



KFN5-Q Series

**KFN5-Q
KFN5-Q/SAS
KFN5-Q/1U**

Motherboard

E2924

**First Edition V1
January 2007**

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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.



The symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

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> +

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**

KFN5-Q Series specifications summary

CPU	Quad Socket F (1207) for next generation AMD® Opteron™ 8000 Series processor Supports AMD 64 architecture that enables simultaneous 32-bit and 64-bit architecture
Chipset	NVIDIA® nForce Professional 3600 (MCP55 Pro) Intel® 6702PXH (I/O Bridge)
System Bus	1000 MHz HyperTransport Link
Memory	Dual-channel memory architecture 16 x 240-pin DIMM sockets support registered ECC DDR2 400/533/667 memory modules Supports 256 MB up to 64 GB system memory
Expansion slots	<p>KFN5-Q model:</p> <ul style="list-style-type: none"> 1 x PCI Express™ x16 slot (x8 Link) 1 x PCI Express™ x8 slot (x8 Link) 1 x HyperTransport (HTX) connectors 1 x PCI 32bit/33MHz (5V) slot 2 x PCI-X 64bit/133/100MHz (3.3V) slots 1 x DDR2 SO-DIMM socket for ASUS Server Management Board 3 Series (ASMB3) <p>KFN5-Q/SAS model:</p> <ul style="list-style-type: none"> 1 x PCI Express™ x16 slot (x8 Link) 1 x PCI Express™ x8 slot (x8 Link) 1 x HyperTransport (HTX) connectors 1 x PCI 32bit/33MHz (5V) slot 1 x PCI-X 64bit/100MHz (3.3V) slot for optional Zero Channel RAID (ZCR) card (green) 1 x PCI-X 64bit/100MHz (3.3V) slots 1 x DDR2 SO-DIMM socket for ASUS Server Management Board 3 Series (ASMB3) <p>KFN5-Q/1U model:</p> <ul style="list-style-type: none"> 1 x PCI Express™ x16 slot (x8 Link) 1 x PCI Express™ x8 slot (x8 Link) 1 x HyperTransport (HTX) connectors 1 x PCI 32bit/33MHz (5V) slot 1 x DDR2 SO-DIMM socket for ASUS Server Management Board 3 Series (ASMB3)
Dual LAN	Dual Onboard BCM5721 Gigabit PCI-E LAN controllers
USB	2 x USB 2.0 ports (on the rear panel) 2 x USB 2.0 connector (on board)

(continued on the next page)

KFN5-Q Series specifications summary

Special features	ASUS Smart Fan Technology ASUS Smart Fan2 Technology ASUS CrashFree BIOS 2 ASUS MyLogo2 ASUS CPU Overheating Protection (C.O.P) BIOS Recovery CPU Warning LED
BIOS features	AMI BIOS, 8 MB LPC, Green, PnP, DMI, SMBIOS 2.3, ACPI 2.0a, Trend Chip Away Virus (TCAV)
Discrete graphics	ATI ES1000 PCI display controller Supports 32MB display memory
Rear panel	1 x Serial port 1 x VGA port 2 x USB 2.0 ports 1 x PS/2 keyboard port 1 x PS/2 mouse port 2 x RJ-45 ports
Storage	NVIDIA® nForce 3600 Professional supports: <ul style="list-style-type: none"> - 1 x IDE connector for up to two Ultra DMA 33/66/100/133 devices - 6 x Serial ATA 3.0 Gb/s connectors support six Serial ATA devices - RAID 0, RAID 1, RAID 10, RAID 5, and JBOD supported across Serial ATA drives via the onboard NVIDIA® MediaShield™ Utility KFN5-Q/SAS model only: LSI1068 PCI-X SAS controller supports: <ul style="list-style-type: none"> - 2 x Serial Attached SCSI (SAS) channels (each channel supports four HDDs) with RAID 0, RAID 1, and RAID 1E configurations - Zero-Channel RAID card (optional)
Power Requirement	SSI power supply (with 24-pin and 2 x 8-pin 12 V plugs) EPS 12V 2.0 compliant Minimum 800W power is recommended
Form Factor	Full-AT form factor: 16" x 13" (40.6 cm x 33.0 cm)

(continued on the next page)

KFN5-Q Series specifications summary

Internal connectors	<div>1 x Floppy disk drive connector (34-1 pin FLOPPY1)</div> <div>1 x IDE connector (40-1 pin PRI_IDE1)</div> <div>6 x Serial ATA connectors (7-pin SATA1, SATA2, SATA3, SATA4, SATA5, SATA6)</div> <div>1 x Hard disk activity LED connector (4-pin HDLED1)</div> <div>1 x USB connector (10-1 pin USB34)</div> <div>1 x Serial port connector (10-1 pin COM2)</div> <div>1 x Power supply SMBUS connector (5-pin PSUSMB1)</div> <div>1 x Parallel port connector (26-1 pin LPT1)</div> <div>1 x Backplane SMBUS connector (7-1 pin BPSMB1)</div> <div>1 x Serial General Purpose Input/Output connector for NVIDIA® MediaShield™ RAID SATA LED (8-1 pin SGPIO1)</div> <div>1 x System panel connector (20-1pin PANEL1)</div> <div>1 x System panel auxiliary connector (20-2 pin AUX_PANEL1)</div> <div>1 x LPC connector for LPC debug (14-1 pin LPC1)</div> <div>1 x TPM connector (20-1 pin TPM1)</div> <div>SSI power connectors (24-pin ATXPWR1, 2x 8-pin ATX12V1, ATX12V2)</div> <div>CPU (x4), front (x6), and rear (x2) 4-pin fan connectors</div> <div> (KFN5-Q/SAS model only)</div> <div>2 x mini-SAS connectors support a total of eight (8) devices</div> <div>1 x SAS LSI1068 ports LED connector (18-1 pin SASLED1)</div>
Support CD contents	<div>Device drivers</div> <div>ASUS Live Update utility</div> <div>ASUS Server Web-based Management (ASWM)</div> <div>NVIDIA Raid Utility</div> <div>ASUS Flash Utility under DOS</div>

*Specifications are subject to change without notice.

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

1 **Product introduction**

Chapter summary

1

1.1	Welcome!	1-1
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1.4	Special features	1-2

1.1 Welcome!

Thank you for buying an ASUS® KFN5-Q Series 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.

		KFN5-Q Retail Pack	KFN5-Q /1U Retail Pack	KFN5-Q /SAS Retail Pack
Cables	Serial ATA signal cable	6	6	6
	Serial ATA power cable	3	3	3
	SAS cable	-	-	2
	2-in-1 Floppy/Ultra ATA disk drive cable set	1	1	1
Accessories	I/O shield	1	1	1
	Retention module & screws	4	-	4
Application CD	Support CD	1	1	1
Documentation	User guide	1	1	1
Packing Quantity		3 pieces per carton	3 pieces per carton	3 pieces per carton



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

1.3 Serial number label

Before requesting support from the ASUS Technical Support team, you must take note of the motherboard's serial number containing 12 characters such as xxM0Axxxxxxx. See figure below.

With the correct serial number of the product, ASUS Technical Support team members can then offer a quicker and satisfying solution to your problems.



1.4 Special features

1.4.1 Product highlights

Latest processor technology

The motherboard comes with a 1207-pin surface mount Land Grid Array (LGA) socket coded Socket F, designed for the next generation AMD Opteron™ 8000 series processor. The motherboard with the new socket supports registered DDR2-667/533/400 memory, delivering advanced performance and ensuring reliable data protection.

DDR2-667 memory support



The motherboard supports DDR2 memory which features data transfer rates of up to 667 MHz to meet the higher bandwidth requirements of the latest server applications. The dual-channel memory architecture doubles the bandwidth of your system memory to boost system performance, eliminating bottlenecks with peak bandwidths of up to 10.7 GB/s.

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 or PCI-X specifications.

HyperTransport (HTX)

HyperTransport (HTX) is an industry-standard interconnect that allows direct peripheral-card to the system CPU communications, speeding performance, and reducing latency. The HTX specification support up to 6.4GB/s data transfer rate, and with 2 x 16-bit, double data rate HyperTransport Inks working at 800MHz clock.

Serial Attached SCSI (SAS) technology support (KFN5-Q/SAS only)

SAS is the latest storage interface for enterprise-class storage devices. Building on and improving the parallel SCSI foundation, SAS is the new industry standard that includes Serial ATA interoperability, and is projected to be the successor of the Ultra320 SCSI technology.

Zero Channel RAID (ZCR) solution (KFN5-Q/SAS only)

The motherboard comes with a ZCR socket for an optional Zero-Channel RAID card, allowing RAID 0 (striping), RAID 1 (mirroring), RAID 0+1, and RAID 5 configurations. The ZCR capability provides a cost-effective high-performance and added reliability.

Gigabit LAN solution



The motherboard comes with dual Gigabit LAN controllers and ports to provide a total solution for your networking needs. The onboard Broadcom® BCM5721 Gigabit LAN controllers use the PCI Express interface and could achieve network throughput close to Gigabit bandwidth.

Serial ATA II technology



The motherboard supports the Serial ATA II technology through the Serial ATA interfaces controlled by the NVIDIA® chipset. The SATA specification allows for thinner, more flexible cables with lower pin count, reduced voltage requirement, and up to 300 MB/s data transfer rate.

SAS RAID solution

(KFN5-Q/SAS only)

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

The NVIDIA® MCP55 Pro allows JBOD, RAID0, RAID1, and RAID5 (Software) configurations for six SATA connectors.

The LSIS AS1068 is an eight-port, 3.0 Gbit/s SAS/SATA controller that is compliant with the Fusion-MPT™ architecture, and supports the Integrated RAID™ solution.

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.

Temperature, fan, and voltage monitoring

The CPU temperature is monitored by the ASIC (integrated in the Winbond hardware monitor) 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.

1.4.2 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.

ASUS Smart Fan technology

The ASUS Smart Fan technology smartly adjusts the fan speeds according to the system loading to ensure quiet, cool, and efficient operation.

