K8N-DRE

Motherboard

E2129

First Edition
August 2005

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Notices

Federal Communications Commission Statement

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

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the features of the motherboard and the new technology it supports.

- **Chapter 2: Hardware information**

  This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.

- **Chapter 3: Powering up**

  This chapter describes the power up sequence, the vocal POST messages, and ways of shutting down the system.

- **Chapter 4: BIOS setup**

  Tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

- **Chapter 5: RAID configuration**

  Provides information on RAID configurations for this motherboard.

- **Chapter 6: Driver installation**

  This chapter provides information on RAID and LAN driver installation for this motherboard.

- **Appendix: Reference information**

  This appendix includes additional information that you may refer to when configuring the motherboard.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**

   The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**

   Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select.
Italics	Used to emphasize a word or a phrase.
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key. Example: <Enter> means that you must press the Enter or Return key.
<Key1+Key2+Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: <Ctrl+Alt+D>
`Command`	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets. Example: At the DOS prompt, type the command line: **`format A:/S`**

K8N-DRE specifications summary

CPU	Dual Socket 940 for AMD Opteron™ 64 processors Supports AMD 64 architecture that enables simultaneous 32-bit and 64-bit computing
Chipset	NVIDIA® nForce Professional 2200
System Bus	1600/2000 MT per second
Memory	Dual-channel memory architecture 8 x 184-pin DIMM sockets support registered ECC 400/333/266 MHz DDR memory modules Supports up to 32 GB system memory *(Note: Tested only up to 16 GB on this motherboard due to 2 GB DDR availability)*
Expansion slots	1 x PCI Express x16 slot 1 x PCI slot
Storage	NVIDIA® nForce Professional 2200 chipset supports: - 2 x Ultra DMA 133/100/66/33 IDE drives - 4 x SATA-II 3Gb/s drives - RAID 0, RAID 1, RAID 1+0, and JBOD configurations LSI 1020A SCSI RAID controller supports: - RAID 0, RAID 1, and RAID 1E configurations (SCSI model only)
Dual LAN	2 x BROADCOM® BCM5721 Gigabit PCI-E LAN controllers
USB	2 x USB 2.0 ports (on the rear panel) 1 x USB 2.0 connector (on board; supports 2 ports)
Special features	ASUS Q-Fan 2 ASUS CrashFree BIOS 2 ASUS MyLogo2
Rear panel	1 x Serial port (COM1) 2 x LAN (RJ-45) port 1 x VGA port 2 x USB 2.0 ports 1 x PS/2 keyboard port 1 x PS/2 mouse port
BIOS features	8 Mb Flash ROM, AMI BIOS, PnP, DMI2.0, WfM2.0, SM BIOS 2.3
Power Requirement	ATX power supply (with 24-pin and 8-pin 12 V plugs) ATX 12 V 2.0 compliant

(continued on the next page)

K8N-DRE specifications summary

Internal connectors	1 x Floppy disk drive connector 2 x IDE connectors 4 x Serial ATA connectors 1 x 68-pin SCSI connector (*SCSI models only*) 6 x Front fan connector 4 x Rear fan connector 1 x 24-pin ATX power connector 1 x 8-pin ATX 12 V power connector 1 x Power supply SMBUS connector 1 x Serial port (COM2) 1 x USB 2.0 connector for 2 additional USB 2.0 ports 1 x SMBus header for back-plane 1 x 4-pin Hard Disk LED connector 1 x 26-1 pin printer port connector 1 x 20-1 pin auxiliary panel connector 1 x 24-1 pin system panel connector
Form Factor	E-ATX form factor: 12 in x 13 in (30.5 cm x 33 cm)
Support CD contents	Device drivers ASUS Live Update utility Norton Internet Security 2005

This chapter describes the motherboard features and the new technologies it supports.

1 Product introduction

Chapter summary

1.1 Welcome!

Thank you for buying an ASUS® K8N-DRE motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

1.2 Package contents

Check your motherboard package for the following items.

Motherboard	ASUS K8N-DRE motherboard
Cables	4 x Serial ATA signal cables (dual plugs) 2 x Serial ATA power cables (dual plugs) 1 x SCSI Ultra320 cable (SCSI model only) 1 x 3-in-1 IDE and floppy cable
Accessories	I/O shield 2 x Copper heatsink 2 x Support plates for CPU 2 x Adhesive pads 4 x Screws
Application CD	ASUS motherboard support CD
Documentation	User guide

If any of the above items is damaged or missing, contact your retailer.

1.3 Special features

1.3.1 Product highlights

Latest processor technology

The motherboard comes with dual 940-pin sockets for the AMD Opteron™ 64 processors. The processors are based on AMD's 64-bit and 32-bit architecture, which represents the landmark introduction of the industry's first x86-64 technology, provide a dramatic leap forward in compatibility, performance, investment protection, and reduced total cost of ownership and development.

PCI Express™ interface

The motherboard fully supports PCI Express, the latest I/O interconnect technology that speeds up the PCI bus. PCI Express features point-to-point serial interconnections between devices and allows higher clockspeeds by carrying data in packets. This high speed interface is software compatible with existing PCI specifications. See page 2-17 for details.

HyperTransport™ Technology

HyperTransport™ Technology is a high-speed, low latency, point-to-point link designed to increase the communication speed between integrated circuits in computers, networking and telecommunicatons equipment up to 48 times faster than other existing technologies.

Dual Channel DDR memory support

Employing the Double Data Rate (DDR) memory technology, the motherboard supports up to 4GB of system memory using DDR400/333/266 DIMMs. The ultra-fast 400MHz memory bus delivers the required bandwidth for the latest 3D graphics, multimedia, and Internet applications. See page 2-12.

Serial ATA 3Gb/s technology

The motherboard supports the next-generation Serial ATA 3Gb/s technology through the Serial ATA interfaces and the NVIDIA® nForce4® PRO chipset. The SATA 3Gb/s specification provides twice the bandwidth of the current Serial ATA products. Additionally, Serial ATA allows thinner, more flexible cables with lower pin count, and reduced voltage requirement. See pages 2-24.

Dual RAID solution

Onboard RAID controllers provide the motherboard with dual-RAID functionality that allows you to select the best RAID solution using IDE or Serial ATA devices.

The NVIDIA® nForce4® PRO allows RAID 0, RAID 1, RAID 0+1 and JBOD configuration for four SATA and two PATA connectors. See pages 2-23 and 2-24 for details.

The LSI 1020A controller (*SCSI models only*) supports a single-channel SCSI Ultra320 and allows RAID 0, RAID 1, and RAID 1E. See pages 2-25 for details.

USB 2.0 technology

The motherboard implements the Universal Serial Bus (USB) 2.0 specification, dramatically increasing the connection speed from the 12 Mbps bandwidth on USB 1.1 to a fast 480 Mbps on USB 2.0. USB 2.0 is backward compatible with USB 1.1. See pages 2-22 and 2-27 for details.

Temperature, fan, and voltage monitoring

The CPU temperature is monitored by the ASIC (Winbond W83792D) to prevent overheating and damage. The system fan rotations per minute (RPM) is monitored for timely failure detection. The ASIC monitors the voltage levels to ensure stable supply of current for critical components. See section "4.4.8 Hardware Monitor" on page 4-27.

1.3.2 Innovative ASUS features

CrashFree BIOS 2 

This feature allows you to restore the original BIOS data from the support CD in case when the BIOS codes and data are corrupted. This protection eliminates the need to buy a replacement ROM chip. See details on page 4-5.

ASUS MyLogo2™ 

This new feature present in the motherboard allows you to personalize and add style to your system with customizable boot logos.

ASUS Q-Fan 2

The ASUS Q-Fan 2 technology smartly adjusts the fan speeds according to the system loading to ensure quiet, cool, and efficient operation. See page 4-27 for details.

This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

2 Hardware information

Chapter summary

2.1 Before you proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. See "10. ATX power connectors" on page 2-28 for details.
- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or to a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- **Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply.** Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

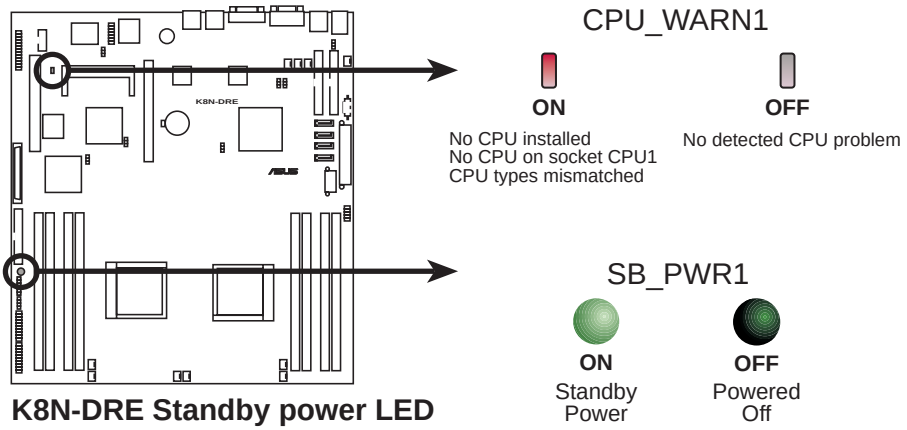
Onboard LEDs

1. Standby power LED (SB_PWR1)

The motherboard comes with a green standby power LED that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component.

2. CPU warning LED (CPU_WARN1)

The CPU warning LED lights up to indicate that a processor is not installed or the processor is not installed properly in CPU 1 socket.



K8N-DRE Standby power LED

2.2 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

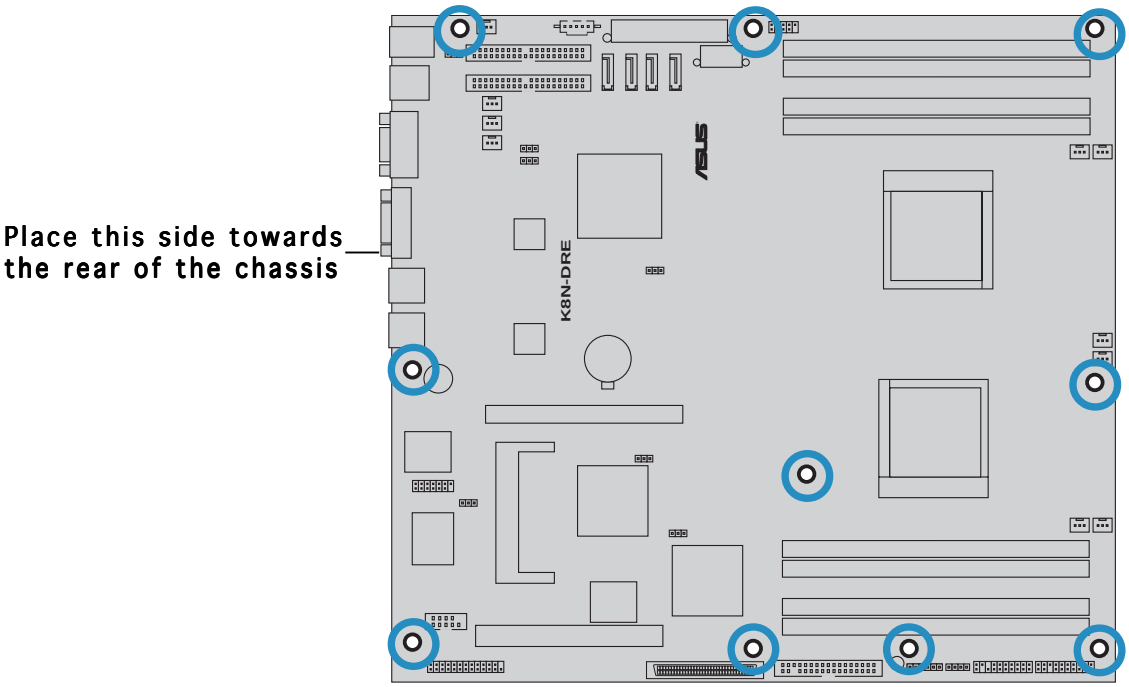
2.2.1 Placement direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

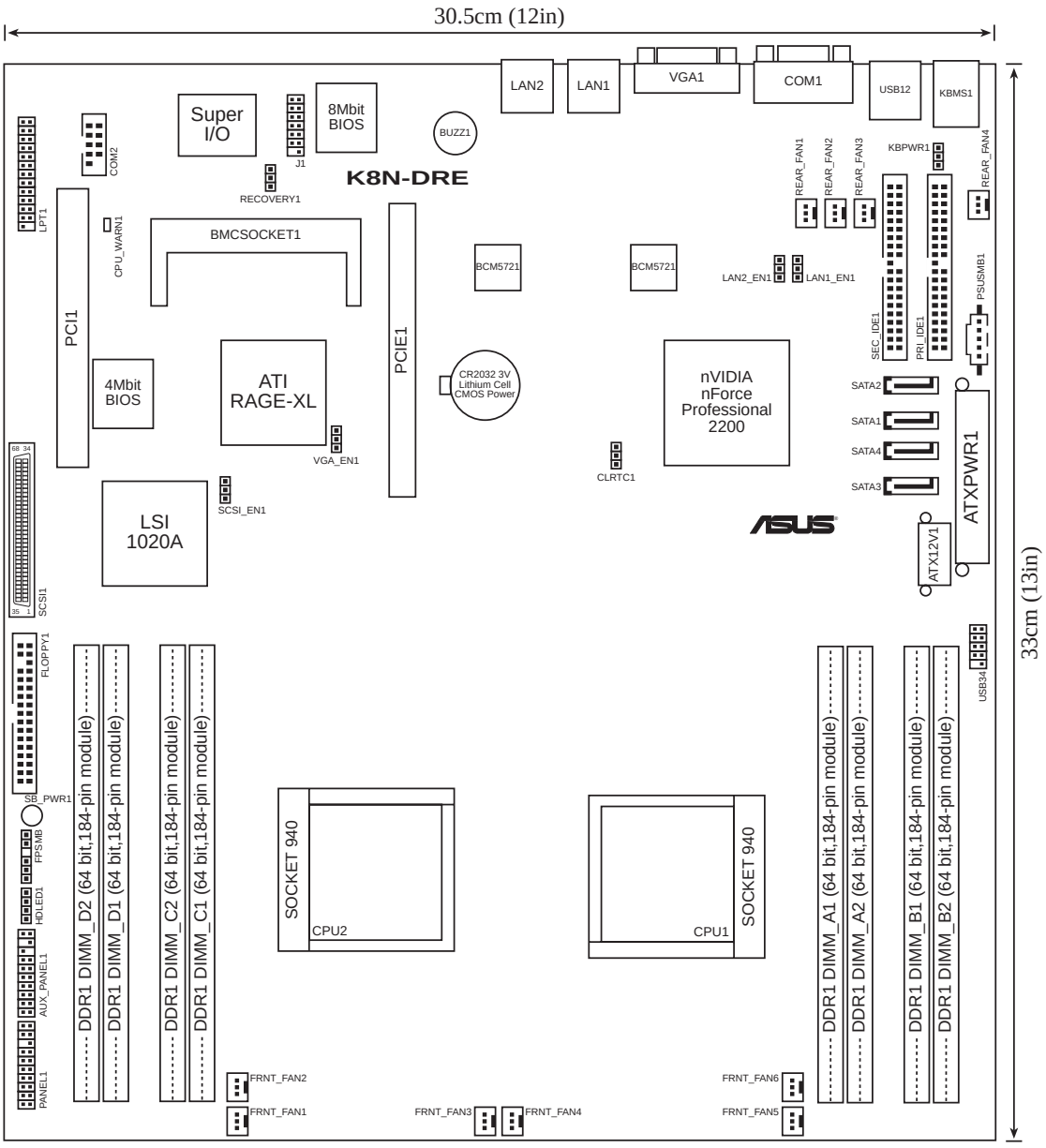
2.2.2 Screw holes

Place ten (10) screws into the holes indicated by circles to secure the motherboard to the chassis.

Do not overtighten the screws! Doing so can damage the motherboard.



2.2.3 Motherboard layout

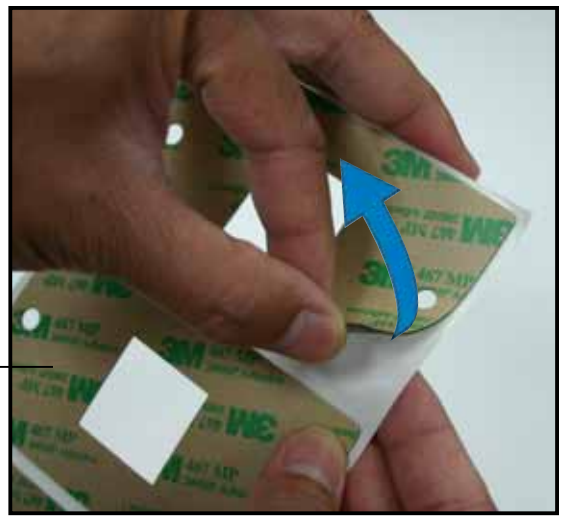


2.2.4 Heatsink plates

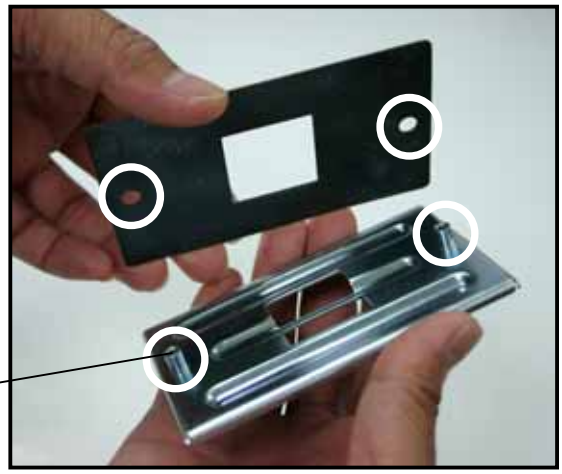
Two heatsink plates come with the motherboard package. These plates support the weight of the CPU heatsinks.

To install the heatsink plates:

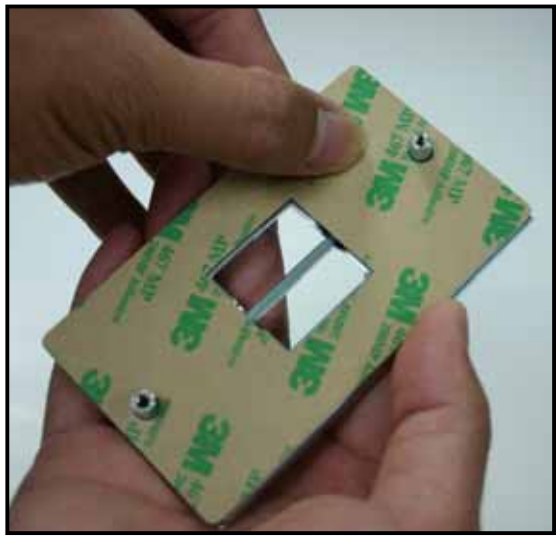
1. Peel off the adhesive pads that came with the motherboard package.



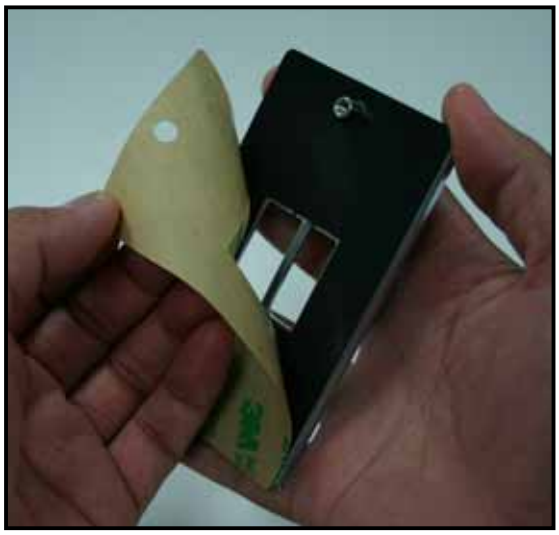
2. Match the holes of the adhesive pad with the heatsink plate standoffs.



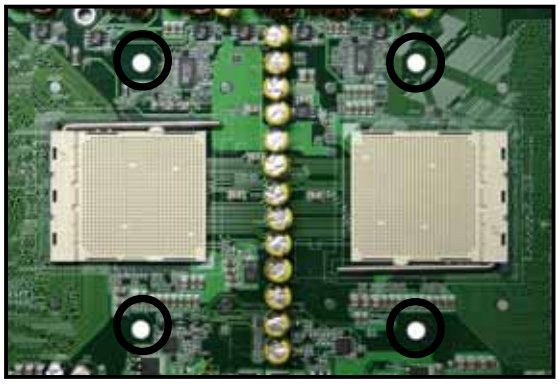
3. Press the adhesive pad flat on the heatsink plate.



4. Peel off the adhesive pad cover.

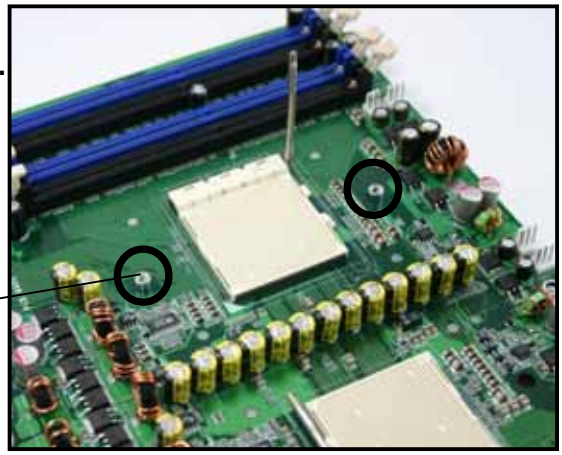


5. Locate the heatsink holes on the motherboard.



6. Position the heatsink plate underneath the motherboard and match the motherboard CPU1 heatsink holes with the heatsink plate standoffs.
7. Press the heatsink plate flat under the motherboard.

The heatsink plate standoffs appears as shown when installed.



8. Repeat steps 1-7 if you want to install a second processor in CPU2 socket.

Even if you are not installing a second processor now, we recommend that you install the second heatsink plate.

9. Secure the motherboard with ten (10) screws.
Refer to section “2.2.2 Screw Holes” for the illustration.

2.2.5 Layout Contents

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4.	SCSI connector (68-pin SCSI1)	2-25
5.	Storage add-in card activity LED connector (4-pin HDLED1)	2-25
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2.3 Central Processing Unit (CPU)

2.3.1 Overview

The motherboard comes with dual surface mount 940-pin Zero Insertion Force (ZIF) sockets designed for AMD Opteron™ 64 processors.

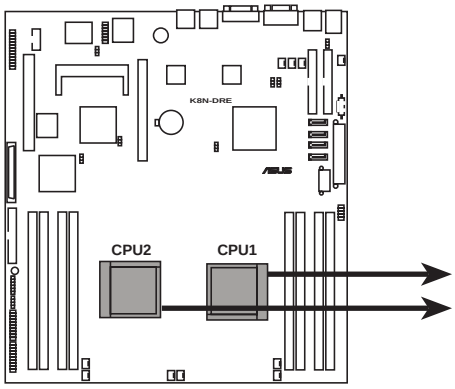
The 128-bit-wide data paths of these processors can run applications faster than processors with only 32-bit or 64-bit wide data paths.

Take note of the notched corner on the CPU. This corner should match a specific corner on the socket to ensure correct installation.

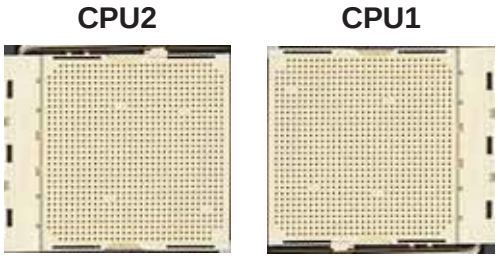
2.3.2 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

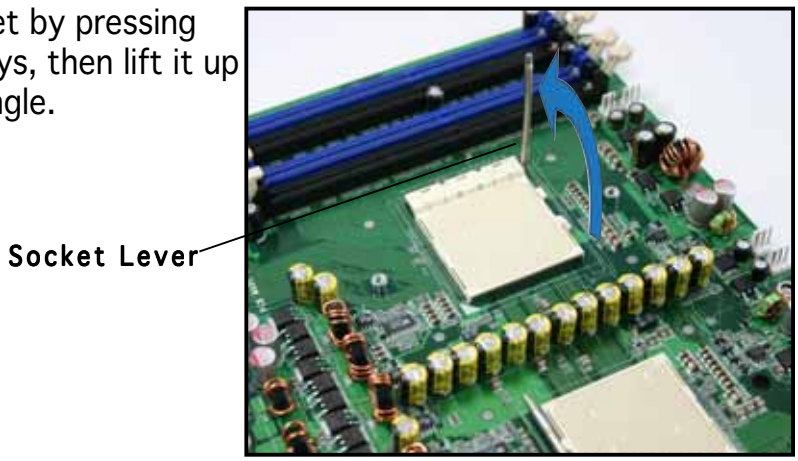


K8N-DRE CPU Socket 940



- Before installing the CPU, make sure that the socket box is facing towards you and the load lever is on your left.
- If installing only one CPU, use the CPU socket marked CPU1.

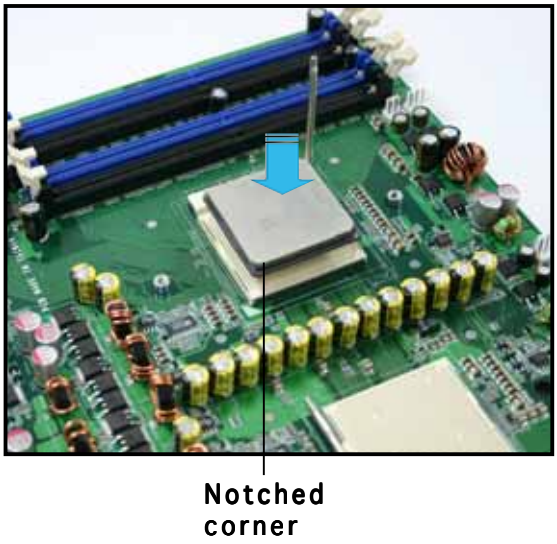
2. Unlock the socket by pressing the lever sideways, then lift it up to a 90°-100° angle.



Make sure that the socket lever is lifted up to 90°-100° angle, otherwise the CPU does not fit in completely.

3. Position the CPU above the socket such that the notched corner matches the socket corner with a triangle mark.

4. Carefully insert the CPU into the socket until it fits in place.



The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!

5. When the CPU is in place, push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

6. Repeat steps 1-5 to install a second processor in CPU 2 socket.

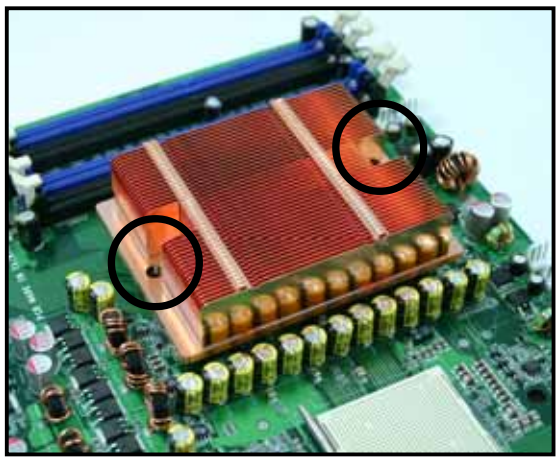
2.3.3 Installing the heatsink

The AMD Opteron™ 64 processors require a specially designed heatsink to ensure optimum thermal condition and performance.

Make sure that you use only qualified heatsink assembly.

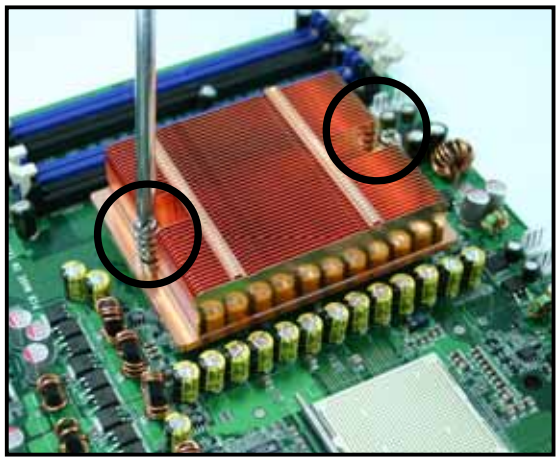
Follow these steps to install the CPU heatsink.

1. Place the heatsink on top of the installed CPU, making sure that the screw holes are matched with the heatsink standoffs.

