K8NF4 Series

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FCC Compliance Statement

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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. However, there is no guarantee that interference will not occur in a particular installation.

Ver: EG102 120410151M2N

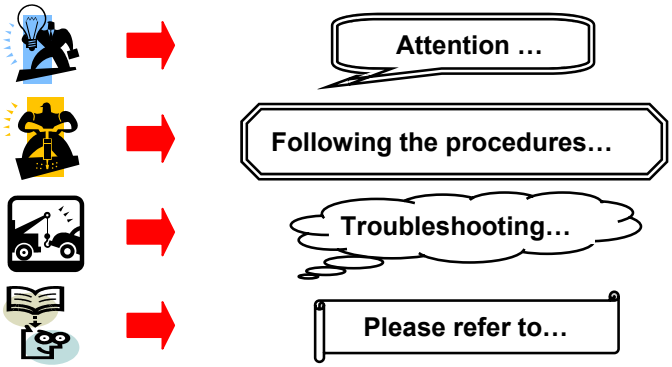
You have to know !!!

- The images and pictures in this manual are for reference only and may vary slightly from actual product installation depending on specific hardware models, third party components and software versions.
- Unplug your computer when installing components and configuring switches and pins.
- This mainboard contains very delicate IC chips. Use a grounded wrist strap when working with the system.
- Do not touch the IC chips, leads, connectors or other components.
- Unplug the AC power when you install or remove any device on the mainboard.

Package Contents

- K8NF4 Series mainboard
- IDE Cable/ FDC Cable
- SATA Power cord/ SATA Cable
- USB Bracket (optional)
- SPDIF & FRONT AUDIO Port Bracket (optional)
- I/O Shield
- Mainboard Setup Driver CD
- Mainboard User Manual CD
- Mainboard Quick Installation Guide

Symbols



K8NF4 Series

nVIDIA® nForce4 Ultra/Standard/4X
Supports Socket 939 AMD® Athlon™ 64 Processor
AMD® Athlon™ 64 FX Processor

USER Manual

Dimensions (ATX form-factor):

- 194mm x 295mm (WxL)

Operating System:

- Supports most popular operating systems: Windows® 2000/XP etc.

Contents

CHAPTER 1. GETTING STARTED 1

INTRODUCTION.....1
SPECIFICATION.....2
CONFIGURATION.....5
Layout of K8NF4 Series.....5
HARDWARE INSTALLATION.....6
CPU Processor Installation.....6
Memory Installation.....7
Back Panel Configuration.....10
Front Panel Indicator: SW/LED、SPEAKER.....12
Connectors.....13
Headers & Jumpers.....14
Audio Connectors.....18
Slots.....19
Power Supply Attachments.....20

CHAPTER 2. BIOS SETUP.....21

INTRODUCTION.....21
MAIN MENU.....23
ADVANCED BIOS FEATURES.....25
INTEGRATED PERIPHERALS.....31
POWER MANAGEMENT.....35
HARDWARE MONITOR.....37
LOAD DEFAULTS.....38
EXIT MENU.....39

CHAPTER 3: SOFTWARE SETUP.....40

SOFTWARE LIST.....40
SOFTWARE INSTALLATION.....40
APPENDIX I: 5.1 CHANNEL SETUP.....42
APPENDIX II: RAID SETUP.....43

INSTALLATION NOTE

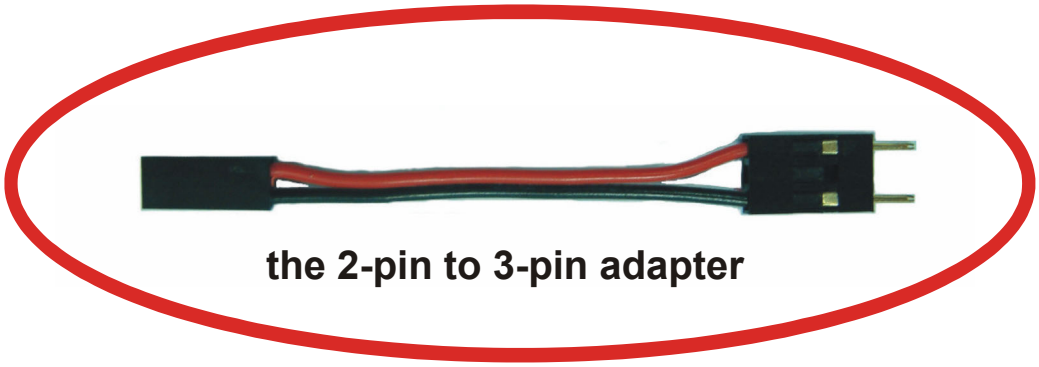
This mainboard complies with the ATX standard, which means the ACPI connector on this board is 2-pin. If the Power LED cable of your case uses a 3-pin adapter, you must use the 2-pin to 3-pin adapter (contained in the packaging).

本主機版之電路設計遵循標準 ATX 規格，標準 ATX 規格的 ACPI 針腳爲 2 pin；若機殼面板的 Power LED 連接線爲 3 pin 時，請利用隨產品包裝所附的 2 pin 轉 3 pin 連接線來連接。

本メインボードの電路は ATX 規格に基づいて、設計されたものだから、ACPI コネクタは 2-ピンです。ケースの Power LED ケーブルが 3-ピンである場合は、パッケージの中での 2-3 ピンアダプタを使って、LED をこのコネクタに接続してください。

La carte de mère se conforme à ATX norme, signifie que l'adaptateur de ACPI sur cette carte est 2-broche. Si le ACPI câble de votre boîtier d'ordinateur est 3-broche, utlisez l'adapteur 2-broche vers 3-broche dans le paquet pour le connecter.

Dieses Mainboard stimmt mit dem ATX-Standard überein (d.h. auf der Hauptplatine befindet sich ein 2-poliger ACPI-Anschluss). Falls Ihr Power-LED-Kabel 3-polig ist, benutzen Sie bitte einen 3 poligen zu 2 poligen Zwischenstecker.

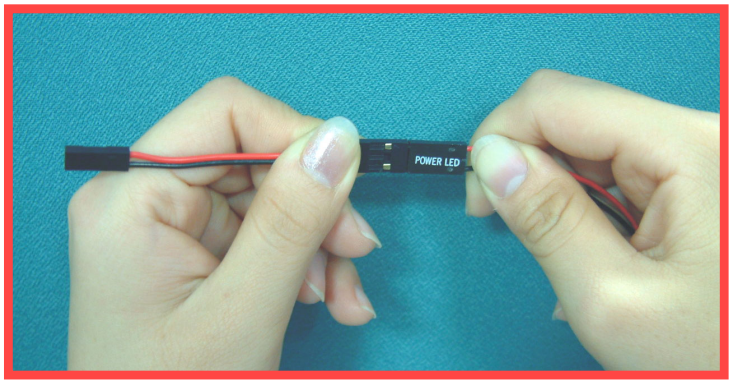


the 2-pin to 3-pin adapter

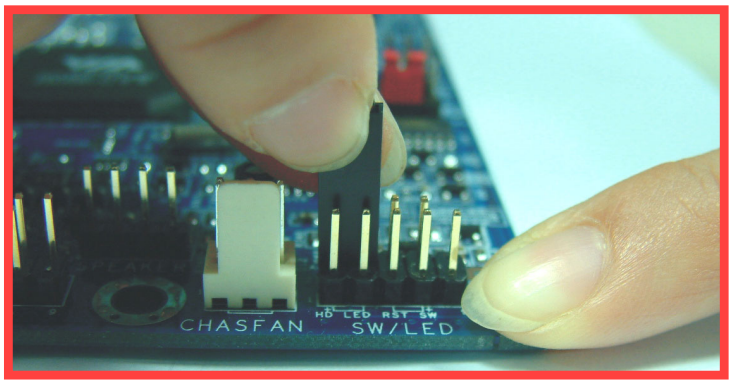
120470017M1N

- Locate the Power LED cable attached to the case. If the Power LED cable has a 3-pin adapter, you must use the 2-pin to 3-pin adapter which comes with the packaging.

- The heads of the power cables usually have a triangular mark which indicates the positive electrode(+). Connect the 3-pin end of the adapter to the Power LED cable, matching up the positive electrodes(+).



- Finally, attach the 2-pin end of the adapter to the ACPI pins on the mainboard, making sure you match up the positive electrodes(+).



Chapter 1. Getting Started

Introduction

Congratulations on choosing the K8NF4 Series mainboard! It based on nVIDIA® nForce4 Ultra/Standard/4X chipset. It also supports AMD® Athlon™ 64 / AMD® Athlon™ 64 FX Processor.

The K8NF4 Series mainboard provides 4 sockets using 184 pin DDR SDRAM (Dual channel). You can install DDR400/ 333/ 266 (PC3200/ 2700/ 2100) SDRAM. It supports install up to 4GB memory size.

These mainboards provide one 16-lane (x16) PCI-Express slot for use with a PCI-Express graphics card. This slot can provide 4 GB/s bandwidths in each direction. It also has three 1-lane (x1) PCI-Express slots for additional cards. These slots provide 250 MB/s bandwidths in each direction.

The K8NF4 Series provides a BIOSCN1 header for an additional Card (ABS). This can provide a second BIOS when the original one is damaged. You don't have to be worried about what a damaged BIOS may cause.

The K8NF4 Series mainboard includes built in IDE facilities that support Ultra ATA 66/ 100/ 133. It also includes built in Serial ATA or Serial ATA2 facilities that support SATA RAID 0/ 1/ 0+1/ JBOD and support transfer rate to 150MB/sec or 300 MB/s per channel.

The K8NF4 Series comes with an AC'97 audio controller (ALC655) which supports high quality 6 channel audio (5.1 channel audio effect). It supports also Sony/ Philips Digital Interface.

The K8NF4 Series mainboard also comes with 10/100 or 1Gbits different LAN PHY Chip which supports a back panel LAN port capable of 1 Gbit/s or 10/100 transmission speeds.

The K8NF4 Series mainboard comes with eight USB 2.0/1.1 ports.

All of the information in this manual only for reference. This specification is subject to change without notice.

Specification

CPU:

- Supports Socket 939 AMD® Athlon™ 64 / AMD® Athlon™ 64 FX Processor
- Supports system bus 800(1600MT/s)/ 1000+ (2000+MT/s)
- HyperTransport™ Link
- supports 16-bit to be capable of operating up to 1GHz (2000 MT/s) with a bandwidth of up to 2 Gbytes/s in each direction

Chipset:

- Single Chip – nVIDIA® nForce4 Ultra (K8NF4U) / Standard (K8NF4S) / 4X (K8NF4X)
- I/O Controller – Winbond Super I/O W83627HF-AW
- AC'97 Codec – Realtek ALC655
- GB LAN PHY – Vitesse CIS8201 (Optional)
- 10/100 LAN PHY – Broadcom AC131(Optional)

DRAM Memory:

- Supports DDR400 (DDR333 (PC2700)/ DDR266 (PC2100) SDRAM
- Supports 64 MB/ 128 MB/ 256 MB/ 512 MB/ 1 GB unbuffered DIMM modules
- Supports up to four memory modules with a total capacity of 4 GB
- Supports Dual-Channel data bus

PCI-Express BUS Slots:

- Provides 1 x 16 PCI Express slot with 4 GB/s bandwidth (each direction)
- Provides 3x 1 PCI Express slots with 250 MB/s bandwidth (each direction)
- All PCI Express slots are fully PCI Express 1.0a compliant

PCI BUS Slots:

- Provides 2 PCI slots
- Contains 33MHz, 32bit PCI interface, PCI 2.3 is compliant

AC'97 Sound Codec Onboard:

- High performance CODEC with high S/N ratio (>90 dB)
- Compliant with AC'97 2.3 specification
- Integrated S/ PDIF transmitter
- 6-channel playback capability (5.1 Channel Audio Effect)
- 3D Stereo enhancement

LAN PHY Chip:

- Broadcom AC131 10/ 100 Mbps Ethernet support (Optional)
- VITESSE CIS8201 10/ 100/ 1000 Mbps Ethernet support (Optional)

Universal Serial Bus:

- Supports up to eight USB ports for USB interface devices
- Supports USB 2.0 Enhanced Host Controller Interface (EHCI) and dual USB 1.1 Open Host Controller Interface (OHC1)

IDE Facilities:

- Supports Ultra ATA 66, Ultra ATA 100, Ultra ATA 133
- Supports IDE interface with CD-ROM
- Supports high capacity hard disk drives
- Supports installation of up to 4 drives, with separate IDE connections for Primary and Secondary connectors

Serial ATA or Serial ATA2 facilities:

- Compatible with SATA 1.0
- Compatible with SATA 2.0 (K8NF4U only)
- Supports Serial ATA specification of 150 MB/sec transfers
- Supports Serial ATA specification of 300 MB/sec transfers (K8NF4U only)
- Supports SATA RAID 0/ 1/ 0+1/ JBOD mode

I/O facilities:

- One multi-mode Parallel Port capable of supporting the following specifications:
  - 1. Standard & Bi-direction Parallel Port
  - 2. Enhanced Parallel Port (EPP)
  - 3. Extended Capabilities Port (ECP)
- Supports one serial port 16550 UART in the back panel and one optional onboard serial port header (COM2).
- Supports one SPDIF-OUT RCA port and an SPDIF IN/OUT onboard header
- Supports Infrared Data Transmissions using IrDA(optional)
- Supports PS/2 mouse and PS/2 keyboard
- Supports 360 KB, 720 KB, 1.2 MB, 1.44 MB, and 2.88 MB floppy disk drives
- Game port compatible (optional)

BIOS:

- Phoenix-Award™ BIOS
- Supports APM1.2
- Supports ACPI power management

ABS (Albatron BIOS Security):

- Supports ABS (Albatron BIOS Security) card (optional)
- Provides BIOS backup function

Green Functionality:

- Supports Phoenix-Award BIOS ™ power management functionality
- Contains an inactivity power down timer that can be set from 1 to 15 minutes
- Wakes from power saving sleep mode with any keyboard or mouse activity

Shadow RAM:

- This mainboard is equipped with a memory controller providing shadow RAM and support for ROM BIOS

Flash Memory:

- Supports flash memory functionality
- Supports ESCD functionality

Hardware Monitor Function:

- Monitors CPU/Chassis Fan Speed
- Monitors CPU & system Temperature
- Monitors System Voltage

Watch Dog Timer:

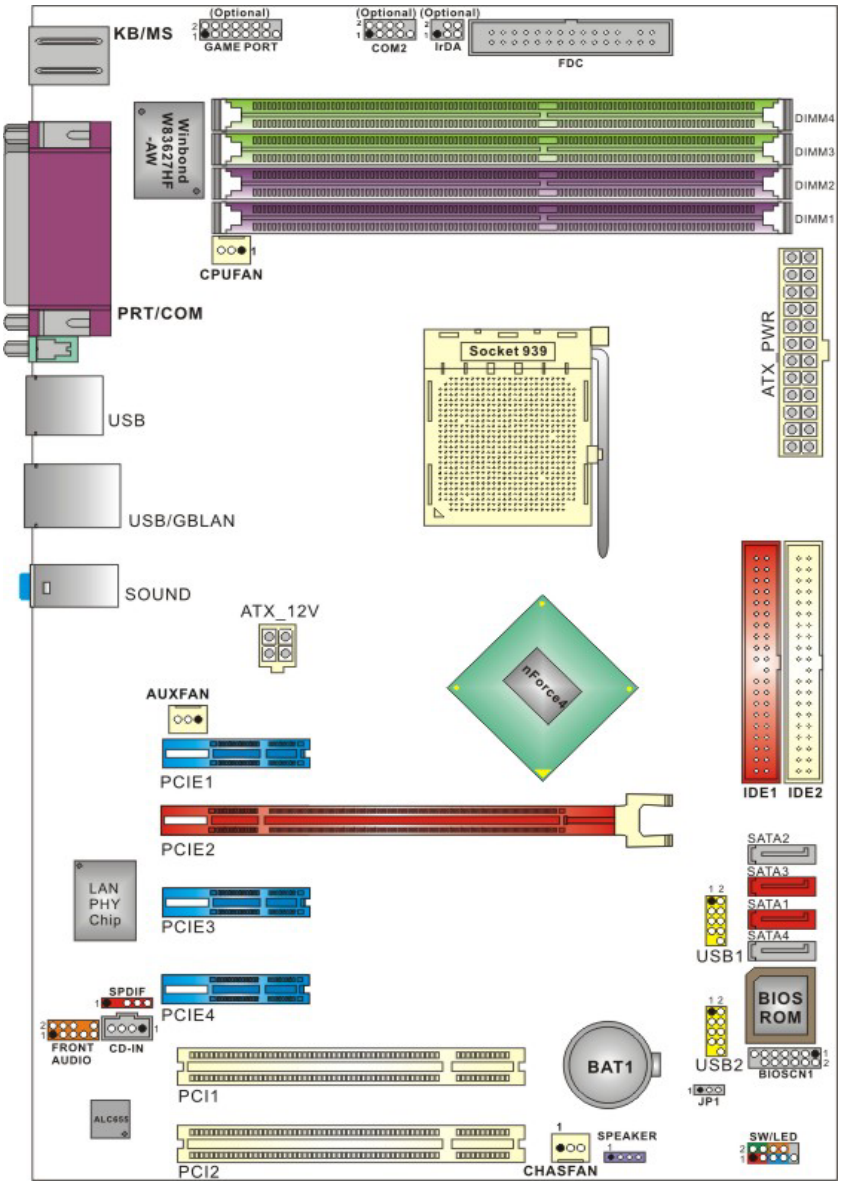
- The mainboard contains a special feature called the “Watch Dog Timer” which is used to detect when the system is unable to handle over-clocking configurations during POST stage. Once detected the system will reset the configurations and reboot the system after five seconds

Firewall:

- Supports hardware Firewall (K8NF4U)
- Supports software Firewall (K8NF4S)

Configuration

Layout of K8NF4 Series



Hardware Installation

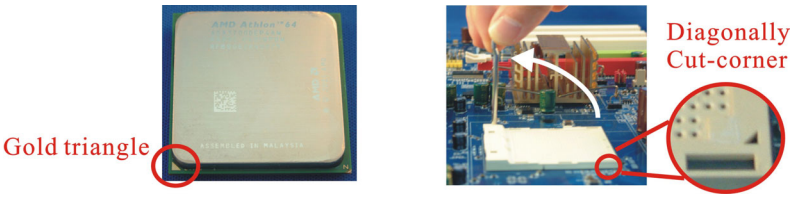
This section will assist you in quickly installing your system hardware. Wear a wrist ground strap before handling components. Electrostatic discharge may damage your system components.

CPU Processor Installation

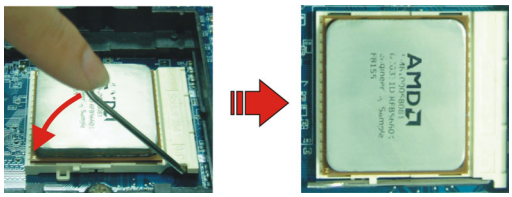
This mainboard supports AMD® Athlon™ 64/ 64FX processor using a Socket 939. Before building your system, we suggest you visit the AMD website and review the processor installation procedures.
http://www.amd.com

CPU Socket 939 Configuration Steps:

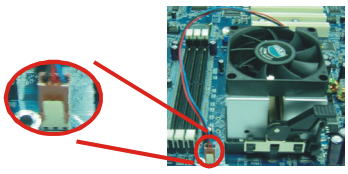
1. Locate the CPU socket on your mainboard and nudge the locking lever away from the socket. Then lift the lever to a 90-degree angle.
2. On the socket, locate the corner which has the "diagonally cut-corner" on the rectangular shaped pattern of pinholes (see diagram below-left). Match that corner with the "gold triangle" on the CPU (see diagram below-right) and lower the CPU onto the socket. The bottom of the CPU should be flush with the face of the socket.



3. Lower the lever until it snaps back into position. This will lock down the CPU.



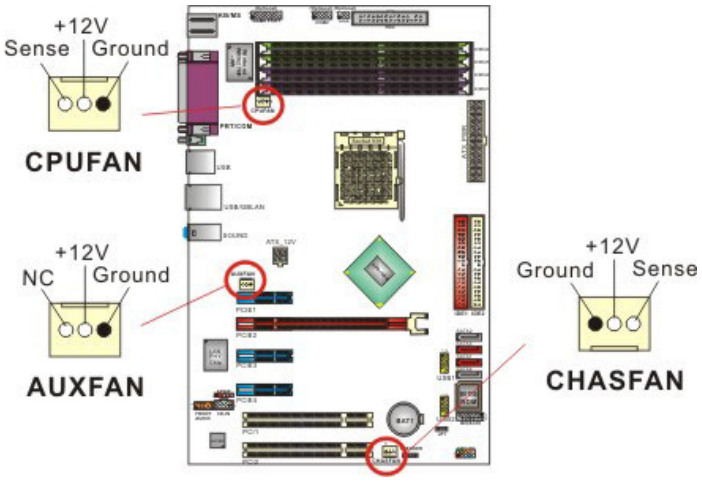
4. Smear thermal grease on top of the CPU. Lower the CPU fan onto the CPU and use the clasps on the fan to attach it to the socket. Finally, extend the power cable from the fan and insert it onto the "CPUFAN" adapter.



Attention
Overheating may damage the CPU and other sensitive components.
Please check the installation completely before starting the system.
Make sure the heatsink and the CPU fan are properly installed.

FAN Headers

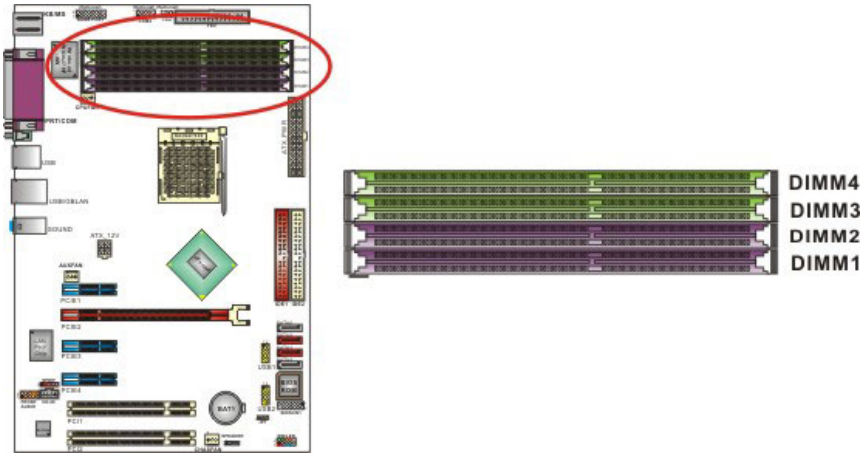
Three power headers are available for cooling fans, which play an important role in maintaining the ambient temperature in your system.



Attention
We strongly recommend that you use a CPU fan sink with your CPU. You can attach the CPU fan to the CPUFAN header.

Memory Installation

The K8NF4 Series mainboard contain 4 sockets, which use 184- pin DDR SDRAM with a total memory capacity of up to 4 GB. You can install unbuffered DDR400/ 333/ 266(PC3200/ 2700/ 2100) SDRAM.



To Enable Dual-Channel DDR, the following conditions must be met:

1.You must use either DIMM1 & DIMM2 together or DIMM3 & DIMM4 together or all four DIMM slots together. If you want to use only one DIMM, you must use DIMM1 or DIMM3.

2.You must use matching DIMM configurations between DIMM1 & DIMM2. You must use matching DIMM configurations between DIMM3 & DIMM4.

- Same Density (128MB, 256MB, 512MB, etc.)
- Same DRAM technology (128Mb, 256Mb, or 512Mb)
- Same DRAM bus width (x8 or x16)
- Both either single-sided or dual-sided
- Same brand
- Same timing specifications
- Same DDR speed

Please refer the table below to install the memory DIMMs.

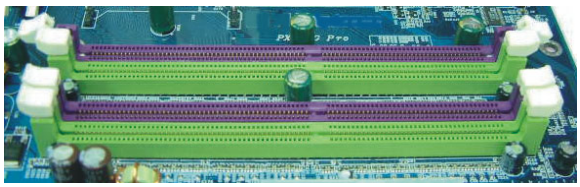
Data Bus	DIMM 1	DIMM 2	DIMM 3	DIMM 4	Maximum DRAM SPEED	
					1T	2T(default)
64-bits Single channel	single side	X	---	X	DDR400	DDR400
	Double side	X	---	X	DDR400	DDR400
	---	X	single side	X	DDR400	DDR400
	---	X	Double side	X	DDR400	DDR400
	single side	X	single side	X	DDR333	DDR400
	single side	X	Double side	X	DDR200	DDR400
	Double side	X	single side	X	DDR200	DDR400
	Double side	X	Double side	X	DDR200	DDR333
128-bits Dual channel	single side	single side	---	---	DDR400	DDR400
	Double side	Double side	---	---	DDR400	DDR400
	---	---	single side	single side	DDR400	DDR400
	---	---	Double side	Double side	DDR400	DDR400
	single side	single side	single side	single side	DDR333	DDR400
	single side	single side	Double side	Double side	DDR200	DDR400
	Double side	Double side	single side	single side	DDR200	DDR400
	Double side	Double side	Double side	Double side	DDR200	DDR333

NOTE：1T & 2T(default) can be switched in Bios setting.