ASUS MyLogo2™



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

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

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2.7	Switches	2-29
2.7	Connectors	2-31

2.1 Before you proceed

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

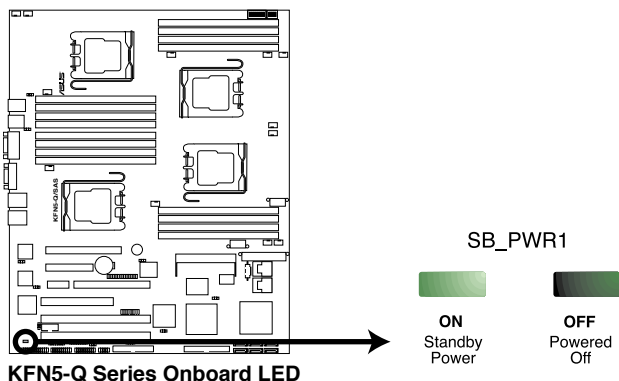


- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. See “10. SSI power connectors” on page 2-38 for details.
- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap, or touch a safely grounded object or a metal object (such as the power supply case) before handling components to avoid damaging them due to static electricity.
- Hold the 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

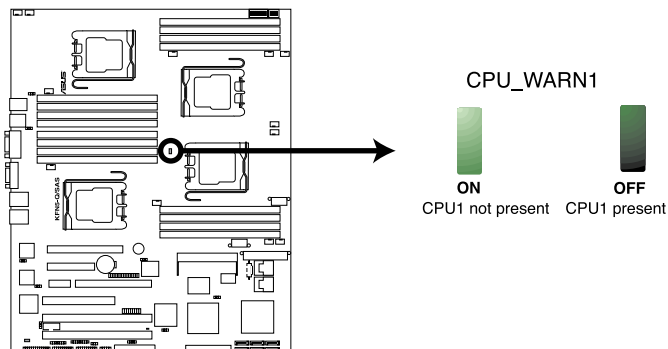
1. Standby power LED (SB_PWR1)

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)

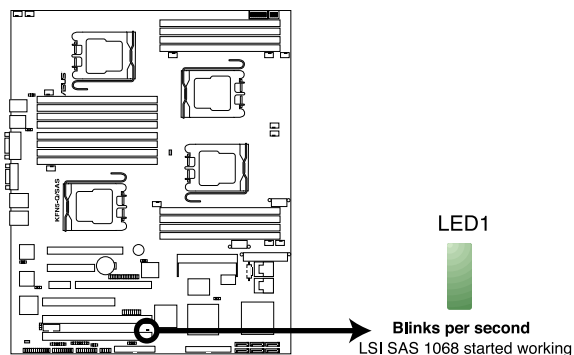
The red CPU warning LED lights up to indicate that a processor is not installed or the processor is not installed properly in CPU 1 socket.



KFN5-Q Series Onboard CPU_WARN1 LED

3. Heartbeat LED (LED1) (For KFN5-Q/SAS model only)

The green Heartbeat LED blinks per second to indicate that the LSI SAS 1068 chipset has started working.



KFN5-Q Series HeartBeat LED



This LED is only for the KFN5-Q/SAS model, and it indicates if the LSI SAS 1068 is working normally.

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.

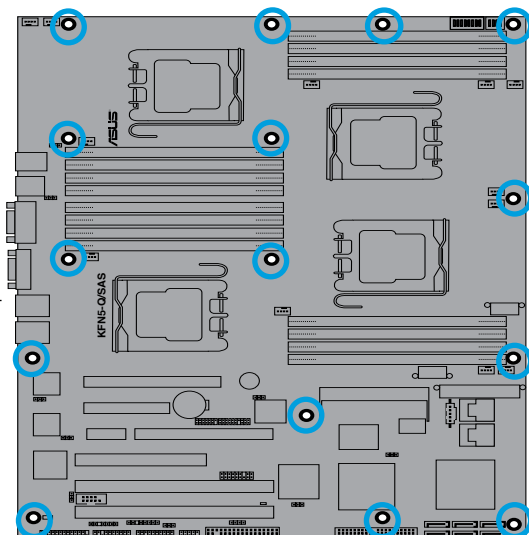
2.2.2 Screw holes

Place 15 screws into the holes indicated by circles to secure the motherboard to the chassis.



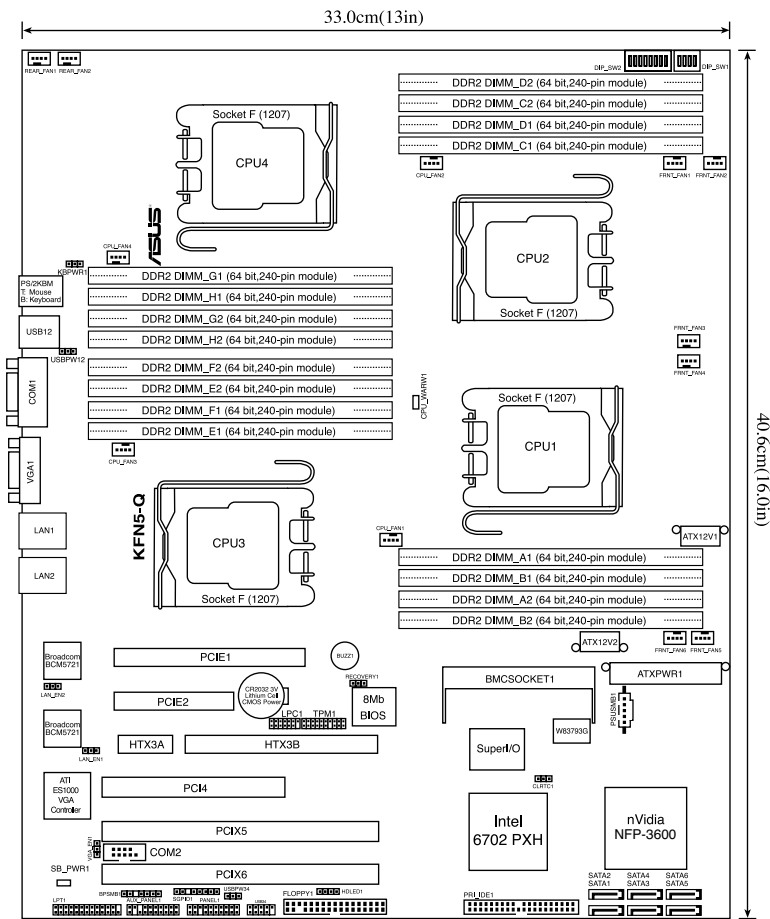
Do not overtighten the screws! Doing so can damage the motherboard.

Place this side
towards the rear of
the chassis

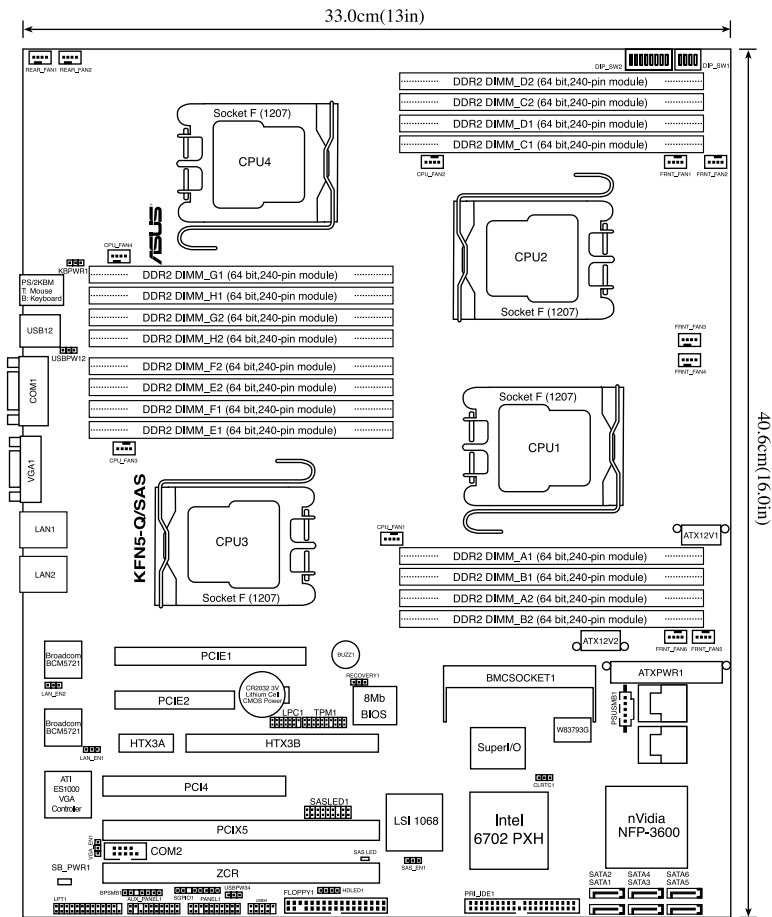


2.2.3 Motherboard layout

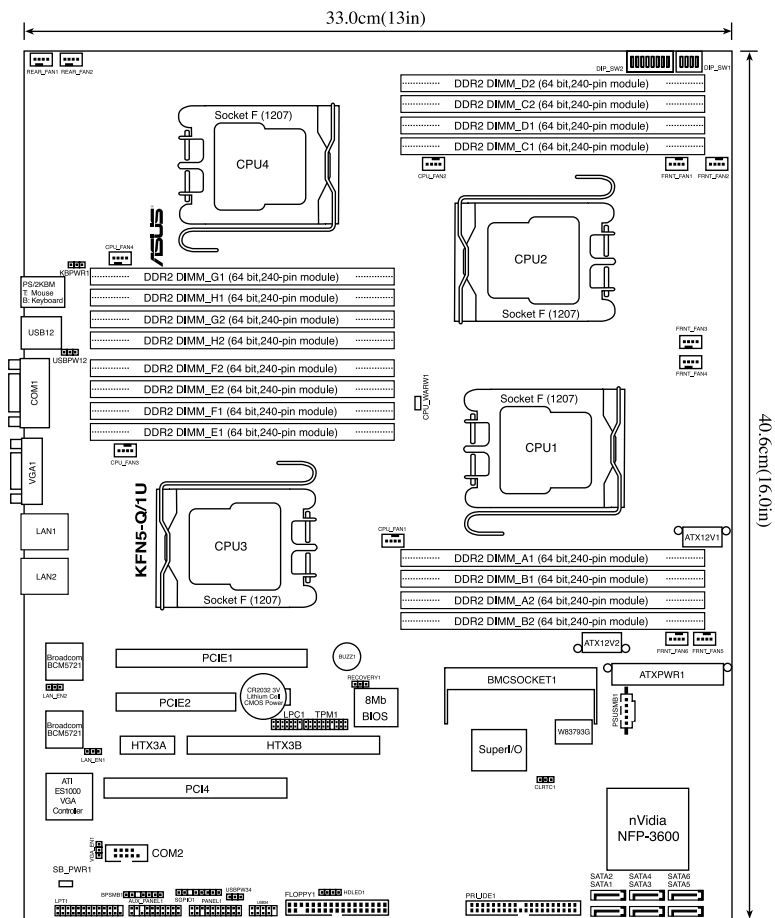
KFN5-Q model



KFN5-Q/SAS model



KFN5-Q/1U



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2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount Socket F designed for the AMD® Opteron® CPU in the Land Grid Array (LGA) package.

