Click on the utility you like to install, and follow the proceeding instructions.



Driver Installation

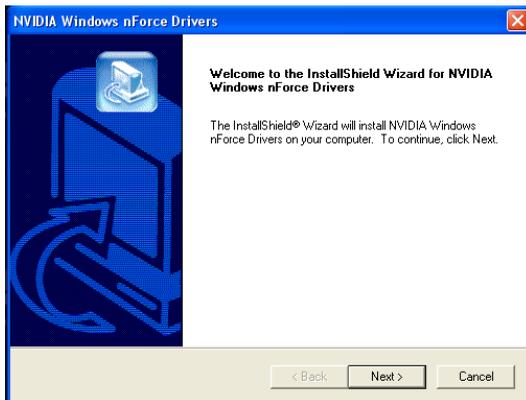
Click on the **Driver** tab and the screen below will display. Click on the driver you like to install, and follow the proceeding instructions.



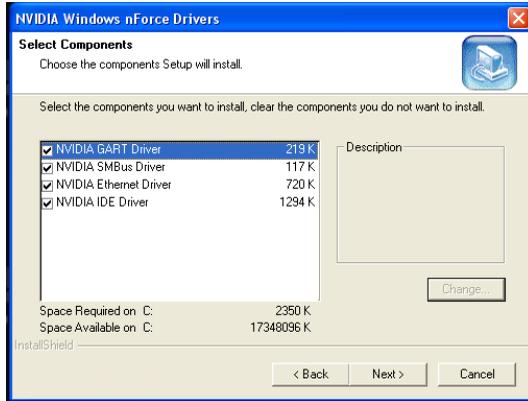
NVIDIA nForce3 System Driver

This driver is only available for Windows 2000 and Windows XP operating system. Please follow the following step to install the driver correctly.

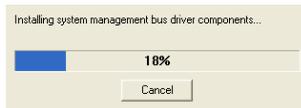
1. Click on this button to install the NVIDIA nForce3 System Drivers for your Windows OS. Then the welcome dialogue will display. Click **Next** to continue.



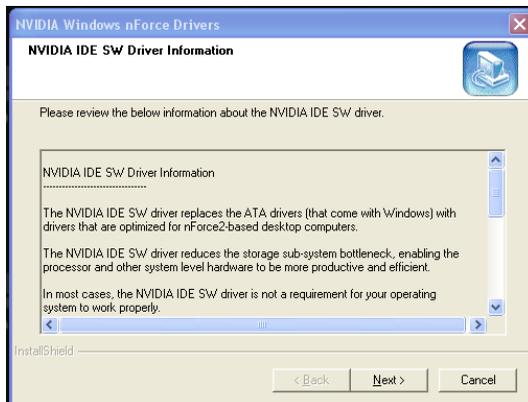
2. Then the following screen displays the available components to install. All the components shown here will be selected to be installed by default. Then click **Next**.



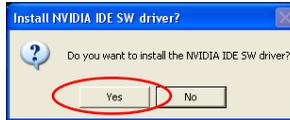
3. The system will start installing the selected driver components automatically.



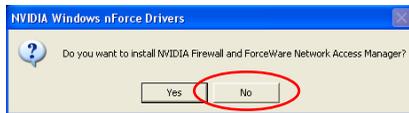
4. Then the following screen displays the information for the NVIDIA IDE SW Driver installation. Click **Next** to continue.



5. Then the following screen displays the installation of NVIDIA IDE SW Driver. Click **Yes** to continue.



6. Then the following screen displays the installation of NVIDIA Firewall and ForceWare Network Access Manager. It is a software firewall to protect the softwares from hacking. However, it is strongly suggested that you do not install this component, for you have to search other PC with its IP address instead of its PC name in your local network. Click **No** to continue.



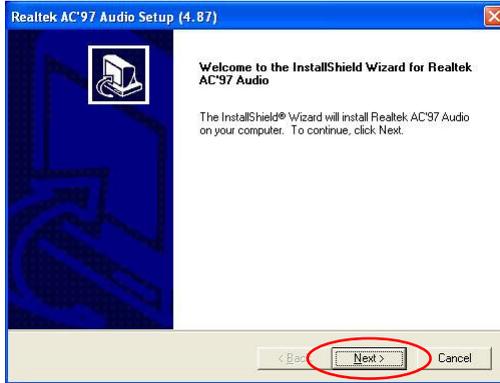
If you accidentally install NVIDIA Firewall and ForceWare Network Access Manager, we recommend you uninstall it by using the **Add or Remove Programs** function in the **Control Panel**.