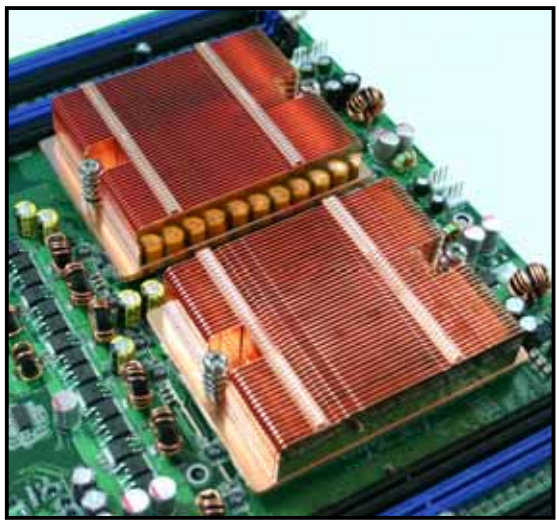


2. Secure the heatsink with two screws.

Make sure that the heatsink is not skewed or tilted otherwise, the CPU will overheat.



3. If you installed a second processor, repeat steps 1-2 to install the second heatsink.

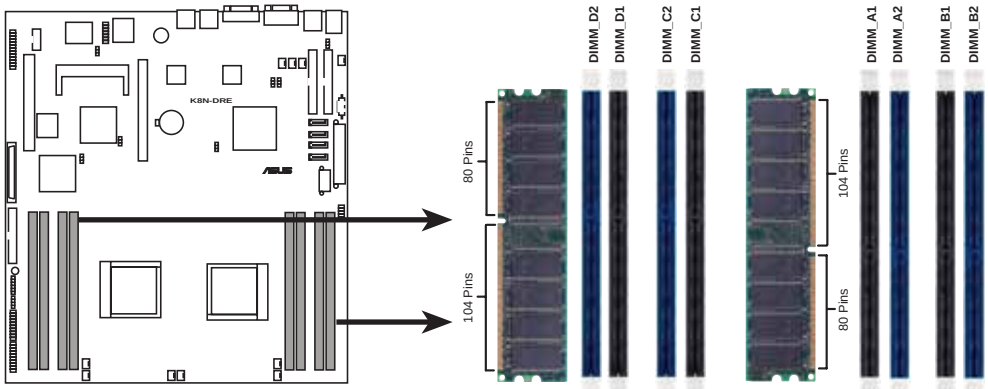


2.4 System memory

2.4.1 Overview

The motherboard comes with eight 184-pin Double Data Rate (DDR) Dual Inline Memory Modules (DIMM) sockets.

The following figure illustrates the location of the sockets:



K8N-DRE 184-pin DDR DIMM sockets

For CPU 1	Sockets
Channel A	DIMM_A1 and DIMM_A2
Channel B	DIMM_B1 and DIMM_B2
For CPU 2	**Sockets**
Channel A	DIMM_C1 and DIMM_C2
Channel B	DIMM_D1 and DIMM_D2

2.4.2 Memory Configurations

You may install 256 MB, 512 MB, 1 GB, 2 GB, or 4 GB registered ECC DDR DIMMs into the DIMM sockets using the memory configurations in this section.

- For dual-channel configuration, the total size of memory module(s) installed per channel must be the same for better performance.
  Single CPU:
  DIMM_A1=DIMM_A2=DIMM_B1=DIMM_B2
  Dual CPU:
  DIMM_A1=DIMM_A2=DIMM_B1=DIMM_B2=
  DIMM_C1=DIMM_C2 =DIMM_D1=DIMM_D2
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- 4 GB DDR400 registered ECC DIMMs operate in 2000SER, 2003SER, or 64-bit operating systems.

Recommended memory configuration for CPU1

Mode	DIMM_A1	DIMM_A2	DIMM_B1	DIMM_B2
Single channel	—	populated	—	—
Dual channel	—	populated	—	populated
	populated	populated	populated	populated

Recommended memory configuration for CPU2

Mode	DIMM_C1	DIMM_C2	DIMM_D1	DIMM_D2
Single channel	—	populated	—	—
Dual channel	—	populated	—	populated
	populated	populated	populated	populated

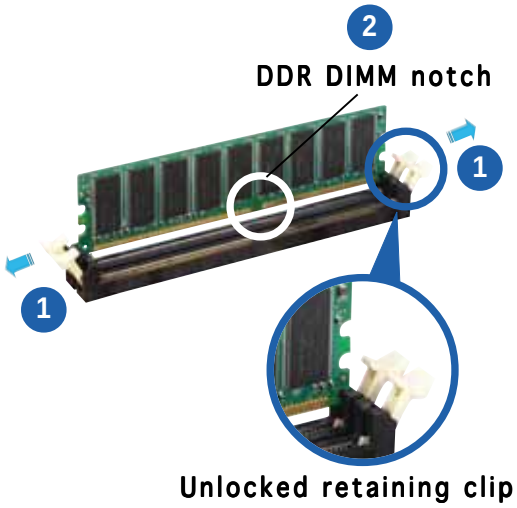
If you install a processor with Rev. CG or C0 with DDR 400 DIMMs, some memory configurations may not run at 400MHz. Refer to table below for details.

Mode	DIMM_A1/ DIMM_C1	DIMM_A2/ DIMM_C2	DIMM_B1/ DIMM_D1	DIMM_B2/ DIMM_D2	Max Speed
Single channel (72 bits)	Single rank	—	—	—	DDR400
	Double rank	—	—	—	DDR400
	—	Single rank	—	—	DDR400
	—	Double rank	—	—	DDR400
	Single rank	Single rank	—	—	DDR400
	Single rank	Double rank	—	—	DDR400
	Double rank	Single rank	—	—	DDR400
	Double rank	Double rank	—	—	DDR333
Dual channel (144 bits)	Single rank	—	Single rank	—	DDR400
	Double rank	—	Double rank	—	DDR400
	—	Single rank	—	Single rank	DDR400
	—	Double rank	—	Double rank	DDR400
	Single rank	Single rank	Single rank	Single rank	DDR400
	Single rank	Double rank	Single rank	Double rank	DDR400
	Double rank	Single rank	Double rank	Single rank	DDR400
	Double rank	Double rank	Double rank	Double rank	DDR333

2.4.3 Installing a DIMM

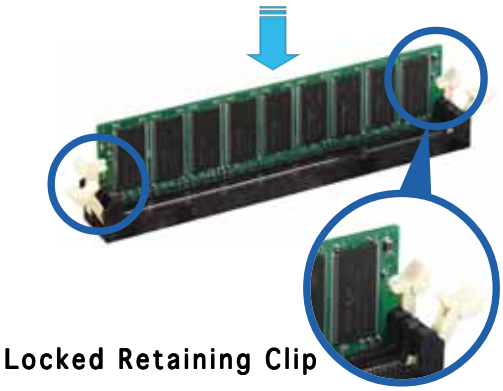
Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.



A DDR DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

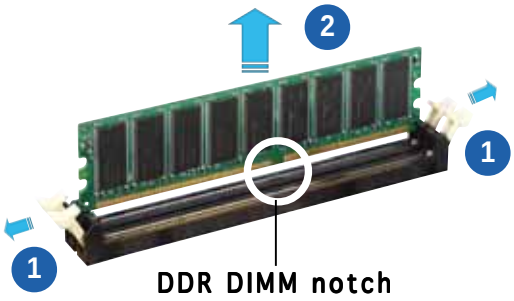
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



2.4.4 Removing a DIMM

Follow these steps to remove a DIMM.

1. Simultaneously press the retaining clips outward to unlock the DIMM.



Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

2.5 Expansion slots

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.

Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

2.5.1 Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the riser card connector with the slot and press firmly until the riser card is completely seated on the slot.
5. Align the card connector with the slot on the riser card and press firmly until the card is completely seated on the riser card slot.
6. Secure the card to the chassis with the screw you removed earlier.
7. Replace the system cover.

2.5.2 Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 4 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

2.5.3 Interrupt assignments

Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	–	Programmable interrupt
4	12	Communications Port (COM1)*
5	13	IRQ holder for PCI steering*
6	14	Floppy Disk Controller
7	15	Printer Port (LPT1)*
8	3	System CMOS/Real Time Clock
9	4	IRQ holder for PCI steering*
10	5	IRQ holder for PCI steering*
11	6	IRQ holder for PCI steering*
12	7	PS/2 Compatible Mouse Port*
13	8	Numeric Data Processor
14	9	Primary IDE Channel
15	10	Secondary IDE Channel

* These IRQs are usually available for ISA or PCI devices.

2.5.4 PCI Express x16

This motherboard comes with one PCI Express x16 graphics slot that complies with the PCI Express specifications. If your chassis supports a PCI Express riser card, install the riser card to support two PCI Express x8 cards. The figure shows a PCI Express riser card installed on the PCI Express x16 slot.

2.6 Jumpers

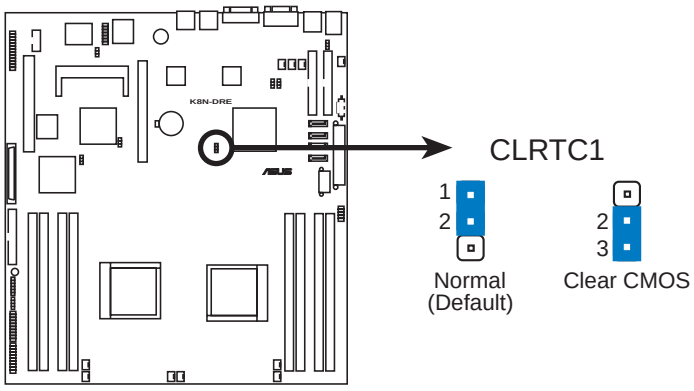
1. Clear RTC RAM (CLRTC1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

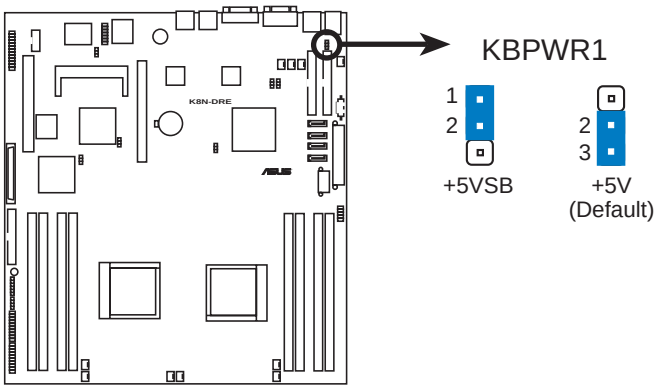
Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



K8N-DRE Clear RTC RAM

2. Keyboard power (3-pin KBPWR1)

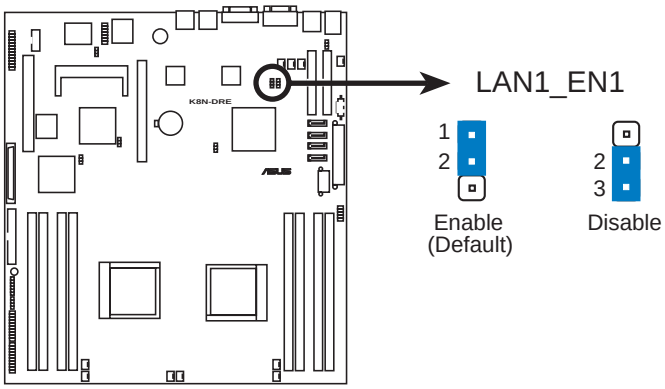
This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 1-2 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.



K8N-DRE Keyboard power setting

3. Gigabit LAN1 controller setting (3-pin LAN1_EN1)

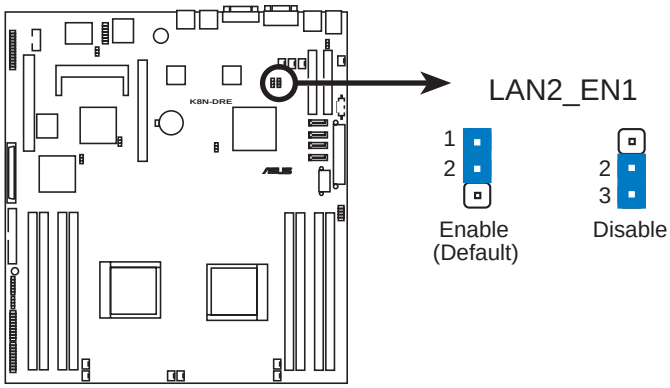
This jumper allows you to enable or disable the onboard Broadcom® BCM5721 Gigabit LAN1 controller. Set to pins 1-2 to activate the Gigabit LAN feature.



K8N-DRE LAN1_EN1 setting

4. Gigabit LAN2 controller setting (3-pin LAN2_EN1)

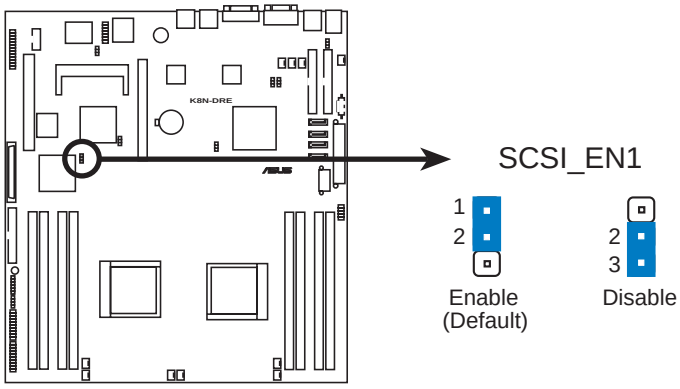
This jumper allows you to enable or disable the onboard Broadcom® BCM5721 Gigabit LAN2 controller. Set to pins 1-2 to activate the Gigabit LAN feature.



K8N-DRE LAN2_EN1 setting

5. SCSI controller setting (3-pin SCSI_EN1)

These jumpers allow you to enable or disable the onboard LSI 1020A SCSI controller. Set to pins 1-2 to activate the SCSI feature.



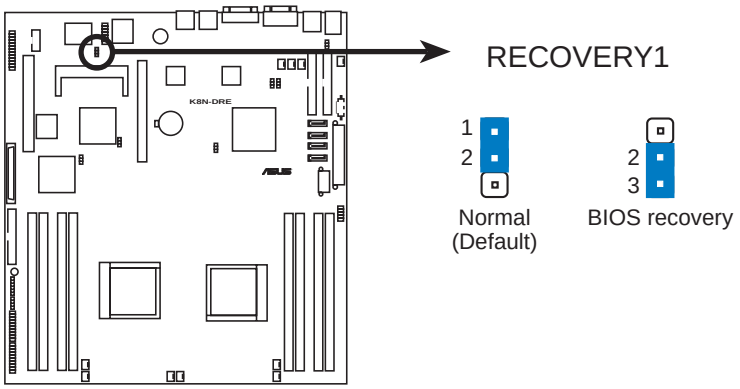
K8N-DRE SCSI_EN setting

6. BIOS Recovery (3-pin RECOVERY1)

This jumper allows you to recover your original BIOS from a floppy disk in case the BIOS codes and data are corrupted.

To recover the BIOS:

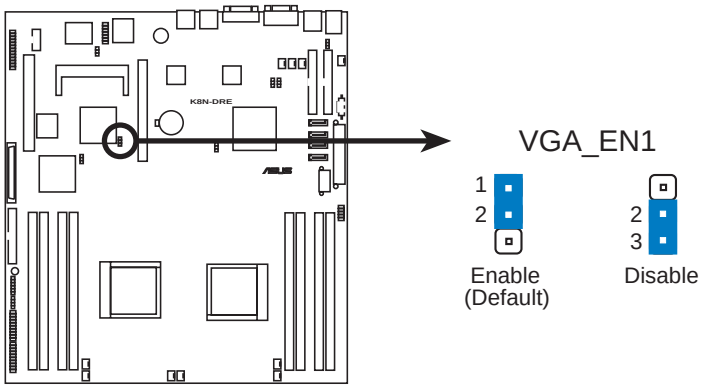
1. Turn OFF your computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3.
3. Insert a floppy disk with the original or updated BIOS file.
4. Plug the power cord and turn ON the computer.
5. The system searches for the BIOS file in the floppy then reflashes the BIOS.
6. When finished, shut down your computer.
7. Replace the jumper cap from pins 2-3 to pins 1-2.
8. Reboot your computer.
9. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.



K8N-DRE BIOS recovery setting

7. VGA Graphics controller setting (3-pin VGA_EN1)

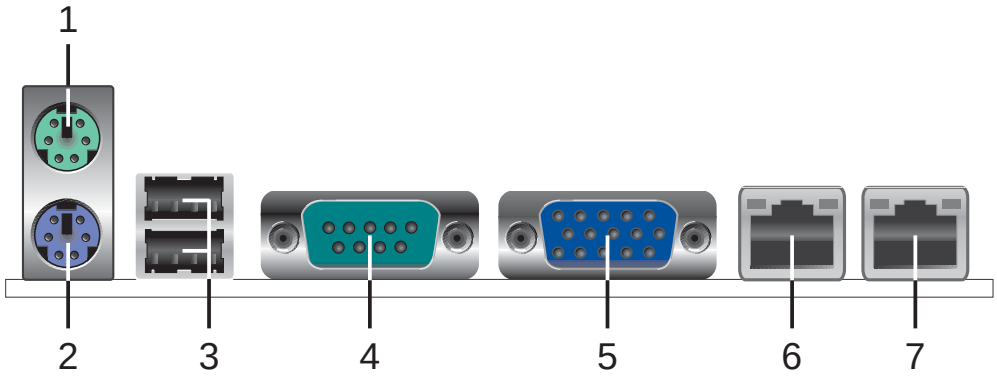
These jumpers allow you to enable or disable the onboard ATI Rage XL video graphics controller. Set to pins 1-2 to enable the video graphics controller.



K8N-DRE VGA setting

2.7 Connectors

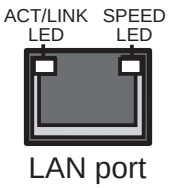
2.7.1 Rear panel connectors



1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
2. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.
3. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
4. **Serial (COM 1) port.** This 9-pin communication port os for pointing devices or other serial devices.
5. **Video port.** This port is for a VGA monitor or other VGA-compatible devices.
6. **LAN1 (RJ-45) port.** Supported by the BROADCOM® BCM5721 Gigabit LAN controller, this port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.
7. **LAN2 (RJ-45) port.** Supported by the BROADCOM® BCM5721 Gigabit LAN controller, this port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications

ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
GREEN	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection

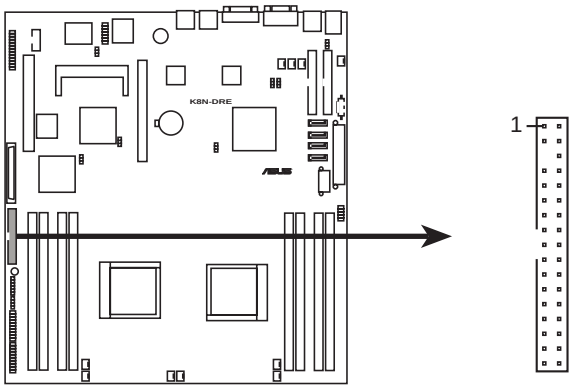


LAN port

2.7.2 Internal connectors

1. Floppy disk drive connector (34-1 pin FLOPPY1)

This connector is for the provided floppy disk drive (FDD) signal cable. Insert one end of the cable to this connector, then connect the other end to the signal connector at the back of the floppy disk drive.

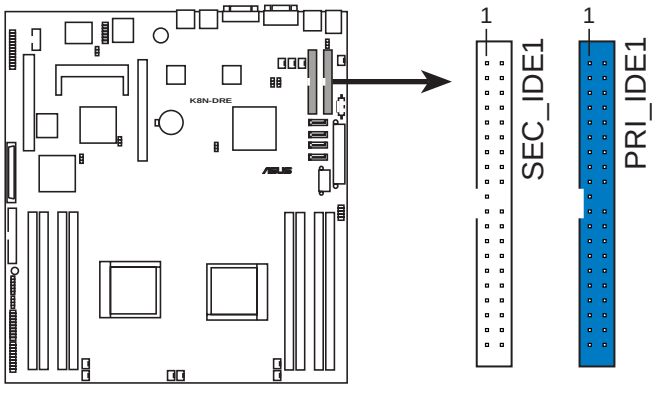


K8N-DRE Floppy disk drive connector

2. IDE connectors (40-1 pin PRI_IDE1, SEC_IDE1)

These connectors are for Ultra DMA 133/100/66 signal cables. The Ultra DMA 133/100/66 signal cable has three connectors: a blue connector for the primary IDE connector on the motherboard, a black connector for an Ultra DMA 133/100/66 IDE slave device (optical drive/hard disk drive), and a gray connector for an Ultra DMA 133/100/66 IDE master device (hard disk drive). If you install two hard disk drives to the same cable, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.

- The Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA133/100/66 IDE devices.

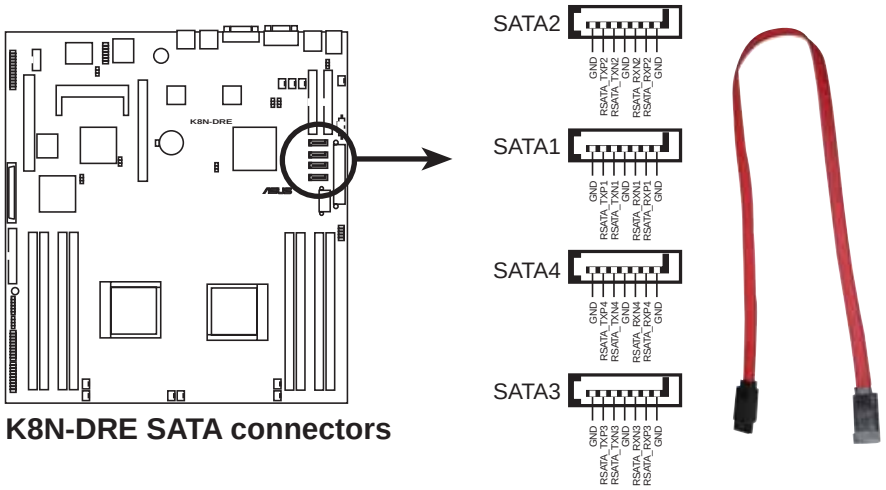


K8N-DRE IDE connectors

3. Serial ATA connectors (7-pin SATA1, SATA2, SATA3, SATA4)

Supported by the NVIDIA® nForce4™ chipset, these connectors are for the Serial ATA signal cables for Serial ATA hard disk drives that allows up to 3Gb/s of data transfer rate.

If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 1+0, or JBOD configuration.



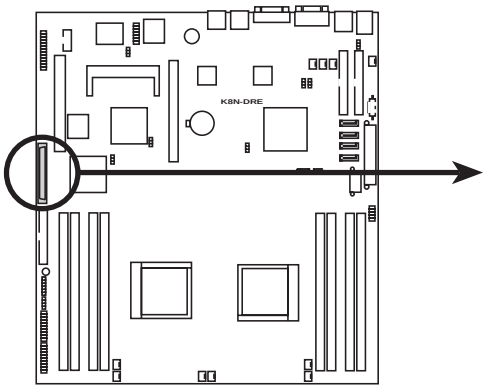
K8N-DRE SATA connectors

Important notes on Serial ATA

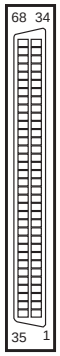
The actual data transfer rate depends on the speed of Serial ATA hard disks installed.

4. SCSI connector (68-pin SCSI1) (for SCSI model only)

This 68-pin Ultra160/320 SCSI connector supports a maximum of 15 devices as specified by the Ultra160/320 standards.



K8N-DRE Onboard SCSI connector

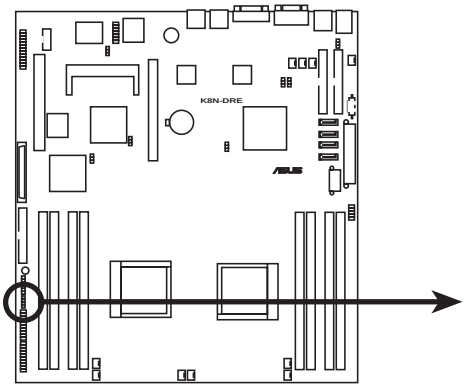


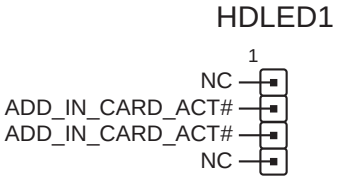
SCSI1
68-Pin Ultra320/
Ultra2-Wide SCSI Connector

The onboard SCSI chipset incorporates an advanced multi-mode I/O cell that supports both single-ended (SE), Ultra2, and Ultra160/320 devices. With Ultra160/320 devices, the SCSI bus platform performs at full Ultra160/320 speeds (up to 160MB/s or 320MB/s) and extended cabling of 12m (or 25m in a point-to-point configuration). When an SE device is attached, the bus defaults to an SE speed and 1.5m cable length.

5. Storage add-on card activity LED connector (4-pin HDLED1)

This connector is for the storage add-on card cable connected to the SCSI or SATA add-on card. The read or write activities of any device connected to the SCSI or SATA add-on card causes the front panel LED to light up.



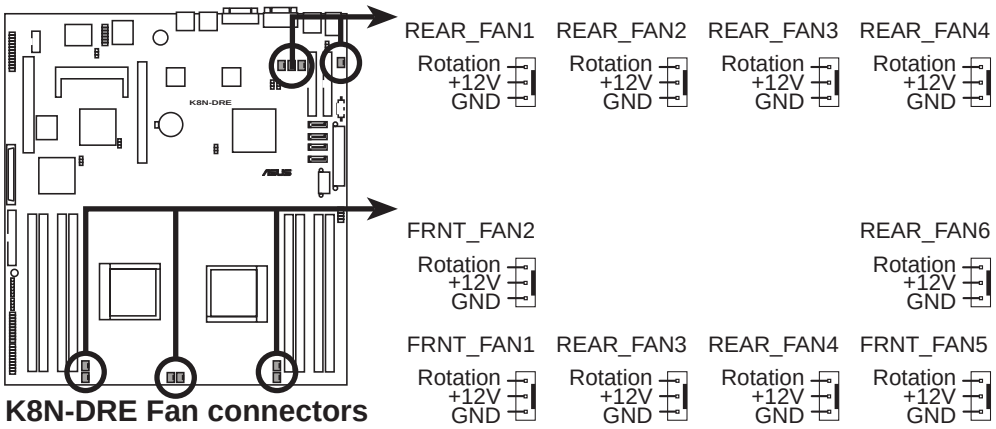


K8N-DRE Hard disk activity LED connector

6. Front and rear fan connectors (3-pin FRNT_FAN1, FRNT_FAN2, FRNT_FAN3, FRNT_FAN4, FRNT_FAN5, FRNT_FAN6, REAR_FAN1, REAR_FAN2, REAR_FAN3, REAR_FAN4)

The fan connectors support cooling fans of 350mA~2000mA (24 W max.) or a total of 1A~3.48A (41.76 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

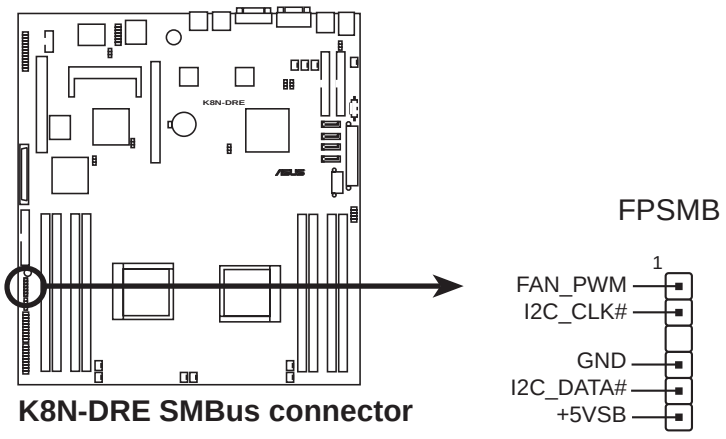
- Do not forget to connect the fan cables to the fan connectors. Lack of sufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!
- All fan features the ASUS Smart Fan technology.



K8N-DRE Fan connectors

7. Backplane SMBus connector (6-1 pin FPSMB)

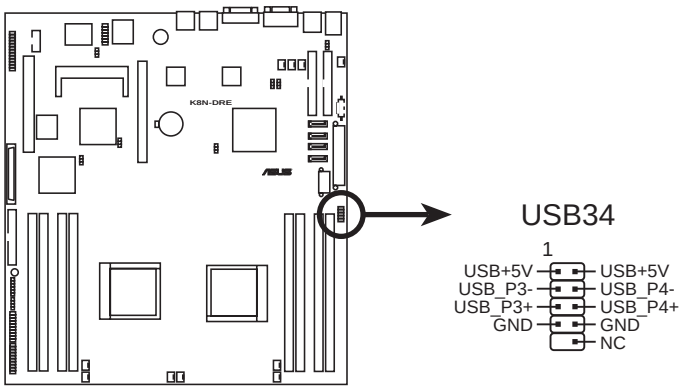
This connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and /or other SMBus devices using the SMBus interface.