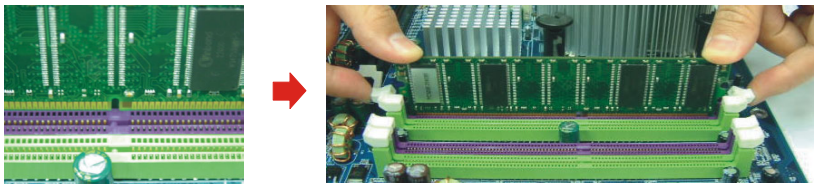
RAM Module Installation:

The following instructions explains memory module installation for these mainboards:

1. Before install your RAM module, please make sure that the power supply is **UNPLUGGED**. Pull the white plastic tabs at both ends of the slot away from the slot.

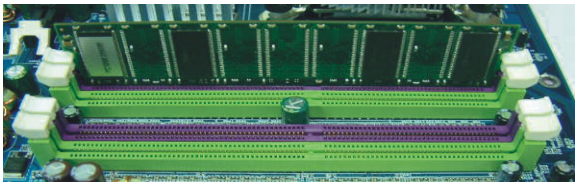


2. Match the notch on the RAM module with the corresponding pattern in the DIMM slot. This will ensure that the module will be inserted with the proper orientation.



Attention: There's a little red led beside the DIMM slots. If it's on, that means the AC power is connected. **DO NOT** install the RAM module when the led is on.

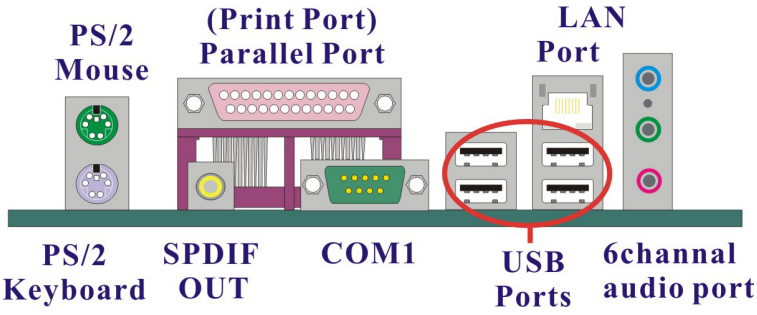
3. Lower the RAM module into the DIMM Slot and press firmly using both thumbs until the module snaps into place.



4. Repeat steps 1, 2 & 3 for the remaining RAM modules.

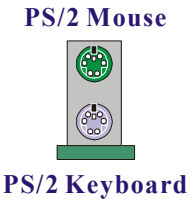
∗ The pictures above are for reference only. Your actual installation may vary slightly from the pictures.

Back Panel Configuration



PS/2 Mouse & PS/2 Keyboard Connectors: KB/MS

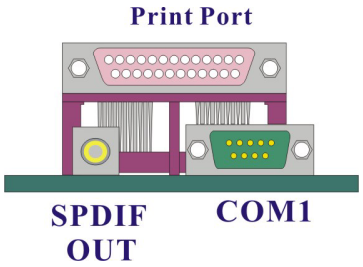
This mainboard provides a standard PS/2 mouse connector and PS/2 Keyboard connector. The pin assignments are described below:



Pin	Assignment	Pin	Assignment
1	Data	4	+5 V (fused)
2	No connect	5	Clock
3	Ground	6	No connect

Serial and Parallel Interface Ports

This mainboard comes equipped with one serial port, one parallel port and one SPDIF out RCA port. There is also one optional onboard serial port header (COM2).



Parallel Interface Port: PRT

The parallel port on your system has a 25-pin, DB25 connector that is used to interface with parallel printers and other devices using a parallel interface.

The Serial Interface: COM1

The serial interface port is sometimes referred to as an RS-232 port or an asynchronous communication port. Mice, modems and other peripheral serial devices can be connected to this port.

SPDIF out connectors

S/PDIF (Sony/Philips Digital Interface) is an audio transfer file format which provides high quality audio using optical fiber and digital signals. This mainboard is capable of a delivering audio output through this SPDIF connector.

USB & LAN Connectors: USB/ LAN

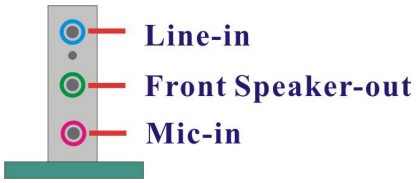
There are four USB connectors on the back panel. These USB connectors are used to attach to USB devices such as: keyboards, mice and other USB devices. You can plug the USB devices directly into this connector. The K8NF4 Series mainboard also provides a LAN port. You can plug LAN devices directly into this connector.

Pin	Assignment	Pin	Assignment
1	TX+	5	TRD2-
2	TX-	6	RX-
3	RX+	7	TRD3+
4	TRD2+	8	TRD3-

Pin	Assignment	Pin	Assignment
1/5	+5 V (fused)	3/7	USBP0+/P1+
2/6	USBP0-/P1-	4/8	Ground

Audio Port Connectors: Sound

The K8NF4 Series comes equipped with three Audio Ports. The three ports, Mic-in, Line-in and Front Speaker-out are standard audio ports that provide basic audio functionality. After you install the 5.1 Channel drivers for K8NF4 Series and setup 5.1 channel Audio effect, the three audio ports are enabled for 5.1 channel and supporting two speakers each.



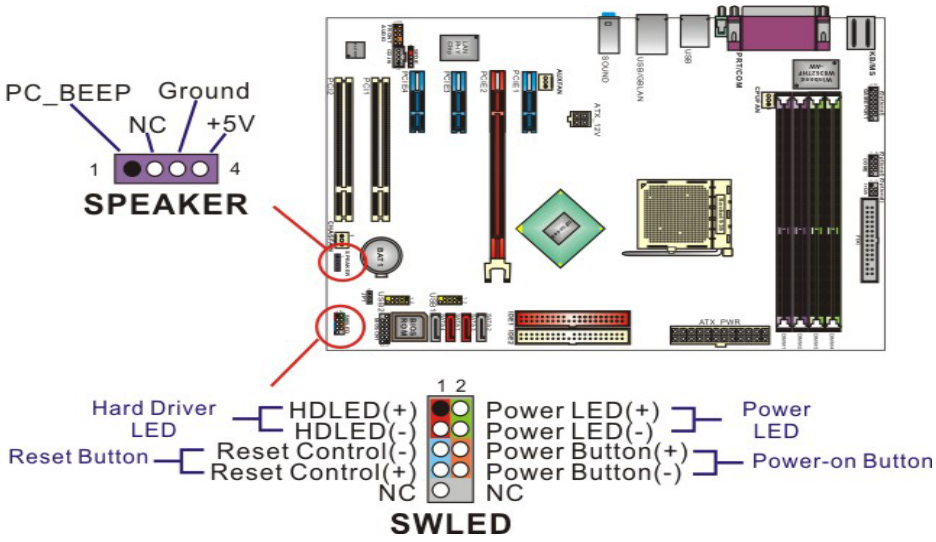
Line In Connects to an external audio device such as a CD player, tape player or other audio devices that provide audio out. For K8NF4 Series, this port becomes the rear speakers when 5.1 Channel Audio Effects driver is installed and enabled.

Front Speaker-Out Connects to standard audio speakers. This port becomes the front speakers when 5.1 Channel Audio Effects driver is installed and enabled. Also note that this port provides the most amperage of all the ports making it suitable for headphones and speakers without power cables.

Mic In Connects to a microphone. For K8NF4 Series, this port becomes the subwoofer/center out when 5.1 Channel Audio Effects driver is installed and enabled.

The K8NF4 Series supports 5.1 Channel Audio effects. See appendix I for more information.

Front Panel Indicator: SW/LED、SPEAKER



HD LED (Hard Drive LED Connector)

This connector can be attached to an LED on the front panel of a computer case. The LED will flicker during disk activity. This disk activity only applies to those IDE drives directly attached to the system board.

RST SW (Reset Switch Connector)

This connector can be attached to a momentary SPST switch. This switch is normally left open. When closed it will cause the mainboard to reset and run the POST (Power On Self Test).

PWR SW (Power on Switch Connector)

This connector can be attached to a front panel power switch. The switch must pull the Power Button pin to ground for at least 50 ms to signal the power supply to switch on or off (the time required is due to internal debouch circuitry on the system board). At least two seconds must pass before the power supply will recognize another on/off signal.

SPEAKER (Speaker Header)

A front panel speaker can be connected to this connector. When you boot your computer, the speaker sounds a short “beep”. If there is something wrong during the Power On Self-Test, the speaker sounds “irregular beep” to warning you.

Connectors

Floppy Disk Connector: FDC

The mainboard provides a standard floppy disk connector (FDC) that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy diskettes. This connector supports the floppy drive ribbon cables provided in the packaging.

Hard Disk Connectors: IDE1/ IDE2、SATA1/ 2/ 3/ 4

The mainboard has two 32-bit Enhanced PCI IDE Controllers that support Ultra ATA 66, Ultra ATA 100 and Ultra ATA 133. It has two HDD connectors, IDE1 and IDE2. The mainboard also has four Serial ATA (150MB/sec) connectors or Serial ATA2 (300MB/sec) connectors that both support SATA RAID 0/ 1/ 0+1/ JBOD.

IDE1 (Primary IDE Connector)

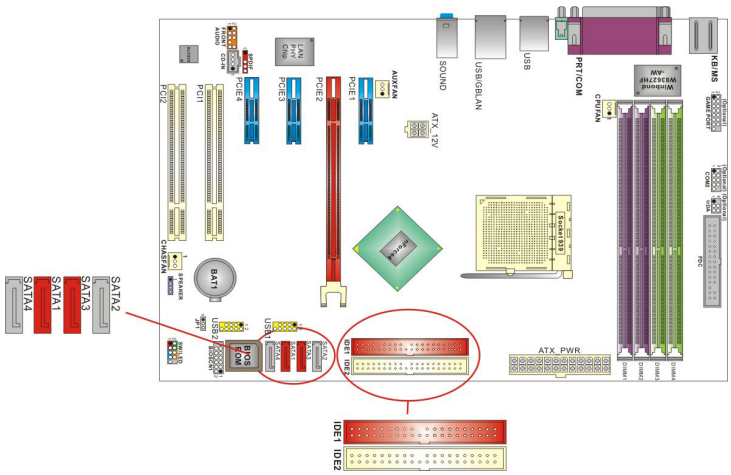
You can connect up to two hard drives to IDE1. If you attach two drives, you must use a ribbon cable with three connectors. You must also configure one drive as the master and one drive as the slave, using the jumpers located on each drive.

IDE2 (Secondary IDE Connector)

The IDE2 controller can also support a Master and a Slave drive. The configuration is similar to IDE1.

SATA1/ SATA2/ SATA3/ SATA4

The SATA or SATA2 connectors support transfer rate up to 150MB/sec or 300 MB/sec, and support SATA RAID 0/ 1/ 0+1/ JBOD mode for both. The connectors only can connect one serial ATA hard disk device of each.

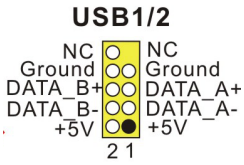


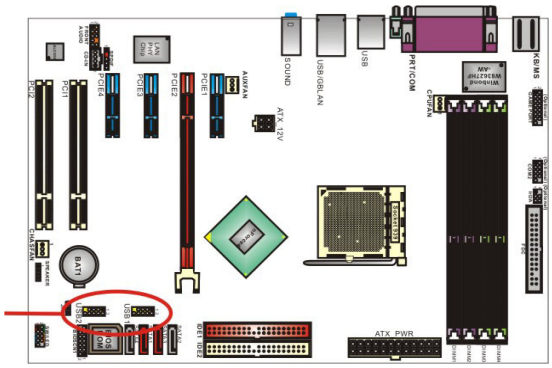
This mainboard supports SATA RAID 0/ 1 / 0+1 / JBOD.
See appendix Ⅱ for more information.

Headers & Jumpers

Front USB Headers (Yellow): USB1/ USB2

This mainboard provides 2 USB headers on the board allowing for 4 additional USB ports. To make use of these headers, you must attach a USB bracket/cable with USB ports (some models will come packaged with a USB 4-port bracket-cable). The optionally packaged bracket will have two connectors that you can connect to the headers (USB1, USB2). The other end (bracket containing the USB ports) is attached to the computer casing. The onboard USB headers do not support the USB wake up function like those on the back panel do.





If you are using a USB 2.0 device with Windows® 2000/XP, you will need to install the USB 2.0 driver from the Microsoft® website. If you are using Service pack 1 (or later) for Windows® XP, and using Service pack4 (or later) for Windows® 2000, you will not have to install the driver.

Front Serial Port Header: COM2 (Optional)

This mainboard supports an optional front serial header. To use this header, you can install a COM port & Game Port bracket (optional) with a wire extending to this header. You can then attach your serial device to the serial port on the bracket.