7. The following screen indicates that the installation is complete. Click **Yes** to restart your computer or click **No** to restart it later.



Realtek AC97 Audio Driver

1. Click on this button to install the Realtek AC97 Audio Driver. Then the welcome dialogue will display. Click **Next** to continue. The installation process will launch automatically.



2. The following screen indicates the installation is complete. Click **Yes** to restart your computer or click **No** to restart it later.

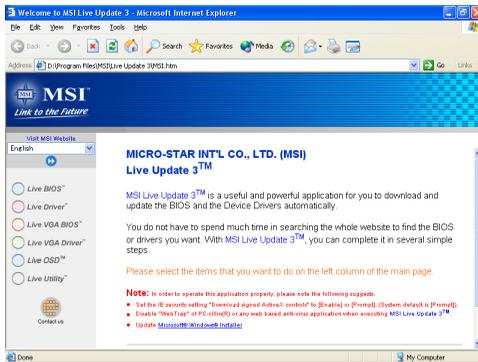


Live Update

Click on the **Live Update** icon in the main menu and the **Live Update** program will be enabled.

The Live Update 3™ is a tool used to detect and update your BIOS/drivers/VGA BIOS/VGA Driver/OSD/Utility 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.

Core Center (for AMD Processor)

Click on the **Core Center** icon in the main menu and the **Core Center** program will be enabled.

Cool'n'Quiet

This utility provides a CPU temperature detection function called **Cool'n'Quiet**. **Cool'n'Quiet** is a special feature designed only for AMD® Athlon64 processor, and with **Cool'n'Quiet**, the system will be capable of detecting the temperature of the CPU according to the CPU's working loading. When the CPU temperature climbs up to a certain degree, the speed of the system cooling fan will be risen automatically, and on the other hand, the speed of the system cooling fan will slow down instantly when the CPU temperature descends to its normal degree.



Here the current system status (including Vcore, 3.3V, +5V and 12V) and the current PC hardware status (such as the CPU & system temperatures and all fans speeds) are shown on the left and right sides for you to monitor.

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.



Left-side: 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 lighted 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-side: 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 values for fan speeds are the minimum thresholds.

Center-side: User mode/Auto mode

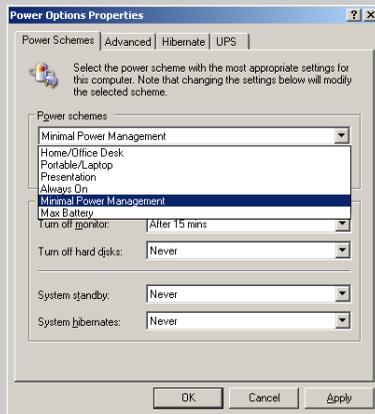
Here you may adjust the CPU fan speed. If you choose **User mode**, you may adjust the CPU fan speed in 8 different modes, from **High Speed** to **Low speed**. If you choose **Cool’n’Quiet**, the system will automatically configure an optimal setting for you.



MSI Reminds You...

To ensure that Cool’n’Quiet function is activated and will be working properly, it is required to double confirm that:

1. Check the serial number printed on the top of CPU. On the top of CPU, there are three lines listed under AMD Athlon™. Find the 13 characters of the first line, and locate the last one from those 13 characters. If the last character is “O” or after “O” (such as P, Q, R, and so on), that means this CPU supports Cool’n’Quiet function. On the contrary, if the last character is before “O”, that means this CPU does not support Cool’n’Quiet function.
2. Run BIOS Setup, and select **Frequency/Voltage Control**. Under **Frequency/Voltage Control**, find **Cool’n’Quiet Support**, and set this item to “Enable.”
3. Enter Windows, and select [Start]->[Settings]->[Control Pannel]->[Power Options]. Enter **Power Options Properties** tag, and select **Minimal Power Management** under **Power schemes**.