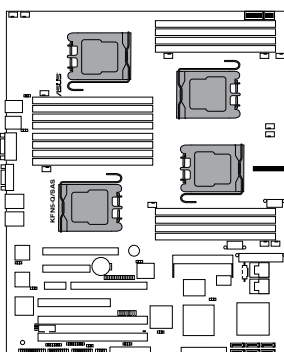


- Upon purchase of the motherboard, make sure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS shoulders the repair cost only if the damage is shipment/transit-related.
- Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the Socket 1207.
- The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

2.3.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

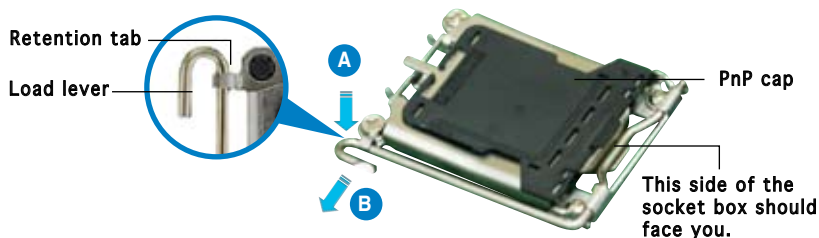


KFN5-Q Series CPU Socket 1207



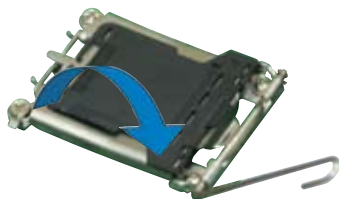
Before installing the CPU, make sure that the cam box is facing towards you and the load lever is on your left.

2. Press the load lever with your thumb (A), then move it to the left (B) until it is released from the retention tab.

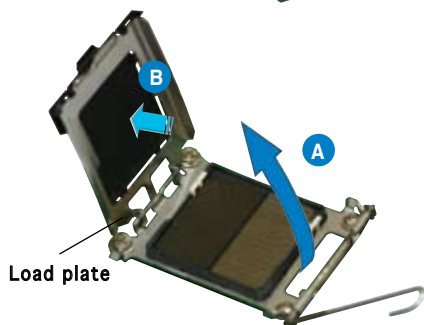


To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

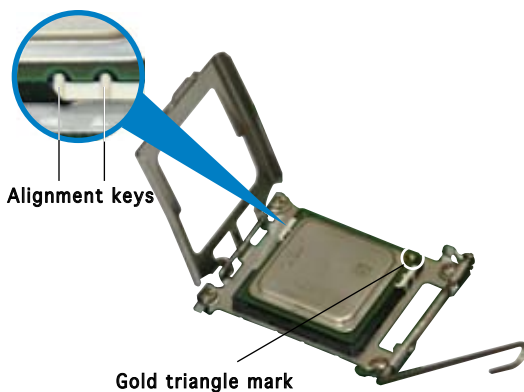
3. Lift the load lever in the direction of the arrow to a 135° angle.



4. Lift the load plate with your thumb and forefinger to a 100° angle (A), then push the PnP cap from the load plate window to remove (B).

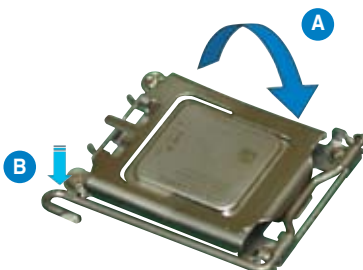


5. Position the CPU over the socket, making sure that the gold triangle is on the bottom-right corner of the socket. The socket alignment keys should fit into the CPU notches.



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

6. Close the load plate (A), then push the load lever (B) until it snaps into the retention tab.



2.3.2 Installing the heatsink and fan

(For KFN5-Q, and KFN-5Q/SAS only)

The AMD Opteron™ processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.



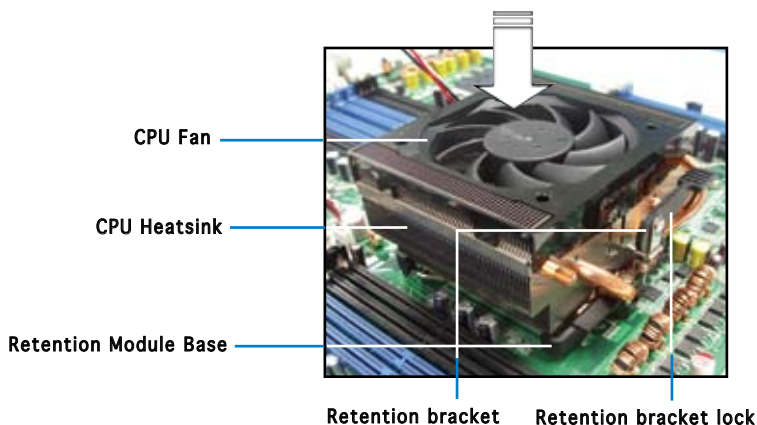
Make sure that you use only qualified heatsink and fan assembly.

Follow these steps to install the CPU heatsink and fan.

1. Place the heatsink on top of the installed CPU, making sure that the heatsink fits properly on the retention module base.

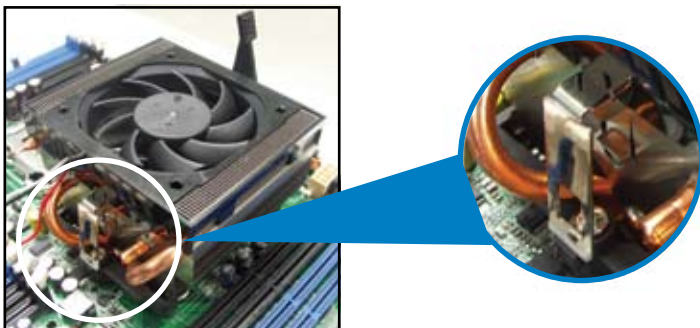


- The retention module base is already installed on the motherboard upon purchase.
 - You do not have to remove the retention module base when installing the CPU or installing other motherboard components.
 - If you purchased a separate CPU heatsink and fan assembly, make sure that a Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.
-



Your boxed CPU heatsink and fan assembly should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.

2. Attach one end of the retention bracket to the retention module base.



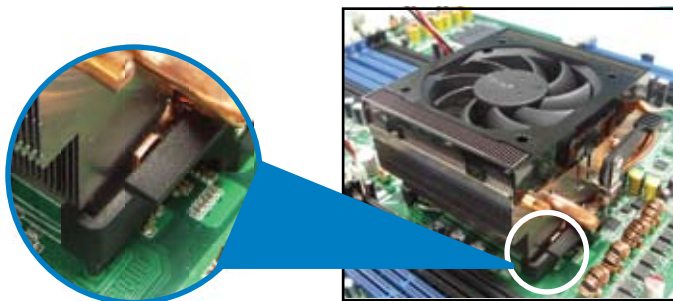
3. Align the other end of the retention bracket (near the retention bracket lock) to the retention module base. A clicking sound denotes that the retention bracket is in place.



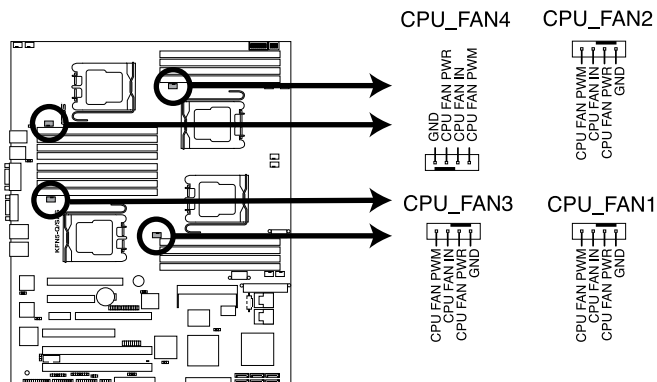
Make sure that the fan and heatsink assembly perfectly fits the retention mechanism module base, otherwise you cannot snap the retention bracket in place.



4. Push down the retention bracket lock on the retention mechanism to secure the heatsink and fan to the module base.



- When the fan and heatsink assembly is in place, connect the CPU fan cable to the appropriate connector on the motherboard, CPU_FAN1, CPU_FAN2, CPU_FAN3, or CPU_FAN4.



KFN5-Q Series CPU Fan Connectors



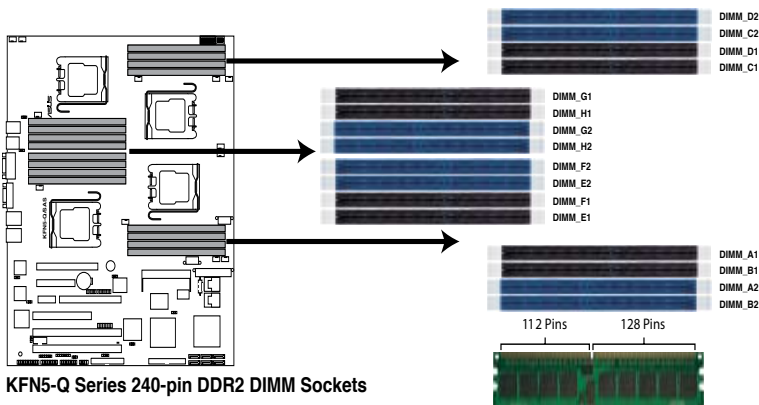
- Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.
- If there is only one CPU fan cable, connect it to the connector labeled CPU_FAN1. Failure to do so may cause hardware monitoring errors.

2.4 System memory

2.4.1 Overview

The motherboard comes with sixteen 240-pin Double Data Rate II (DDR2) Dual Inline Memory Modules (DIMM) sockets.