K8N-DRE SMBus connector

8. USB connector (10-1 pin USB34)

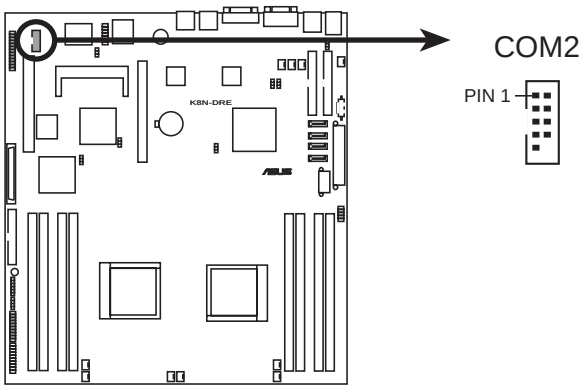
This connector is for USB 2.0 ports. This connector complies with the USB 2.0 specification that supports up to 480 Mbps connection speed.



K8N-DRE USB 2.0 connector

9. Serial port connector (10-1 pin COM2)

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.

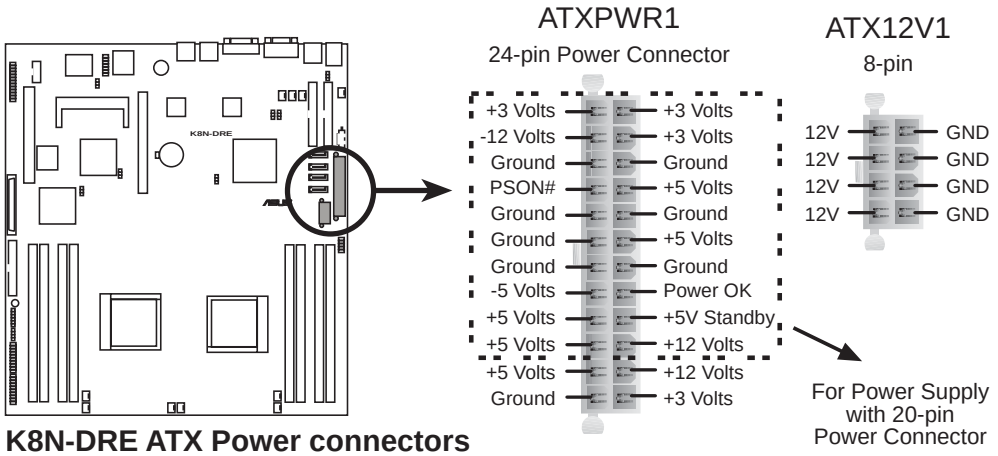


K8N-DRE Serial port2 (COM2) connector

10. ATX power connectors (24-pin ATXPWR1, 8-pin ATX12V1)

These connectors are for an ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

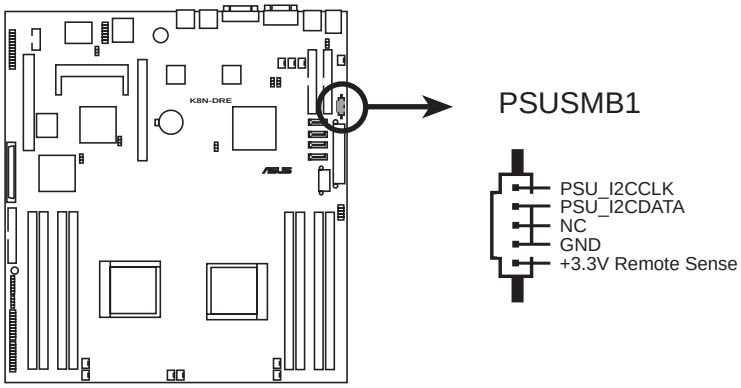
- Do not forget to connect the 8-pin ATX +12 V power plug; otherwise, the system will not boot.
- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. See the table below for details.



K8N-DRE ATX Power connectors

11. Power Supply SMBus connector (5-pin PSUSMB1)

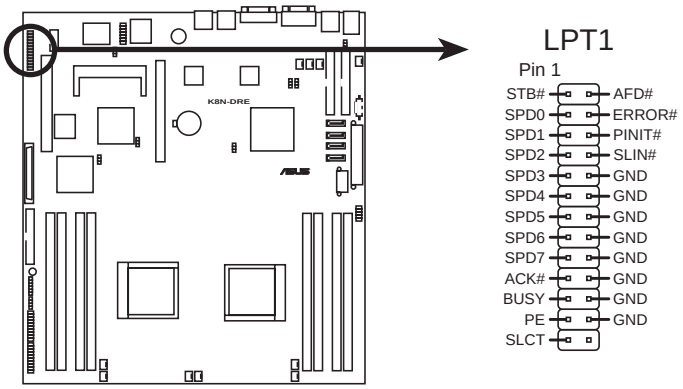
This connector allows you to connect SMBus (System Management Bus) devices to the power supply unit. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.



K8N-DRE Power supply SMBus connector

12. Parallel port connector (26-1 pin LPT1)

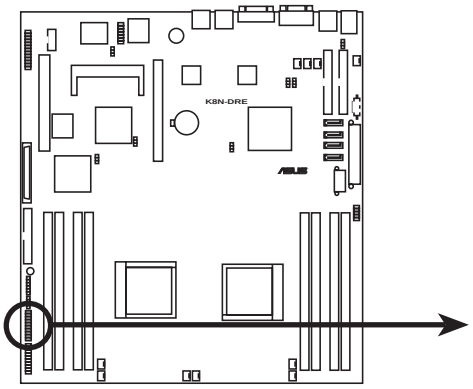
This connector is for a parallel port. Connect the parallel port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



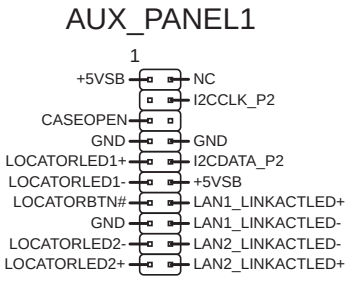
K8N-DRE Parallel port connector

13. System panel auxiliary connector (20-pin AUX_PANEL1)

This connector supports several server system functions.



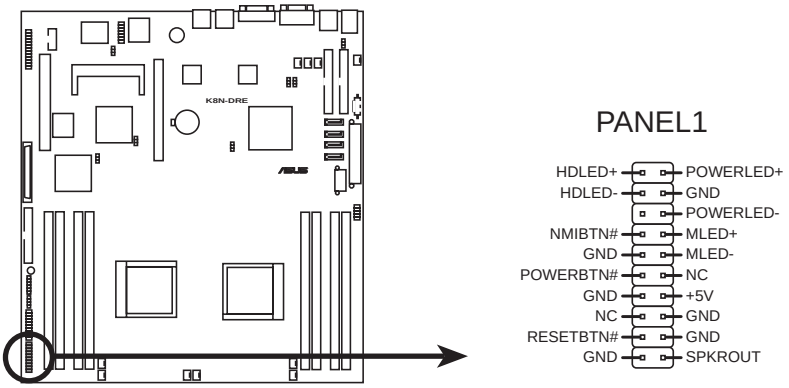
K8N-DRE Auxiliary panel connector



- **Chassis Intrusion connector (3-pin CASEOPEN)**
  This lead is for a chassis with an intrusion detection feature. This requires an external detection mechanism such as a chassis intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to this lead to record a chassis intrusion event.
- **LAN1 link activity LED (2-pin LAN1_LINKACTLED)**
  This 2-pin connector is for the LAN1 Activity LED. Connect the LAN1 Activity LED cable to this connector. This LED blinks during a network activity and is always lit when linked.
- **LAN2 link activity LED (2-pin LAN2_LINKACTLED)**
  This 2-pin connector is for the LAN2 Activity LED. Connect the LAN2 Activity LED cable to this connector. This LED blinks during a network activity and lights up when linked.
- **Locator LED 1 (2-pin LOCATORLED1)**
  This 2-pin connector is for the Locator LED 1. Connect the Locator LED 1 cable to this connector. This LED lights up when the Locator button is pressed.
- **Locator LED 2 (2-pin LOCATORLED2)**
  This 2-pin connector is for the Locator LED 2. Connect the Locator LED 2 cable to this connector.
- **Locator Button/Switch (2-pin LOCATORBTN)**
  This connector is for the locator button. This button queries the state of the system locator.
- **Front Panel SMBus (6-1 pin)**
  This connector allows you to connect SMBus (System Management Bus) devices to the system front panel. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.

14. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.



K8N-DRE System panel connector

The system panel connector is color-coded for easy connection. Refer to the connector description below for details.

- **System power LED (Green 3-pin POWERLED)**
  This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.
- **Hard disk drive activity (Red 2-pin HDDLED)**
  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.
  If an optional SCSI or SATA add-in card is installed, the read or write activities of any device connected to the SCSI or SATA add-in card causes this LED to light up.
- **System warning speaker (Orange 4-pin SPKROUT)**
  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.
- **Power/Soft-off button (Yellow 2-pin POWERBTN)**
  This connector is for the system power button. Pressing the power button turns the system ON or puts the system in SLEEP or SOFT-OFF mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.
- **Reset button (Blue 2-pin RESETBTN)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

This chapter describes the power up sequence, the POST messages, and ways of shutting down the system.

3 Powering up

Chapter summary

3.1 Starting up for the first time

1. After making all the connections, replace the system case cover.
2. Be sure that all switches are off.
3. Connect the power cord to the power connector at the back of the system chassis.
4. Connect the power cord to a power outlet that is equipped with a surge protector.
5. Turn on the devices in the following order:
   a. Monitor
   b. External SCSI devices (starting with the last device on the chain)
   c. System power
6. After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with “green” standards or if it has a “power standby” feature, the monitor LED may light up or switch between orange and green after the system LED turns on.

   The system then runs the power-on self tests or POST. While the tests are running, the BIOS beeps or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.
7. At power on, hold down the <Del> key to enter the BIOS Setup. Follow the instructions in Chapter 4.

3.2 Powering off the computer

3.2.1 Using the OS shut down function

If you are using Windows® 2000/2003 Server:

1. Click the **Start** button then click **Shut Down...**
2. Select **Shut Down** from the **What do you want the computer to do?** list box.
3. Select **Shutdown Event Tracker**.
4. Make sure that the **Planned** check box is checked.
5. Select shutdown option from the list box.
6. If necessary, key in comments.
7. Click **OK**.

3.2.2 Using the dual function power switch

While the system is ON, pressing the power switch for less than four seconds puts the system to sleep mode or to soft-off mode, depending on the BIOS setting. Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting. Refer to section "4.5 Power Menu" in Chapter 4 for details.

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

4 BIOS setup

Chapter summary

4.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup.

1. **ASUS AFUDOS** (Updates the BIOS in DOS mode using a bootable floppy disk.)
2. **ASUS CrashFree BIOS 2** (Updates the BIOS using a bootable floppy disk or the motherboard support CD when the BIOS file fails or gets corrupted.)
3. **ASUS Update** (Updates the BIOS in Windows® environment.)

Refer to the corresponding sections for details on these utilities.

Save a copy of the original motherboard BIOS file to a bootable floppy disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

4.1.1 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.

   DOS environment

   a. Insert a 1.44MB floppy disk into the drive.
   b. At the DOS prompt, type **`format A:/S`** then press <Enter>.

   Windows® XP environment

   a. Insert a 1.44 MB floppy disk to the floppy disk drive.
   b. Click **Start** from the Windows® desktop, then select **My Computer**.
   c. Select the 3 1/2 Floppy Drive icon.
   d. Click **File** from the menu, then select **Format**. A **Format 3 1/2 Floppy Disk** window appears.
   e. **Windows® XP users:** Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

4.1.2 AFUDOS utility

The AFUDOS utility allows you to update the BIOS file in DOS environment using a bootable floppy disk with the updated BIOS file. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility:

- Make sure that the floppy disk is not write-protected and has at least 1024KB free space to save the file.
- The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.
2. Boot the system in DOS mode, then at the prompt type:

   afudos /o[filename]

   where the [filename] is any user-assigned filename not more than eight alphanumeric characters for the main filename and three alphanumeric characters for the extension name.

3. Press <Enter>. The utility copies the current BIOS file to the floppy disk.

```
A:\>afudos /oOLDBIOS1.rom
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
   Reading flash ..... done
   Write to file...... ok
A:\>
```

The utility returns to the DOS prompt after copying the current BIOS file.

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1. Visit the ASUS website (www.asus.com) and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable floppy disk.

Write the BIOS filename on a piece of paper. You need to type the exact BIOS filename at the DOS prompt.

2. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.
3. Boot the system in DOS mode, then at the prompt type:

   afudos /i[filename]

   where [filename] is the latest or the original BIOS file on the bootable floppy disk.

```
A:\>afudos /iK8NDRE.ROM
```

4. The utility verifies the file and starts updating the BIOS.

```
A:\>afudos /iK8NDRE.ROM /pbnc
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

   WARNING!! Do not turn off power during flash BIOS
   Reading file ....... done
   Reading flash ...... done

   Advance Check ......
   Erasing flash ...... done
   Writing flash ...... 0x0008CC00 (9%)
```

Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

```
A:\>afudos /iK8NDRE.ROM /pbnc
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

   WARNING!! Do not turn off power during flash BIOS
   Reading file ....... done
   Reading flash ...... done

   Advance Check ......
   Erasing flash ...... done
   Writing flash ...... done
   Verifying flash .... done

   Please restart your computer

A:\>
```

4.1.3 ASUS CrashFree BIOS 2 utility

The ASUS CrashFree BIOS 2 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support CD or the floppy disk that contains the updated BIOS file.

- Prepare the motherboard support CD or the floppy disk containing the updated motherboard BIOS before using this utility.
- Make sure that you rename the original or updated BIOS file in the floppy disk to **K8NDRE.ROM**.

Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

1. Turn on the system.
2. Insert the floppy disk with the original or updated BIOS file to the floppy disk drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "K8NDRE.ROM". Completed.
Start flashing...
```

DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

4. Restart the system after the utility completes the updating process.

Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

1. Remove any floppy disk from the floppy disk drive, then turn on the system.
2. Insert the support CD to the optical drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When no floppy disk is found, the utility automatically checks the optical drive for the original or updated BIOS file. The utility then updates the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy not found!
Checking for CD-ROM...
CD-ROM found!
Reading file "K8NDRE.ROM". Completed.
Start flashing...
```

DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

4. Restart the system after the utility completes the updating process.

The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website (www.asus.com) to download the latest BIOS file.

4.1.4 ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

- Save the current BIOS file
- Download the latest BIOS file from the Internet
- Update the BIOS from an updated BIOS file
- Update the BIOS directly from the Internet, and
- View the BIOS version information.

This utility is available in the support CD that comes with the motherboard package.

ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

Installing ASUS Update

To install ASUS Update:

1. Place the support CD in the optical drive. The **Drivers** menu appears.
2. Click the **Utilities** tab, then click **Install ASUS Update VX.XX.XX**.
3. The ASUS Update utility is copied to your system.

Quit all Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

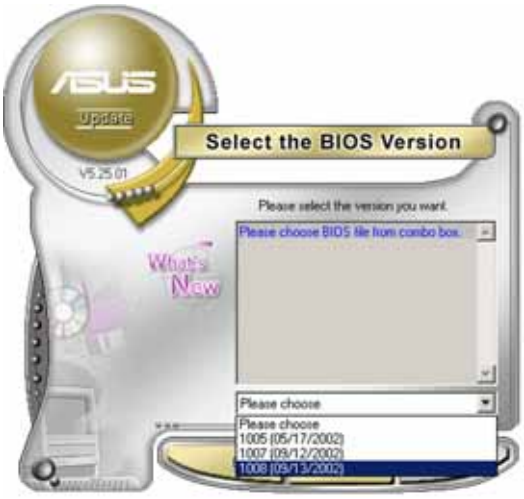
To update the BIOS through the Internet:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start** > **Programs** > **ASUS** > **ASUSUpdate** > **ASUSUpdate**. The ASUS Update main window appears.

2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.

3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

4. From the FTP site, select the BIOS version that you wish to download. Click Next.
5. Follow the screen instructions to complete the update process.



The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.

Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start** > **Programs** > **ASUS** > **ASUSUpdate** > **ASUSUpdate**. The ASUS Update main window appears.
2. Select **Update BIOS from a file** option from the drop-down menu, then click **Next**.

3. Locate the BIOS file from the **Open** window, then click **Open**.
4. Follow the screen instructions to complete the update process.

4.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section "4.1 Managing and updating your BIOS."

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup". This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM.

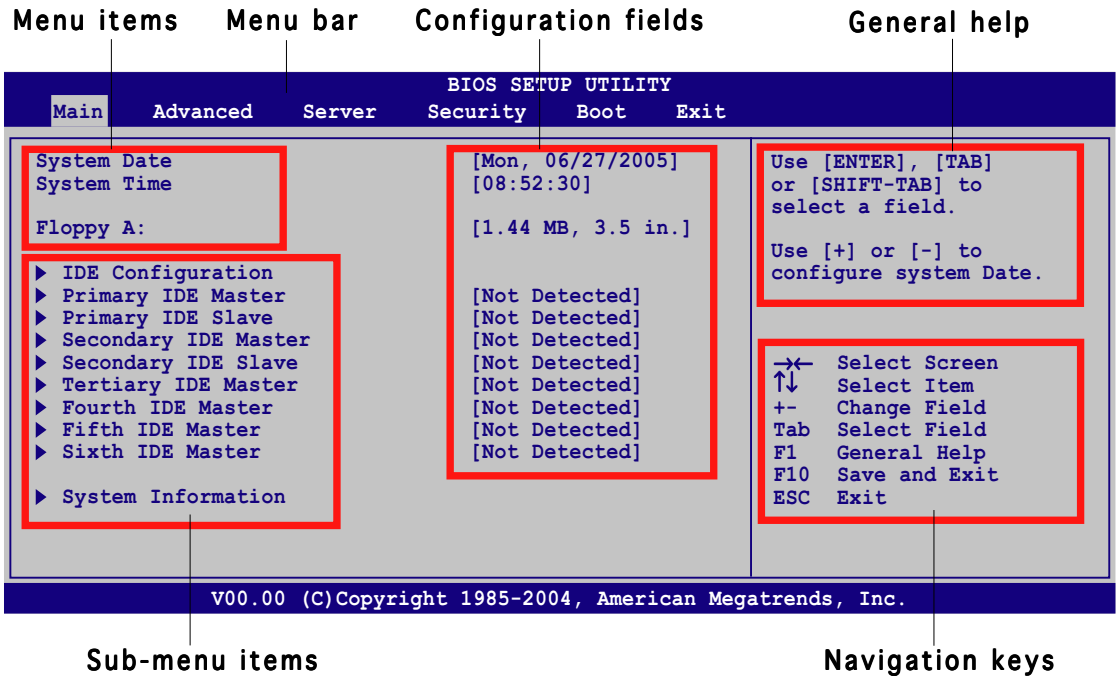
The firmware device on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit Menu. See section "4.7 Exit Menu."
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

4.2.1 BIOS menu screen



4.2.2 Menu bar

The menu bar on top of the screen has the following main items:

Main	For changing the basic system configuration
Advanced	For changing the advanced system settings
Server	For changing the advanced server options
Security	For changing the advanced system security options
Boot	For changing the system boot configuration
Exit	For selecting the exit options and loading default settings

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

4.2.3 Navigation keys

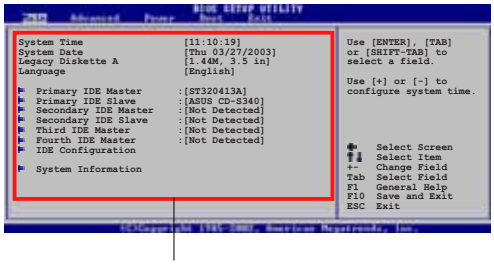
At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

Some of the navigation keys differ from one screen to another.

4.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.



Main menu items

4.2.5 Sub-menu items

A solid triangle before each item on any menu screen means that the iteam has a sub-menu. To display the sub-menu, select the item and press <Enter>.

4.2.6 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

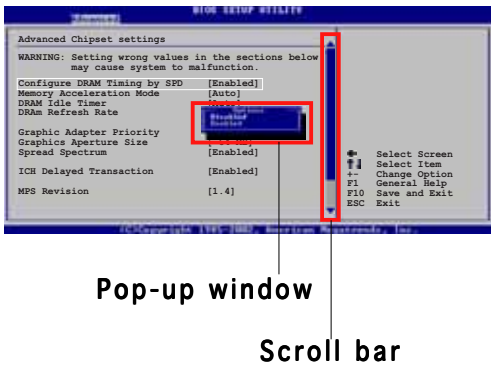
A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to "4.2.7 Pop-up window."

4.2.7 Pop-up window

Select a menu item then press <Enter> to display a pop-up window with the configuration options for that item.

4.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.



Pop-up window

Scroll bar

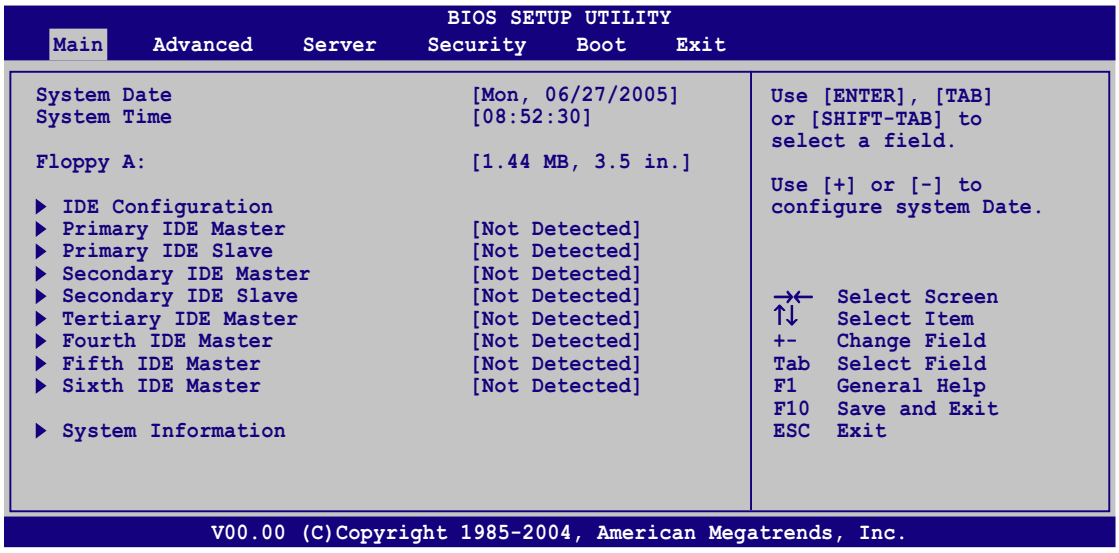
4.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.

4.3 Main menu

When you enter the BIOS Setup program, the **Main** menu screen appears, giving you an overview of the basic system information.

Refer to section "4.2.1 BIOS menu screen" for information on the menu screen items and how to navigate through them.



4.3.1 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

4.3.2 System Time [xx:xx:xx]

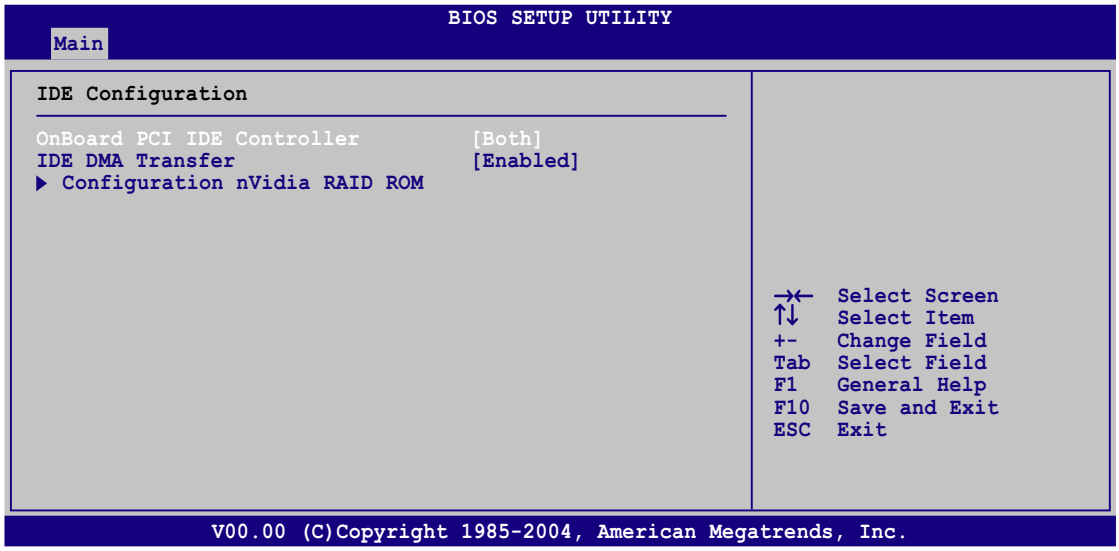
Allows you to set the system time.

4.3.3 Floppy A [1.44M, 3.5 in.]

Sets the type of floppy drive installed. Configuration options: [Disabled] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

4.3.4 IDE Configuration

The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press <Enter> if you wish to configure the item.



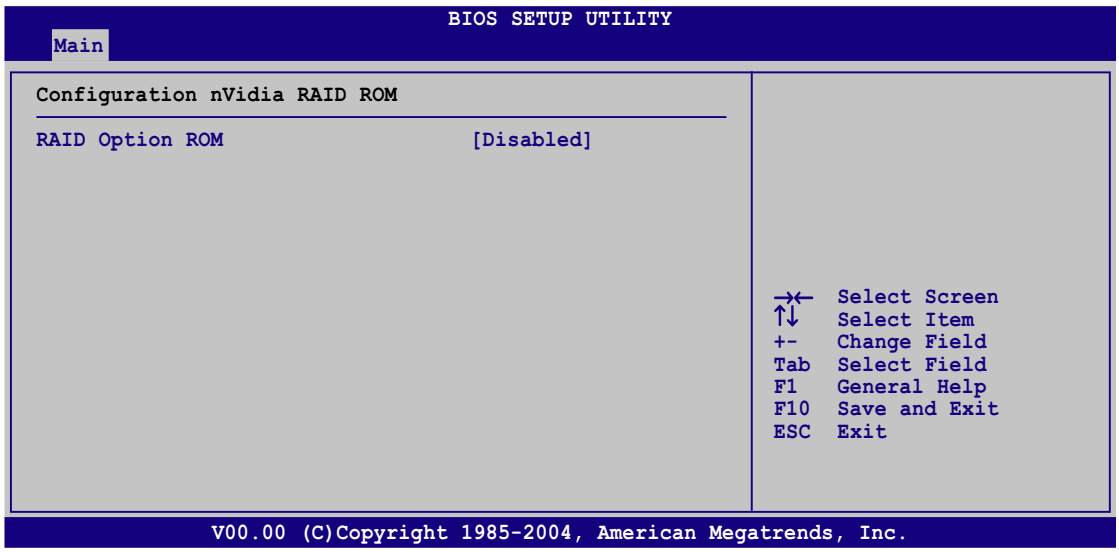
OnBoard PCI IDE Controller [Both]

Enables or disables any or both the primary and/or secondary IDE controllers. Configuration options: [Disabled] [Primary] [Secondary] [Both]

IDE DMA Transfer [Enabled]

Enables or disables IDE DMA transfers.
Configuration options: [Disabled] [Enabled]

Configuration nVidia RAID ROM



RAID Option ROM [Disabled]

Enables or disables the NVIDIA® RAID option ROM.
Configuration options: [Disabled] [Enabled]

The following items appear when the RAID Option ROM is Enabled.