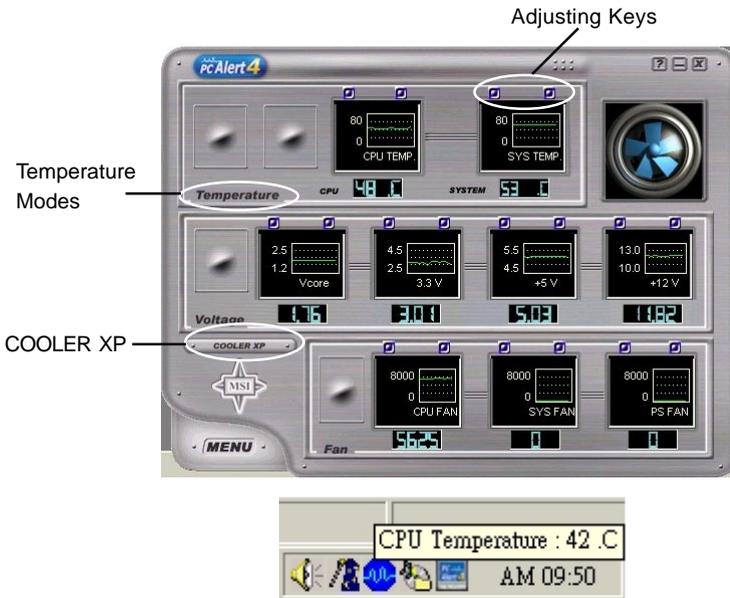
PC Alert™ 4

PC Alert™ 4

The PC Alert™ 4 is a utility you can find in the CD-ROM disk. The utility is just like your PC doctor that can detect the following PC hardware status during real time operation:

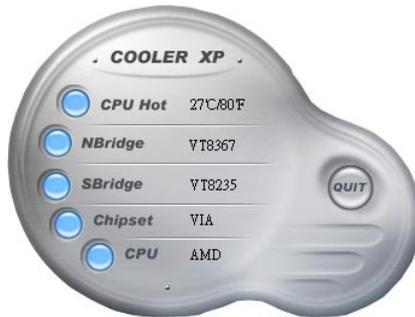
- ✦ monitor CPU & system temperatures
- ✦ monitor fan speeds
- ✦ monitor system voltages

If one of the items above is abnormal, the immediately shown on the screen, with the abnormal item highlighted in red. This will continue to be shown until the condition returns to the normal status.



Users can use the Adjusting Keys to change the minimum and maximum threshold of each item for the system to send out a warning message. Click *Temperature* to select the temperature modes of either Fahrenheit (°F) or Celsius (°C). The PC Alert™ 4 icon on the Status Area will show the current CPU temperature.

To better protect the CPU from overheating, a new feature, **COOLER XP**, has been added to decrease the temperature of AMD Athlon™ XP CPU. To do so, simply click **COOLER XP** and the screen will show the **Cute** skin (as shown below) with information about the CPU and chipset. Right-click the mouse to select the skin you want to switch to.



Cute



MSI Reminds You...

1. The new feature **COOLER XP** will work only if your mainboard supports AMD Athlon™ XP CPU.
2. Items shown on PC Alert 4 vary depending on your system status.
3. Whenever the minimum or maximum threshold of each item has been changed, please close the PC Alert 4 program for the new settings to take effect.

Appendix: Using 4- or 6-Channel Audio Function

The motherboard 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.

TOPICS

<i>Installing the Audio Driver</i>	<i>A-2</i>
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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.

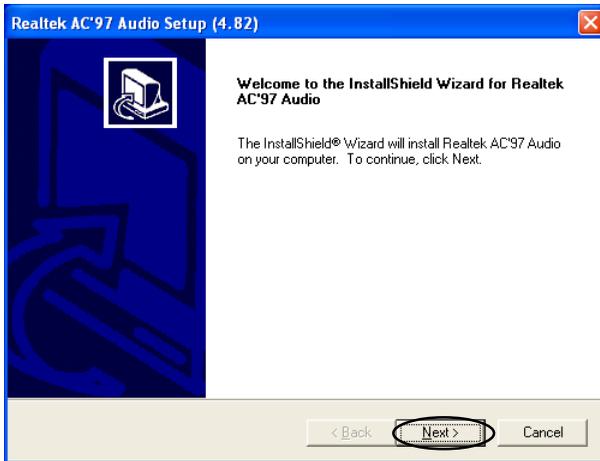
1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear. (*Please note the screen below might be different depending on the different mainboard you purchased.*)
2. Click **Realtek AC97 Audio Drivers**.