The following figure illustrates the location of the sockets:



KFN5-Q Series 240-pin DDR2 DIMM Sockets

For CPU 1	Sockets
Channel A	DIMM_A1, DIMM_A2
Channel B	DIMM_B1, DIMM_B2
For CPU 2	Sockets
Channel A	DIMM_C1, DIMM_C2
Channel B	DIMM_D1, DIMM_D2
For CPU 3	Sockets
Channel A	DIMM_E1, DIMM_E2
Channel B	DIMM_F1, DIMM_F2
For CPU 4	Sockets
Channel A	DIMM_G1, DIMM_G2
Channel B	DIMM_H1, DIMM_H2

2.4.2 Memory Configurations

You may install 256 MB, 512 MB, 1 GB, 2GB, 4GB OR 8GB registered ECC DDR2 667/533/400MHz 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:

$\text{DIMM_A1} + \text{DIMM_B1} = \text{DIMM_A2} + \text{DIMM_B2}$

Dual CPU:

$\text{DIMM_A1} + \text{DIMM_B1} = \text{DIMM_A2} + \text{DIMM_B2}$

$\text{DIMM_C1} + \text{DIMM_D1} = \text{DIMM_C2} + \text{DIMM_D2}$

Quad CPU:

$\text{DIMM_A1} + \text{DIMM_B1} = \text{DIMM_A2} + \text{DIMM_B2}$

$\text{DIMM_C1} + \text{DIMM_D1} = \text{DIMM_C2} + \text{DIMM_D2}$

$\text{DIMM_E1} + \text{DIMM_F1} = \text{DIMM_E2} + \text{DIMM_F2}$

$\text{DIMM_G1} + \text{DIMM_H1} = \text{DIMM_G2} + \text{DIMM_H2}$

- Always install DIMMs with the same CAS latency. For optimum compatibility, we recommend that you obtain memory modules from the same vendor. Refer to the DDR2 Qualified Vendors List at the ASUS web site.

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

Recommended memory configuration for CPU3

Mode	DIMM_E1	DIMM_E2	DIMM_F1	DIMM_F2
Single channel	—	populated	—	—
Dual channel	— populated	populated populated	— populated	populated populated

Recommended memory configuration for CPU4

Mode	DIMM_G1	DIMM_G2	DIMM_H1	DIMM_H2
Single channel	—	populated	—	—
Dual channel	— populated	populated populated	— populated	populated populated

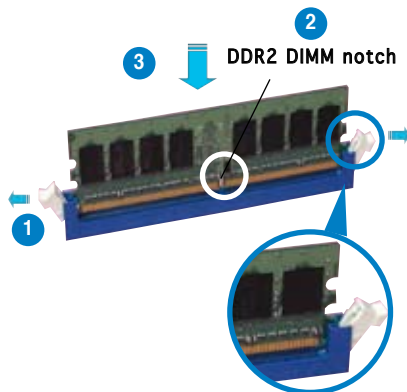
2.4.3 Installing a DIMM



Unplug the power supply before adding or removing DIMMs or other system components. Failure to do so can cause severe damage to both the motherboard and the components.

To install a DIMM:

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



Unlocked retaining clip



- A DDR2 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.
- The DDR2 DIMM sockets do not support DDR DIMMs. DO NOT install DDR DIMMs to the DDR2 DIMM sockets.

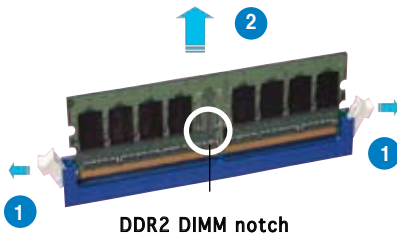
2.4.4 Removing a DIMM

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 expansion card connector with the slot and press firmly until the expansion card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. 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

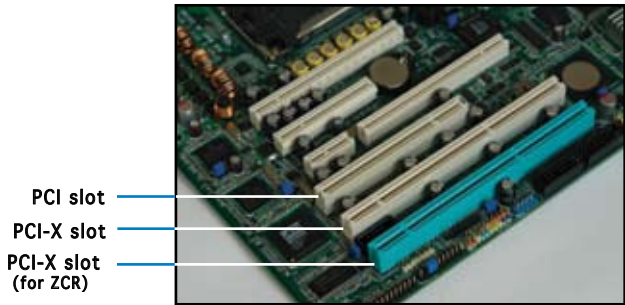
Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	-	Programmable interrupt
3	11	Communications Port (COM2)
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/PCI-X slots

The PCI/PCI-X slots supports cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI 2.3 and PCI-X 1.0 specifications.



When you choose to install an ZCR card, install the card on the PCI-X6 slot (for ZCR), which is the green slot on the KFN5-Q/SAS model.



- Important note on KFN5-Q:
When one PCI-X slot is populated, the PCI-X frequency is 133MHz.
When all PCI-X slot is populated, the PCI-X frequency is 100 MHz.
Refer to the table below for details.
- Important note on KFN5-Q/SAS:
When one or two PCI-X slot is populated, the PCI-X frequency is 100MHz. Refer to the table below for details.

PCI-X Frequency *(KFN5-Q model)*

PCI-X 1 slot (PCIX5)	PCI-X 1 slot (PCIX6)	Frequency
populated —	— populated	133MHz
populated — populated	populated populated —	100MHz

PCI-X Frequency *(KFN5-Q/SAS model)*

PCI-X 1 slot (PCIX5)	PCI-X 1 slot (PCIX6)	Frequency
populated — populated	— populated populated	100MHz

2.5.5 PCI Express x16 slot (x8 link)

This motherboard supports PCI Express I/O cards that comply with the PCI Express specifications. The figure shows a graphics card installed on the PCI Express x 16 slot.

PCI Express x16 slot

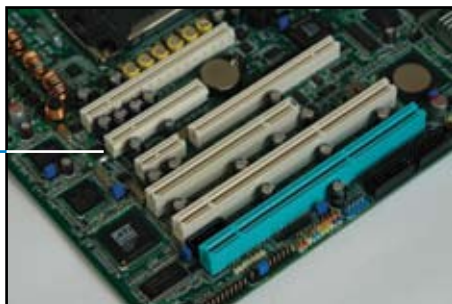


A PCI Express x16 add-on card inserted to the onboard PCI Express x16 slot runs at x8 speed only (hardware limitation). Make sure that you use a PCI Express x 16 add-on card that supports x8 speed.

2.5.6 PCI Express x8 slot (x8 link)

The onboard PCI Express x8 slot provides x8 link. This slot is designed for various server class high performance I/O add-on cards like SCSI RAID card, and fiber-channel card.

PCI Express x8 slot



2.5.7 ZCR slot (*KFN5-Q/SAS model*)

The 64-bit PCI-X slot (green) on the motherboard supports a Zero-Channel RAID card that allows RAID0, RAID1, RAID10, and RAID5 configurations.

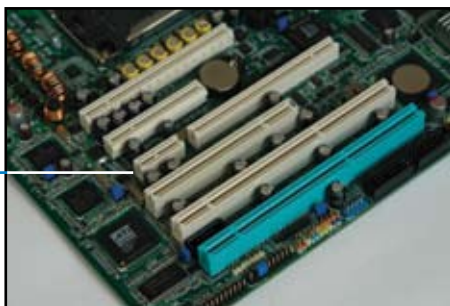
ZCR slot



2.5.8 HyperTransport (HTX) slot

The HTX slot supports HTX InfiniBand card that complies with HTX interface specifications.

HTX slot



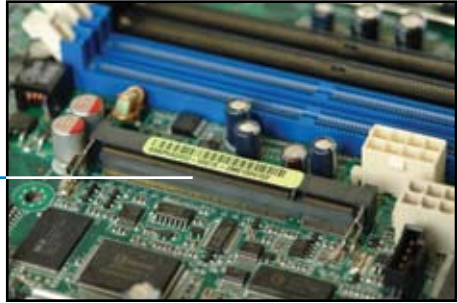
The figure shows an InfiniBand card installed on an HTX slot.



2.5.9 DDR2 SO-DIMM socket

The DDR2 SODIMM socket on the motherboard supports an ASUS Server Management Board 3 Series (ASMB3).

DDR2-SODIMM socket



2.6 Jumpers

1. Clear RTC RAM (3-pin CLRTC1)

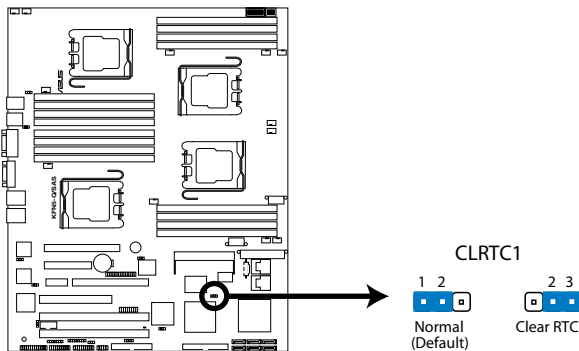
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

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 key during the boot process and enter BIOS setup to re-enter data.



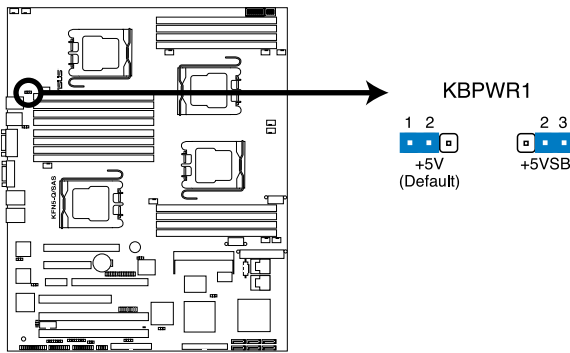
Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



KFN5-Q Series Clear RTC RAM

2. Keyboard power (3-pin KBPWR1)

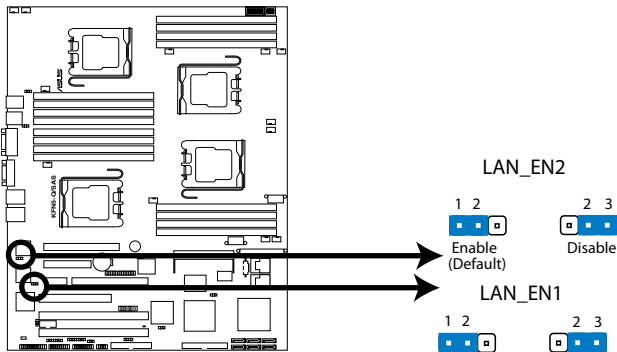
This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.



KFN5-Q Series Keyboard Power Setting

3. Gigabit LAN controller setting (3-pin LAN_EN1, LAN_EN2)

These jumpers allow you to enable or disable the onboard Broadcom® BCM5721 Gigabit LAN controllers. The LAN_EN1 jumper controls the LAN1 port. The LAN_EN2 jumper controls the LAN2 port.