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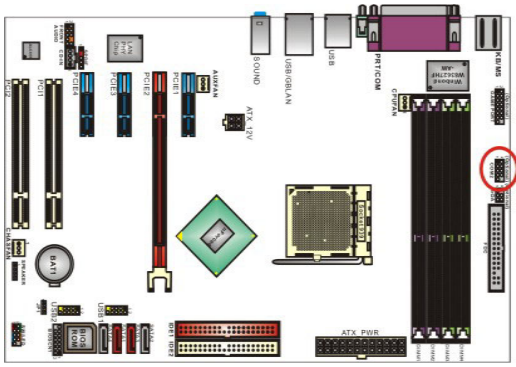
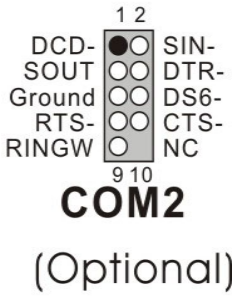
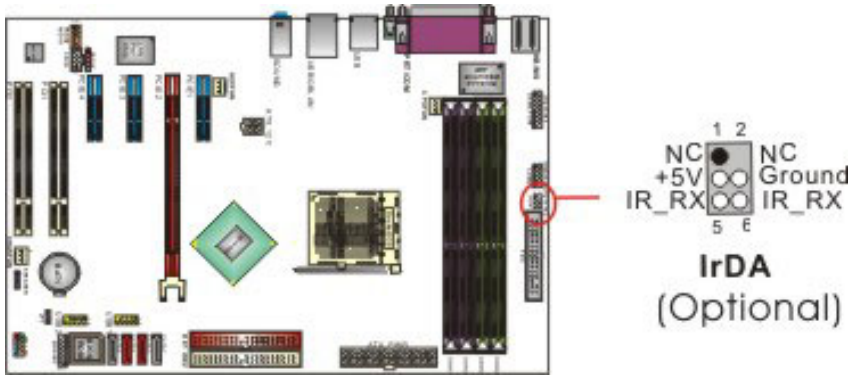




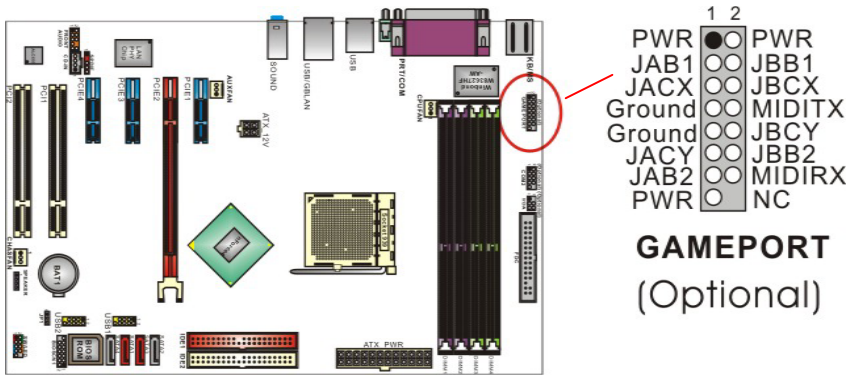
Infrared Header: IrDA (Optional)

This IrDA connector can be configured to support wireless infrared and is used to attach to an infrared sensing device. After the IrDA interface is configured, you can use this connector for connectionless data transfer to and from portable devices such as laptops and PDAs.



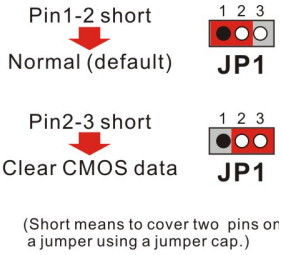
Game Port Header: GAME PORT(Optional)

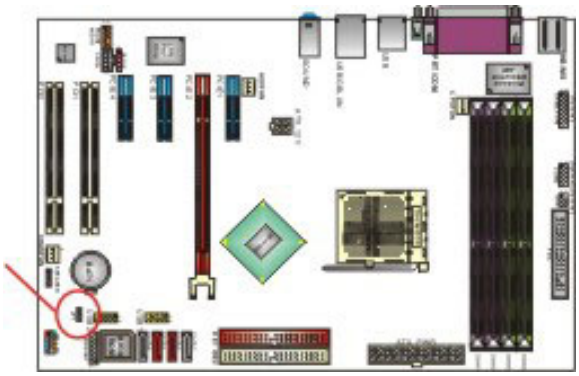
There is a game port header on these mainboards. To use this header, you must attach a game port bracket-cable so that you can interface to gaming devices (game port bracket is optional).



Clear CMOS Jumper: JP1

The "Clear CMOS" jumper is used when you cannot boot your system due to some CMOS configuration such as a password that is forgotten. This jumper allows you to reset the CMOS configurations, and then reconfigure.





The following steps explain how to reset your CMOS configurations when you have forgotten your system password.
1. Turn off your system and disconnect the AC power cable.
2. Set JP1 to OFF (2-3 Closed).
3. Wait several seconds.
4. Set JP1 to ON (1-2 closed).
5. Connect the AC power cable and turn on your system.
6. Reset your new password.

ABS (Albatron BIOS security) Header: BIOSCN1 (Optional)

This mainboard includes one ABS header (BIOSCN1) for the ABS card which can provide a second BIOS for the mainboard in case the original BIOS is damaged. To set up the jumper on the ABS card, please refer to figure1. (Attention: Whether you want to use this function or not, removing this jumper cap from the ABS card is interdictory.)

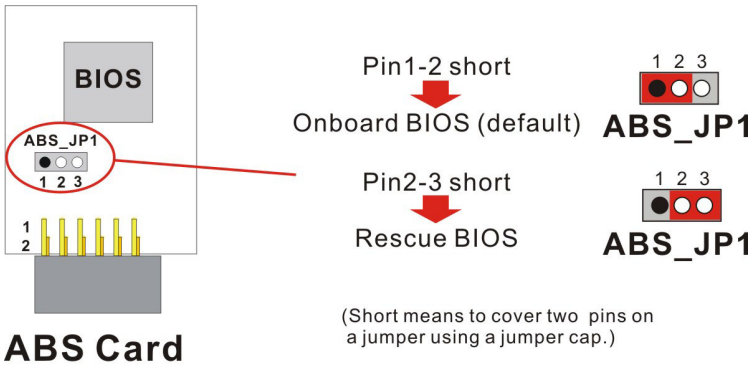


Figure1

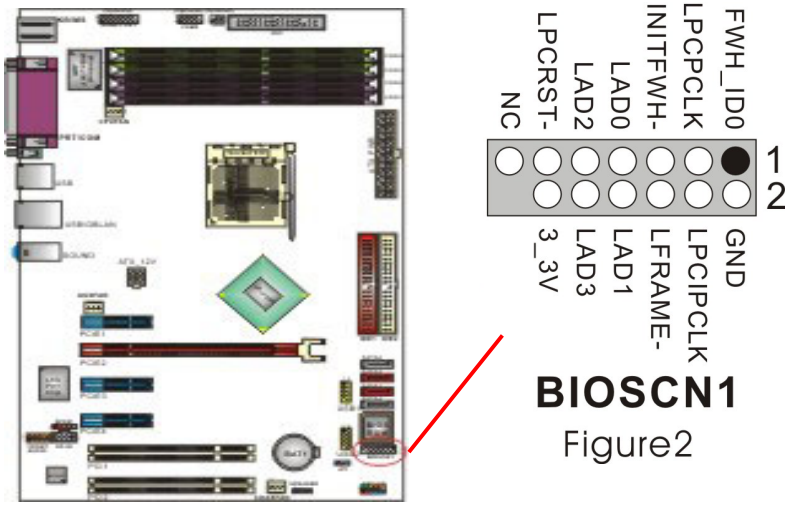
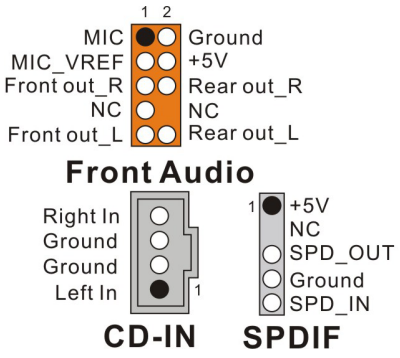
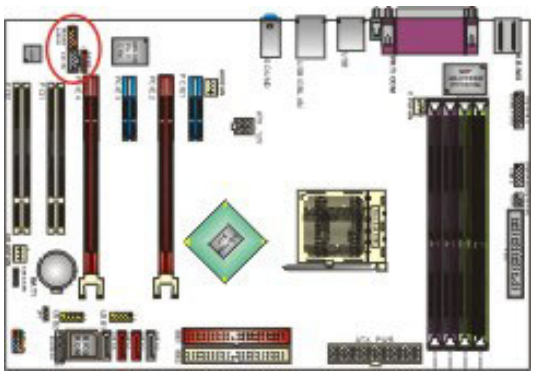


Figure2

Attention: There are two jumper caps on the ABS header (BIOSCN1). One is in pin1 -2, and the other is in pin3 -4. Before installing the ABS card, remember to remove these jumper caps first. But, if you don't want to use the ABS card, please **DO NOT** change the positions of the jumper caps and **DO NOT** remove them. Otherwise, the mainboard and the ABS card might become damaged.

Audio Connectors





CD-ROM Audio-In Header: CD-IN

This header is used to connect to a CD-ROM / DVD audio cable.

Front Panel Audio Header: FRONT AUDIO

You can use the Front Panel Audio header (FRONT AUDIO) to connect to a separate audio bracket or to connect to case embedded audio equipment. The Front AUDIO header provides MIC-in and Line–out functionality and cannot be used simultaneously with the back panel mic and speakers. An SPDIF/Audio bracket is optionally packaged with some models.

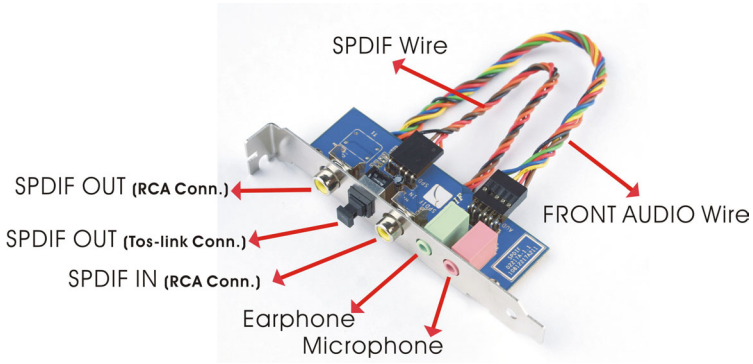
S/PDIF Header: SPDIF

S/PDIF (Sony/Philips Digital Interface) is an audio transfer file format which provides high quality audio using optical fiber and digital signals. This mainboard is equipped with an SPDIF header and must be used with a bracket-cable containing S/PDIF ports. An SPDIF/Audio bracket is optionally packaged with some models. The bracket has RCA connectors similar to that used with most consumer audio products and TOS-Link connectors and you can use these connectors to output/input audio to and from an S/PDIF device. The devices you connect to must be S/PDIF compliant for optimal effect.

Note: The SPDIF out RCA port was already built in the back panel. If you want to use the optional SPDIF bracket, you will find there are two SPDIF out RCA port (one is on the back panel and the other is on the SPDIF card), and you can use only one of them at the same time.

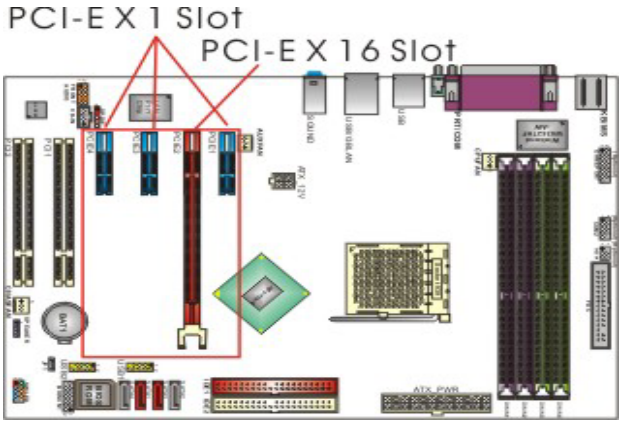
SPDIF & FRONT AUDIO bracket (optional)

You can connect the bracket to the SPDIF and FRONT AUDIO Headers (This photo can be varied with different models).



Slots

There is one PCI-Express x16 slot, 3 PCI-Express x1 slots and 2 PCI slots. These slots are designed for expansion cards to complement and enhance the functionality of the mainboard.



PCI-Express slots: PCIE1/ PCIE2/ PCIE3/ PCIE4

PCI-E x16 slot is for installing PCI-Express graphics cards. The PCI-E x1 slot is for expansion cards which fit the PCI-E x1 slot.