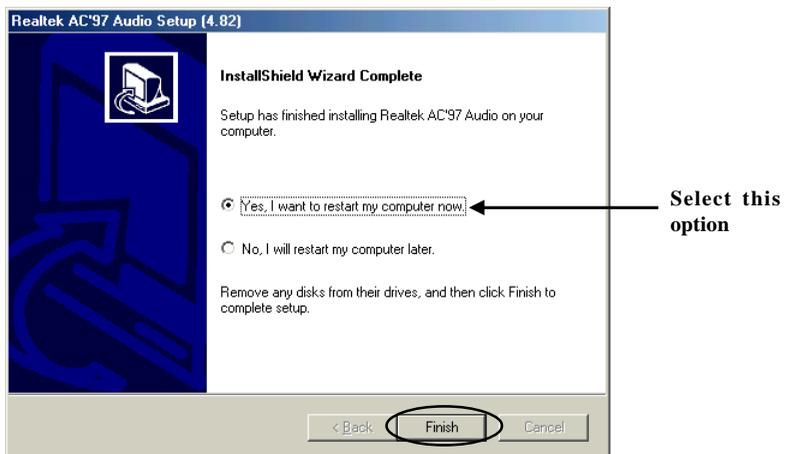
MSI Reminds You...

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 start installing files into the system.



4. Click **Finish** to restart the system.



Using 4- or 6-Channel Audio Function

After installing the audio driver, you are able to use the 4-/6-channel audio feature now. To enable 4- or 6-channel audio operation, first connect 4 or 6 speakers to the appropriate audio connectors, and then select 4- or 6-channel audio setting in the software utility.

Using the Back Panel

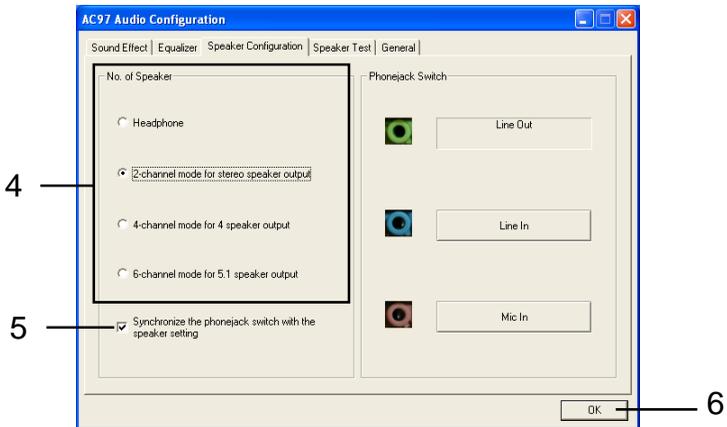
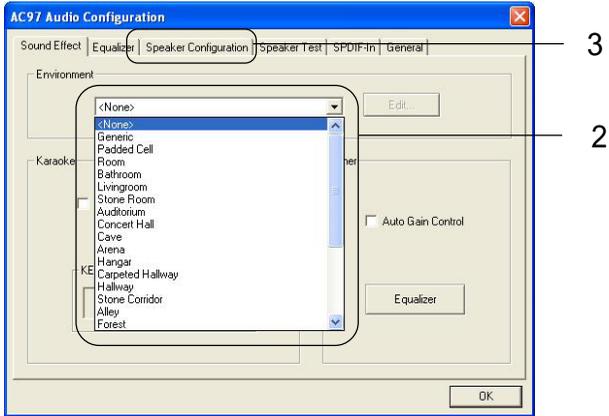
In addition to a default 2-channel analog audio output function, the audio connectors on the Back Panel also provide 4- or 6-channel analog audio output function if a proper setting is made in the software utility.

Read the following steps to have the Multi-Channel Audio Function properly set in the software utility, and have your speakers correctly connected to the Back Panel.

Configuration in the Software Utility

1. Click the audio icon  from the window tray at the lower-right corner of the screen.
2. Select a desired surround sound effect from the “Environment” drop-down menu.
3. Click the **Speaker Configuration** tab.
4. Select **Synchronize the phonejack switch with the settings**.
5. Select a desired multi-channel operation from **No. of Speakers**.
 - a. 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
6. Click **OK** to close this window.

Using 4- or 6-Channel Audio Function



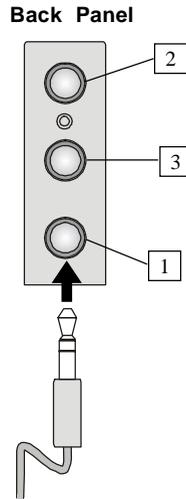
Connecting the Speakers

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.