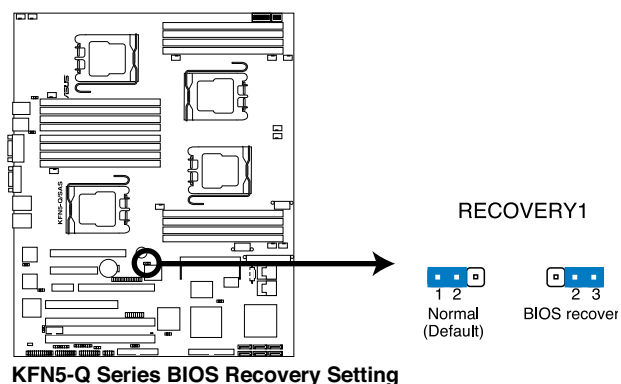
KFN5-Q Series LAN_EN1 & LAN_EN2 Setting

4. 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.

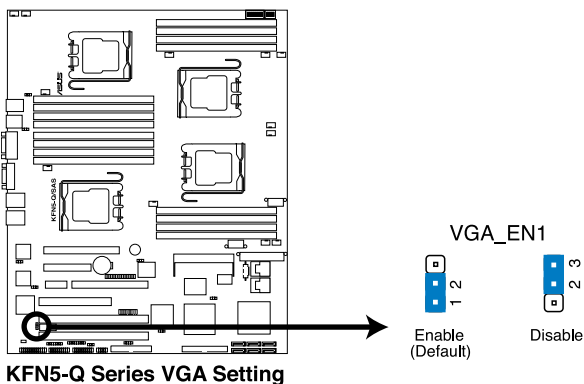
To recover the BIOS:

1. Turn OFF your computer and unplug the power cord.
2. Move the jumper cap from pins 2-3 (default) to pins 1-2.
3. Insert a floppy disk with the original or updated BIOS file. The BIOS file name is **I8044A00.ROM**
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 1-2 to pins 2-3.
8. Reboot your computer.
9. Hold down the key during the boot process and enter BIOS setup to re-enter data.



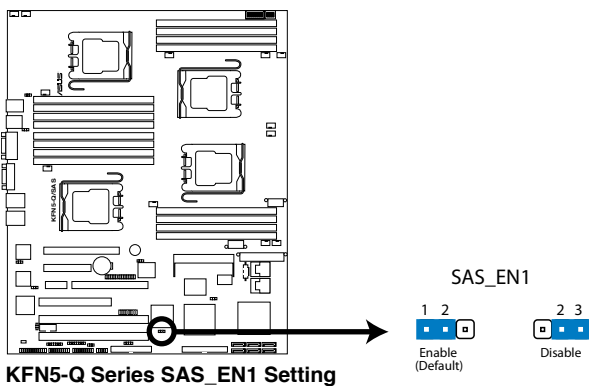
5. VGA Graphics controller setting (3-pin VGA_EN1)

These jumpers allow you to enable or disable the onboard ATI ES1000 video graphics controller.



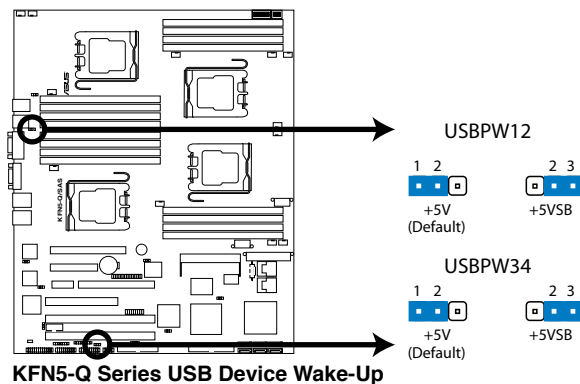
6. Onboard storage setting (3-pin SAS_EN1) (KFN5-Q/SAS model)

This jumper allows you to enable or disable the onboard LSI SAS1068 chip.



7. USB device wake-up (3-pin USBPW12, USBPW34)

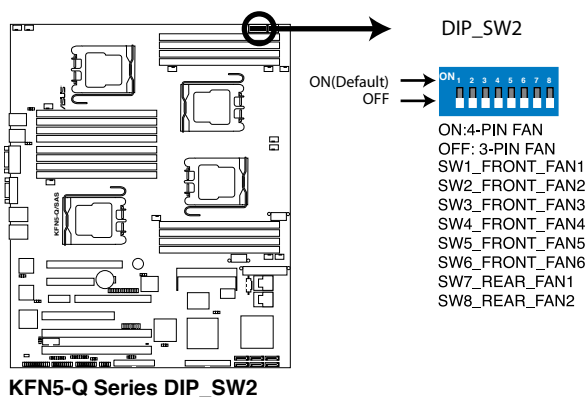
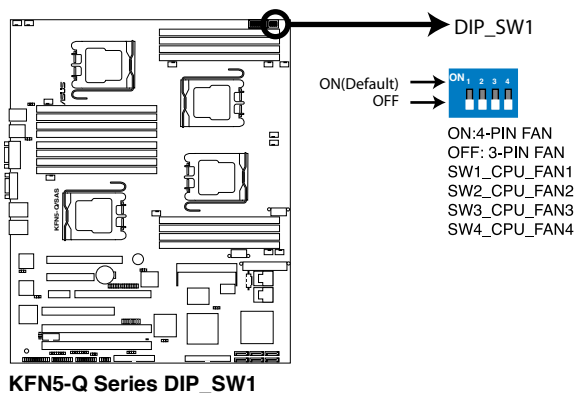
Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S4 sleep mode (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).



- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system will not power up.
- If you are using Windows® 2000, you need to install Service Pack 4 to wake up the system from S4 sleep mode.
- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

2.7 Switches

This motherboard features two DIP switches for fan pin selection.



The following tables show the corresponding switch for each fan connector.

DIP_SW1:

Switch	Fan connector	Default Setting
1	CPU_FAN1	ON (4-pin fan)
2	CPU_FAN2	ON (4-pin fan)
3	CPU_FAN3	ON (4-pin fan)
4	CPU_FAN4	ON (4-pin fan)

DIP_SW2:

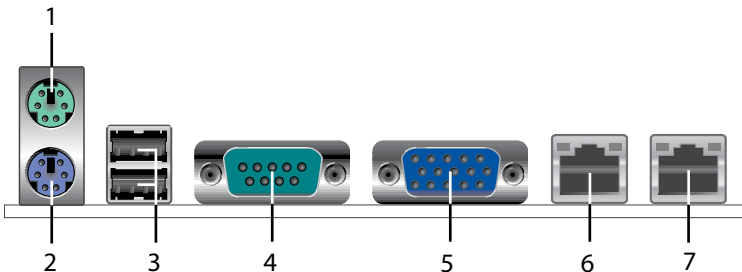
Switch	Fan connector	Default Setting
1	FRNT_FAN1	ON (4-pin fan)
2	FRNT_FAN2	ON (4-pin fan)
3	FRNT_FAN3	ON (4-pin fan)
4	FRNT_FAN4	ON (4-pin fan)
5	FRNT_FAN5	ON (4-pin fan)
6	FRNT_FAN6	ON (4-pin fan)
7	REAR_FAN1	ON (4-pin fan)
8	REAR_FAN2	ON (4-pin fan)



- If you use a 4-pin fan but set the DIP switch for a 3-pin fan, the fan you installed may not work.
- If you use a 3-pin fan but set the DIP switch for a 4-pin fan, the fan control will not work and the fan you installed will always run at full speed.

2.8 Connectors

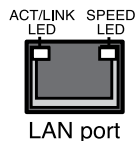
2.8.1 Rear panel connectors



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 is for pointing devices or other serial devices.
5. **VGA port.** This 15-pin 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



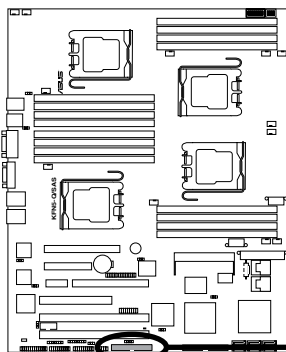
2.8.2 Internal connectors

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.



Pin 5 on the connector is removed to prevent incorrect cable connection when using a FDD cable with a covered Pin 5.



FLOPPY1

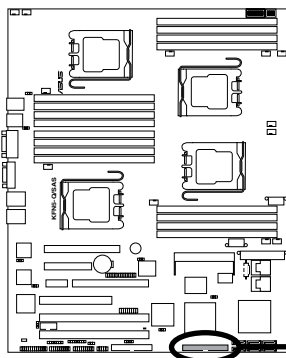


NOTE: Orient the red markings on the floppy ribbon cable to PIN1.

KFN5-Q Series Floppy Disk Drive Connector

2. IDE connectors (40-1 pin PRI_IDE1)

The onboard IDE connector is for Ultra DMA 133/100/66 signal cable. There are three connectors on each Ultra DMA 133/100/66 signal cable: blue, black, and gray. Connect the blue connector to the motherboard's IDE connector, then select one of the following modes to configure your device(s).



PRI_IDE1



NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.

KFN5-Q IDE Series Connector

	Drive jumper setting	Mode Cable of device(s)	Cable connector
Single device	Cable-Select or Master	-	Black
Two devices	Cable-Select	Master Slave	Black Gray
	Master Slave	Master Slave	Black or gray



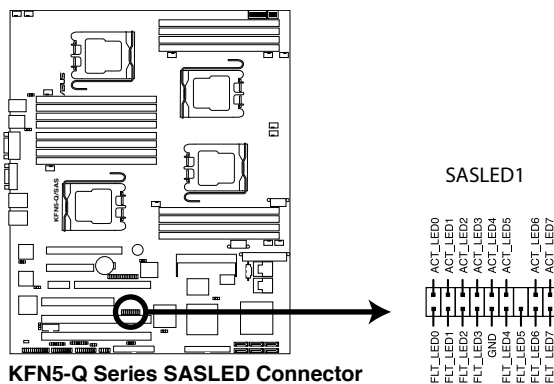
- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 133/100/66 IDE devices.



If any device jumper is set as “Cable-Select,” make sure all other device jumpers have the same setting.

3. SAS LSI1068 ports LED connector (18-1 pin SASLED1) (For KFN5-Q/SAS model only)

This connector is for SAS link state's LED. The active LOW Fault LED signals are nominally configured to indicate a SAS link fault for each respective phy. The active LOW Activity LED signals are nominally configured to indicate SAS link activity.