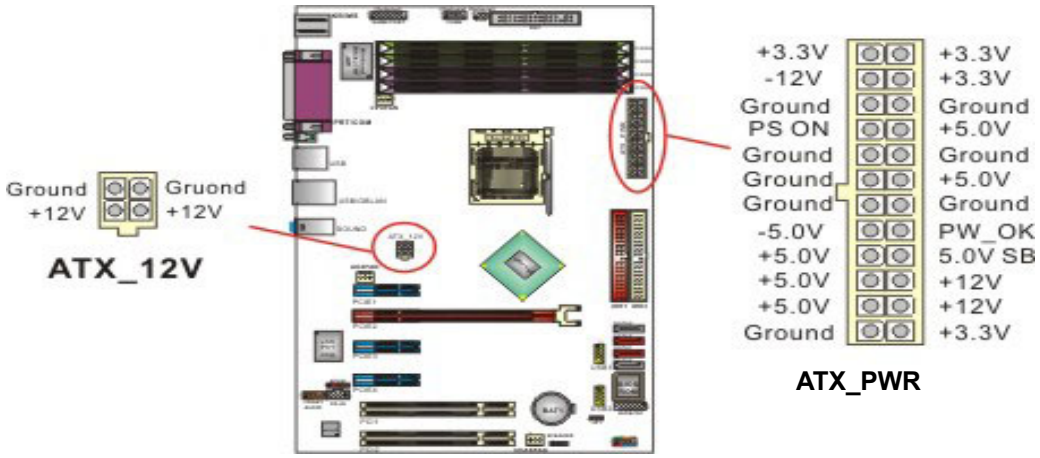
PCI Slots: PCI1/ PCI2

This mainboard is equipped with 2 standard PCI slots. PCI stands for Peripheral Component Interconnect and is a bus standard for expansion cards, which has, for the most part, supplanted the older ISA bus standard. This PCI slot is designated as 32 bit.

Power Supply Attachments

ATX Power Connector: ATX_PWR、ATX_12V

This mainboard requires two ATX power connections. The first is a 24-pin connector and the second is a 4-pin connector. Attach the 4-pin connector first and then attach the 24-pin connector. Make sure the connectors are secure before applying power. (ATX_PWR can be attached to a 20-pin connector but be extra careful with the connector orientation when connecting the cables)



Attention: Please make sure that the 4-pin power cable has plugged in the ATX_12V connector in case that the over load power requirement may damage the mainboard.

Chapter 2. BIOS Setup

Introduction

This section describes PHOENIX-AWARD™ BIOS Setup program which resides in the ROM BIOS firmware. The Setup program allows users to modify the basic system configuration. The configuration information is then saved to CMOS RAM where the data is sustained by Li-battery after power-down.

The BIOS provides critical low-level support for standard devices such as disk drives, serial ports and parallel ports. As well, the BIOS controls the first stage of the boot process, loading and executing the operating system.

The PHOENIX-AWARD™ BIOS installed in Flash ROM is a custom version of an industry standard BIOS. This means that it supports the BIOS of AMD® based processors.

This version of the PHOENIX-AWARD™ BIOS includes additional features such as virus and password protection as well as special configurations for fine-tuning the system chipset. The defaults for the BIOS values contained in this document may vary slightly with the version installed in your system. (When you boot up the computer, the BIOS version will appear at up-left of the POST screen.)

Plug and Play Support

This PHOENIX-AWARD™ BIOS supports the Plug and Play Version 1.0A specification as well as ESCD (Extended System Configuration Data) write.

EPA Green PC Support

This PHOENIX-AWARD™ BIOS supports Version 1.03 of the EPA Green PC specification.

APM Support

This PHOENIX-AWARD™ BIOS supports Version 1.1 & 1.2 of the Advanced Power Management (APM) specification. These features include system sleep and suspend modes in addition to hard disk and monitor sleep modes. Power management features are implemented using the System Management Interrupt (SMI).

PCI/ PCI-Express Bus Support

This PHOENIX-AWARD™ BIOS also supports Version 2.3 of the Intel PCI (Peripheral Component Interconnect) local bus specification and the PCI-Express v1.0a specification.

Supported CPUs

This PHOENIX-AWARD™ BIOS supports the AMD® Athlon™ 64 / 64 FX CPU.

Key Function

In general, you can use the arrow keys to highlight items, press <Enter> to select, use the <PgUp> and <PgDn> keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate within the BIOS Setup program.

Keystroke	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left (menu bar)
Right arrow	Move to the item on the right (menu bar)
Esc	Main Menu: Quit without saving changes Submenus: Exit Current page to the next higher level menu
Move Enter	Move to the item you desire
PgUp key	Increase the numeric value or enter changes
PgDn key	Decrease the numeric value or enter changes
+ Key	Increase the numeric value or enter changes
- Key	Decrease the numeric value or enter changes
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

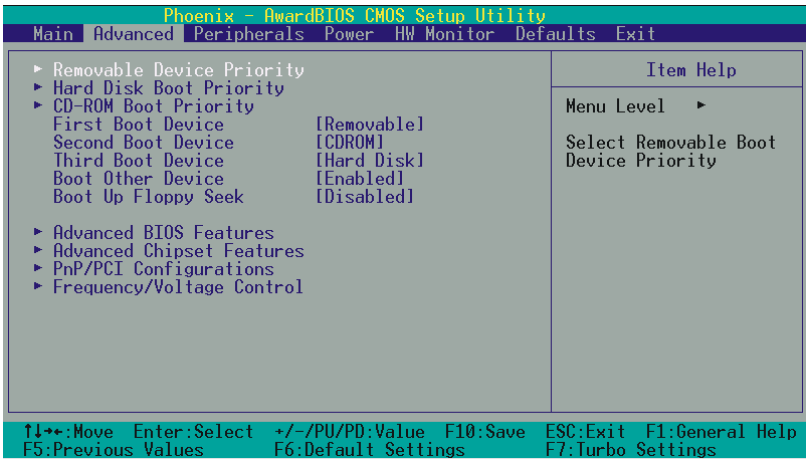
Main Menu

When you enter the PHOENIX-AWARD™ BIOS Utility, the Main Menu will appear on the screen. The Main menu allows you to select from several configuration options. Use the left/right arrow keys to select a particular configuration screen from the top menu bar or use the down arrow key to access and configure the information below.

Main Menu Setup Configuration Options

Item	Options	Description
Date	mm dd yyyy	Set the system date. Note that the 'Day' automatically changes when you set the date.
Time	Hh: mm: ss	Set the current time of the system.
IDE Primary Master	Options contained in sub menu.	Press <Enter> to enter the sub menu.
IDE Primary Slave	Options contained in sub menu.	Press <Enter> to enter the sub menu.
IDE Secondary Master	Options contained in sub menu.	Press <Enter> to enter the sub menu.
IDE Secondary Slave	Options contained in sub menu.	Press <Enter> to enter the sub menu.
Drive A **Drive B**	360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5in 2.88M, 3.5 in None	Select the type of floppy disk drive installed in your system.
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device.
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/ Key	Select the situation in which you want the BIOS to stop the POST process and notify you.
Security	Options contained in sub menu.	Press <Enter> to enter the sub menu.
Base Memory	N/A	Displays the amount of conventional memory detected during boot up.
Extended Memory	N/A	Displays the amount of extended memory detected during boot up.
Total Memory	N/A	Displays the total memory available in the system.

Advanced BIOS Features



Removable Device Priority

Select removable device priority. Just like floppy, LS120, ZIP-100, USB-FDD and USB-ZIP.

Hard Disk Boot Priority

Select hard disk boot priority.

CD-ROM Boot Priority

Select CD-ROM boot priority.

First /Second/Third Boot Device

Select the order in which devices will be searched in order to find a boot device.

Options: Removable (default for first boot device)、CD ROM (default for second boot device)、Hard Disk (default for third boot device)、Disabled

Boot Other Device

Set to “Enabled” allows the system to try to boot from other devices if the system fails to boot from the 1st/ 2nd/ 3rd boot devices. Options: Enabled (default)、Disabled

Boot Up Floppy Seek

When Enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks. Drives with 720KB, 1.2MB, and 1.44MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to "Disabled".

Options: Enabled、Disabled (default)

Advanced BIOS Features

Virus Warning

Set the virus warning feature for IDE hard disk boot sector protection. If the function is enabled, any attempt to write data into this area will cause a beep and warning message display on screen. Options: Disabled (default)、Enabled

CPU Internal Cache

Make CPU internal cache active or inactive. System performance may degrade if you disable this item. Options: Enabled (default)、Disable.

External Cache

This option allows you to enable or disable "Level 2" secondary cache on the CPU to enhance performance. Options: Enabled (default)、Disabled

Quick Power On Self Test

Allow the system to skip certain tests while booting. This will speed up the boot process.

Options: Enabled (default)、Disabled.

Swap Floppy Drive

If the system has two floppy drives, choose "Enabled" to assign physical drive B to logical drive A and vice-versa. Options: Disabled (default)、Enabled.

Boot Up NumLock Status

Selects the power on state for NumLock.

Options: On (default) Numpad keys are number keys.
Off Numpad keys are arrow keys.

Typematic Rate Setting

When "Enabled", the "typematic rate" and "typematic delay" can be configured. Typematic Rate determines the keystroke repeat rate used by the keyboard controller. Options: Disabled (default)、Enabled

Typematic Rate (Chars/Sec)

The rate at which a character repeats when you hold down a key.

Options: 6 (default)、8、10、12、15、20、24、30

Typematic Delay (Msec)

The delay before keystrokes begin to repeat. Options: 250 (default)、500、750、1000

APIC Mode

By enabling this option, “MPS version control for OS” can be configured.

Options: Disabled、Enabled (default)

MPS Version Control For OS

The 1.1 version is the older version that supports 8 more IRQs in the Windows NT environment. Choose the new 1.4 version for Windows 2000 and Windows XP.

Options: 1.4 (default)、1.1

OS Select For DRAM > 64MB

Select “OS2” only if you are running the OS/2 operating system with greater than 64 MB of RAM. Options: Non-OS2 (default)、OS2

HDD S.M.A.R.T. Capability

Self Monitoring Analysis and Reporting Technology is a technology that enables a PC to attempt to predict the possible failure of storage drives. Options: Disabled (default)、Enabled

Small LOGO (EPA) Show

This item allows you to show or hide the small LOGO EPA.

Options: Disabled (default)、Enabled

Advanced Chipset Features

DRAM Configuration

Timimng Mode

This item allows you to select if you want to let the bios detect and use informations in SPD or it’s you to configure those items below. Options: Auto (default)、Manual

Memclock index value (Mhz)

This item allows you to select the memory clock. When it set to “auto”, the system will automatically detected the memory clock. Options: 200、100、133、166

CAS# latency (Tcl)

This item determines CAS Latency. When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer. Options: 2.0、2.5、3

Min RAS# active time (Tras)

This item allows you to select DRAM Active to Precharge Delay.

Options: Auto、5T、6T、7T、8T、9T、10T、11T、12T、13T、14T、15T

RAS# to CAS# delay (Trcd)

Select the DRAM delay time when being read.

Options: Auto、2T、3T、4T、5T、6T、7T

Row precharge Time (Trp)

You can set the time to precharge. Options: Auto、2T、3T、4T、5T、6T、7T

1T/2T Memory Timing

Use this item to select the memory timing that you installed.

Options: 1T、2T(default)

System BIOS Cacheable

When enabled, accesses to system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is enabled. Options: Enabled、Disabled (default)

PnP/PCI Configurations

Reset Configuration Data

Select "Enabled" to reset the Extended System Configuration Data (ESCD) if you have installed a new add-on card and the system reconfiguration has caused such a serious conflict that the OS cannot boot. Options: Disabled (default)、Enabled

Resources Controlled By

BIOS can automatically configure all the boot and Plug and Play compatible devices. If you choose Auto, you will not be able to manually assign IRQ DMA and memory base address fields, since BIOS automatically assigns them. Options: Auto <ESCD> (default)、Manual

IRQ Resources

When resources are controlled manually, you can assign each system interrupt a type, depending on the type of device using the interrupt. This is only configurable when "Resources Controlled By" is set to "Manual".

IRQ-3 assigned to: PCI device
IRQ-4 assigned to: PCI device
IRQ-5 assigned to: PCI device
IRQ-7 assigned to: PCI device
IRQ-9 assigned to: PCI device
IRQ-10 assigned to: PCI device
IRQ-11 assigned to: PCI device
IRQ-12 assigned to: PCI device
IRQ-14 assigned to: PCI device
IRQ-15 assigned to: PCI device

PCI / VGA Palette Snoop

Some graphic controllers that are not VGA compatible take the output from a VGA controller and map it to their display as a way to provide boot information and VGA compatibility. Options: Disabled (default)、Enabled

PCI Latency Timer (CLK)

This item allows you to set up the PCI Latency Time (0-255). If you select the "32" it will optimize PCI speeds. Options: 0-255、32 (default)

PCI Express relative items

Maximum Payload Size

This item allows you to set maximum TLP payload size for the PCI Express devices. The uinit is byte.

Options: 128、256、512、1024、2048、4096(default)

Frequency/Voltage Control

CPU Speed Detected

This item displays the CPU speed information detected by the system.