Primary Master as RAID [Disabled]

Sets the primary master interface as RAID.
Configuration options: [Disabled] [Enabled]

Primary Slave as RAID [Disabled]

Sets the primary slave interface as RAID.
Configuration options: [Disabled] [Enabled]

Secondary Master as RAID [Disabled]

Sets the secondary master interface as RAID.
Configuration options: [Disabled] [Enabled]

Secondary Slave as RAID [Disabled]

Sets the secondary slave interface as RAID.
Configuration options: [Disabled] [Enabled]

Tertiary Master as RAID [Disabled]

Sets the tertiary master interface as RAID.
Configuration options: [Disabled] [Enabled]

Fourth Master as RAID [Disabled]

Sets the fourth master interface as RAID.
Configuration options: [Disabled] [Enabled]

Fifth Master as RAID [Disabled]

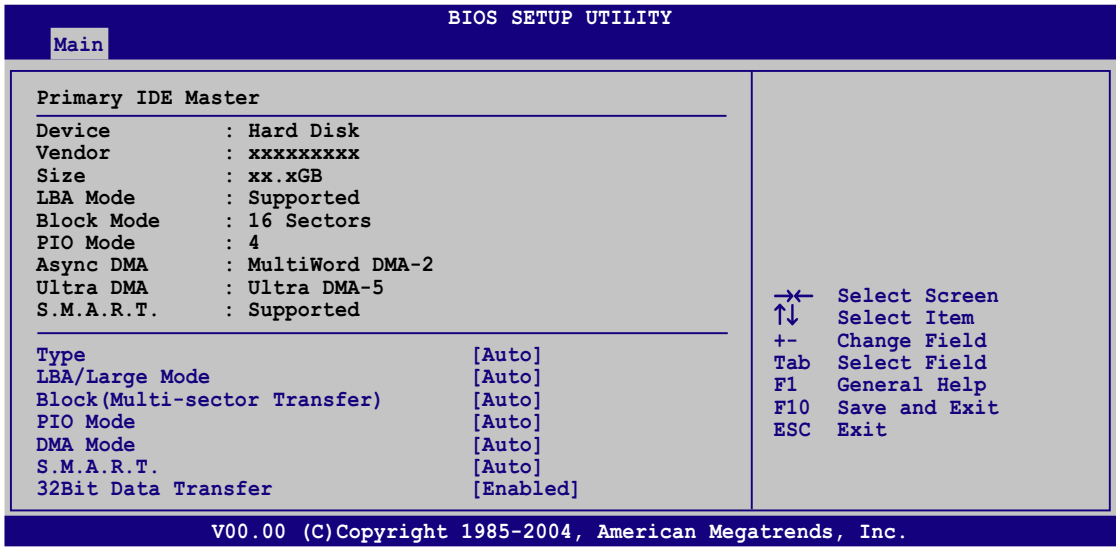
Sets the fifth master interface as RAID.
Configuration options: [Disabled] [Enabled]

Sixth Master as RAID [Disabled]

Sets the sixth master interface as RAID.
Configuration options: [Disabled] [Enabled]

4.3.5 Primary, Secondary, Tertiary, Fourth, Fifth, and Sixth IDE Master/Slave

The BIOS automatically detects the connected IDE devices. There is a separate sub-menu for each IDE device. Select a device item, then press <Enter> to display the IDE device information.



The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and S.M.A.R.T. monitoring). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

Type [Auto]

Selects the type of IDE drive. Setting to [Auto] allows automatic selection of the appropriate IDE device type. Select [CDROM] if you are specifically configuring a CD-ROM drive. Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.
Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

Block (Multi-sector Transfer) [Auto]

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Selects the PIO mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

Sets the DMA mode.
Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4]

S.M.A.R.T. [Auto]

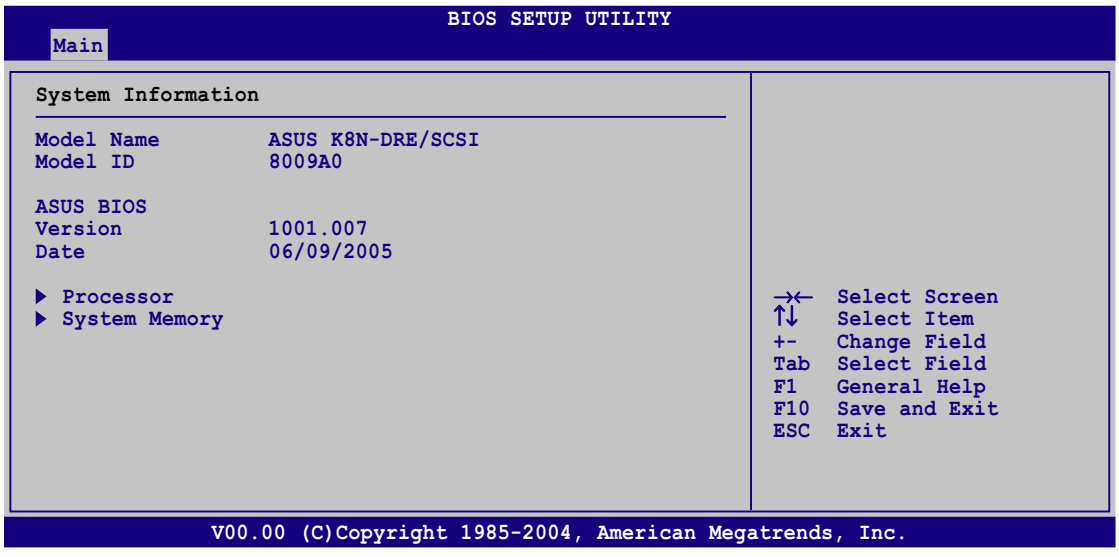
Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Enabled]

Enables or disables 32-bit data transfer.
Configuration options: [Disabled] [Enabled]

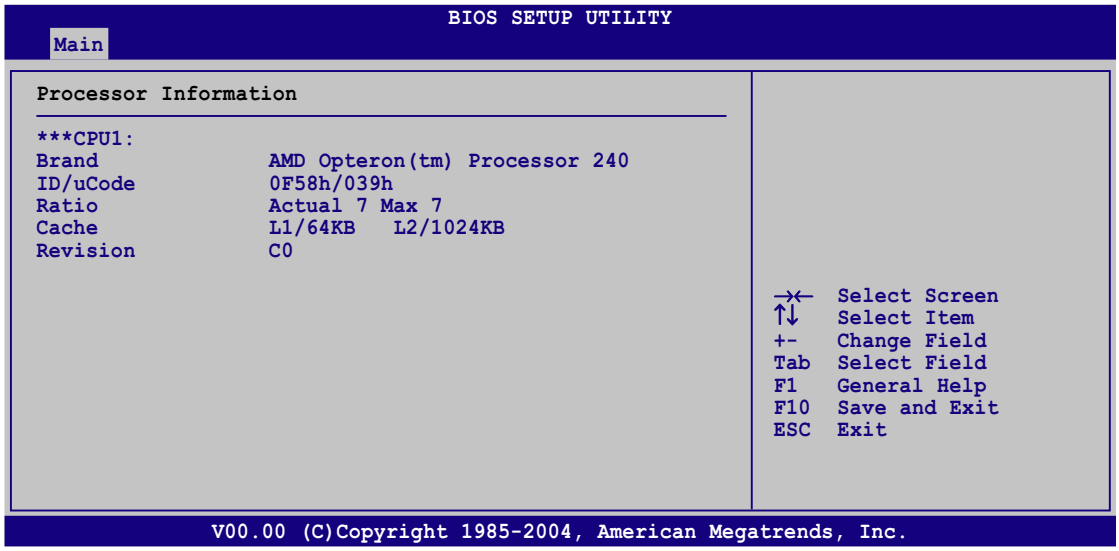
4.3.6 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.



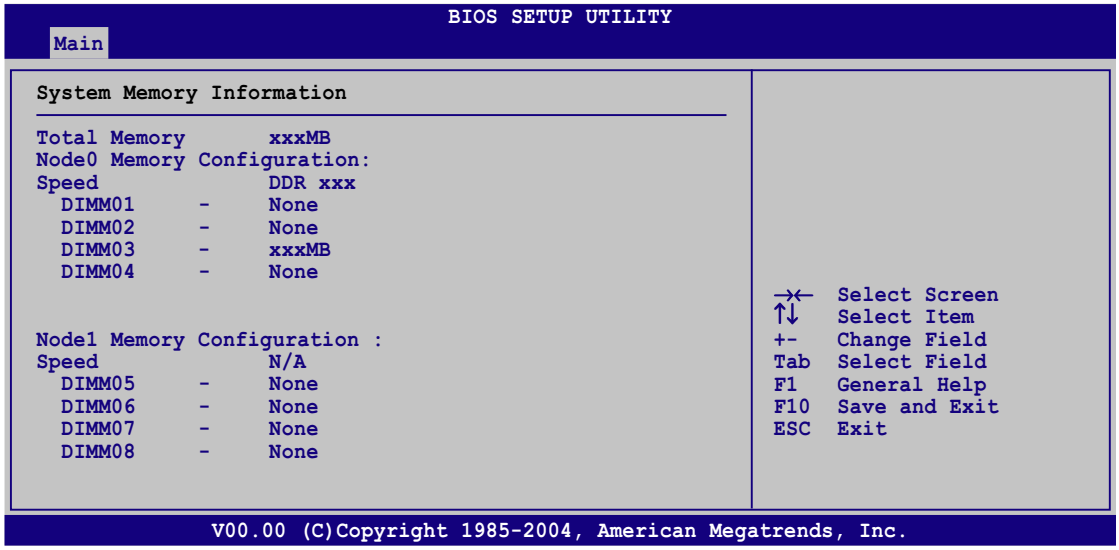
Processor

Displays the installed processor information.



System Memory

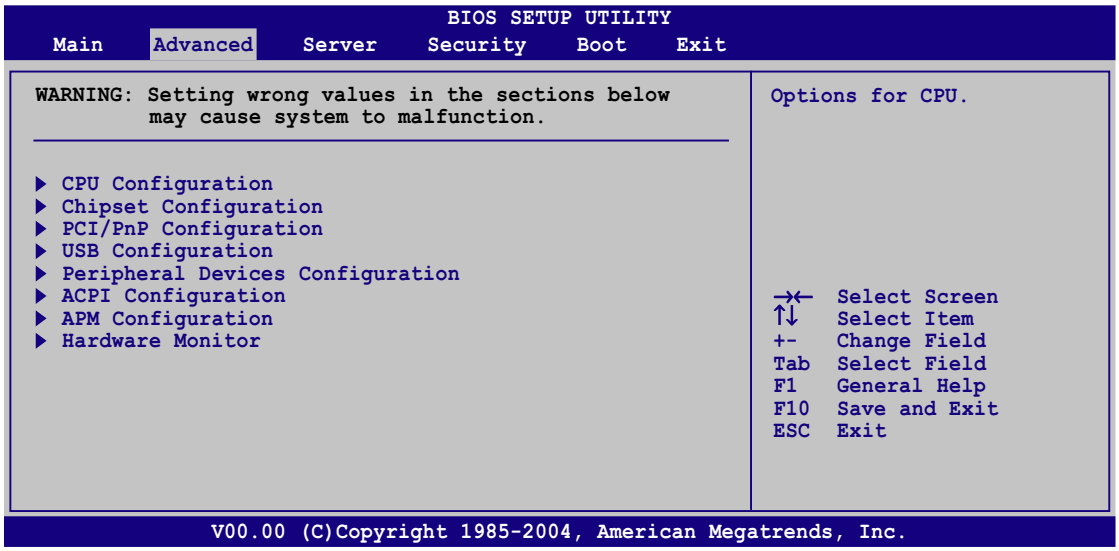
Displays the installed system memory information.



4.4 Advanced menu

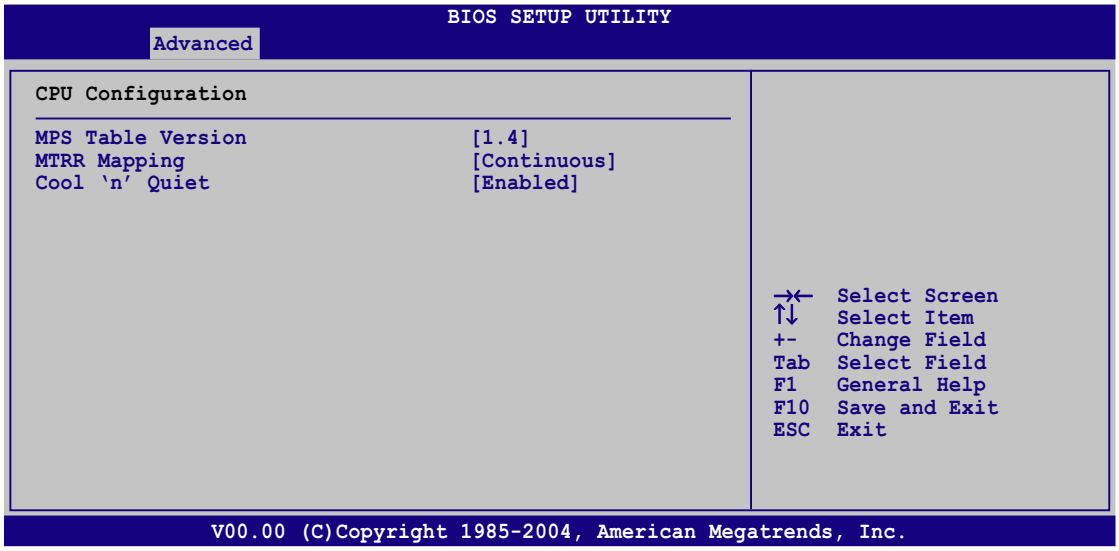
The Advanced menu items allow you to change the settings for the CPU and other system devices.

Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.



4.4.1 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.



MPS Table Version [1.4]

Sets the Multi-Processor System (MPS) table version.
Configuration options: [1.1] [1.4]

MTRR Mapping [Continuous]

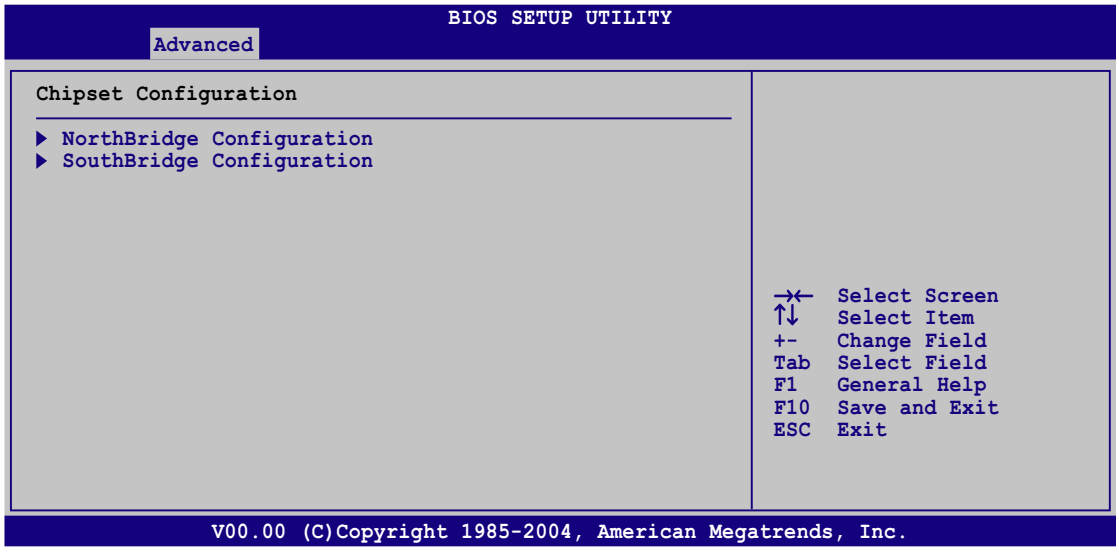
Determines the method used for programming processor MTRRs when using more than 4GB of system memory.
Configuration options: [Continuous] [Discrete]

Cool 'n' Quiet [Enabled]

Enables or disables the AMD® Cool 'n' Quiet! (Power Now) feature.
Configuration options: [Enabled] [Disabled]

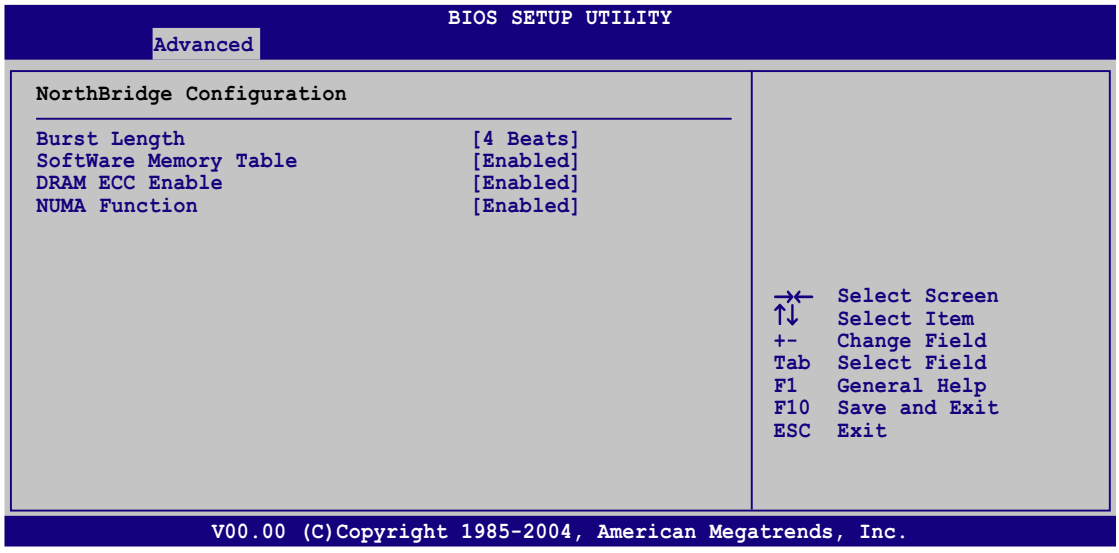
4.4.2 Chipset Configuration

The Chipset configuration menu allows you to change advanced chipset settings. Select an item then press <Enter> to display the sub-menu.



NorthBridge Configuration

The NorthBridge Configuration menu allows you to change the Northbridge settings.



Burst Length [4 Beats]

Sets the burst length. Configuration options: [8 Beats] [4 Beats] [2 Beats]

SoftWare Memory Hole [Enabled]

Enables or disables the software memory hole.
Configuration options: [Disabled] [Enabled]

DRAM ECC Enable [Enabled]

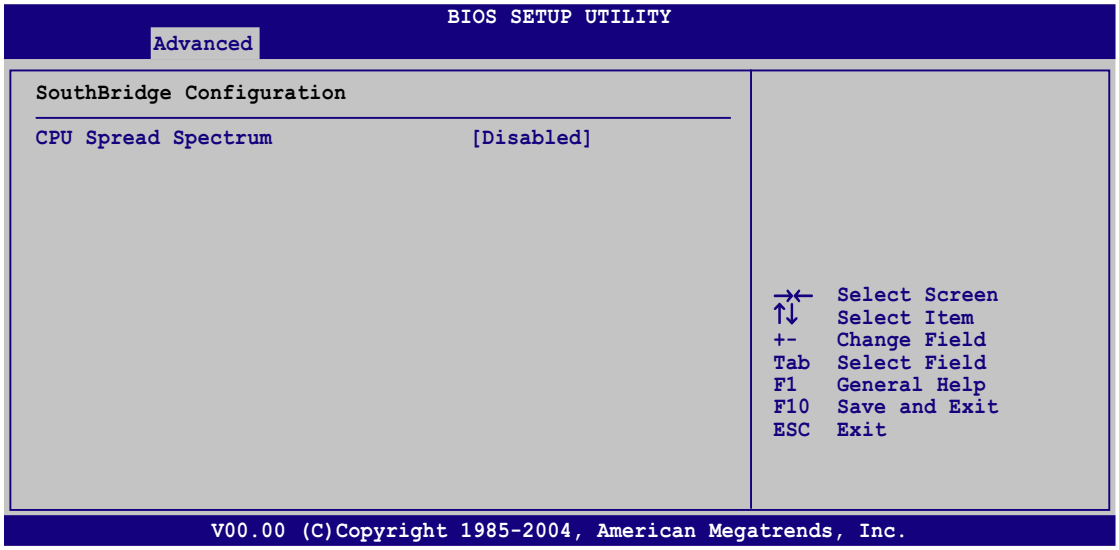
Enables or disables the DRAM ECC that allows the hardware to report and correct memory errors automatically.
Configuration options: [Disabled] [Enabled]

NUMA Function [Enabled]

Enables or disables the non-uniform memory access (NUMA) function.
Configuration options: [Disabled] [Enabled]

SouthBridge Configuration

The SouthBridge configuration menu allows you to change the Southbridge settings.



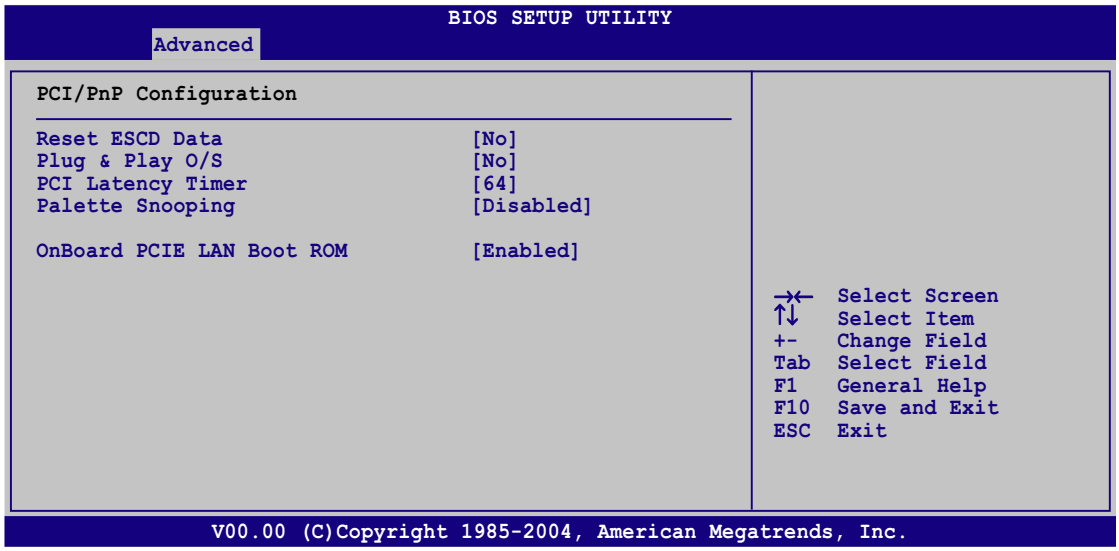
CPU Spread Spectrum [Disabled]

Sets or disables the processor spread spectrum.
Configuration options: [Disabled] [Center Spread]

4.4.3 PCI PnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel resources for either PCI/PnP or legacy ISA devices, and setting the memory size block for legacy ISA devices.

Take caution when changing the settings of the PCI PnP menu items. Incorrect field values can cause the system to malfunction.



Reset ESCD Data [No]

Clears the non-volatile RAM (NVRAM) during boot.
Configuration options: [No] [Yes]

Plug And Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot.
Configuration options: [No] [Yes]

PCI Latency Timer [64]

Allows you to select the value in units of PCI clocks for the PCI device latency timer register. Configuration options: [32] [64] [96] [128] [160] [192] [224] [248]

Palette Snooping [Disabled]

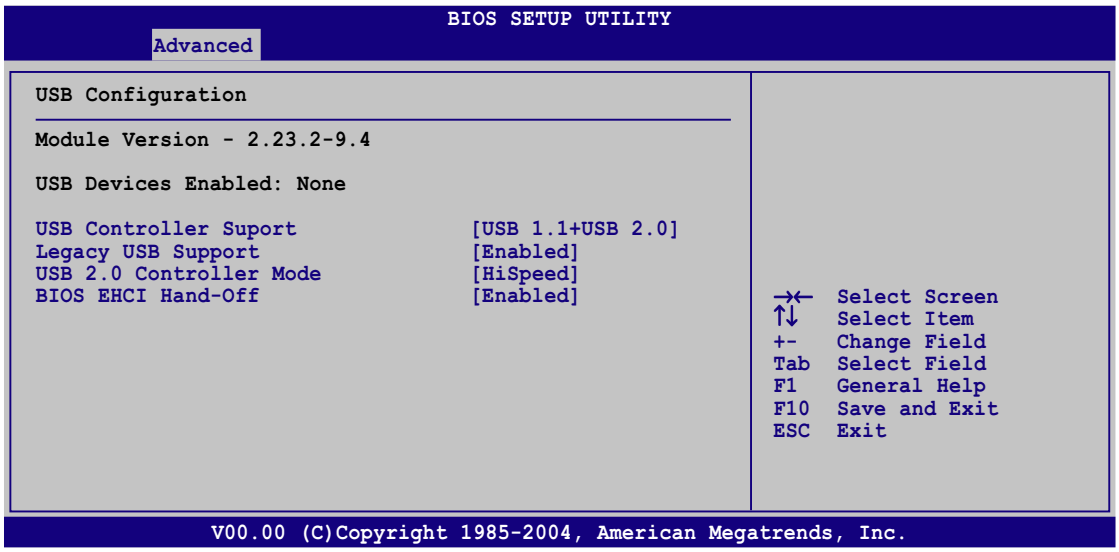
When set to [Enabled], the pallete snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Configuration options: [Disabled] [Enabled]

OnBoard PCIE LAN Boot ROM [Enabled]

Allows you to enable or disable the option ROM in the onboard PCI Express LAN controller. Configuration options: [Disabled] [Enabled]

4.4.4 USB Configuration

The items in this menu allows you to change the USB-related features. Select an item then press <Enter> to display the configuration options.



The **Module Version** and **USB Devices Enabled** items show the auto-detected values. If no USB device is detected, the **USB Devices Enabled** item shows **None**.

USB Controller Support [USB 1.1+USB 2.0]

Sets or disables the USB controller support.
Configuration options: [Disabled] [USB 1.1 Only] [USB 1.1+USB 2.0]

Legacy USB Support [Enabled]

Allows you to enable or disable support for legacy USB devices. Setting to [Auto] allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.
Configuration options: [Disabled] [Enabled] [Auto]

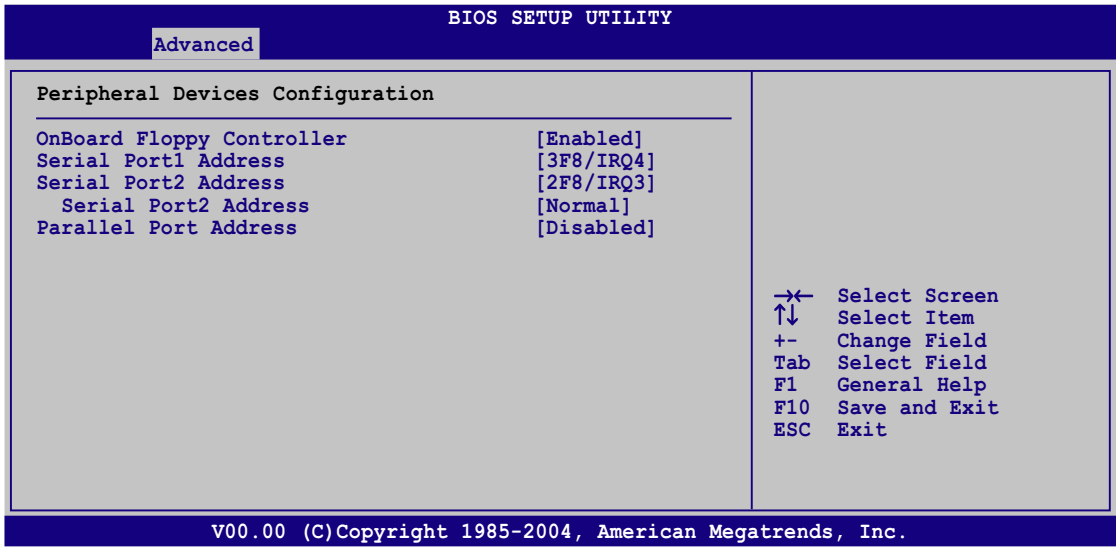
USB 2.0 Controller Mode [HiSpeed]

Allows you to set the USB 2.0 controller mode to HiSpeed (480 Mbps) or FullSpeed (12 Mbps). Configuration options: [HiSpeed] [FullSpeed]

BIOS EHCI Hand-Off [Enabled]

Enables or disables the BIOS EHCI hand-off support.
Configuration options: [Disabled] [Enabled]

4.4.5 Peripheral Devices Configuration



OnBoard Floppy Controller [Enabled]

Enables or disables the onboard floppy controller.
Configuration options: [Disabled] [Enabled]

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.
Configuration options: [Disabled] [3F8/IRQ4] [3E8/IRQ4] [2E8/IRQ3]

Serial Port2 Address [2F8/IRQ3]

Allows you to select the Serial Port2 base address.
Configuration options: [Disabled] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Serial Port 2 Mode [Normal]

Sets the serial port 2 mode.
Configuration options: [Normal] [IrDA] [ASK IR]

Parallel Port Address [378]

Allows you to select the Parallel Port base addresses.
Configuration options: [Disabled] [378] [278] [3BC]

Parallel Port Mode [Normal]

Allows you to select the Parallel Port mode.
Configuration options: [Normal] [Bi-directional] [ECP] [EPP] [ECP & EPP]

EPP Version [1.9]

Allows selection of the Parallel Port EPP version. This item appears when the Parallel Port Mode is set to [EPP] or [ECP & EPP].
Configuration options: [1.9] [1.7]

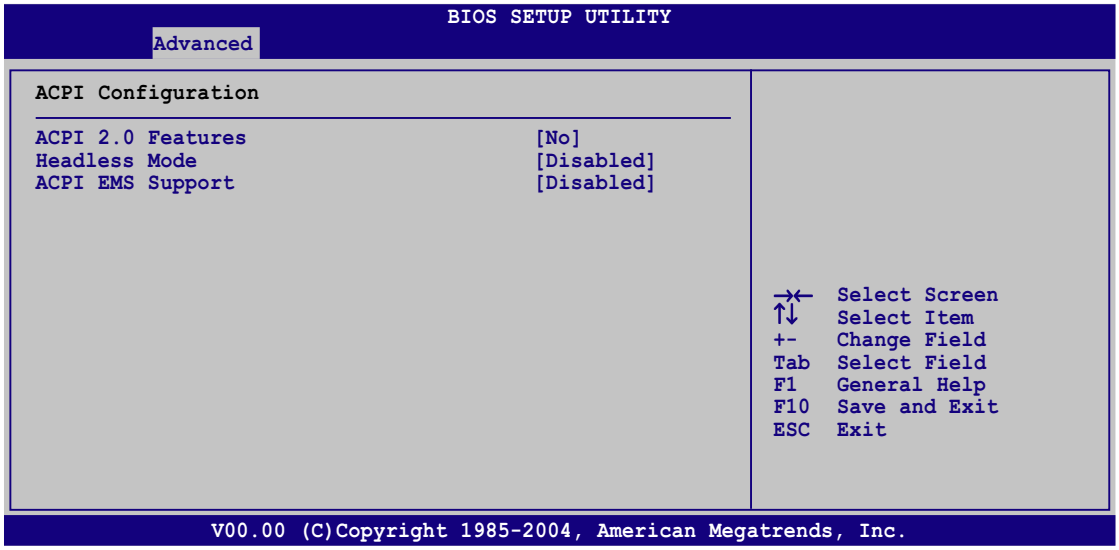
ECP Mode DMA Channel [DMA3]

Appears when the Parallel Port Mode is set to [ECP] or [ECP & EPP]. This item allows you to set the Parallel Port ECP DMA.
Configuration options: [DMA0] [DMA1] [DMA3]

Parallel Port IRQ [IRQ7]

Sets the Parallel port IRQ. Configuration options: [IRQ5] [IRQ7]

4.4.6 ACPI Configuration



ACPI 2.0 Features [No]

Enables or disables the ACPI 2.0 features.
Configuration options: [Yes] [No]

Headless Mode [Disabled]

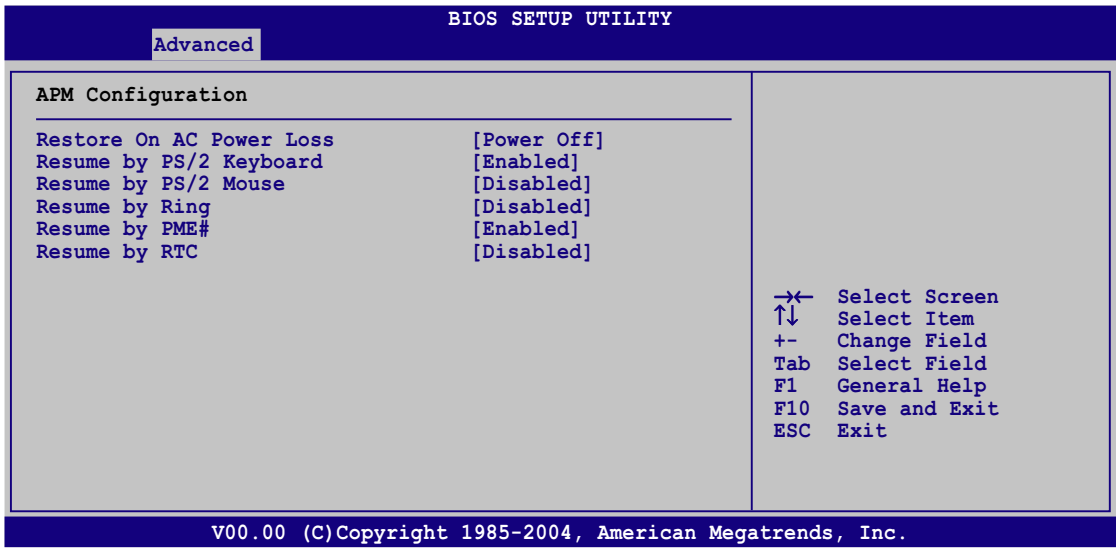
Enables or disables the headless operation mode in ACPI.
Configuration options: [Disabled] [Enabled]

ACPI EMS Support [Disabled]

Enables or disables the ACPI EMS support.
Configuration options: [Disabled] [Enabled]

4.4.7 APM Configuration

This sub-menu allows you to change Advanced Power Management (APM) features. Select an item then press <Enter> to display the configuration options.