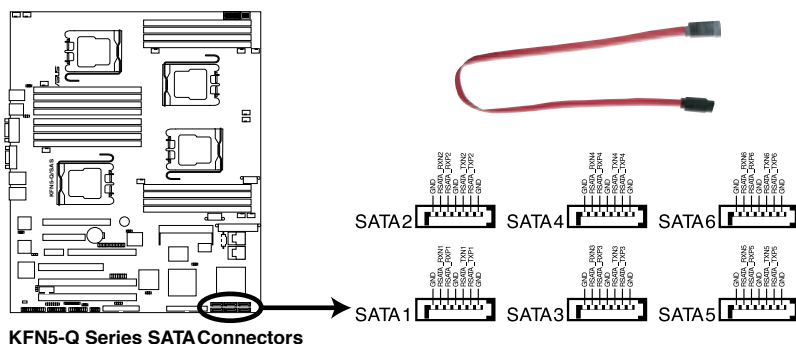
4. Serial ATA connectors (SATA1, SATA2, SATA3, SATA4, SATA5, SATA6)

Supported by the NVIDIA® MCP55 Pro 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 0+1, RAID 5, or JBOD configuration. Refer to Chapter 5 for details on how to set up the RAID configurations.



These connectors are set to **SATA** by default. In SATA mode, you can connect Serial ATA boot or data hard disk drives to these connectors. If you intent to create a Serial ATA RAID set using these connectors, enable the RAID function of each port from the **nVidia RAID Setup** sub-menu item in the BIOS. See section “4.3.5 IDE Configuration” on page 4-14 for details.



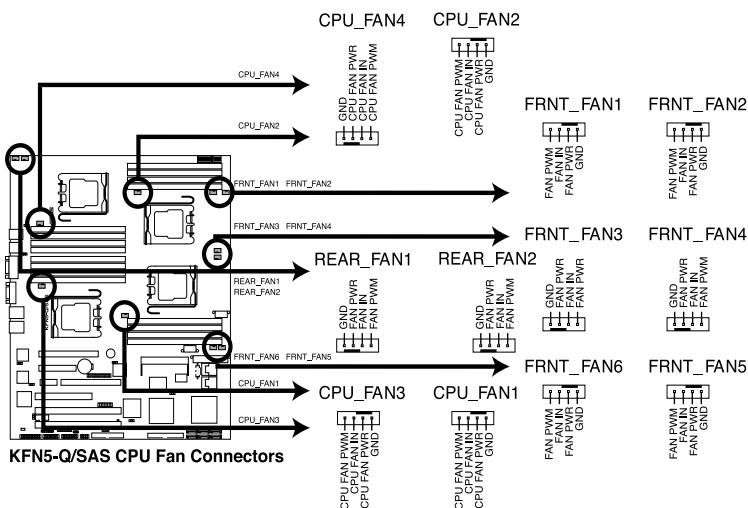
The actual data transfer rate depends on the speed of Serial ATA hard disks installed.

5. CPU, Front and Rear fan connectors (4-pin CPU_FAN1/4, FRNT_FAN1/6, REAR_FAN1/2)

The fan connectors support cooling fans of 350mA~740mA (8.88 W max.) or a total of 4.2A~8.88A (106.56 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.

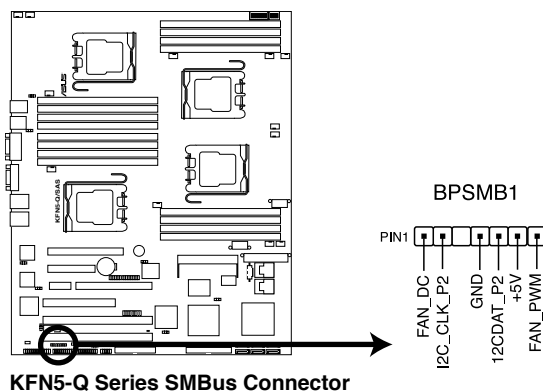


- Do not forget to connect the fan cables to the fan connectors. Lack of sufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!
- All fans feature the ASUS Smart Fan technology.



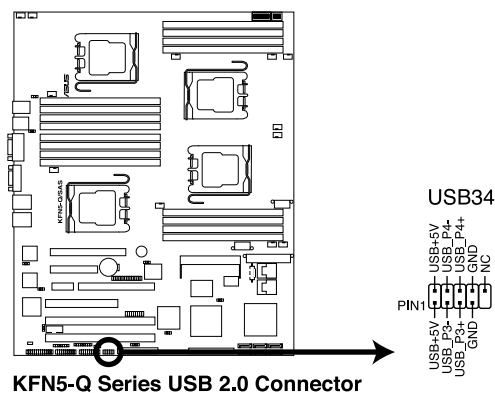
6. Backplane SMBus connector (7-1 pin BPSMB1)

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.



7. USB connector (10-1 pin USB34)

This connector is for USB 2.0 ports. Connect the USB module cable to this connector, then install the module to a slot opening at the back of the system chassis. This USB connector complies with USB 2.0 specification that supports up to 480 Mbps connection speed.



8. System panel auxiliary connector (20-2 pin AUX_PANEL1)

This connector supports several server system functions.

1 Chassis intrusion connector (3-pin CASE_OPEN)

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.

2 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.

3 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 connector blinks during a network activity and lights up when linked.

4 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.

5 Locator LED 2 (2-pin LOCATORLED2)

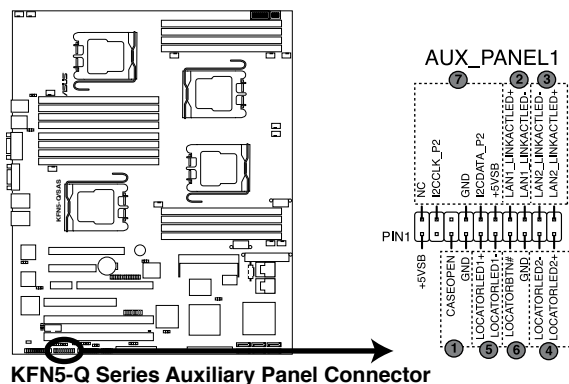
This 2-pin locator is for the Locator LED 2. Connect the Locator LED 2 cable to this connector.

6 Locator Button/Switch (2-pin LOCATORBTN)

This connector is for the locator button. This button queries the state of the system locator.

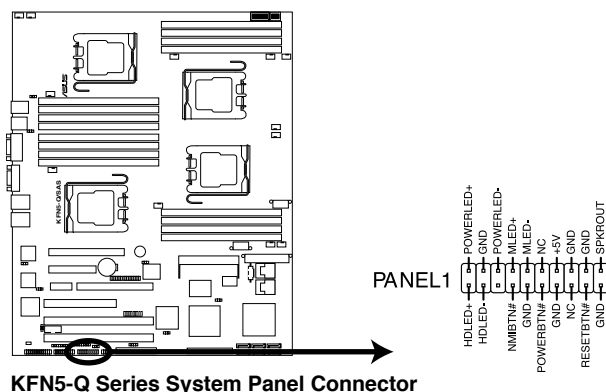
7 Front Panel SMBus (6-1 pin)

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.



9. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.



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

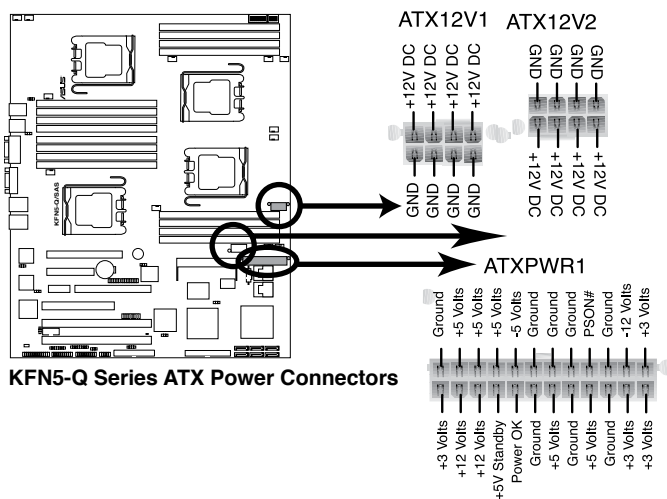
- **System power LED (Green 3-pin POWERLED)**
This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.
- **Hard disk drive activity (Red 2-pin 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 SATA add-in card is installed, the read or write activities of any device connected to the 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.

10. SSI power connectors (24-pin ATXPWR1, 2 x 8-pin ATX12V1, ATX12V2)

SSI power connectors (24-pin ATXPWR1, 2-8 pin ATX12V1, ATX12V2). These connectors are for SSI 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.

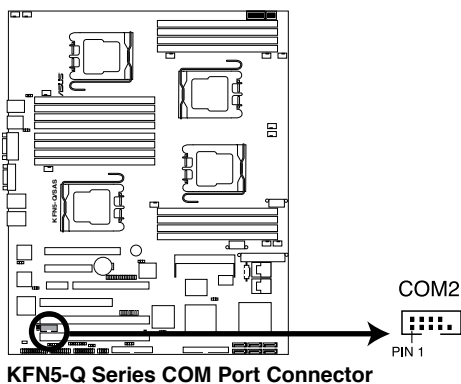
Use of an SSI 12 V Specification 2.0-compliant power supply unit (PSU) that provides a minimum power of 800 W is recommended for a fully-configured system. Do not forget to connect the two 8-pin ATX +12 V power plug; otherwise, the system will not boot up.

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. You must install a PSU with a higher power rating if you intend to install additional devices.



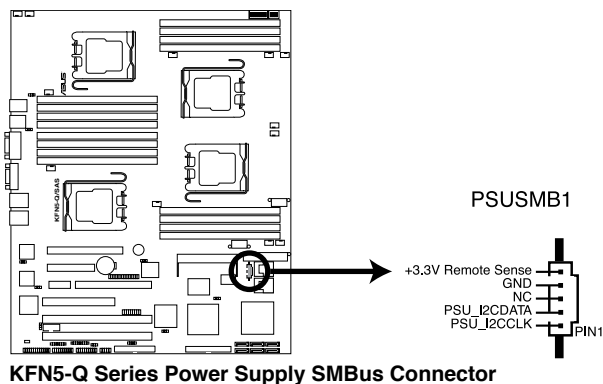
11. Serial port connector (10-1 pin COM2)

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.