CPU Host Frequency (MHz)

This item displays the CPU Host frequency. You can set it from 200 to 450. The default depends on your CPU frequency. The default for this field depends on the CPU installed.

CPU Spread Spectrum

The Spread Spectrum function can reduce the EMI (Electromagnetic Interference) generated. Options: Enabled (default)、Disabled

DDR Speed (strobe/sec)

This item display the current DDR speed (CPU Host frequency * Max Memclock ÷ 100.)

Hammer Fid control

This item displays the CPU ratio information detected by the system.

Options: The options that will be available will depend on the default value of the CPU installed. For example, if the CPU default value is 10 then the options will be from 4 to 10.

Note: Before you try to make any adjustments to this option, make sure that your CPU Ratio is adjustable and has not been locked by the CPU manufacturer.

CPU Speed Setting

This item display the CPU speed that you setting for. If you don't change the "CPU Host Frequency" or the "CPU Clock Ratio" and the item will display the current CPU speed.

CPU Speed = Current CPU Host Frequency x CPU Clock Ratio,
DDR Speed = Current CPU Host Frequency x (Max Memclock ÷ 100)

HT Ratio

This item allows you to set Hyper Transport Frequency.

Options: Auto(default)、1x、2x、3x、4x、5x

HT Frequency

This item displays the result of your HT Ratio setting

PCIE Clock

This item allows you to select PCIE clock form 100 Mhz(default) to 145Mhz.

PCIE Spread Spectrum

The Spread Spectrum function can reduce the EMI (Electromagnetic Interference) generated. Options: Enabled (default)、Disabled

CPU Voltage (Volt)

This item allows you to adjust your CPU core voltage. Options range from +15%、+10%、+5%、Default

DDR Voltage (Volt)

This item allows you to adjust the RAM voltage. Options: 2.7(default)、2.8、2.9、3.0

Chipset Voltage (Volt)

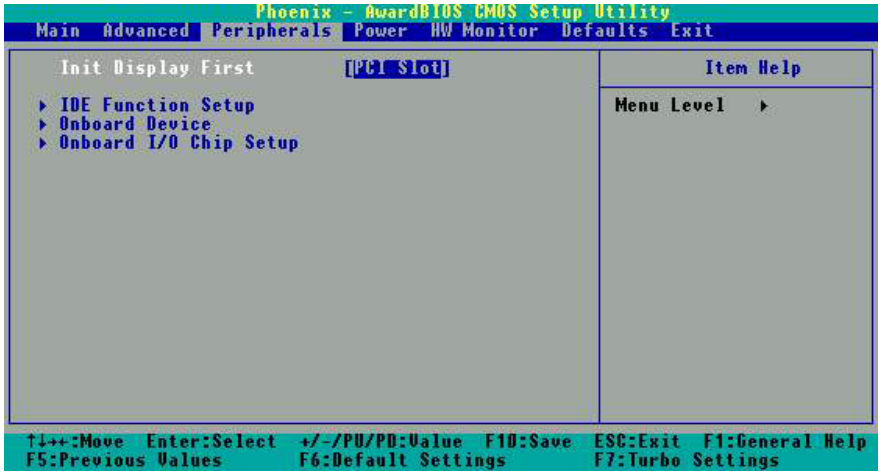
This item allows you to adjust the North/ South bridge chipsets voltage.

Options: 1.5v(default)、1.8v、1.7v、1.6v

Attention

Before overclocking, please make sure your system components are capable of overclocking. If you are familiar with the overclocking, we strongly recommend you to set the clock to the defult settings. We do not guarantee that damage will or will not occur when overclocking.

Integrated Peripherals



Init Display First

With systems that have multiple video cards, this option determines whether the primary display uses a PCI slot or an PCIEx slot. Options: PCIEx、PCI Slot (default)

IDE Function Setup

If you highlight the “IDE Function Setup” label and then press the enter key, it will take you to a submenu with the following options:

OnChip IDE Channel 0/1

The mainboard chipset contains a PCI IDE interface with support for two IDE channels. Select “Enabled” to activate the first and/or second IDE interface. Select “Disabled” to deactivate an interface if you are going to install a primary and/or secondary add-in IDE interface.

Options: Enabled (default)、Disabled

Primary/Secondary/Master/Slave PIO

The IDE PIO (Programmed Input / Output) fields let you set a PIO mode (0-4) for each of the IDE devices that the onboard IDE interface supports. Modes 0 to 4 will increase performance incrementally. In Auto mode, the system automatically determines the best mode for each device. Options: Auto (default)、Mode0、Mode1、Mode2、Mode3、Mode4.

Primary / Secondary /Master / Slave UDMA

Ultra DMA 100 functionality can be implemented if it is supported by the IDE hard drives in your system. As well, your operating environment requires 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 100, select "Auto" to enable BIOS support. Options: Auto (default)、Disabled

IDE Prefetch Mode

The "onboard" IDE drive interfaces supports IDE prefetching for faster drive access. If you install a primary and/or secondary add-in IDE interface, set this option to "Disabled" if the interface does not support prefetching. Options: Enabled (default)、Disabled

IDE HDD Block Mode

Block mode is otherwise known as block transfer, multiple commands, or multiple sector read/write. Select the "Enabled" option if your IDE hard drive supports block mode (most new drives do). The system will automatically determine the optimal number of blocks to read and write per sector. Options: Enabled (default)、Disabled

RAID Config

If you highlight the "RAID Config" label and then press the enter key, it will take you to a submenu with the following options:

RAID Enable

This item allows you to enable or disabled the following eight options. Options: Enabled、Disabled (default)

IDE Primary/ Secondary /Master/Slave RAID

This allows you to enable or disable the RAID function for the Primary/ Secondary /Master/Slave device. Options: Enabled、Disabled (default)

SATA1/2 Primary/ Secondary RAID

This allows you to enable or disable the RAID function for the SATA1 /2/Primary/ Secondary device. Options: Enabled、Disabled(default)

Serial-ATA 1/2

This item allows you to enable or disable the SATA1/2 device. Options: Enabled (default)、Disabled

SATA Spread Spectrum

When you installed a SATA device this item will allow you to enable/ disable the SATA speed spread spectrum. We recommend you to enabled this item to decrease EMI noise.

Options: Enabled (default)、Disabled

Onboard Device

If you highlight the "Onboard Device" label and then press the enter key, it will take you to a submenu with the following options:

OnChip USB

This option should be enabled if your system has a USB port installed on the system board. You will need to disable this feature if you add a higher performance controller.

Options: V1.1+V2.0 (default)、Disabled、V1.1

USB Memory Type

This item allows you to set your USB Memory Type

Options: SHADOW、Bast Memory(640k)(default)

USB Keyboard Support

This item allows you to enable the USB attached keyboards and storages.
Options: Disabled (default)、Enabled

AC97 Audio

This option allows you to control the onboard AC'97 audio.

Options: Enabled (default)、Disabled

MAC Lan

This option allows you to control the onboard LAN device.

Options: Enabled (default)、Disabled

Onboard I/O Chip Setup

If you highlight the "Onboard I/O Chip Setup" label and then press the enter key, it will take you to a submenu with the following options:

Power On Function

This field allows you to select a way to power on your computer. Options: Password、Hot KEY、Mouse Left、Mouse Right、Any KEY、BUTTON ONLY (default), and Keyboard 98

Hot Key Power ON

This field allows you to use the Ctrl key along with a hot key (function key) to power on your system. This field is only configurable when "Power On Function" is set to "Hot Key".

Options: Ctrl-F1、Ctrl-F2…… Ctrl-F12

Onboard FDC Controller

Select "Enabled" if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select "Disabled".
Options: Enabled (default)、Disabled

Onboard Serial Port

Select an address and corresponding interrupt for the first/ second serial port.
Options: Disabled、3F8/IRQ4 (default for port1)、2F8/IRQ3(default for port2)、3E8/IRQ4、2E8/IRQ3、Auto

Onboard Parallel Port

Select an address and corresponding interrupt for the onboard parallel port.
Options: 378/IRQ7 (default)、278/IRQ5、3BC/IRQ7、Disabled

Parallel Port Mode

This option allows you to select a parallel port mode for the onboard parallel port.

Options:	ECP(default)	Extended Capabilities Port.
	EPP	Enhanced Parallel Port.
	SPP	Standard Printer Port.
	ECP+EPP	ECP & EPP mode.
	Normal	

EPP Mode Select

Select EPP port type 1.7 or 1.9. This field is only configurable if "Parallel Port Mode" is set to "EPP" or "ECP+EPP". Options: EPP 1.9(default)、EPP 1.7

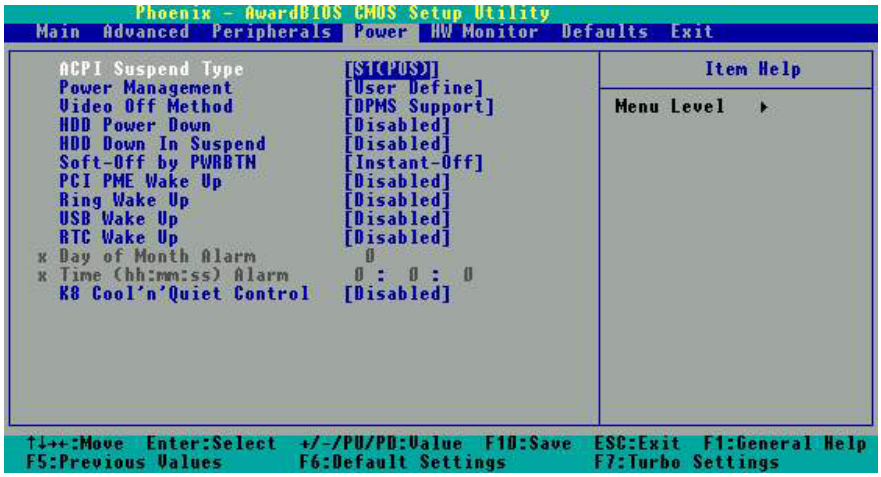
ECP Mode Use DMA

Select a DMA Channel for the parallel port when using the ECP mode. This field is only configurable if "Parallel Port Mode" is set to "ECP". Options: 3 (default)、1

PWRON After PWR-Fail

This field will determine whether your system will boot after restoring power after a power failure. If you select "On", the system will boot whether or not the system was on before power failure. If you select "Former-Sts", the system will be restored to the status before the power failure.
Options: Off (default)、On、Former-Sts

Power Management



The Power Management Setup Menu allows you to configure your system to utilize energy conservation features as well as power-up/ power-down options.

ACPI Suspend Type

The item allows you to select the suspend type using the ACPI operating system.

Options: S1 (POS) (default) Power on Suspend
S3 (STR) Suspend to RAM
S1 & S3 POS and STR

Power Management

There are three options of Power Management:

1. Min. Power Saving

Minimum power management

HDD Power Down = 15 minutes

2. Max. Power Saving

Maximum power management (only available for sl CPUs).

HDD Power Down = 1 minute

3. User Defined (default)

Allows you to set each mode individually.

When this option is enabled, each of the ranges are from 1 minute to 1 hour except for HDD Power Down, which ranges from 1 minute to 15 minute and includes a “disable” option.

Note: If you select Min. or Max. Power Saving modes, the “HDD Power Down” value will fixed.

User Define、Min Saving、Max Saving

Video Off Method

This option determines the manner in which the monitor goes blank.

Options:

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 (default) Initial display power management signaling.

HDD Power Down

When enabled, the hard disk drive will power down after a certain configurable period of system inactivity. All other devices remain active.

Options: Disabled (default)、1 Min、2 Min、3 Min、4 Min、5 Min、6 Min、7 Min、8 Min、9 Min、10 Min、11 Min、12 Min、13 Min、14 Min、15Min

HDD Down In Suspend

This allows you to enable/ disable the hard driver power down in the suspend state.

Options: Disabled (default)、Enabled

Soft-Off by PWRBTN

In situations where the system enters a “hung” state, you can configure the BIOS so that you are required to press the power button for more than 4 seconds before the system enters the Soft-Off state.

Options: Delay 4 Sec, Instant-Off (default).

PCI PME Wake Up

This option will also cause the system to wake up with any onboard LAN activity.

Options: Disabled (default)、Enabled

Ring Wake Up

This option allows you to awaken the system upon receiving an incoming call to modem device.
Options: Disabled (default)、Enabled.

USB Wake up

This item allows you to awaken the system from suspend mode using a USB devices.

Options: Enabled、Disabled (default)

RTC Wake Up

When “Enabled”, you can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode. Options: Enabled、Disabled (default).