Restore on AC Power Loss [Power Off]

When set to Power Off, the system goes into off state after an AC power loss. When set to Power On, the system will reboot after an AC power loss. When set to Last State, the system goes into either off or on state, whatever the system state was before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

Resume By PS/2 Keyboard [Enabled]

Allows you to use specific keys on the keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Resume By PS/2 Mouse [Disabled]

When set to [Enabled], this parameter allows you to use the PS/2 mouse to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Resume By Ring [Disabled]

When set to [Enabled], the system will generate a wake event when the external modem receives a call while the computer is in Soft-off mode. Configuration options: [Disabled] [Enabled]

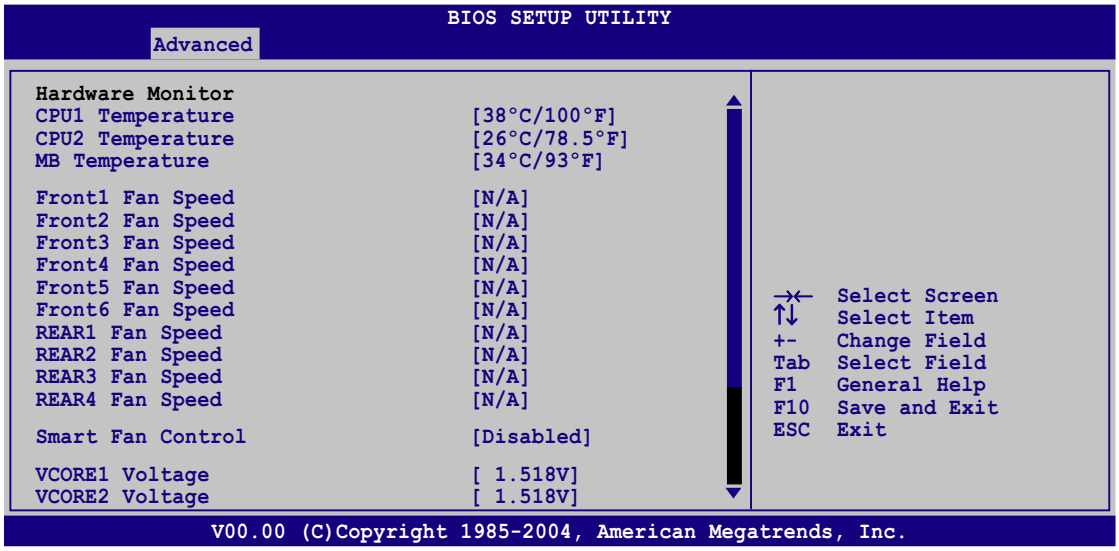
Resume By PME# [Disabled]

When set to [Enabled], the system enables the PME to generate a wake event while the computer is in Soft-off mode.
Configuration options: [Disabled] [Enabled]

Resume by RTC [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to [Enabled], the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values.
Configuration options: [Disabled] [Enabled]

4.4.8 Hardware Monitor



CPU1/CPU2 Temperature [xxx°C/xxx°F]
MB Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures. Select [Ignored] if you do not wish to display the detected temperatures. The CPU2 Temperature shows N/A if no processor is installed in CPU 2 socket.

Front1/2/3/4/5/6 Fan Speed [xxxxRPM] or [N/A]
Rear1/2/3/4 Fan Speed [xxxxRPM] or [N/A]

The onboard hardware monitor automatically detects and displays the front and rear fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows N/A.

Smart Fan Control [Disabled]

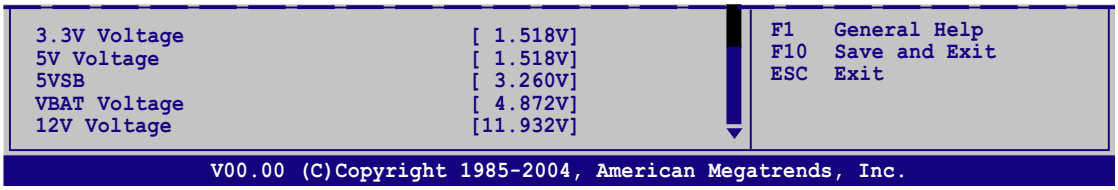
Allows you to enable or disable the ASUS Smart Fan feature that smartly adjusts the fan speeds for more efficient system operation. Configuration options: [Disabled] [Enabled]

The **CPU1 Temperature**, **CPU2 Temperature**, and **Front1 Temperature** items appear when you enable the **Smart Fan Control** feature.

CPU1/CPU2 Temperature [XXX]
Front1 Temperature [XXX]

Allows you to set the CPU and system threshold temperature before the Smart Fan Control is disabled.

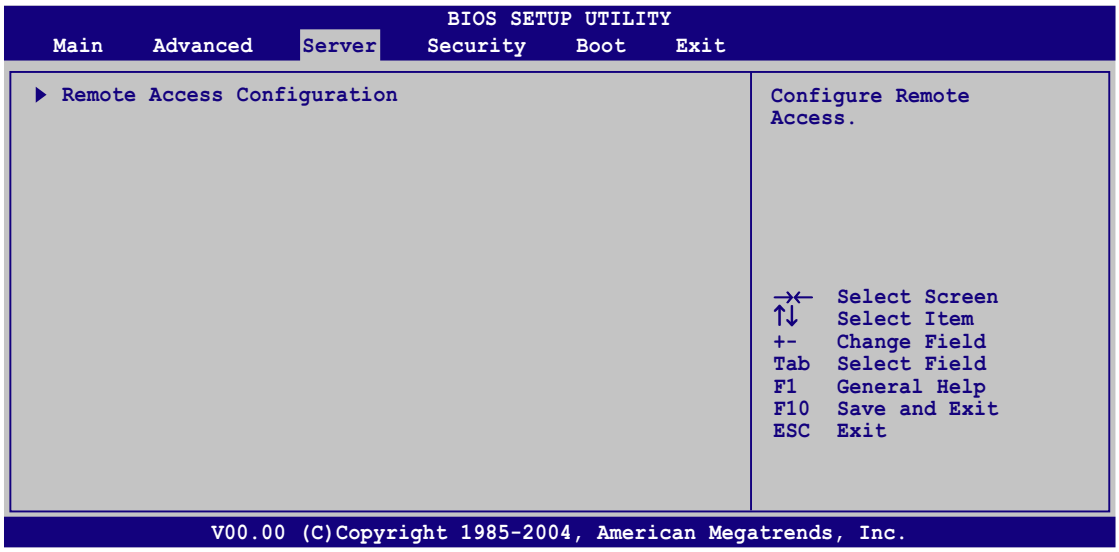
Use the arrow down key to scroll down the menu.



VCORE1 Voltage, VCORE2 Voltage, 3.3V Voltage, 5V Voltage, 5VSB Voltage, VBAT Voltage, 12V Voltage

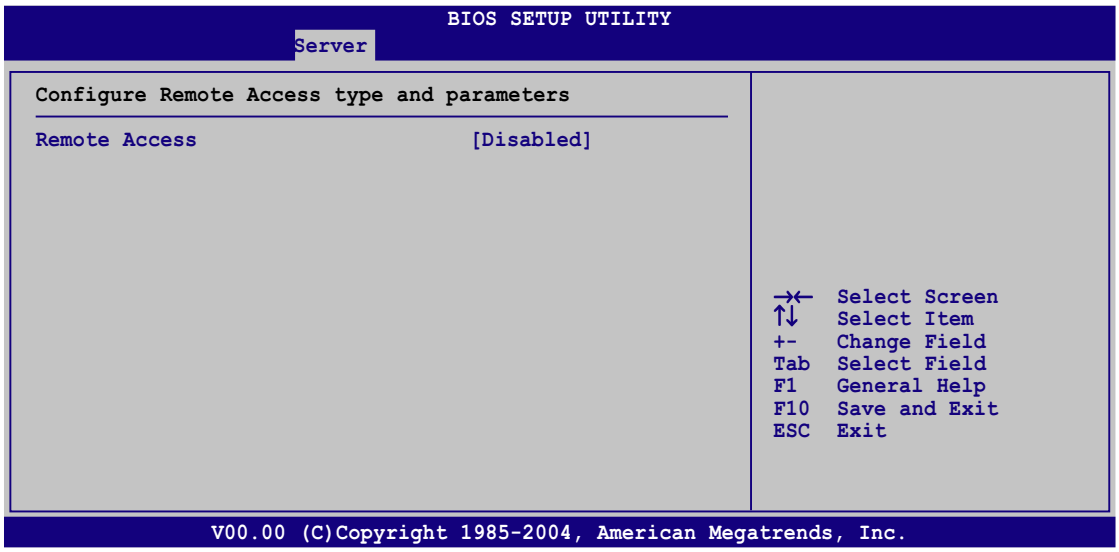
The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators. The VCORE2 item shows N/A if no processor is installed in CPU 2 socket.

4.5 Server menu



Remote Access Configuration

The items in this menu allows you to configure the Remote Access features. Select an item then press <Enter> to display the configuration options.



Remote Access [Disabled]

Enables or disables the remote access feature.
Configuration options: [Disabled] [Enabled]

The following items appear only when the **Remote Access** item is Enabled.

Serial port number [COM1]

Selects the serial port for console redirection.
Configuration options: [COM1] [COM2]

Baudrate [57600]

Sets the baudrate.
Configuration options: [115200] [57600] [38400] [19200] [9600]

Flow Control [None]

Allows you to select the flow control for console redirection.
Configuration options: [None] [Hardware] [Software]

Redirection After BIOS POST [Always]

Sets the redirection mode after the BIOS Power-On Self-Test (POST). Some operating system may not work when set to Always.
Configuration options: [Disabled] [Boot Loader] [Always]

Terminal Type [ANSI]

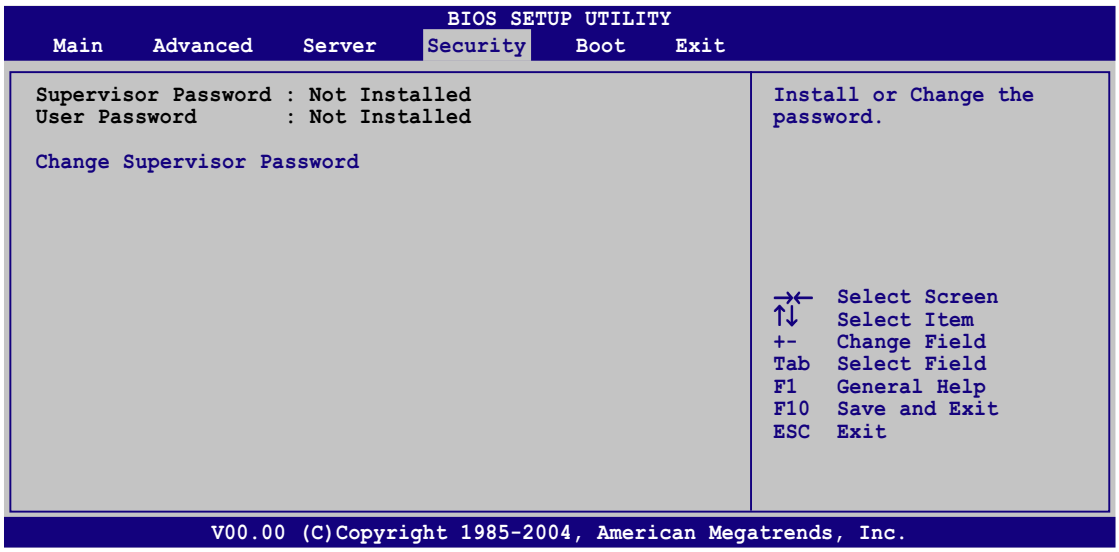
Allows you to select the target terminal type.
Configuration options: [ANSI] [VT100] [VT-UTF8]

VT-UTF8 Combo Key Support [Disabled]

Enables or disables the VT-UTF8 combo key support for ANSI or VT100 terminals. Configuration options: [Disabled] [Enabled]

4.6 Security menu

The Security menu items allow you to change the system security settings. Select an item then press <Enter> to display the configuration options.



Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a Supervisor Password:

1. Select the **Change Supervisor Password** item, then press <Enter>.
2. From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

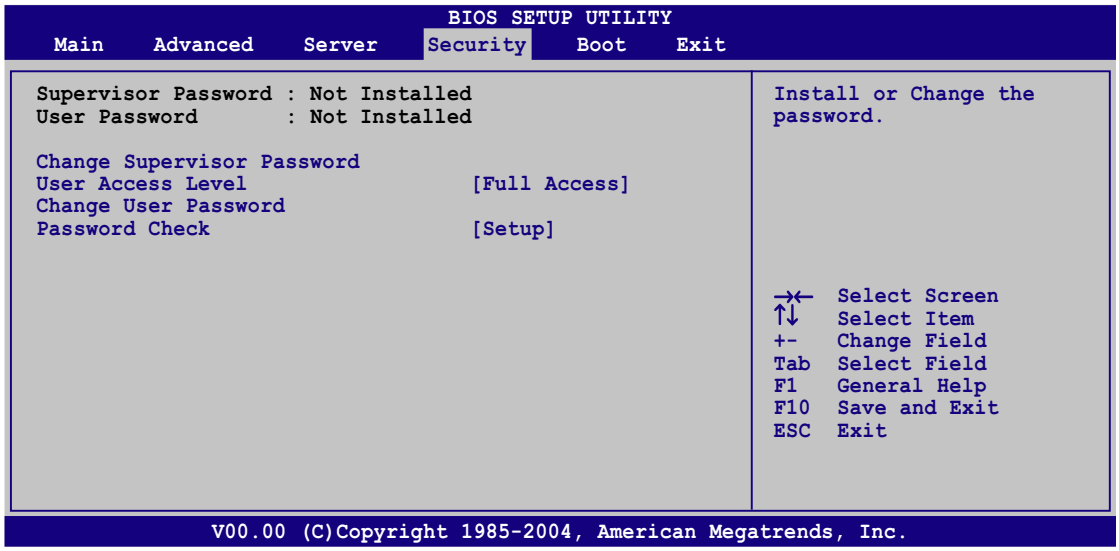
The message “Password Installed” appears after you successfully set your password.

To change the user password, follow the same steps as in setting a supervisor password.

To clear the supervisor password, select the **Change Supervisor Password** then press <Enter>. The message “Password Uninstalled” appears.

If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section “2.6 Jumpers” for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.



User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

No Access prevents user access to the Setup utility.

View Only allows access but does not allow change to any field.

Limited allows changes only to selected fields, such as Date and Time.

Full Access allows viewing and changing all the fields in the Setup utility.

Change User Password

Select this item to set or change the user password. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a User Password:

1. Select the Change User Password item and press <Enter>.
2. On the password box that appears, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message “Password Installed” appears after you set your password successfully.

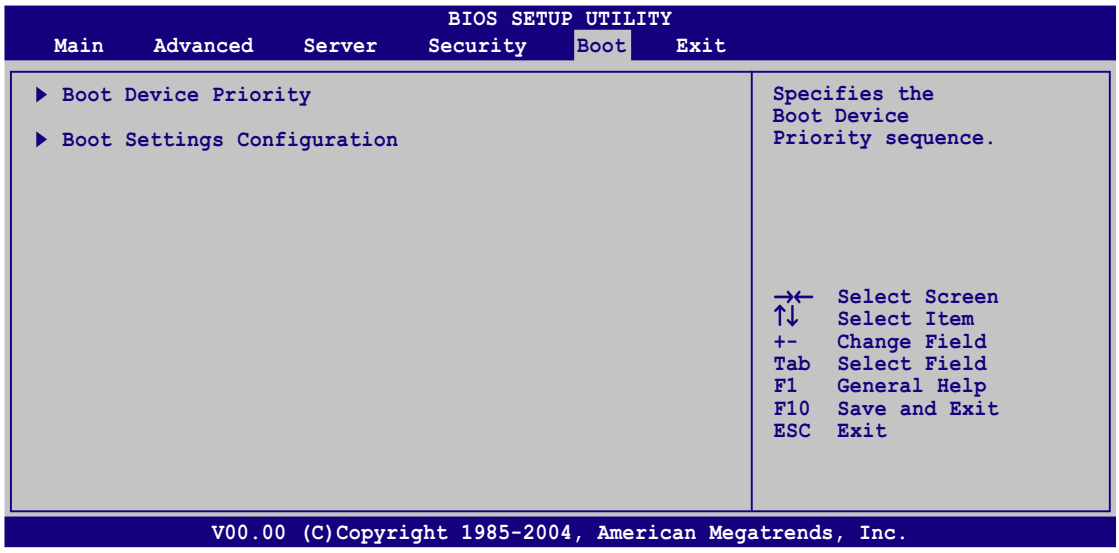
To change the user password, follow the same steps as in setting a user password.

Password Check [Setup]

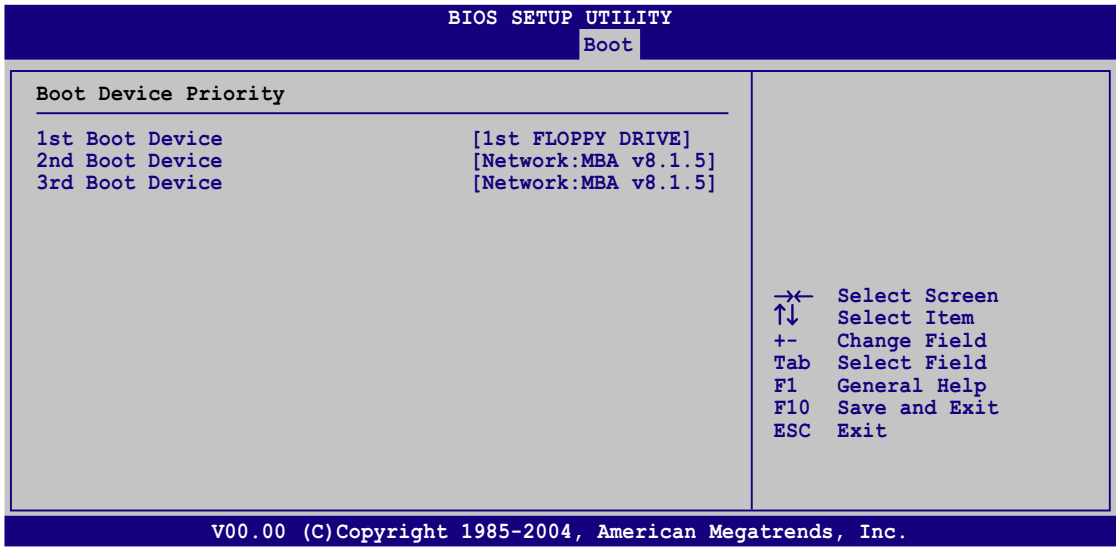
When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system.
Configuration options: [Setup] [Always]

4.7 Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press <Enter> to display the sub-menu.



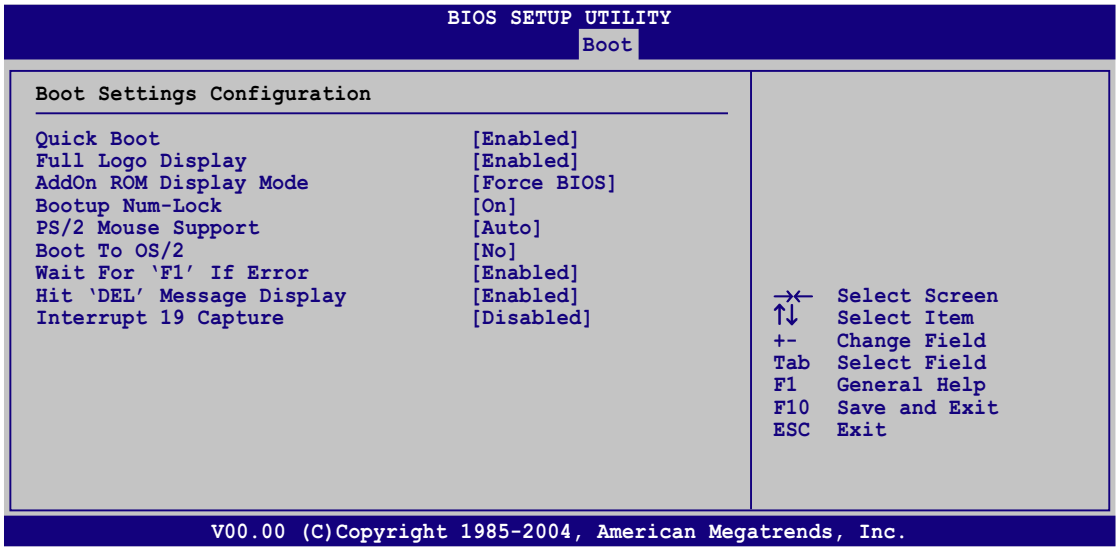
4.7.1 Boot Device Priority



1st ~ xxth Boot Device [1st FLOPPY DRIVE]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.
Configuration options: [xxxxx Drive] [Disabled]

4.7.2 Boot Settings Configuration



Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.
Configuration options: [Disabled] [Enabled]

Full Logo Display [Enabled]

Allows you to enable or disable the full screen logo display feature.
Configuration options: [Disabled] [Enabled]

Set this item to [Enabled] to use the ASUS MyLogo2™ feature.

Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.
Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.
Configuration options: [Off] [On]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.
Configuration options: [Disabled] [Enabled] [Auto]

Boot To OS/2 [No]

Allows you to enable or disable boot to OS/2.
Configuration options: [No] [Yes]

Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for the F1 key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]

Hit 'DEL' Message Display [Enabled]

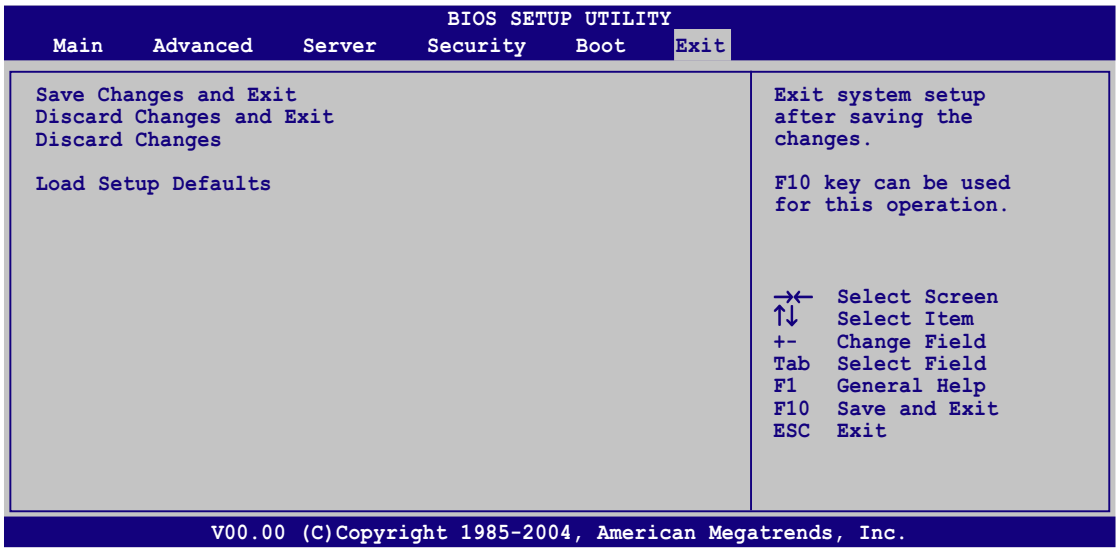
When set to Enabled, the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

Interrupt 19 Capture [Disabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19. Configuration options: [Disabled] [Enabled]

4.8 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

Save Changes & Exit

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the computer is turned off. When you select this option, a confirmation window appears. Select **Ok** to save the changes and exit.

If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Press <Enter> to save the changes while exiting.

Discard Changes & Exit

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

Discard Changes

Allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select **Ok** to discard any changes and load the previously saved values.

Load Setup Defaults

Allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **Ok** to load default values. Select **Save Changes & Exit** or make other changes before saving the values to the non-volatile RAM.

This chapter provides instructions for setting up, creating, and configuring RAID sets using the available utilities.

5 RAID configuration

Chapter summary

5

5.1 Setting up RAID

The motherboard comes with the following RAID solutions:

- The **NVIDIA® nForce Professional 2200** chipset comes with a built-in SATA RAID controller that allows you to configure RAID 0, RAID 1, RAID 1+0 and JBOD with IDE and SATA hard disk drives.
- The **LSI 1020A SCSI RAID controller** supports SCSI hard disk drives that you can configure as RAID 0, RAID 1, or RAID 1-E.

5.1.1 RAID definitions

RAID 0 *(Data striping)* optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

RAID 1 *(Data mirroring)* copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

RAID 1-E *(Enhanced RAID 1)* has a striped layout with each stripe unit having a secondary (or alternate) copy stored on a different disk. You can use three or more hard disk drives for this configuration.

RAID 1+0 is *data mirroring* and *data striping* combined. This configuration uses two or more drives that are mirrored together and then the mirrors are striped together.