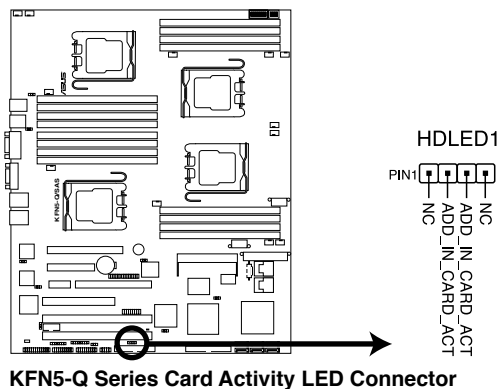
12. Power supply SMBus connector (5-pin PSUSMB1)

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..



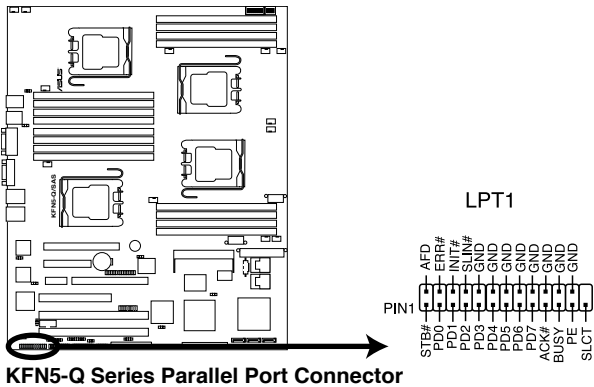
13. Hard disk activity LED connector (4-pin HDLED1)

This connector is used to connect to a hard disk drive active LED connector on the SCSI or RAID card.



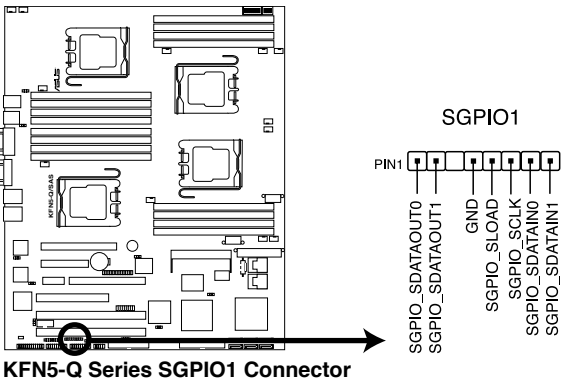
14. Parallel port connector (26-1 pin LPT1)

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.



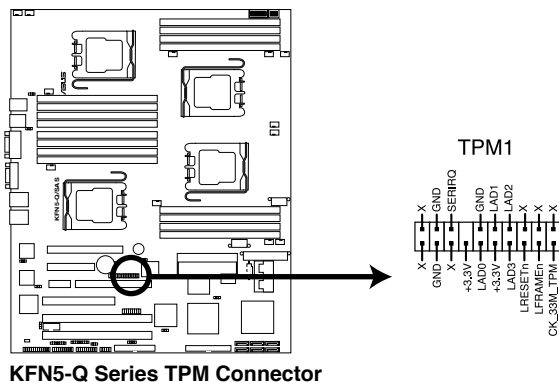
15. Serial General Purpose Input/Output connector (8-1 pin SGPIO1)

This connector is used for the SGPIO peripherals for the NVIDIA Media Shield RAID SATA LED.



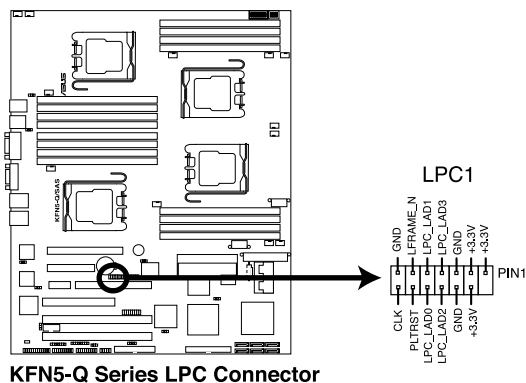
16. TPM connector (20-1 pin TPM)

This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.



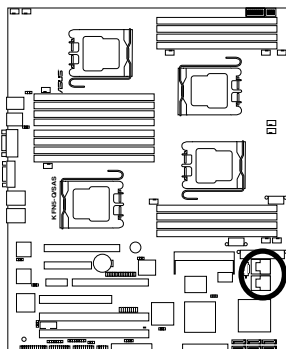
17. LPC debug card connector.(14-1 pin LPC1)

This is a low pin count interface used to plug in the LPC debug card.



18. Mini-SAS connectors (KFN5-Q/SAS model only)

This motherboard comes with two Serial Attached SCSI (SAS) connectors, the next generation storage technology that supports both Serial Attached SCSI and Serial ATA. Each connector supports up to four (4) devices.

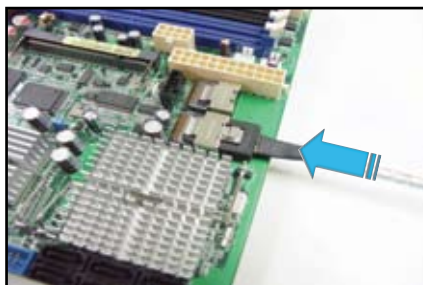


KFN5-Q/SAS Mini SAS connectors

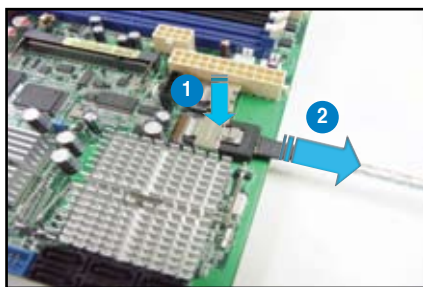
To connect the SAS cable:

Plug the SAS cable to the mini-SAS connector until the cable lock snaps in place.

To disconnect the SAS cable:



1. With your thumb, push down the cable lock to release.
2. While still keeping your thumb's grip on the cable lock, carefully pull away the cable from the connector.



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

Powering up 3

Chapter summary

3

3.1	Starting up for the first time	3-1
3.2	Powering off the computer.....	3-2

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-Test (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.

AMI BIOS beep codes

Beep Description	Error
One beep	Keyboard controller error Refresh Time error No master drive detected
Two continuous beeps followed by two short beeps	Floppy controller failure
Two continuous beeps followed by four short beeps	Hardware component failure

7. At power on, hold down the <Delete> 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:

1. Click the **Start** button then click **Shut Down...**
2. Make sure that the **Shut Down** option button is selected, then click the **OK** button to shut down the computer.
3. The power supply should turn off after Windows® shuts down.

If you are using Windows® XP:

1. Click the **Start** button then select **Turn Off Computer**.
2. Click the **Turn Off** button to shut down the computer.
3. The power supply should turn off after Windows® shuts down.

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

4.1	Managing and updating your BIOS	4-1
4.2	BIOS setup program.....	4-7
4.3	Main menu.....	4-10
4.4	Advanced menu	4-14
4.5	Server menu.....	4-29
4.6	Security menu.....	4-31
4.7	Boot menu	4-32
4.7	Exit menu.....	4-35

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**.
2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

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 1.1MB 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.

```
A:\>afudos /oOLDBIOS1.rom
```

Main filename 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 /iI8044A00.ROM
```

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

```
A:\>afudos /iI8044A00.ROM
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 ..... 0x008CC00 (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 /i8044A00.ROM
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 **I8044A00.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 "I8044A00.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 "I8044A00.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
- Update the BIOS from an updated BIOS file, 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 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 **Save**.
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 of the firmware hub.

The firmware hub 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 during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

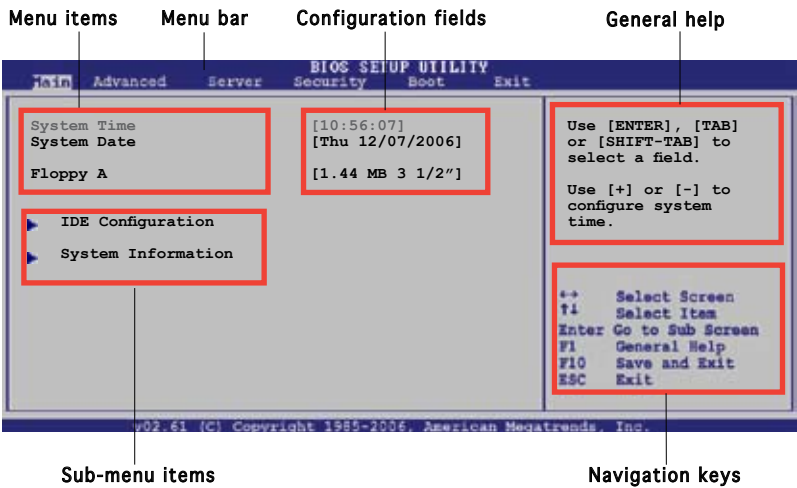
If you wish to enter Setup after POST, restart the system by pressing <Ctrl> + <Alt> + , or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

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 server configuration
- Security** For changing the security settings
- 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.

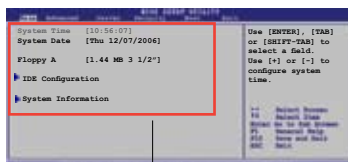


Some of the navigation keys differ from one screen to another.

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 item 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 items on the screen.

4.2.9 General help

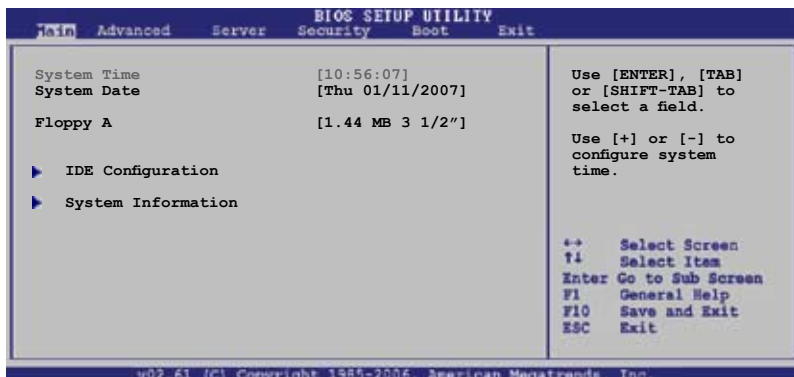
At the top right corner of the menu screen is a brief description of the selected item.

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 Time [xx:xx:xxxx]

Allows you to set the system time.