Day of Month Alarm

You can choose which date of the month the system will boot up. This field is only configurable when “RTC Wake Up” is set to “Enabled”. Min=0 Max=31

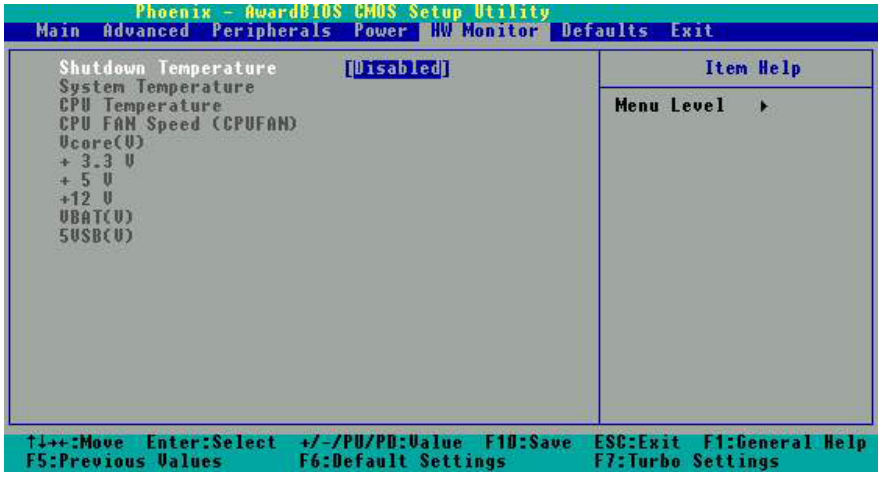
Time (hh: mm: ss) Alarm

You can choose the hour, minute and second the system will boot up. This field is only configurable when “RTC Wake Up” is set to “Enabled”.

K8 Cool’n’Quiet Control

When set to “Auto”, the system will auto control the CPU voltage and frequency depends the loading of system. Options: Auto、Disabled (default)

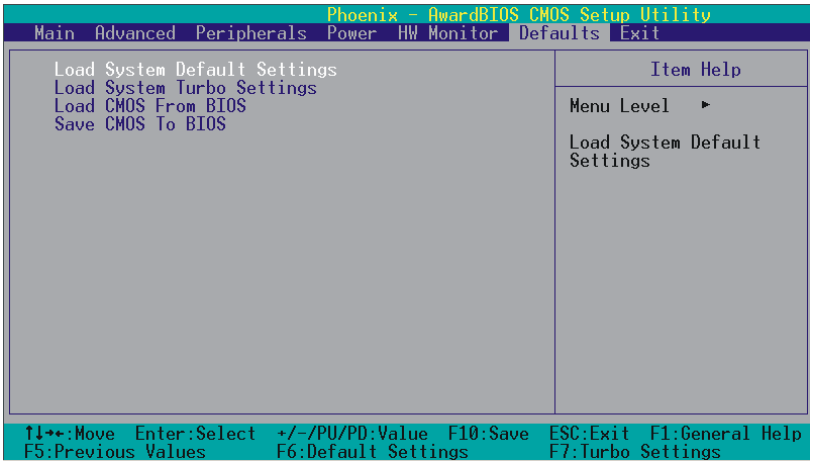
Hardware Monitor



Shutdown Temperature

When the CPU temperature is higher than this setting, the shutting down mechanism will be activated. Options: Disabled(default) 、75℃/167℉、85℃/185℉、95℃/203℉、105℃/221℉

Load Defaults



Load System Default Settings

Load System Default Settings.

Load System Turbo Settings

Load System Turbo Settings.

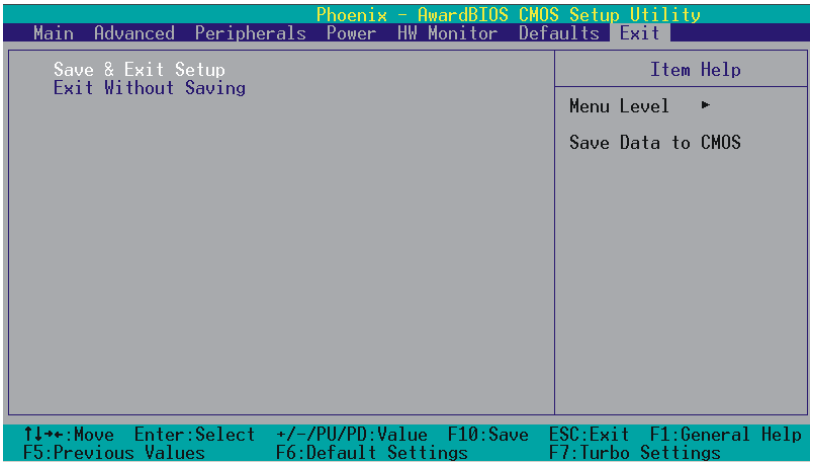
Load CMOS From BIOS

Load defaults from flash ROM for systems without batteries.

Save CMOS To BIOS

Save defaults to flash ROM for systems without batteries.

Exit Menu



Save & Exit Setup

Save all configuration changes to CMOS (memory) and exit setup. A confirmation message will be displayed before proceeding.

Exit Without Saving

Abandon all changes made during the current session and exit setup. A confirmation message will be displayed before proceeding.

Chapter 3: Software Setup

Software List

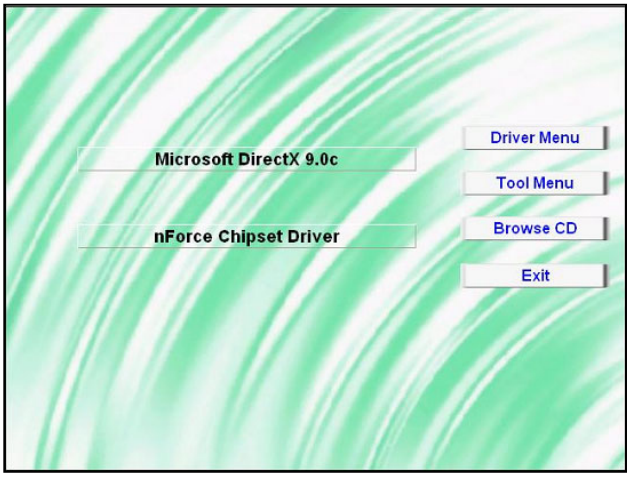
Category	Platform
Microsoft DirectX 9.0c	Windows 98 /ME /2000 /XP
nForce Chipset Driver	Windows 2000 /XP
Trend PC-Cillin 2004	Windows 98 /ME /2000 /XP
Acrobat Reader 5	Windows 98 /ME /2000 /XP

Software Installation

Place the Driver CD into the CD-ROM drive and the Installation Utility will auto-run. You can also launch the Driver CD Installation Utility manually by executing the nVIDIA.exe program located on the Driver CD. (For more details, please refer to the Readme.txt files that in each folder of the Driver.)

◎ The screen and images are only for general reference. The version of the screens you received with your software may vary slightly.

1. When you install the driver CD into the CD-ROM, you will see the Driver Menu screen as shown below. For the most optimal conditions, we strongly recommend you to install the Microsoft DirectX 9.0c (or later version) before you install the nForce Chipset Driver.



Attention:
Please install the Microsoft DirectX 9.0c (or later version) before installing the nForce Chipset Driver.

- Microsoft DirectX – provides software of Microsoft DirectX
- nForce Chipset Driver – Provides all the drivers needed for the chipset. It also includes the audio driver.
  Note: We recommend that you install the "nVIDIA IDE SW" during Windows® XP installation.

2. Click the "Tool Menu" button and the screen will display as below. This screen displays all of the software that you can install from the Driver CD.

- Trend PC-Cillin 2004 – provides the software of Trend PC-Cillin 2004 (Anti-virus program)
- Acrobat Reader – install Adobe Acrobat Reader program that you can browse pdf files
- Microsoft DirectX – provides software of Microsoft DirectX

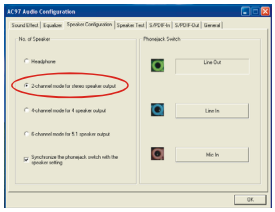
3. If you click the "Browse CD" button, you can browse all the files in the Driver CD.

4. Click "Exit" button to exit the program.

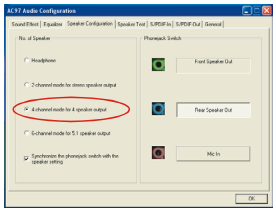
Appendix I: 5.1 Channel Setup

1. After get into the system, click the audio icon from the Windows screen.
2. Click Speaker Configuration button, you can see the screen like the picture below.
3. You can choose 2, 4 or 6 channels by your speakers.

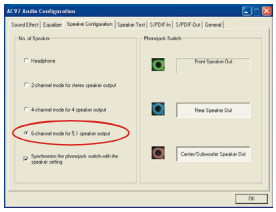
2 Channels



4 Channels



6 Channels



Super 5.1 Channel Audio Effect

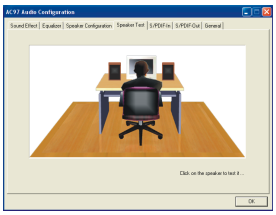
This mainboard comes with an ALC655 Codec which supports high quality 5.1 Channel audio effects. With ALC655, you are able to use standard line-jacks for surround audio output without connecting to any auxiliary external modules. To use this function, you have to install the audio driver in the bonus Pack CD as well as an audio application supporting 5.1 Channel audio effects. See the audio Port Connectors in the Hardware Installation section for a description of the output connectors.

Speaker Test

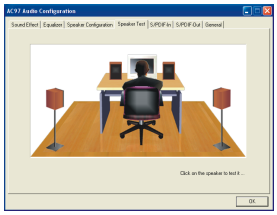
Make sure the cable is firmly into the connector.

1. Click the audio icon from the Windows screen.
2. Click Speaker Test button, you can see the screen like the pictures below.
3. Select the speaker which you want to test by clicking on it.

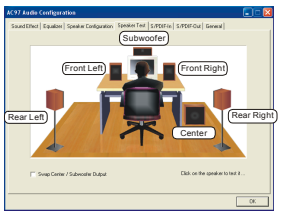
2 Channels



4 Channels



6 Channels



Appendix II: RAID Setup

Introduction to RAID

RAID (Redundant Array of Independent Disks) technology is a sophisticated disk management system that manages multiple disk drives. It enhances I/O performance and provides redundancy in order to prevent the loss of data in case of individual disk failure. The RAID facility on this board provides RAID 0, RAID 1, RAID 0+1 and RAID SPAN. The total number of drives you can apply depends on the number of connectors on your board. A board with 2 PATA connectors and 4 SATA connectors can connect up to 8 drives (4 PATA drives and 4 SATA drives). However one of the PATA drives may be used for the CD-ROM drive, in which case the maximum number of drives will be 5. The descriptions below are based on 2 PATA connectors and 4 SATA connectors.

Disk Striping (RAID 0)

Striping is a performance-oriented, non-redundant disk storage technology. With RAID striping, multiple disks are used to form a larger virtual disk. Data is then striped or mapped across all the physical disks. In this way, multiple I/O operations can be executed in parallel, enhancing performance. Striping does not provide fault tolerance. The minimum number of hard drives for RAID 0 is 2.

Disk Mirroring (RAID 1)

With Disk Mirroring there are redundant disks that mirror the primary disks. Data that is written to the primary disks are also written to the redundant disks. This redundancy provides fault tolerant protection from a single disk failure. If a read/write failure occurs on one drive, the system can still read and write data using the other drive. The minimum number of drives for a RAID 1 configuration is 2. You are required to use an even number of drives.

Disk Striping + Mirroring (RAID 0+1)

This mode combines both the performance benefits of RAID 0 with the fault tolerance of RAID 1. The minimum number of drives for RAID 0+1 configuration is 4 drives. This configuration also requires an even number of drives. **Note:** All mirrored configurations or striped/mirrored configurations should use drives of the same size.

RAID SPAN

RAID SPAN allows JBOD (Just a Bunch Of Disks) configurations which simply uses multiple disks to form a larger virtual disk without any other specialized disk management functionality. RAID SPAN is not considered a standard RAID implementation.

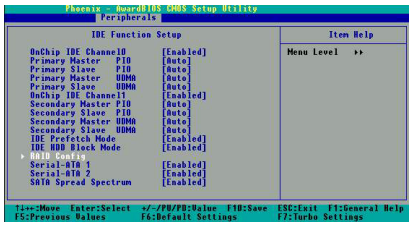
Before create RAID Array

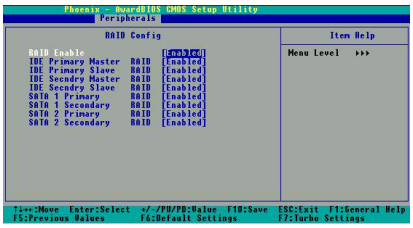
Before you configure your RAID Array, you have to enable the “RAID config” option in the BIOS Setup Utility.

1. After you boot your system, press the “Del” key when prompted to enter the BIOS Setup Utility.

2. The “RAID config” option for enabling RAID will be found on the “Peripherals” screen as part of the “IDE Function Setup” section shown as below-left (Peripherals >> IDE Function Setup >> RAID config). Arrow down to the IDE RAID item and press enter.