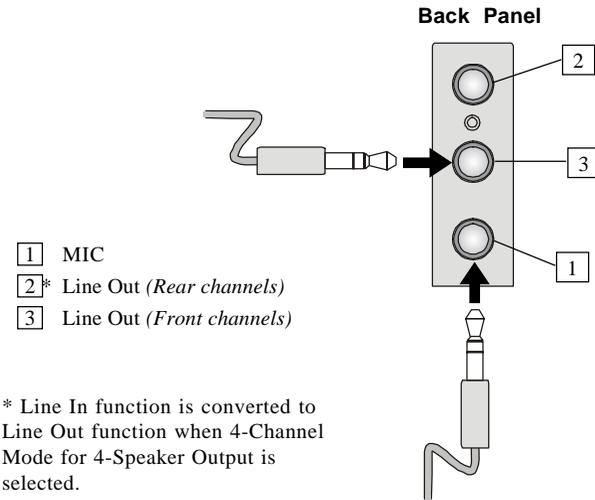
- 1 MIC
- 2 Line In
- 3 Line Out (Front channels)



■ **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.

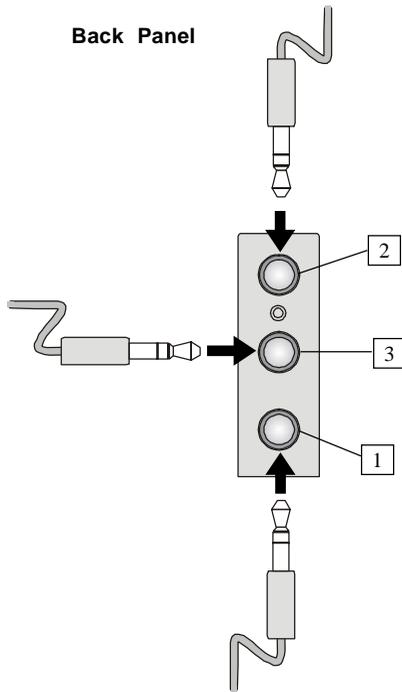


■ 6-Channel Mode for 6-Speaker Output

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 (Center and Subwoofer channel)
- 2* Line Out (Rear channels)
- 3* Line Out (Front channels)

* Both Line In and MIC function are converted to Line Out function when 4-Channel Mode for 6-Speaker Output is selected.



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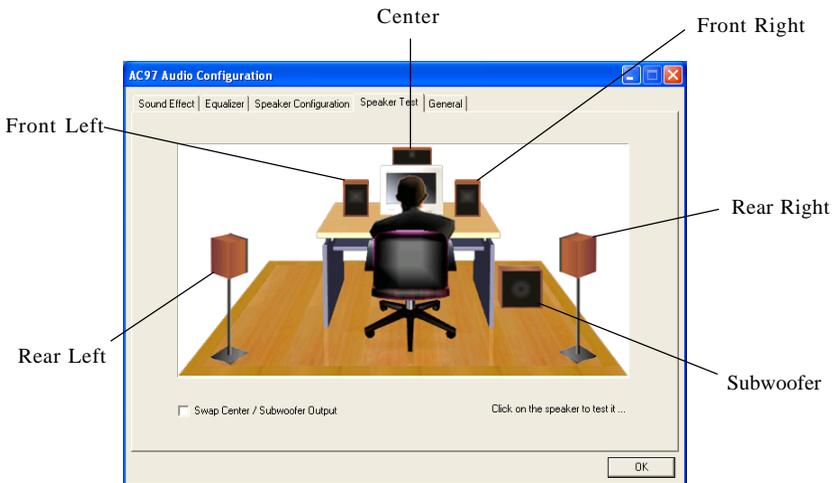
If the Center and Subwoofer speaker exchange their audio channels when you play video or music on the computer, a converter may be required to exchange center and subwoofer audio signals. You can purchase the converter from a speaker store.

Testing the Connected Speakers

To ensure that 4- or 6-channel audio operation works properly, you may need to test each connected speaker to make sure every speaker work 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.

Testing Each Speaker

1. Click the audio icon  from the window tray at the lower-right corner of the screen.
2. Click the **Speaker Test** tab.
3. The following window appears. Select the speaker which you want to test by clicking it.



MSI Reminds You...

6 speakers appear on the "Speaker Test" window only when you select "6-Channel Mode" in the "No. of Speakers" column. If you select "4-Channel Mode", only 4 speakers appear on the window.

4. 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.



Select this function

Playing KaraOK

The KaraOK function 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.

Playing KaraOK

1. Click the audio icon  from the window tray at the lower-right corner of the screen.
2. In the Sound Effect tab, select **Voice Cancellation** under “KaraOK.”
3. Click **OK** to close this window.