JBOD *(Spanning)* stands for **Just a Bunch of Disks** and refers to hard disk drives that are not yet configured as a RAID set. This configuration stores the same data redundantly on multiple disks that appear as a single disk on the operating system. Spanning does not deliver any advantage over using separate disks independently and does not provide fault tolerance or other RAID performance benefits.

If you want to boot the system from a hard disk drive included in a created RAID set, copy first the RAID driver from the support CD to a floppy disk before you install an operating system to the selected hard disk drive. Refer to Chapter 6 for details.

5.1.2 Installing hard disk drives

The motherboard supports Serial ATA (both models) and SCSI hard disk drives (SCSI model only) for RAID set configuration. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SATA hard disks for RAID configuration:

1. Install the SATA hard disks into the drive bays following the instructions in the system user guide.
2. Connect a SATA signal cable to the signal connector at the back of each drive and to the SATA connector on the motherboard.
3. Connect a SATA power cable to the power connector on each drive.

To install the SCSI hard disks for RAID configuration:

1. Install the SCSI hard disks into the drive bays following the instructions in the system user guide.
2. Connect the SCSI interface cable connectors at the back of the SCSI drives.
3. Connect the other end of the SCSI interface cable to the SCSI connector on the motherboard.

5.1.3 RAID configuration utility

You can create a RAID set using the utility embedded in each RAID controller. For example, you can use the **NVIDIA® RAID Utility** if you installed IDE and/or SATA hard disk drives to the IDE and/or SATA connectors supported by the NVIDIA® nForce Professional 2200 chip. Refer to the succeeding sections for details on how to enter the RAID configuration utility.

5.2 NVIDIA® RAID configurations

The motherboard includes a high performance SATA RAID controller integrated in the NVIDIA® nForce Professional 2200 chip. The RAID controller supports RAID 0, RAID 1, RAID 1+0, and JBOD using the four independent Serial ATA channels or two IDE connectors, or both.

5.2.1 Setting the BIOS RAID items

After installing the hard disk drives, make sure to set the necessary RAID items in the BIOS before setting your RAID configuration.

To set the BIOS RAID items:

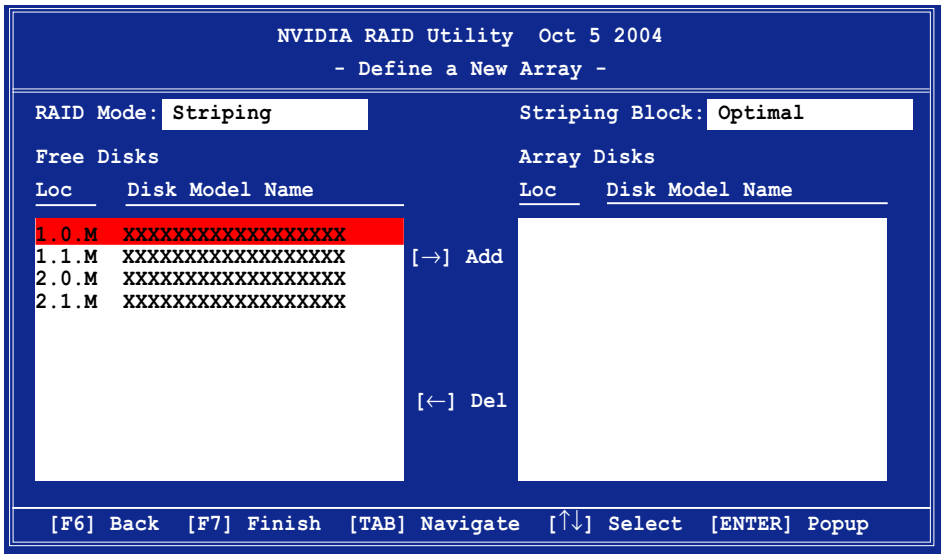
1. Enter the BIOS Setup during POST.
2. Go to the **Main Menu**, select **IDE Configuration**, then press <Enter>.
3. Set the **RAID Option ROM** item to [Enabled], then press <Enter>. The master and slave drive list appears.
4. Enable the drives you want to set as RAID.
5. Save your changes, then exit the BIOS Setup.

- Refer to Chapter 4 for details on entering and navigating through the BIOS Setup.
- The RAID BIOS setup screens shown in this section are for reference only, and may not exactly match the items on your screen.

5.2.2 Entering the NVIDIA® RAID Utility

To enter the NVIDIA® RAID Utility:

1. Restart the computer.
2. During POST, press <F10> to display the utility main menu.



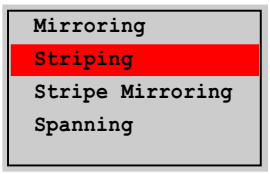
At the bottom section of the screen are the navigation keys. These keys allow you to move through and select menu options.

The navigation keys vary depending on the menu level or option.

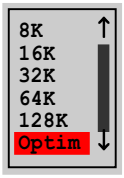
5.2.3 Creating a RAID 0 set (Stripe)

To create a RAID 0 set:

1. From the **Define a New Array** menu, select **RAID Mode**, then press <Enter>. A pop-up menu appears.
2. Use the up or down arrow keys to select **Striping**, then press <Enter>.



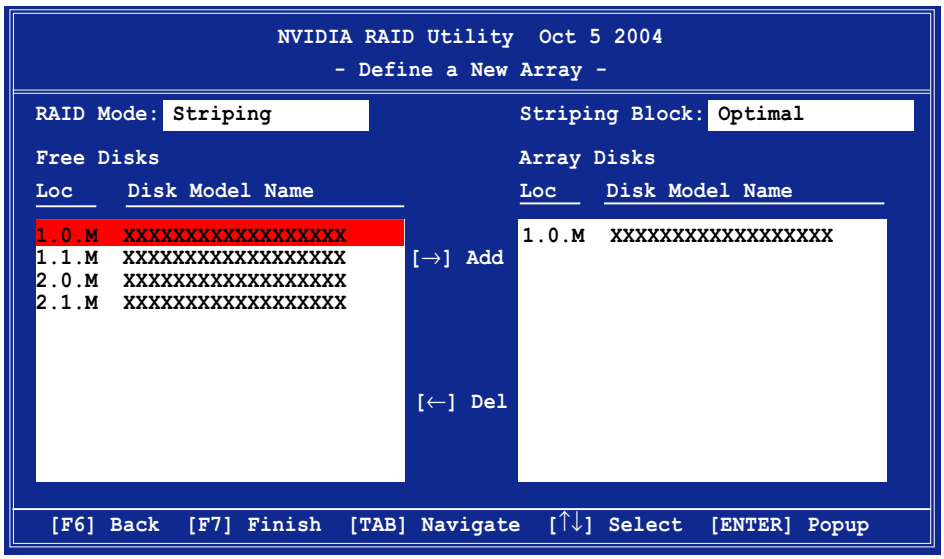
3. Press <TAB> to move to the **Striping Block** option, then press <Enter>.
4. Use the up or down arrow keys to select the stripe block size appropriate to your drive usage, then press <Enter>.



The available stripe size values range from 8KB to 128KB. The default stripe size is 128 KB. You must choose the stripe size value based on the projected drive usage. For low disk usage, select 8 KB/16 KB. For typical disk usage, select 64 KB. Select 128KB for performance disk usage.

TIP. For server systems, we recommend using a lower array block size. For multimedia computer systems used mainly for audio and video editing, we recommend a higher array block size for optimum performance.

5. Press <TAB> to move to the **Free Disks** section.
6. Highlight the hard disk drives that you want to add in the RAID set, then press the right arrow key to select. The selected hard disk drives appear in the **Array Disks** section. Repeat the process until all desired hard disk drives are added.

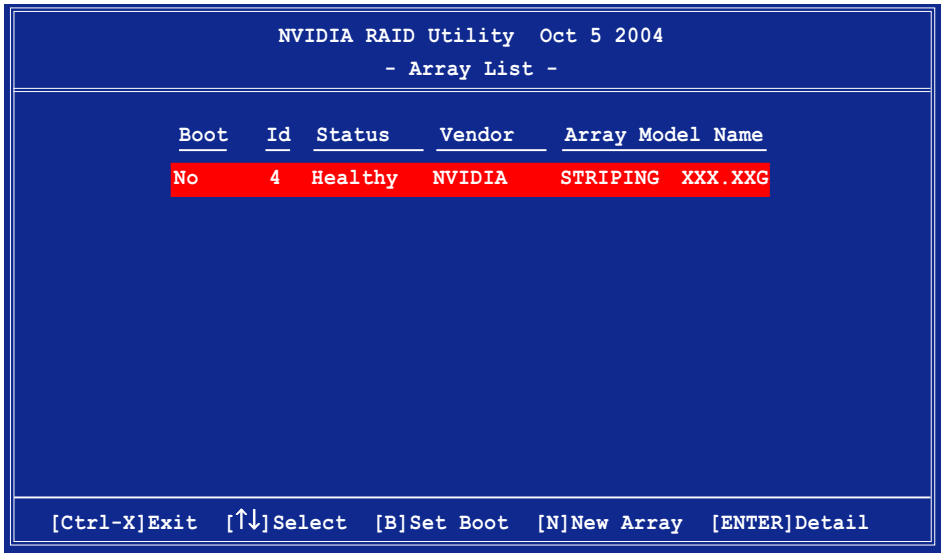


7. After selecting the hard disk drives, press <F7> to create the RAID 0 set. A pop-up window appears.

8. Press <Y> to delete all data from the hard disk drives, or <N> to continue creating the RAID set without deleting the data on the disks.

You will lose all data on the drives if you clear the disk data!

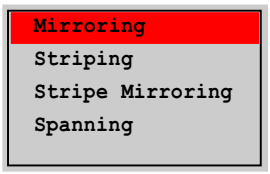
9. The utility displays the created RAID 0 set. Press <Ctrl+X> to save your settings and exit the utility.



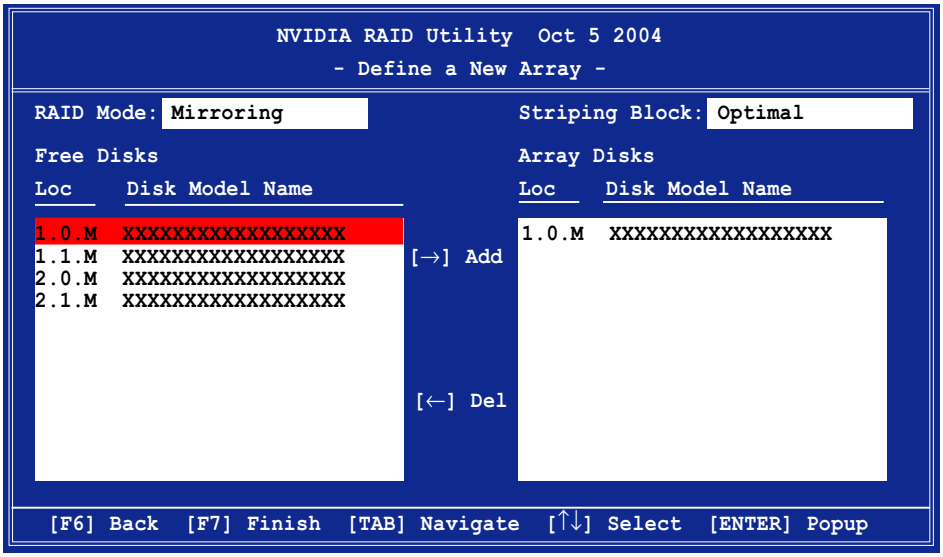
5.2.4 Creating a RAID 1 set (Mirror)

To create a RAID 1 set:

1. From the **Define a New Array** menu, select **RAID Mode**, then press <Enter>. A pop-up menu appears.
2. Use the up or down arrow keys to select **Mirroring**, then press <Enter>.



5. Press <TAB> to move to the **Free Disks** section.
6. Highlight the hard disk drives that you want to add in the RAID set, then press the right arrow key to select. The selected hard disk drives appear in the **Array Disks** section. Repeat the process until all desired hard disk drives are added.



7. After selecting the hard disk drives, press <F7> to create the RAID 1 set. A pop-up window appears.

8. Press <Y> to delete all data from the hard disk drives and continue creating the RAID set. Press <N> to backup exisitng data to a target hard disk drive.

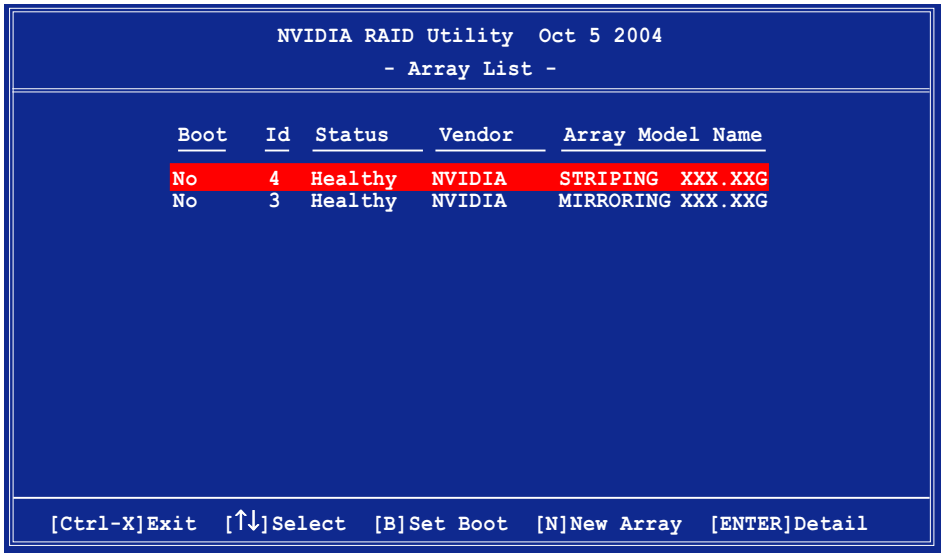
You will lose all data on the drives if you clear the disk data!

9. The utility displays the created RAID 1 set. Press <Ctrl+X> to save your settings and exit the utility.0

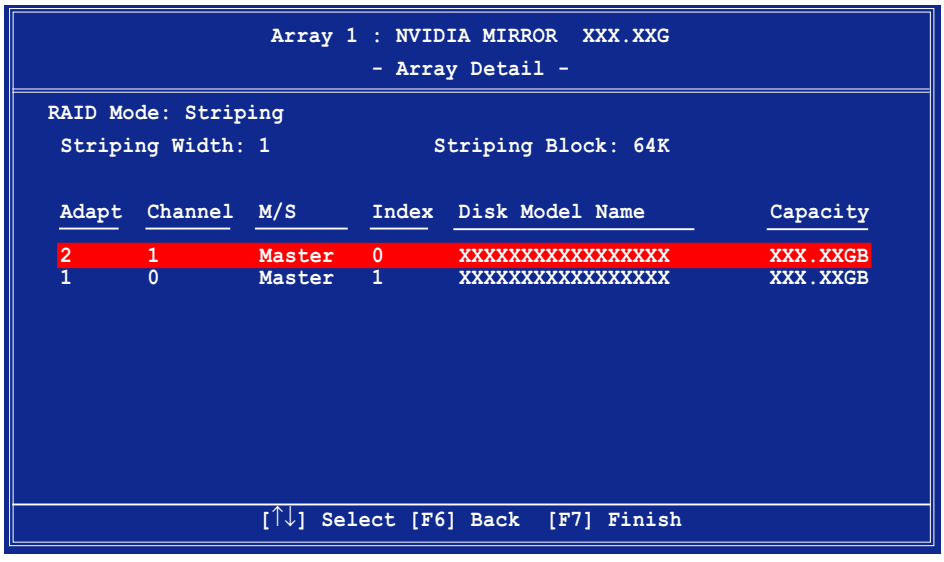
5.2.5 Rebuilding a RAID set

To rebuild a RAID set:

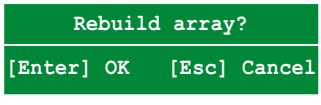
1. From the **Array List**, use the up or down arrow keys to select the RAID set you want to rebuild, then press <Enter>. The RAID set details appear.



2. Press <R>.
3. Use the up or down arrow keys to select a the RAID set you want to rebuild, then press <F7>. A confirmation message appears.



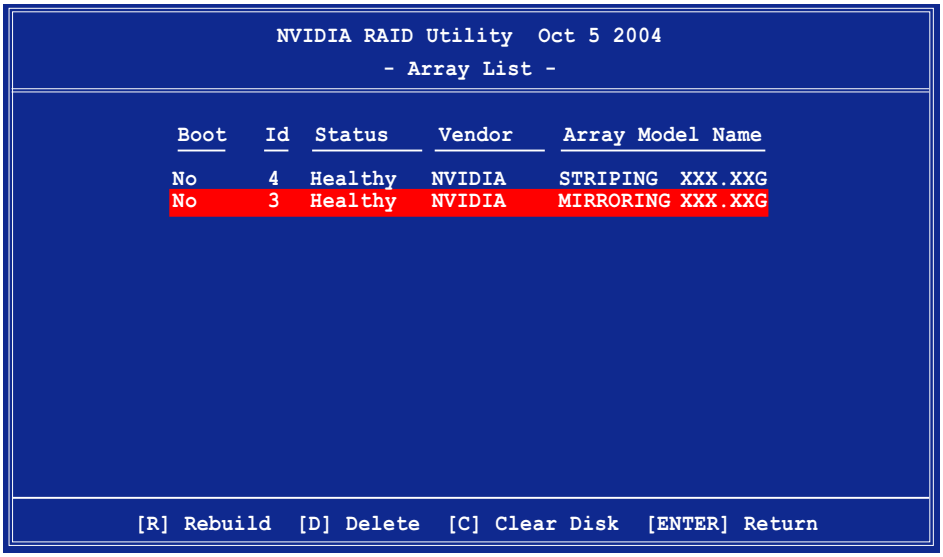
4. Press <Enter> to start rebuilding the array, or <Esc> to cancel. The **Array List** screen displays the RAID set after rebuilding.



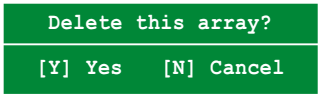
5.2.6 Deleting a RAID array

To delete a RAID array:

1. From the **Array List**, use the up or down arrow keys to select the RAID set you want to delete, then press <Enter>. The RAID set details appear.



2. When the array details appear, press <D> to delete the RAID set. A confirmation message appears.
3. Press <Y> to delete the array, or press <N> to cancel.



You will lose all data on the drives if you delete a disk array!

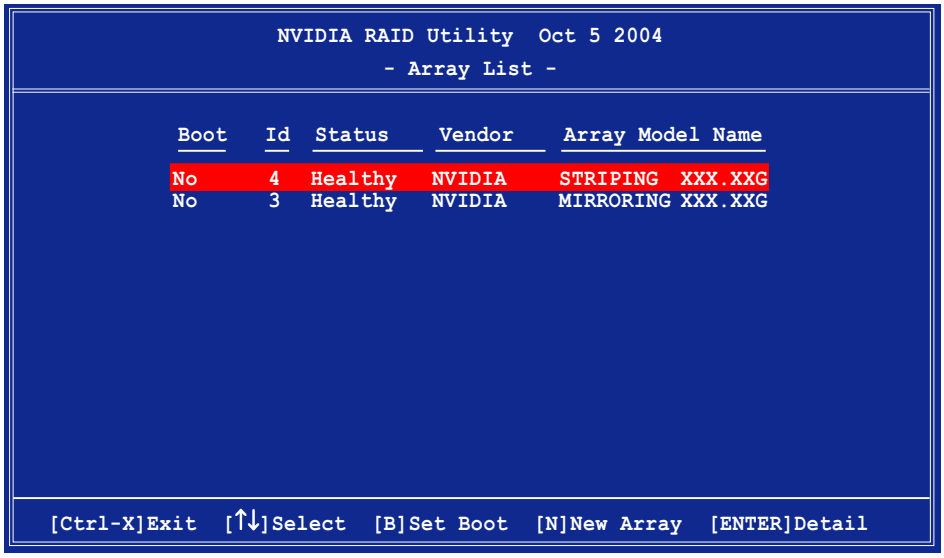
4. The **Define a New Array** menu appears when you press <Y>. Create a new RAID set following the instructions in the previous sections..

5.2.7 Clearing the disk data

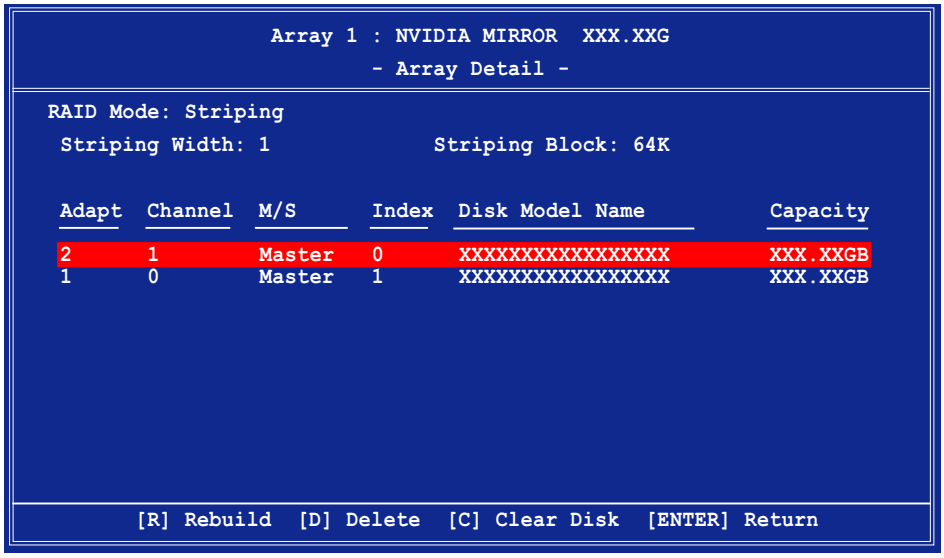
You will lose all data when you clear a disk!

To clear the disk data:

1. From the **Array List**, use the up or down arrow keys to select a RAID set, then press <Enter>. The RAID set details appear.



2. When the array details appear, select the hard disk drive you want to clear, then press <C>. A confirmation message appears.



3. Press <Y> to clear the disk data, or press <N> to cancel.Press <C> to clear disk. The following confirmation message appears.

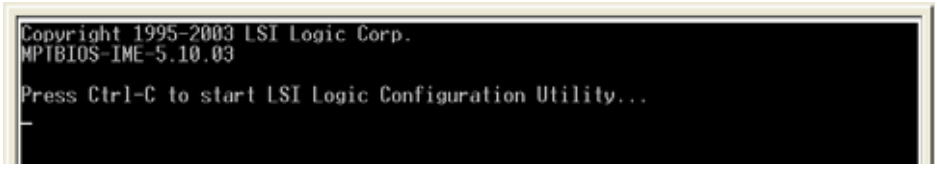
5.3 LSI Logic Configuration Utility

(SCSI model only)

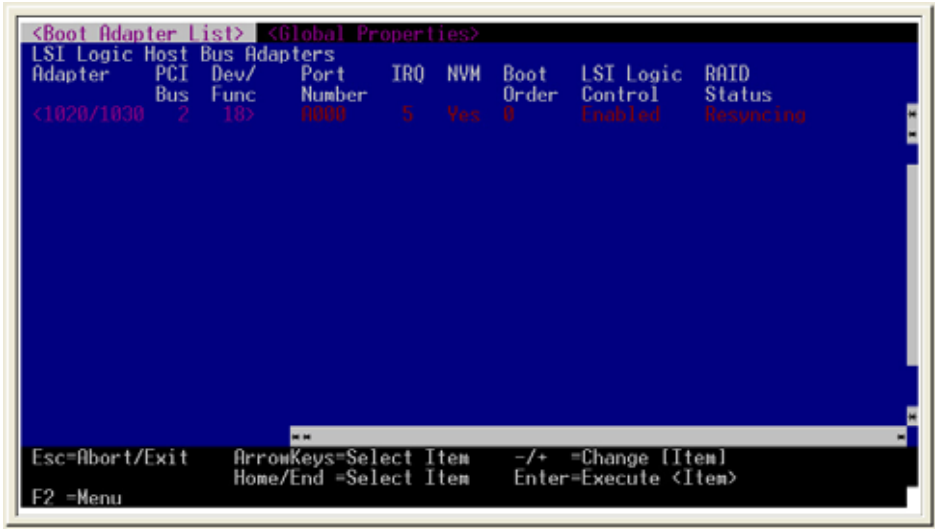
The LSI Logic Configuration Utility allows you to create RAID 0, RAID 1, and RAID-1E from SCSI hard disk drives connected to the SCSI connectors supported by the LSI 1020A SCSI controller.

To enter the LSI Logic Configuration Utility:

1. Turn on the system after installing all the SATA hard disk drives.
2. During POST, Press <Ctrl> + <C> to enter the LSI Logic Configuration Utility.



The LSI Logic Configuration Utility main menu appears.



The LSI Logic Configuration Utility has two tabbed menus that you can select by pressing <F2>. Refer to the next section for details.

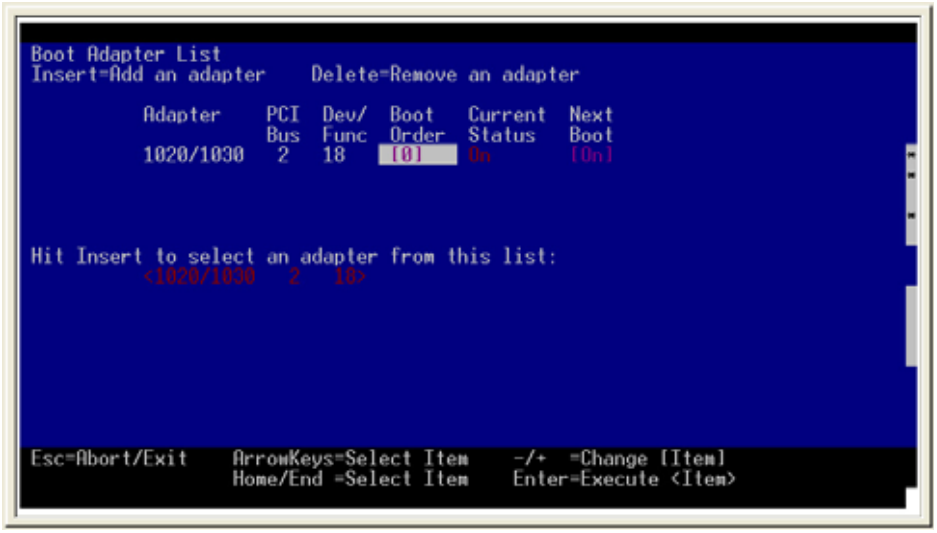
5.3.1 Boot Adapter List

The **Boot Adapter List** tab allows you to select and configure the SCSI controller, create arrays, and arrange the sequence of available boot adapters.

Changing the adapter boot sequence

To change the adapter boot sequence:

1. Select the adapter from the list (1020/1030), then press <Insert>. The screen displays the selected adapter's properties. Refer to the table below for a description of the properties.
2. Move the selection to the **Boot Order** column, then press the <+> or <-> key to adjust the adapter boot sequence.

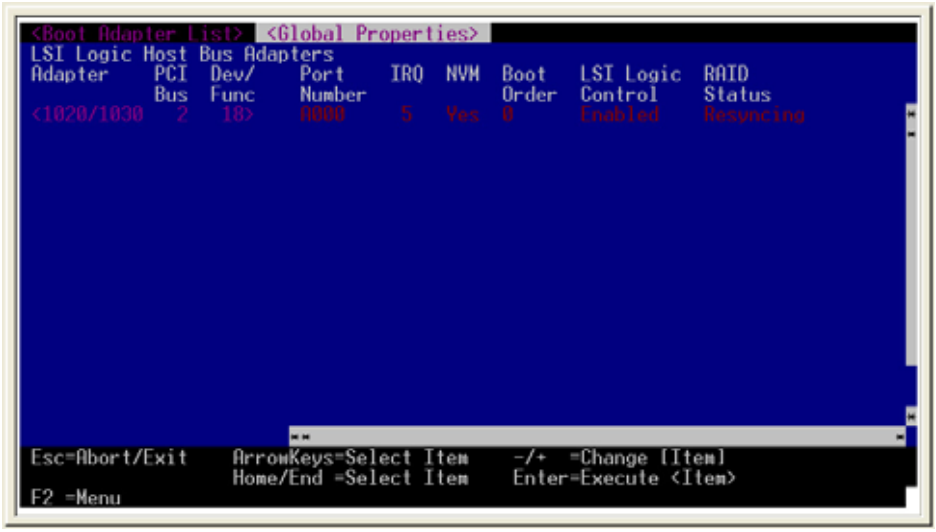


Property	Description
Adapter	Identifies the specific family of LSI Logic Host Adapters.
PCI Bus	Identifies the PCI Bus number assigned by the system BIOS to an adapter (range 0x00 - 0xFF, 0 - 255 decimal).
Dev/Func	Identifies the PCI Device/Function assigned by the system BIOS to the selected adapter.
Boot Order	Identifies the relative boot order (0 to 3) of an adapter. The Fusion-MPT SCSI BIOS traverses up to four adapters in the specified order in search of bootable media. Access the "Boot Adapter List" Menu to modify this item.