3.On the “RAID config” screen (shown below-right), enable the disks that you want to use as RAID disks (in this example there are four SATA hard drives configured as RAID disks).





NVIDIA RAID Utility Configuration

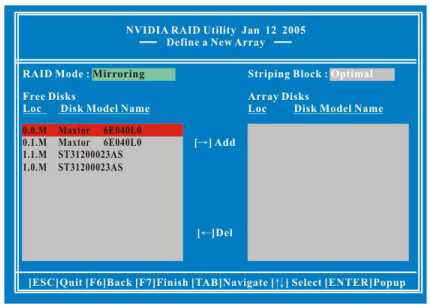
The NVIDIA RAID Utility is used to configure RAID disk management into your hard disks. This section will explain how to setup and maintain your RAID disk drives.

Starting up the NVIDIA BIOS RAID Utility

When the system boots up during the POST (Power-On Self Test), you will be given an opportunity to enter the NVIDIA BIOS RAID Utility when the screen prompts you with following message:

Press F10 to enter RAID setup utility

Press the <F10> key to enter the NVIDIA BIOS RAID utility (note that you will only have a short window of time to press <F10> before the system continues with the next step of the boot process). The Raid Utility screen will display as shown right.



Associating Screen Drive Names with Physical Drives on the Board

This section explains how to associate the drives listed on the "Define a New Array" screen with the physical drives attached to the connectors on the mainboard. This becomes important when identifying drives that need to be replaced or changed.

Channel, Controller, Master/Slave

Located here are 3 identifiers separated by periods. These identifiers represent the Channel, Controller, and Master/Slave ID for a drive. With these identifiers, you can associate the drives on this screen with a physical connector and drive on the board.

Channel 0 – Represents one of the PATA connectors

Channel 1 – Represents one of the SATA connectors

Controller 0 – 1st connector (e.g. PATA1 or SATA1)

Controller 1 – 2nd connector (e.g. PATA2 or SATA2)

Master/Slave – SATA drives will always be Master drives since an SATA connector can only support 1 drive. PATA connectors can support a Master and a Slave drive.

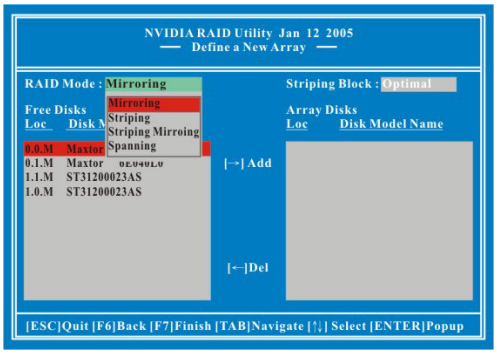
Examples:

On a board with 4 connectors (PATA1, PATA2, SATA1, SATA2), the following applies:

0.0.M = PATA1 (master drive)
0.0.S = PATA1 (slave drive)
0.1.M = PATA2 (master drive)
0.1.S = PATA2 (slave drive)
1.0.M = SATA1
1.1.M = SATA2

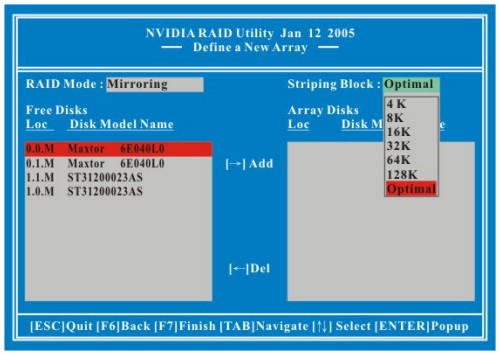
Creating New RAID Array

1. The first screen you will see upon initial configuration is the "Define New Array" screen. First, tab over to the "RAIDMode" text box and press <Enter>. The pop up menu will display as shown below. According to your configuration requirements, select "Mirroring" (RAID 1), "Striping" (RAID 0), "Striping Mirroring" (RAID 0+1) or "Spanning" (JBOD). Then press <Enter>.

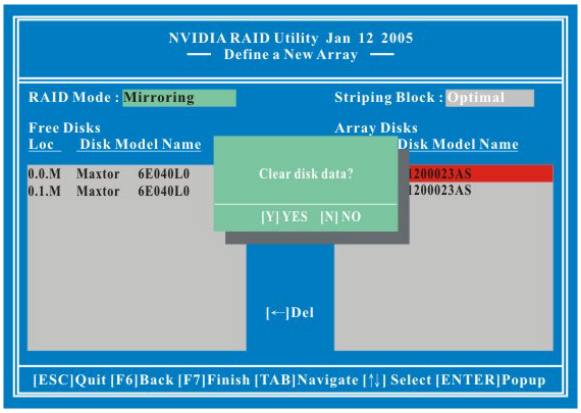


Attention
The "Loc" and "Disk Model Name", located on this screen reflect the disk drives installed on the PATA or SATA connectors. The example disk drive information may differ with the information that displays on your screen.

2. Next, <Tab> over to the "Striping Block" option and press <Enter>. A pop menu will display as shown below. With this option you can manually select the striping block size for your array. This option will affect data access performance. We recommend that you to select "Optimal" option for automatic configuration. Press <Enter>.

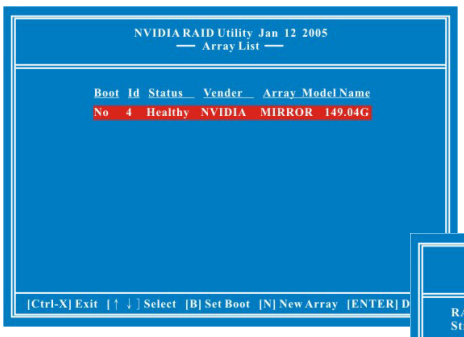


3. Next, in the "Free Disks" section, you can use the up/down arrow keys to select disks to be used in your RAID array. After highlighting a disk, use the right-arrow key to activate the disk as part of the RAID Array. The selected disk will move over to the "Array Disks" section. You can use the left-arrow key to reverse your selection. After you finish selecting all your disks, Press <F7>. A confirmation message will display as shown below. Then press <Y> to complete the RAID array creation.

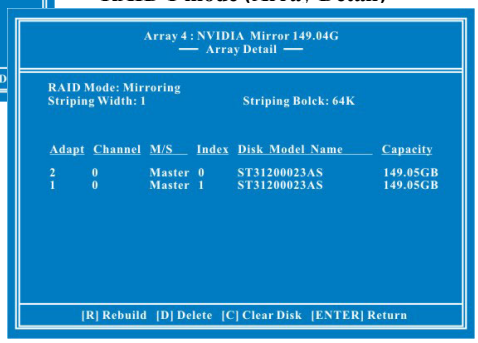


4. After the array has been successfully created, the Array List screen will display as shown below-left. You can press the Enter key to view the RAID details in the "Array Detail" screen.

RAID 1 mode (Array List)

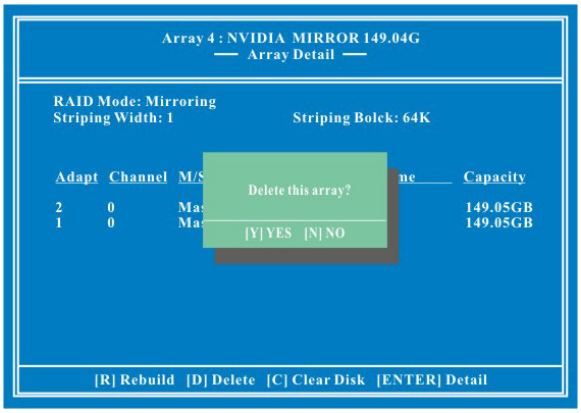


RAID 1 mode (Array Detail)

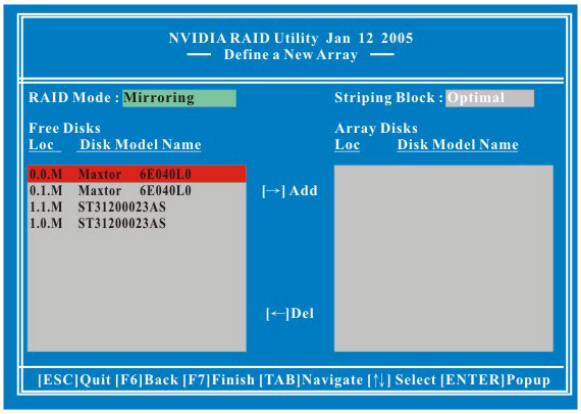


Deleting an Array

1. You can delete an existing array on the "Array Detail" screen. Press the <D> key. A warning/confirmation message will display (as shown below). Press <Y> to confirm.



2. After the array is successfully deleted, the screen will display as shown below.



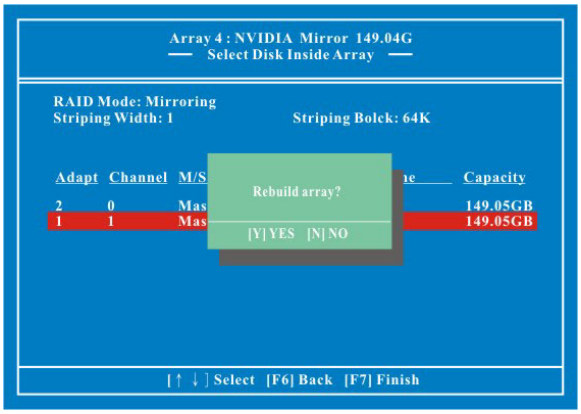
Rebuilding a RAID Mirrored Array

This section applies to Mirrored or Striped/Mirrored RAID configurations and describes how to reestablish the integrity of a mirrored environment after replacing one of the drives (typically because of a single disk failure). After replacing the errant drive, the rebuild process will move data from its mirrored sibling drive (the drive with information still intact) to the newly installed drive. This only applies to mirrored configurations (RAID 1 and RAID 0+1).

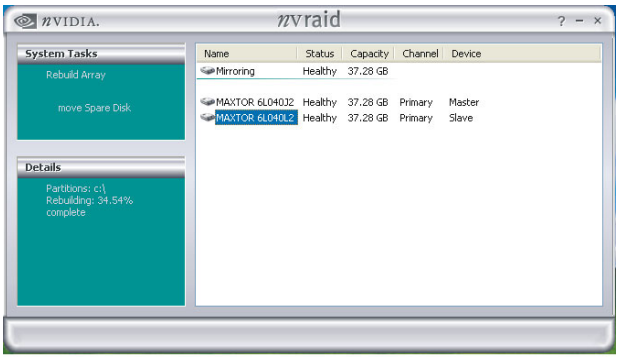
Before you rebuild a RAID Mirrored Array

Before you begin rebuilding a RAID Mirrored Array, you must copy the "NvRaidMan.exe" file from the bundled CD Driver to your C: drive. 【CD File Location Path => D: \ Driver \ nForce \ 4.24 \ IDE \ WIN2K (or WINXP)\ NvRaidMan.exe】

1. To rebuild a mirrored array, bring up the NVIDIA RAID Utility. From the "Array List" screen, select the array with the newly installed drive. Then go to the "Array Detail" screen (press Enter). Then press the <R> key and use the up/down arrow keys to select the hard drive that you just installed. Then press <F7>. A confirmation message will display (as shown below). Press <Y> to confirm. Then press <Ctrl-X> to exit the "NVIDIA RAID Utility" setup.



2. Launch the NVRAID Management utility by double-clicking the NvRaidMan.exe that has been copied to the C: drive. You can view the status of rebuilding under the Details section from the screen as shown below.



Installing RAID Drivers during Windows Installation

Installation of RAID drivers is done during the Windows installation. These steps assume that the hard disks have already been connected to either the PATA or SATA connectors. It is also assumed that the BIOS RAID Utility has already been configured (see NVIDIA BIOS RAID Utility Configuration section) and you have begun the Windows operating system installation.

Preparation: Before beginning with the steps in this section copy the "RAID Driver" and associated files from the bundle CD Driver to an empty floppy disk [Location of files on CD-ROM => \ Driver \ nForce \ 4.24 \ IDE \ WIN2K (or WINXP)\ *.*]. This will have to be done on another system if you are installing the system from scratch.

1. During Windows installation, the "Windows Setup" screen will prompt you with "Press F6 if you need to install third party SCSI or RAID driver". Press <F6>.
2. Press 's' when setup asks if you want to specify an additional device. Insert the floppy disk which includes the "RAID Driver" into the floppy drive. Press 'Enter' and select the appropriate OS device driver.
3. Press 'Enter' again to continue the setup process.
4. Follow the setup instructions and select your choice for partition and file system.
5. After setup examines your disks, it will copy files to the Windows® 2000/ XP installation folders and restart the system. After the system is rebooted the setup program will continue with the installation all the way to completion.
6. Wait until Windows® 2000/ XP finishes installing devices, regional settings, networking settings, components, and the final set of tasks. Reboot the system if you are asked to do so.

Attention
The RAID array can only functions in the Windows® 2000/ XP.