3. When finished, press <Enter> to open the **Adapter Properties** screen; otherwise, press <Esc> to exit the utility.

5.3.2 Global Properties

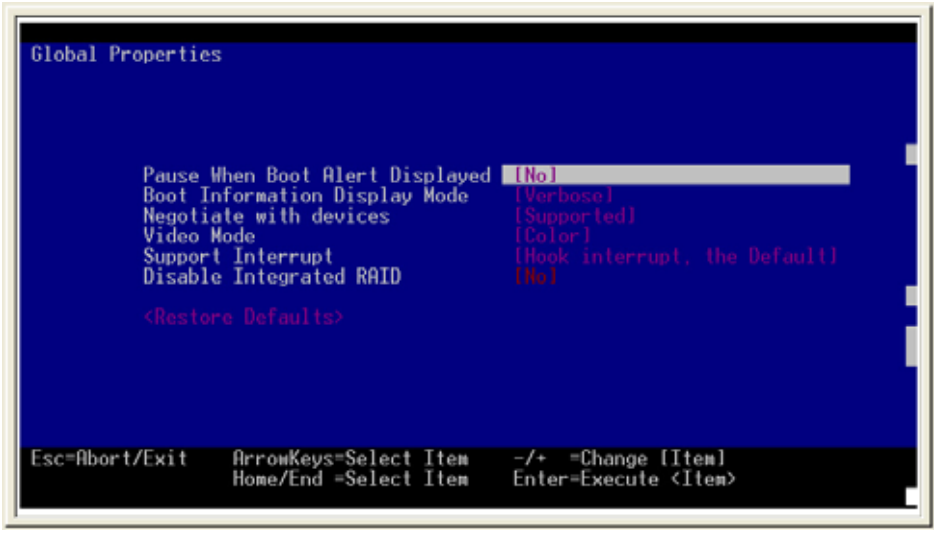
The **Global Properties** tab allows you to configure the general adapter properties. To access the general properties screen, select the adapter from the list, then press <Enter>.



Changing the general adapter properties

To change the general adapter properties:

1. Select an item from the Global Properties screen, then press <+> or <-> change the value.



Pause When Boot Alert Displayed

This option specifies whether to pause for user acknowledgement after displaying an alert message during boot. If you want the user to press any key after displaying the alert message, set this item to [Yes]. Set this item to [No] to continue the boot after displaying the alert message.

Boot Information Display Mode

Allows you to specify the amount of displayed information for the adapters and devices during POST. To display minimum information, set this item to [Terse]. To display detailed information, select [Verbose]

Negotiate with devices

Sets the default value for synchronous and wide negotiations with specified devices. Configuration options: [All] [None] [Supported].

Video Mode

Specifies the default video mode for the Configuration Utility. You can set the Video Mode to [Color] or [Monochrome]. Set this item to [Monochrome] for better screen readability when using a monochrome monitor.

Support Interrupt

Allows you to prevent a hook on INT40, if required.

Disable Integrated RAID

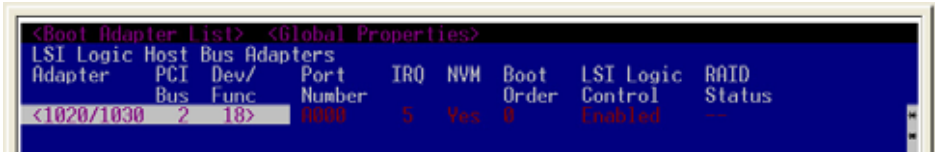
Allows you to disable bus scan search for RAID member devices. This item also allows you to disable configuration of RAID arrays in the BIOS.

<Restore Defaults>

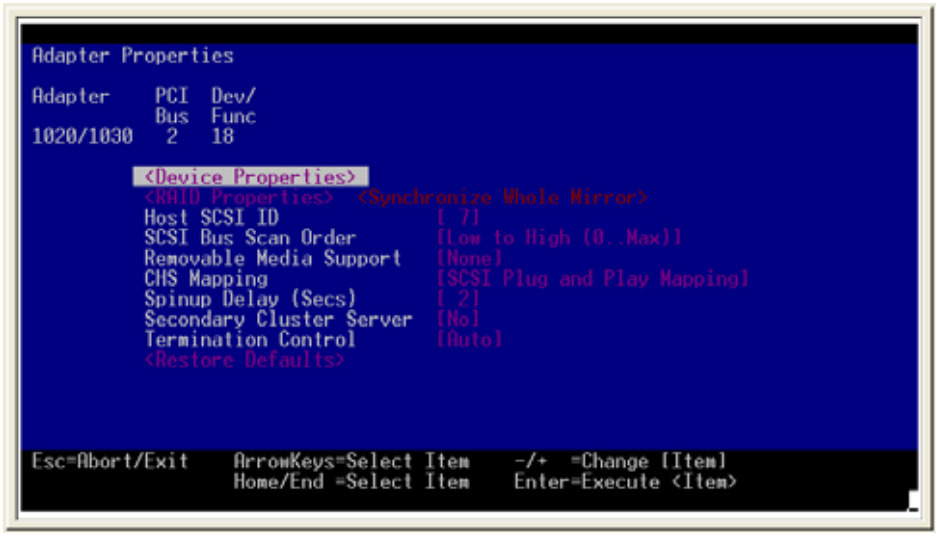
Allows you to load the default settings. Select this item, then press <Enter> to revert to the default settings.

5.3.3 Adapter Properties

The **Adapter Properties** page allows you to configure the device and RAID properties. To access the adapter properties screen, select the adapter from the Boot Adapter List, then press <Enter>.



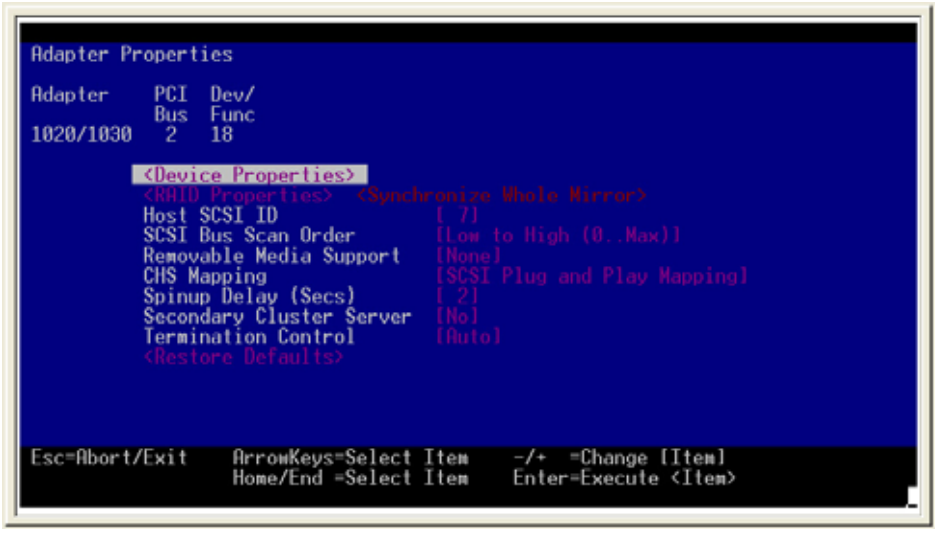
The **Adapter Properties** page appears.



The **Adapter Properties** page allows you to go to the **Device Properties** page or the **RAID Properties** page. Refer to the corresponding sections for details.

Changing the adapter properties

To change the adapter properties, select an item from the Global Properties screen, then press <+> or <-> change the value. Refer to the items description below.



Pause When Boot Alert Displayed

This option specifies whether to pause for user acknowledgement after displaying an alert message during boot. If you want the user to press any key after displaying the alert message, set this item to [Yes]. Set this item to [No] to continue the boot after displaying the alert message.

<Device Properties>

Allows you to view and modify the device properties. Press <Enter> to display the **Device Properties** page.

<RAID Properties>

Allows you to view, create, delete, and/or configure RAID arrays. Press <Enter> to display the **RAID Properties** page.

<Synchronize Whole Mirror>

Allows you to copy the data from the mirrored array primary copy to the secondary copy.

Host SCSI ID

Indicates the SCSI identifier of an adapter [0-7] or [0-15]. It is recommended to set this item to the highest priority SCSI identifier, which is 7.

8-bit SCSI devices can not see identifiers greater than 7.

SCSI Bus Scan Order

Indicates the order in which to scan SCSI identifiers on an adapter. Changing this item will affect drive letter assignment(s) if more than one device is attached to an adapter.

Changing this item may conflict with an operating system that automatically assigns drive order.

Removable Media Support

Allows you to specify the removable media support option for an adapter. Select [None] to disable removable media support whether the drive is selected as first (BBS), or is first in the scan order (non-BBS). Set this item to [Boot Drive Only] to enable removable media support for a removable hard drive if it is first in the scan order. Select [With Media Installed] to enable support for removable media regardless of the drive ordering.

CHS Mapping

Defines how the Cylinder Head Sector values are mapped into a disk without pre-existing partition information. CHS Mapping allows either **SCSI Plug and Play Mapping** (default value) or **Alternate CHS Mapping**.

SCSI Plug and Play Mapping automatically determines the most efficient and compatible mapping.

Alternate CHS Mapping uses an alternate, possibly less efficient mapping that may be required if a device is moved between adapters from different vendors.

These options has no effect after a disk has been partitioned using the FDISK command. To change the CHS Mapping on a partitioned disk, use FDISK command to delete all partitions, then reboot the system to clear memory. If not, the old partitioning data will be reused, thus nullifying the previous operation.

Ensure that the correct disk is the target of an FDISK command.

Spinup Delay (Secs)

Determines the waiting time (in seconds) between spinups of devices attached to an adapter. Staggered spinups will balance the total electrical current load on the system during boot. The default value is 2 seconds. Configuration options: 1 ~ 10 seconds

Secondary Cluster Server

Specifies whether an adapter has one or more devices that are attached or are shared with another adapter(s). When you set this option to [Yes] the Fusion-MPT PCI SCSI BIOS avoids SCSI Bus resets as much as possible when two or more devices are shared with the other adapter.

This option allows you to enable an adapter to join a cluster of adapters without doing any SCSI bus resets. This is a requirement for the Microsoft Cluster Server. The default value is [No].

Termination Control

Indicates whether an adapter has automatic termination control, and displays the current termination control status, if any. When set to [Auto], the adapter automatically determines whether it should enable or disable its termination. Set to [Off] allows the devices at the ends of the SCSI bus to terminate the bus.

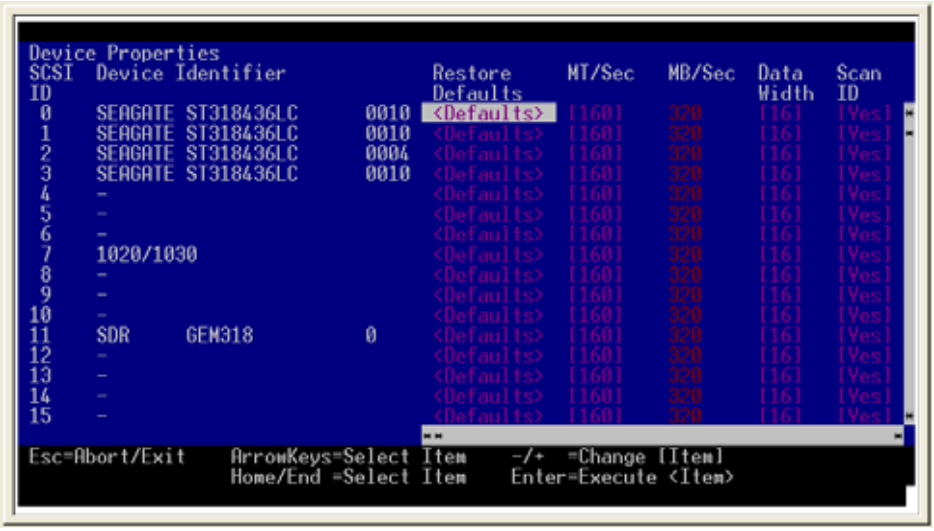
When the option [Auto] is grayed out, termination is automatic and is non-configurable.

Restore Defaults

Select this option, then press <Enter> to load the default settings.

Device Properties

The **Device Properties** page allows you update and view individual devices connected to the adapter.To open the device properties screen, select the **<Device Properties>** from the Adapter Properties window, then press <Enter>. The Device Properties screen appears.



SCSI ID

Displays the SCSI identifier of each device connected to the adapter.

Device Identifier

Displays the ASCII device identifier string extracted from the device's Inquiry Data.

Sync Rate

Displays the maximum synchronous data transfer rate, in Mega Transfers per second.

Data Width

Displays the maximum data width in bits.

Scan ID

Specifies whether to scan for the SCSI device during boot. Set this item to [No] when:

- You want the system to ignore a device and decrease boot time.
- You do not want the device to be available to the system.
- Disable scan on a bus with only a few attached devices.

Scan LUNs > 0

Allows you to scan for LUNs greater than zero for a device. LUN zero is always queried. Use this option if a multi-LUN device responds to unoccupied LUNs or if it is desired to reduce the visibility of a multi-LUN device to LUN zero only.

Set this option to [No] if you have problems with a device that responds to all LUNs whether they are occupied or not. Also, set this item to [No] if a SCSI device with multiple LUNs exists on your system but you do not want all of those LUNs to be available. This will limit the scan to LUN 0 only.

Disconnect

Displays whether to allow a device to disconnect during SCSI operations. Some (mostly newer) devices may run faster when you enable this option, while some (mostly older) devices may run faster when you disable this option.

SCSI Timeout

This field indicates the maximum amount of time [0 to 9999 seconds] to wait for a SCSI operation to complete. While timeouts provide a safeguard that allows the system to recover should an operation fail, it is recommended that you use a value greater than zero. A value of zero allows unlimited time for an operation to complete and could result in the system hanging should an operation fail.

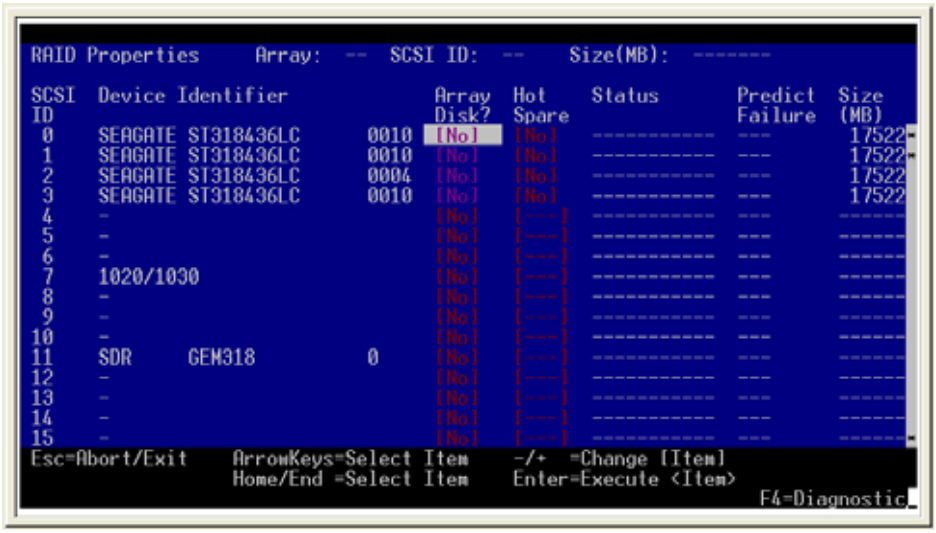
Press <Enter>, type in a value, and then press <Enter> again to set a new timeout value.

Queue Tags

Allows you to use queue tags for a device. Currently, the BIOS does not use queue tags. This item specifies queue tag control to higher level device drivers.

RAID Properties

The **RAID Properties** page allows you update and view individual devices connected to the adapter.To open the device properties screen, select the **<Device Properties>** from the Adapter Properties window, then press <Enter>. The Device Properties screen appears.



SCSI ID

Displays the SCSI ID that the operating system or application addresses the array.

Size(MB)

Displays the size of the array.

Array Disk?

Select [Yes] to include the drive in a disk array. You can select a minimum of two drives and a maximum of six drives. Select a maximum of five drives when you select a hot spare.

Hot Spare

Sets the drive as a hot spare. You can select a single hot spare. The Hot Spare disk provides additional protection by automatically replacing an array member when it fails.

Status

Displays the status of each physical disk in the array.

Predict Failure

Tells whether SMART has determined that the disk will fail in the future.

Size

Shows the physical size of the drive. When the drive is part of an array, this shows the size used for the array.

5.3.4 Creating a RAID 1 (Mirror) set

You can create two types of mirrored configuration using the LSI Logic Configuration Utility: Integrated Mirroring (IM) or RAID 1-E. See section 5.1.1 for RAID definitions.

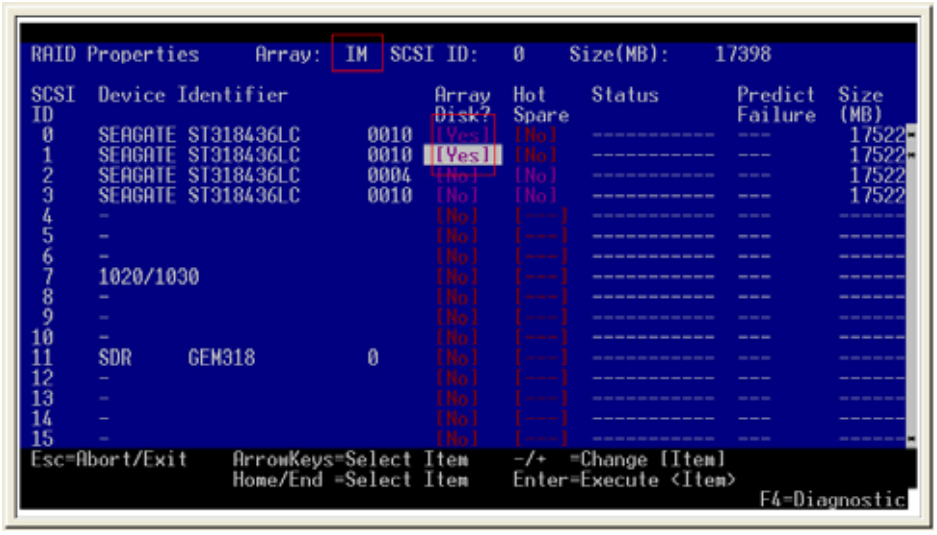
To create an RAID 1 set:

1. From the **RAID Properties** screen, select the drives that you want to include in the RAID 1 set.

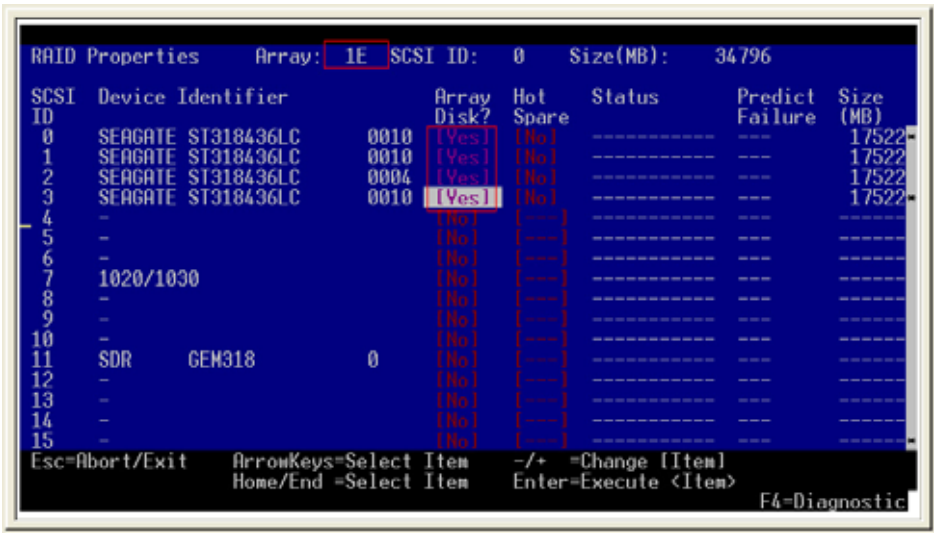
> For Integrated Mirrored array, select first the drive with data that you want to retain. This drive will become the primary copy of the array.

- Integrated Mirrored array - Select a minimum of two drives
- RAID-1E - Select a minimum of four drives

The **Array** label on top of the screen changes to IM or 1E depending on the number of selected hard disk drives.

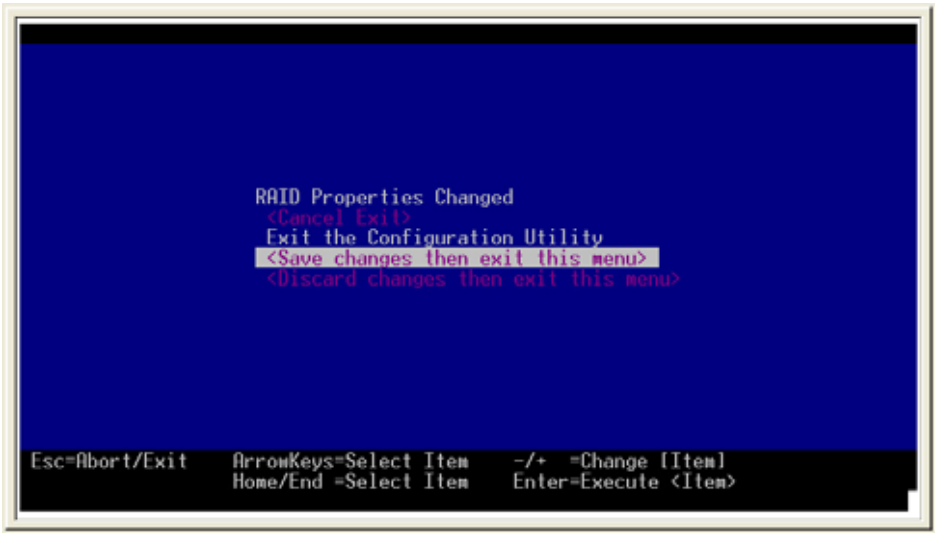


Integrated Mirroring



RAID-1E

2. After selecting the drives, press <Esc>.
3. When prompted, select <Save changes, then exit this menu>, then press <Enter> to create the RAID 1 set.



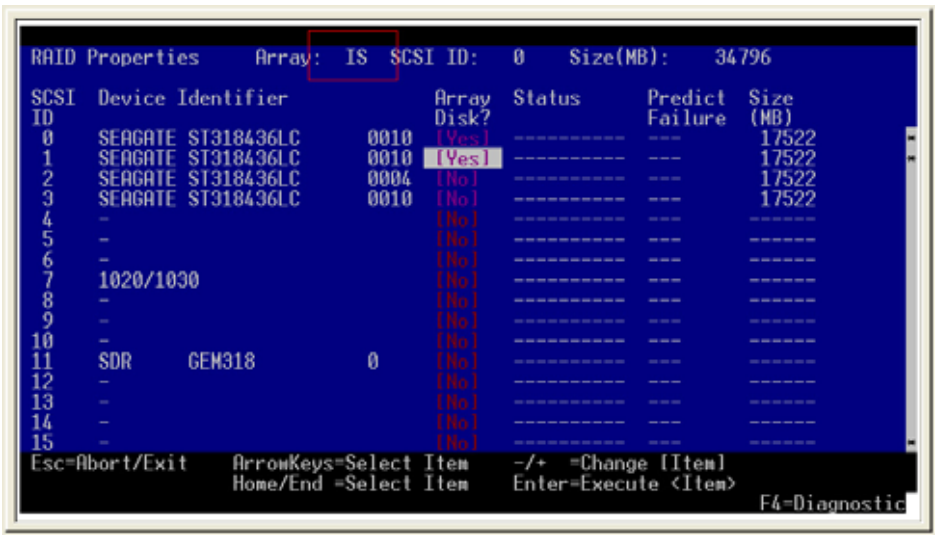
5.3.5 Creating a RAID 0 (Stripe) set

You can create a RAID 0 (striped array) using the LSI Logic Configuration Utility.

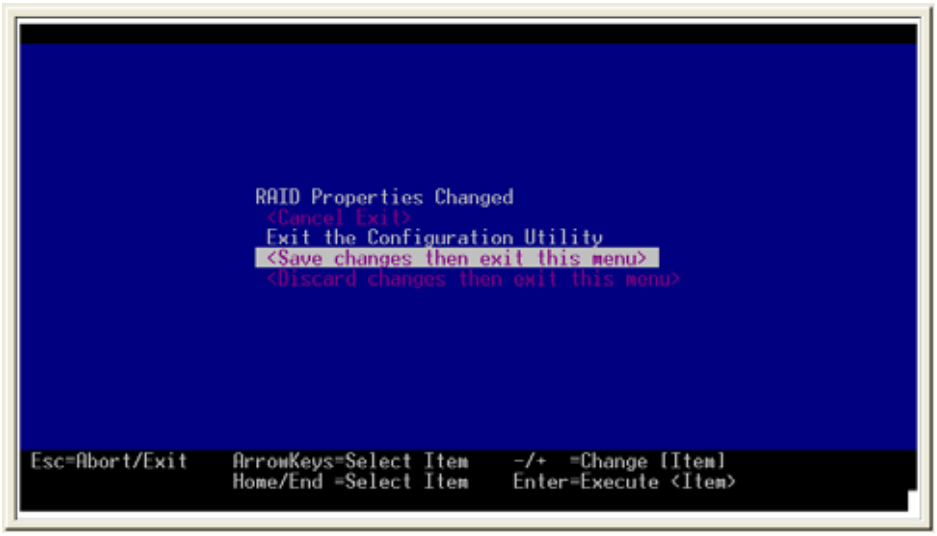
To create a RAID 0 set:

1. From the **RAID Properties** screen, select the drives that you want to include in the RAID 0 set.

   The **Array** label on top of the screen changes to IS (Integrated Striping).



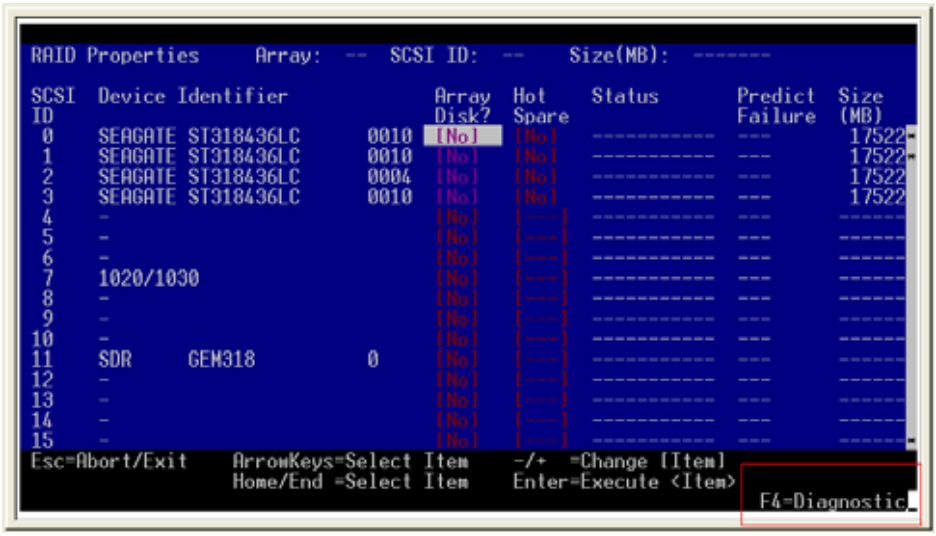
2. After selecting the drives, press <Esc>.
3. When prompted, select <Save changes, then exit this menu>, then press <Enter> to create the RAID 0 set.



5.3.6 Running the Diagnostic Mode

Before creating the array, you may press <F4> to run a diagnostic tool on each drive in the system. After checking the drives, the diagnostic tool displays a code under the **Size** column of the RAID Properties screen. Refer to the table below for the description of the diagnostic codes.

Code	Description
1	Problem with reading disk serial number
2	Disk does not support SMART
3	Unused
4	Disk does not support wide data, synchrounous mode, or queue tagging
5	User disabled, disconnects, or queue tags for device (Device Properties)
6	Unused
7	Disk not big enough to mirror primary disk
8	Unused
9	Unused
10	Disk does not have 512 byte sector size
11	Incorrect device type
12	Hot Spare selection not big enough to be used as an array disk
13	Maximum disks already specified or Maximum array size would be exceeded

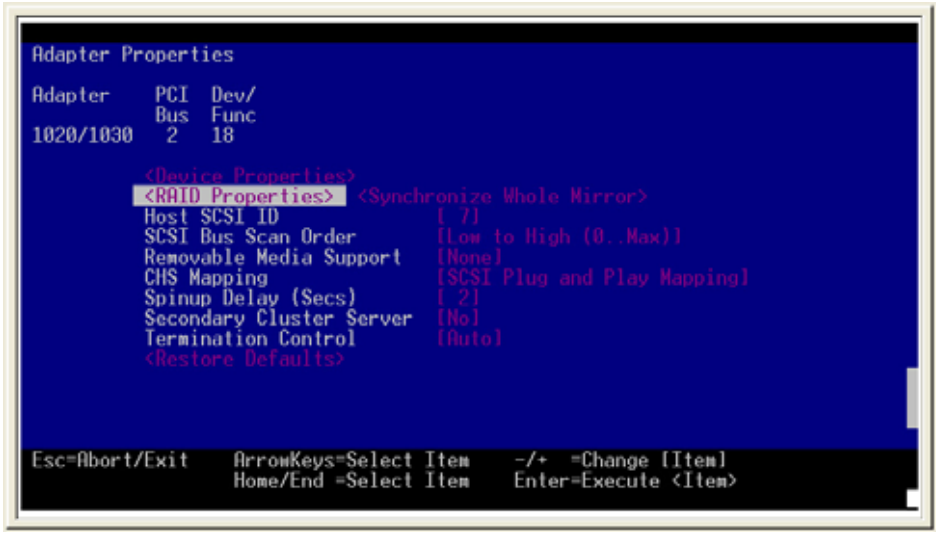


Diagnostic Mode

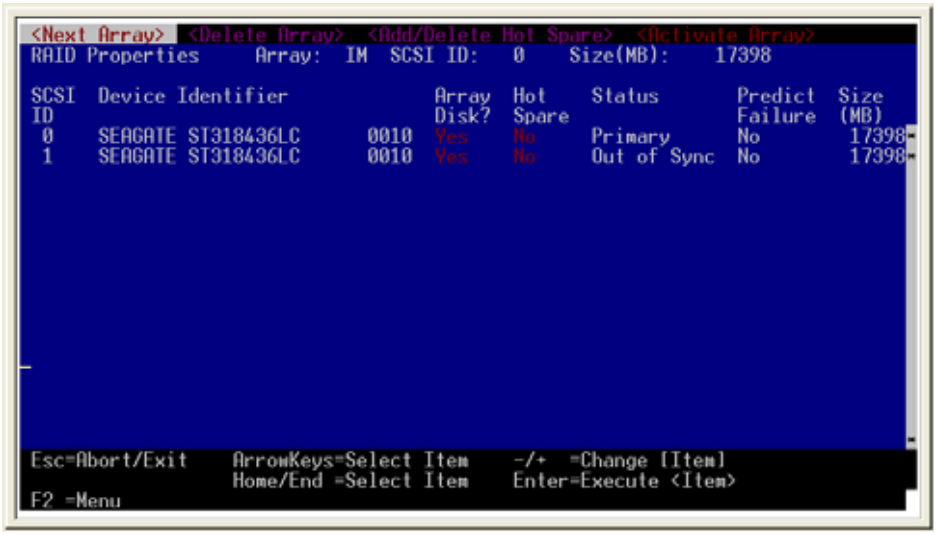
5.3.7 Managing arrays

After creating the array, return to the **Boot Adapter List** screen, select the adapter, then press <Enter>.

Select **<RAID Properties>** from the Adapter Properties screen, then press <Enter>.



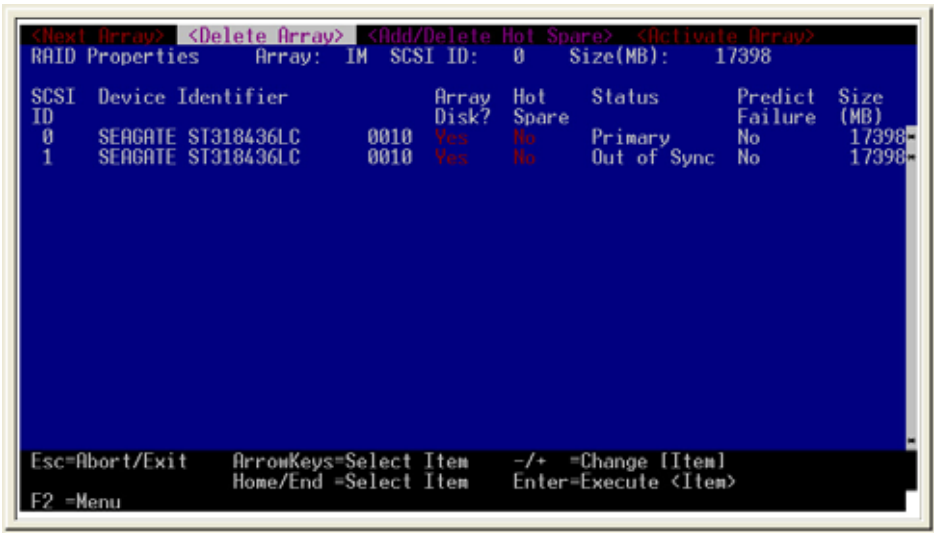
A tabbed menu appears on the top panel of the RAID Properties screen. You can now delete, add/delete hot spare drives, and/or activate arrays using the tabbed menus. Press <F2> to switch tabbed menus.



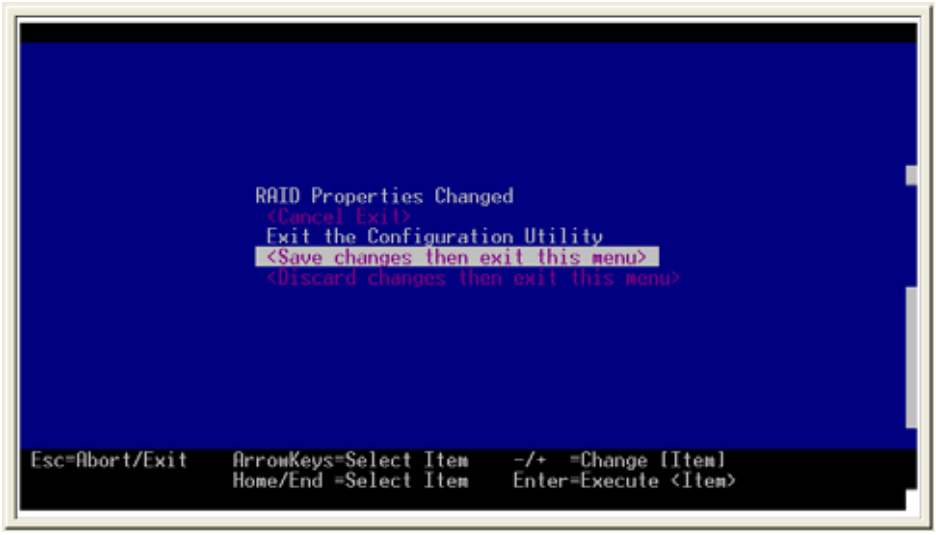
Deleting arrays

To delete an array:

1. Press <F2> to select **<Delete Array>**.
2. Use the arrow keys to select the array you want to delete, then press <Enter>.
3. Press <Esc>.



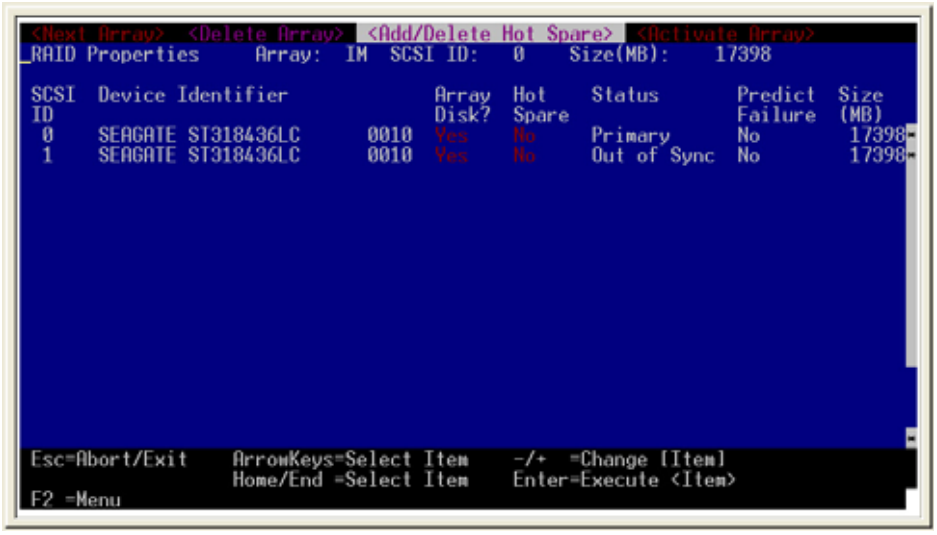
4. When prompted, select **<Save changes, then exit this menu>**, then press <Enter>.



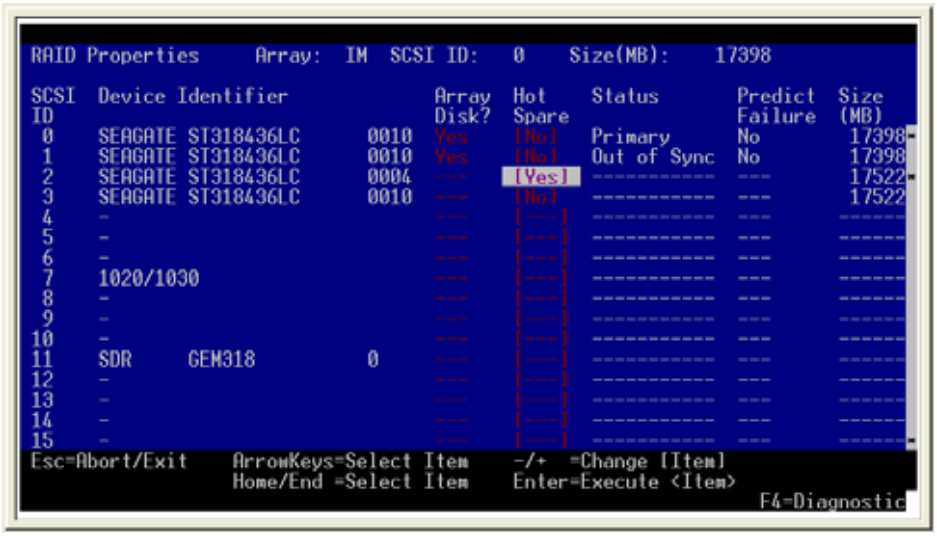
Adding or deleting a hot spare drive

To add a hot spare drive assigned to a RAID set:

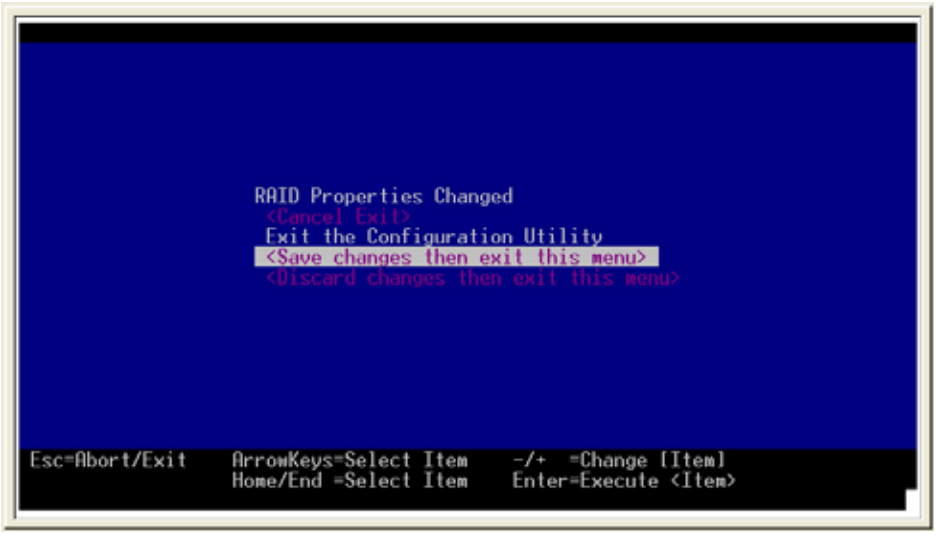
1. From the RAID Properties screen, press <F2> to select **<Add/Delete Hot Spare>**.



2. Use the arrow keys to select the drive you want to assign as spare.
3. Move the selection to the **Hot Spare** column, then press <Enter>.



4. Press <Esc>.
5. When prompted, select **<Save changes, then exit this menu>**, then press <Enter>.



To delete a hot spare drive assigned to a RAID set:

1. From the RAID Properties screen, press <F2> to select **<Add/Delete Hot Spare>**.
2. Use the arrow keys to select the spare drive you want to delete.
3. Move the selection to the **Hot Spare** column, then press <Enter> to change the Hot Spare status to **[No]**.
4. Press <Esc>.
5. When prompted, select **<Save changes, then exit this menu>**, then press <Enter>.

Next Array

The Next Array menu allows you to select the other array on the physical adapter. This screen is enabled when there are more than one array on a physical adapter. The RAID Properties screen allows display of one array at a time. This menu allows you to display and operate on the other array(s) detected.

Activate Array

When there are two arrays on a physical adapter, this menu allows you to instruct the RAID firmware to activate a selected array. Only one array may be activated at a time for each physical adapter. For a physical adapter with multiple arrays, activating one array disables all the remaining arrays.

This chapter provides instructions for installing the necessary drivers for different system components.

6 Driver installation

Chapter summary

6

6.1 RAID driver installation

After creating the RAID sets for your server system, you are now ready to install an operating system to the independent hard disk drive or bootable array. This part provides instructions on how to install the RAID controller drivers during OS installation.

Creating a RAID driver disk

You may have to use another system to create the RAID driver disk from the system/motherboard support CD or from the Internet.

A floppy disk with the RAID driver is required when installing Windows® 2000/XP operating system on a hard disk drive that is included in a RAID set. You can create a RAID driver disk in DOS (using the Makedisk application in the support CD) or in Windows® environment.

To create a RAID driver disk in DOS:

1. Place the motherboard support CD in the optical drive.
2. Restart the computer, then enter the BIOS Setup.
3. Select the optical drive as the first boot priority to boot from the support CD. Save your changes, then exit the BIOS Setup.
4. When prompted, press any key to boot from the support CD.

```
Loading FreeDOS FAT KERNEL GO!
Press any key to boot from CDROM...
```

The Makedisk menu appears.

```
a)  FreeDOS command prompt
b)  Create NVIDIA nForce(TM) PATARAID Driver for Win2K/2K3 32 bit driver
c)  Create NVIDIA nForce(TM) SATARAID Driver for Win2K/2K3 32 bit driver
d)  Create NVIDIA nForce(TM) PATARAID Driver for Win2K3 64 bit driver
e)  Create NVIDIA nForce(TM) SATARAID Driver for Win2K3 64 bit driver
For K8N-DRE/SCSI MB only:
f) Create LSI Logic Fusion-MPT MiniPort for Win2K 32 bit driver
g) Create LSI Logic Fusion-MPT MiniPort for Win2K3 32 bit driver
h) Create LSI Logic Fusion-MPT MiniPort for RH3.OAS driver
Please choose a ~ h:
```

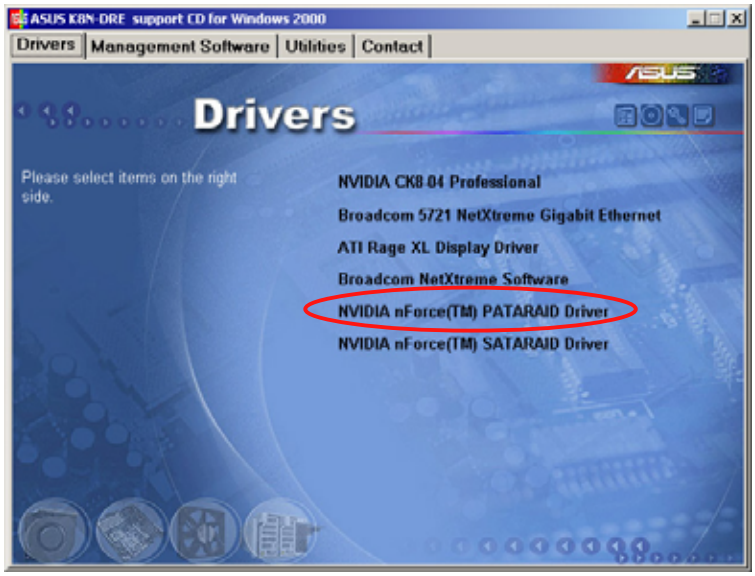
5. Place a blank, high-density floppy disk to the floppy disk drive.

When you insert a floppy disk with data, the utility erases all the data before copying the RAID drivers.

6. Type the letter of the option you like to select, then press <Enter>. For example, if you want to create an NVIDIA nForce(TM) SATA RAID driver disk for a 32-bit Windows 2000/2003 system, press <c>, then press <Enter>.
7. The RAID drivers are copied to the floppy disk. After creating a RAID driver disk, eject the floppy disk, then write-protect it to prevent computer virus infection.

To create a RAID driver disk in Windows®:

1. Place the motherboard support CD in the optical drive.
2. When the **Drivers** menu appears, click **NVIDIA nForce(TM) RAID Driver Disk** to create an nVIDIA nForce RAID driver disk.



To install the RAID driver:

1. Install an operating system to the selected hard disk drive. During installation, the computer prompts you to press the **F6** key if you are installing a third-party SCSI or RAID driver.
2. Press <F6>, then insert the RAID driver disk to the floppy disk drive.
3. Follow screen instructions to install the RAID drivers.

6.3 LAN driver installation

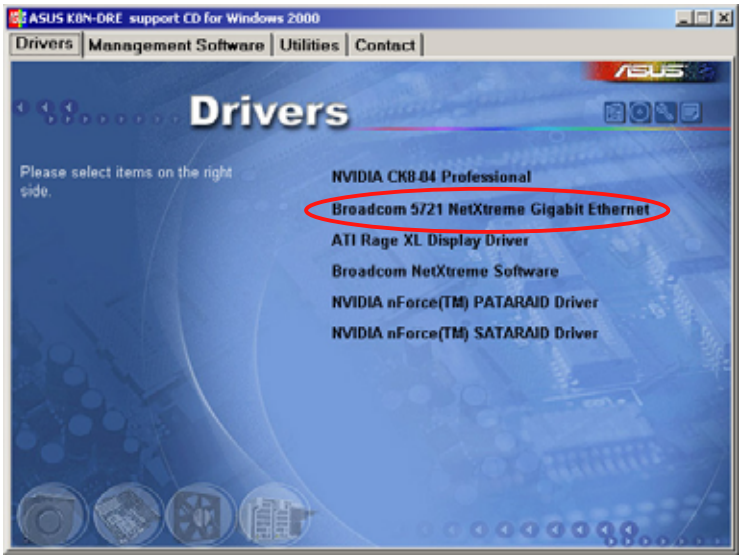
This section provides instructions on how to install the Broadcom® Gigabit LAN controller drivers on a Windows® 2000/XP OS.

To install the LAN controller drivers:

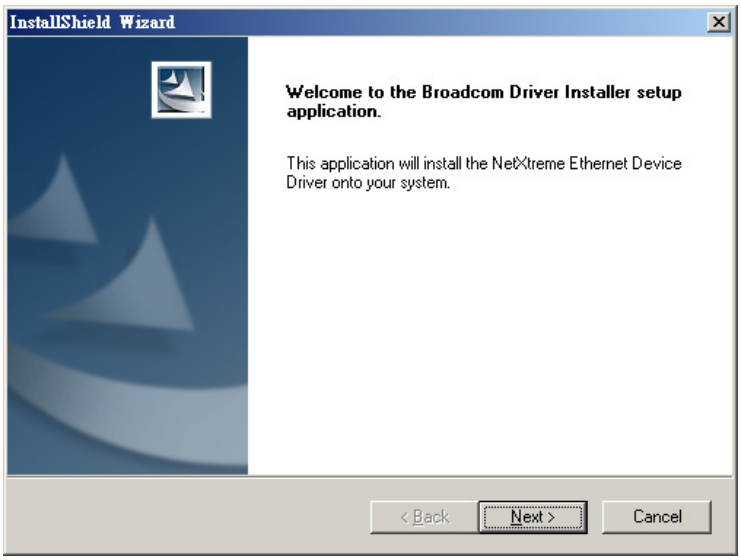
1. Restart the computer, then log on with **Administrator** privileges.
2. Insert the motherboard/system support CD to the optical drive. The CD automatically displays the **Drivers** menu if Autorun is enabled in your computer.

- Windows® automatically detects the LAN controllers and displays a **New Hardware Found** window. Click **Cancel** to close this window.
- If **Autorun** is NOT enabled in your computer, browse the contents of the support CD to locate the file ASSETUP.EXE from the BIN folder. Double-click the **ASSETUP.EXE** to run the CD.

3. Click the **Broadcom 5751 NetXtreme Gigabit Ethernet** option to begin installation.



4. Click **Next** when the InstallShield Wizard window appears. Follow screen instructions to continue installation.



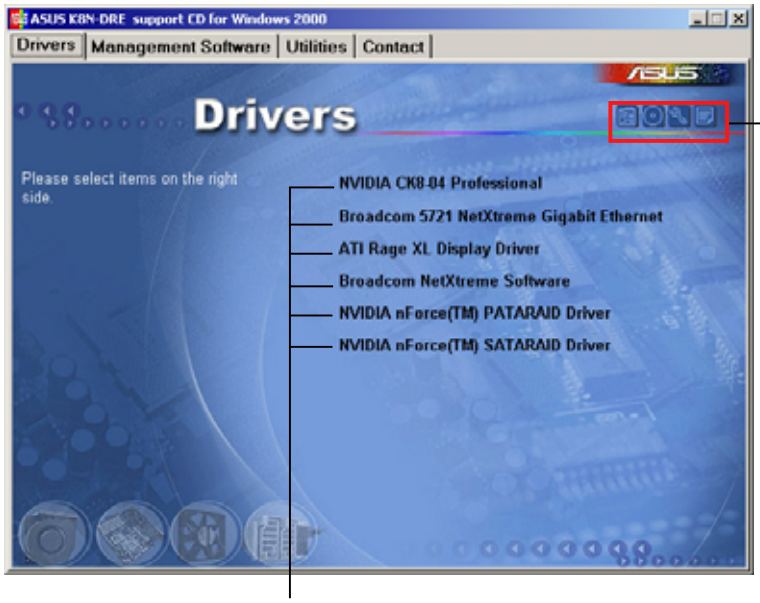
6.4 Support CD information

The support CD that came with the motherboard package contains the drivers, software applications, and utilities that you can install to avail all motherboard features.

The contents of the support CD are subject to change at any time without notice. Visit the ASUS website (www.asus.com) for updates.

6.4.1 Running the support CD

Place the support CD to the optical drive. The CD automatically displays the **Drivers** menu if Autorun is enabled in your computer.

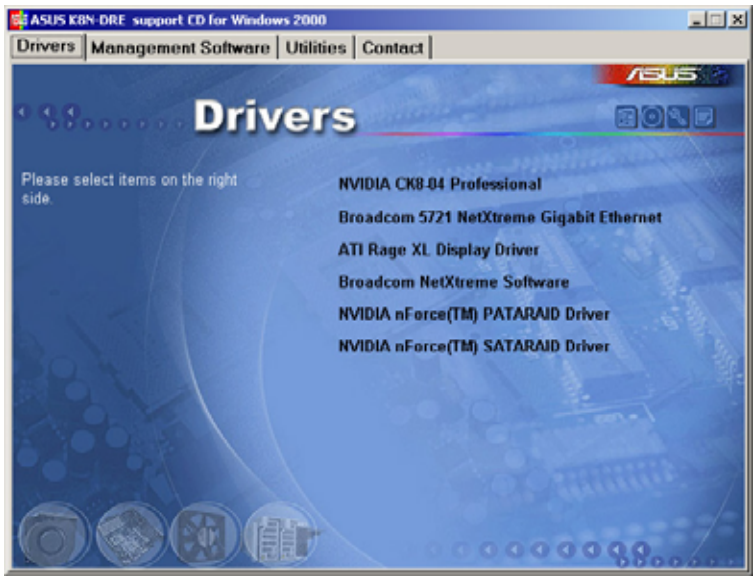


If **Autorun** is NOT enabled in your computer, browse the contents of the support CD to locate the file ASSETUP.EXE from the BIN folder. Double-click the **ASSETUP.EXE** to run the CD.

6.4.2 Drivers menu

The **Drivers** menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to activate the devices.

The screen display and driver options vary under different operating system versions.



NVIDIA CK8-04 Professional

Installs the driver for the NVIDIA CK8-04 chip.

Broadcom 5751 NetXtreme Gigabit Ethernet

Installs the Broadcom 5751 NetXtreme Gigabit Ethernet driver. See page 6-13 for details.

ATI Rage XL Display Driver

Installs the driver for the ATI Rage XL display controller.

Broadcom NetXtreme Software

Installs the Broadcom NetXtreme software application. Refer to the application help file for details.

NVIDIA nForce(TM) PATARAID Driver

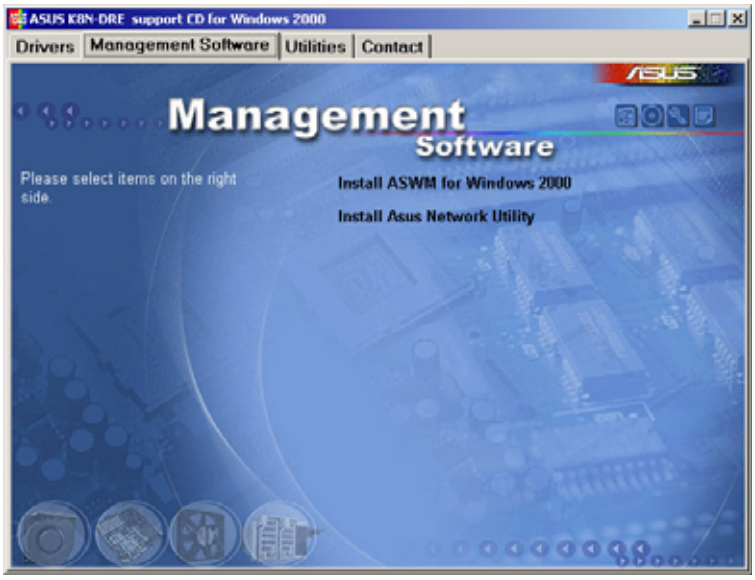
Creates a driver disk for the NVIDIA nForce(TM) Parallel ATA RAID controller.

NVIDIA nForce(TM) SATARAID Driver

Creates a driver disk for the NVIDIA nForce(TM) Serial ATA RAID controller.

6.4.3 Management Software

The **Management Software** menu shows the available server management software applications.



Install ASWM for Windows 2000

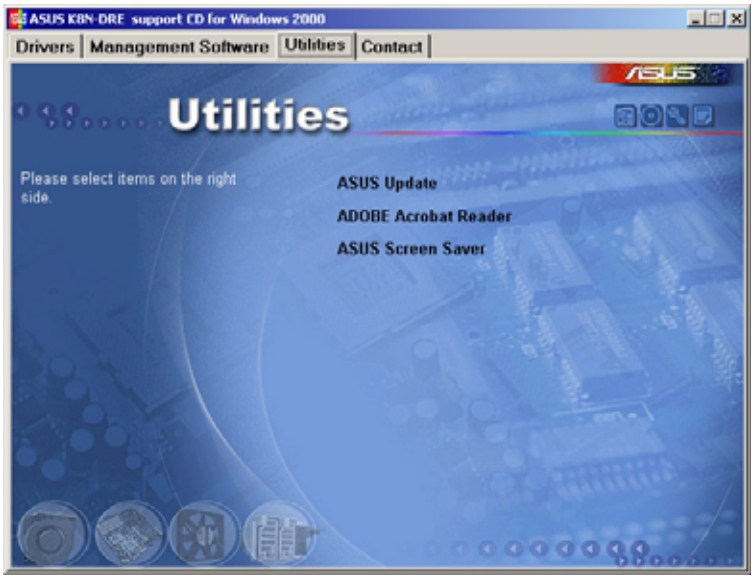
Installs the ASUS System Web-base Management utility. Refer to the application help file for details.

Install ASUS Network Utility

Installs the ASUS Network Utility. Refer to the application help file for details.

6.4.4 Utilities

The **Utilities** menu shows the available software applications for your barebone server.



ASUS Update

The ASUS Update utility that allows you to update the motherboard BIOS in Windows® environment. This utility requires an Internet connection either through a network or an Internet Service Provider (ISP).

ADOBE Acrobat Reader

The Adobe Acrobat® Reader V5.0 is for opening, viewing, and printing documents in Portable Document Format (PDF).

ASUS Screen Saver

Bring life to your idle screen by installing the ASUS screen saver.

This appendix includes additional information that you may refer to when configuring the motherboard.

4 Reference information

Appendix summary

A.1 K8N-DRE block diagram