4.3.2 System Date [Day xx/xx/xxxx]

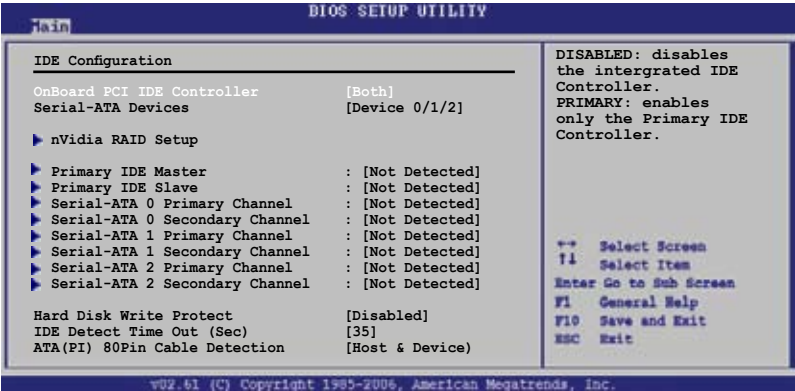
Allows you to set the system date.

4.3.3 Floppy A [1.44 MB, 3 1/2"]

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 [Enabled]

Enables or disables primary IDE controllers.
Configuration options: [Disabled] [Enabled]

Serial-ATA Devices [Device 0/1/2]

Enables or disables the SATA0/1/2 IDE interfaces.
Configuration options: [Disabled] [Device 0] [Device 0/1] [Device 0/1/2]

nVidia RAID Setup

This menu enables you to enable or disable RAID mode for each ATA channhels while entering setup.



nVidia RAID Function [Disabled]

Enables or disables the nVidia RAID function.
Configuration options: [Disabled] [Enabled]



The following items appear when the nVidia RAID function is set to Enabled.

SATA 0 Primary Channel [Disabled]

SATA 0 Secondary Channel [Disabled]

SATA 1 Primary Channel [Disabled]

SATA 1 Secondary Channel [Disabled]

SATA 2 Primary Channel [Disabled]

SATA 2 Secondary Channel [Disabled]

Sets the Serial ATA Channel as RAID mode. Configuration options:
[Enabled] [Disabled]



For nVidia SATA RAID configuration, refer to 5.2 NVIDIA® RAID configurations.

Primary IDE Master/Slave, Serial-ATA 0/1/2 Primary and Secondary Channels

Auto detects the presence of IDE devices.

Hard Disk Write Protect [Disabled]

Enables or disables the hard disk write protection. This will be effective only if device is accessed through BIOS.

Configuration options: [Disabled] [Enabled]

IDE Detect Time Out [35]

Selects the time out value for detecting ATA/ATAPI devices.

Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

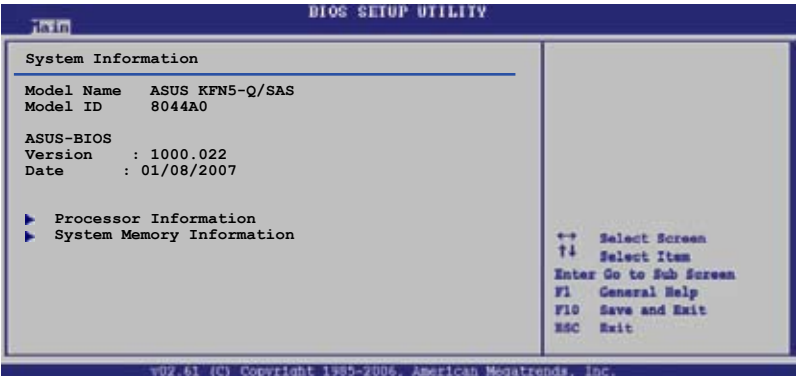
ATA(PI) 80Pin Cable Detection [Host]

Selects the mechanism for detecting 80Pin ATA(PI) Cable.

Configuration options: [Host & Device] [Host] [Device]

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.



Model Name

Displays the model name.

Model ID

Displays the model id.

ASUS-BIOS Version/Date

Displays the ASUS-BIOS version number and date of creation.

Processor Information

Displays information about the processors.

System Memory Information

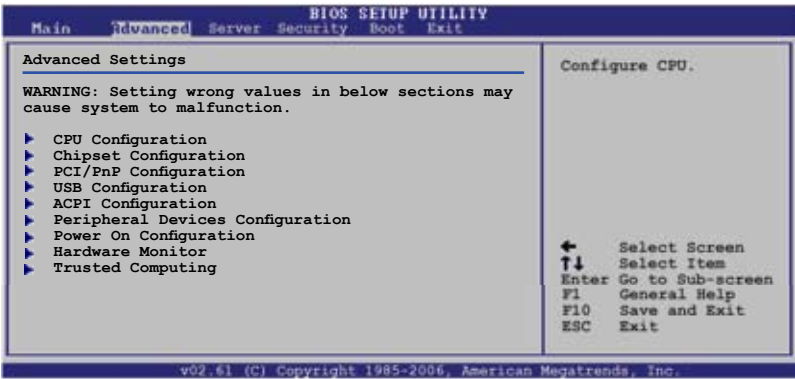
Displays information about the memory configurations of each processor.

4.4 Advanced menu

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

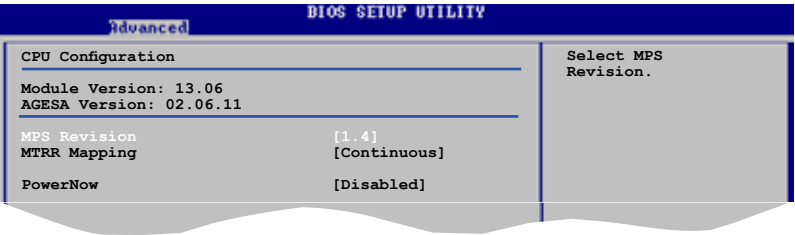


Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.



4.4.1 CPU Configuration

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



MPS Revision [1.4]

Allows you to select MPS revision.
Configuration options: [1.1] [1.4]

MTRR Mapping [Continuous]

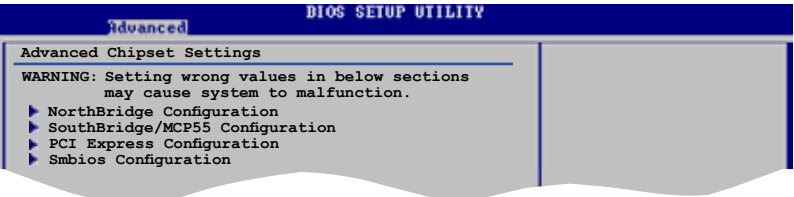
Sets the method used for programming CPU MTRRs when 4GB or more memory is installed on the system. When set to Discrete, the BIOS leaves the PCI hole below the 4GB boundary undescribed. Set to Continuous to describe the PCI hole as non-cacheable.
Configuration options: [Continuous] [Discrete]

PowerNow [Disabled]

Enables or disables generation of the ACPI_PPC, _PSS, and _PCT objects.
Configuration options: [Disabled] [Enabled]

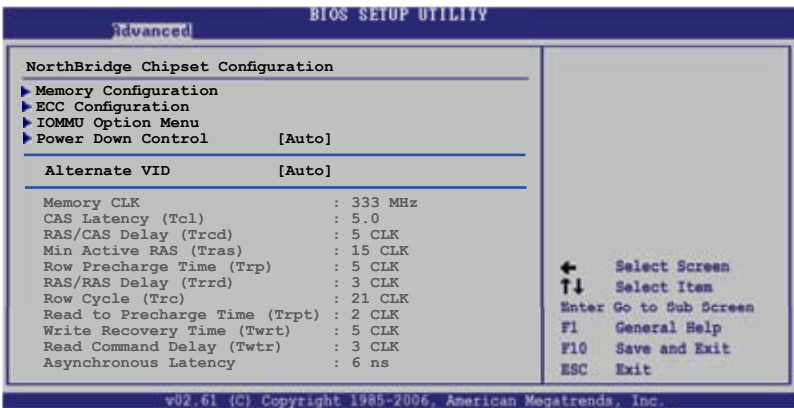
4.4.2 Chipset

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



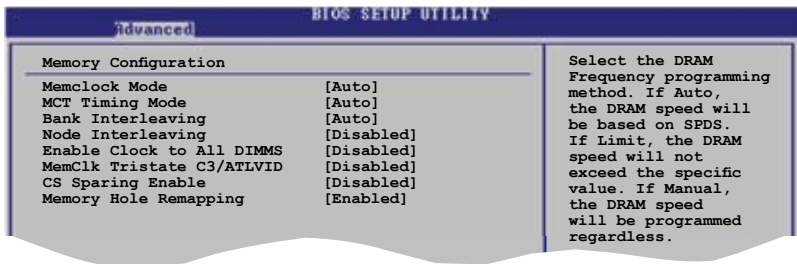
NorthBridge Configuration

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



Memory Configuration

The memory configuration menu allows you to change the memory settings.



Memclock Mode [Auto]

Sets the memory clock mode.

Configuration options: [Auto] [Limit] [Manual]



The following item appears when the Memclock Mode is set to Limit or Manual.

Memclock Value [200 MHz]

Sets the memory clock mode limit.

Configuration options: [200 MHz] [266 MHz] [333 MHz]

MCT Timing Mode [Auto]

Sets the MCT Timing Mode. Configuration options: [Auto] [Limit]

Bank Interleaving [Auto]

Allows you to enable the bank memory interleaving.

Configuration options: [Disabled] [Auto]

Node Interleaving [Disabled]

Allows you to enable the node memory interleaving.

Configuration options: [Disabled] [Auto]

Enable Clock to All DIMMs [Disabled]

Configuration options: [Disabled] [Enabled]

MemClk Tristate C3/ATLVID [Disabled]

Configuration options: [Disabled] [Enabled]

CS Sparing Enable [Disabled]

Configuration options: [Disabled] [Enabled]

Memory Hole Remapping [Enabled]

Enables or disables the memory remapping around memory hole.

Configuration options: [Disabled] [Enabled]

ECC Configuration

The ECC configuration menu allows you to set the ECC options for cache and dram scrubbing.



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]

4-Bit ECC Mode [Disabled]

Enables or disables the 4-Bit ECC feature. This mode is also known as Chipkill ECC mode.

Configuration options: [Disabled] [Enabled]

DRAM SCRUB REDIRECT [Disabled]

Enables or disables the DRAM SCRUB REDIRECT feature that allows the system to correct the DRAM ECC errors immediately when they occur. Configuration options: [Disabled] [Enabled]

DRAM BG SCRUB [Disabled]

Disables or sets the DRAM BG Scrub. Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

L2 Cache BG Scrub [Disabled]

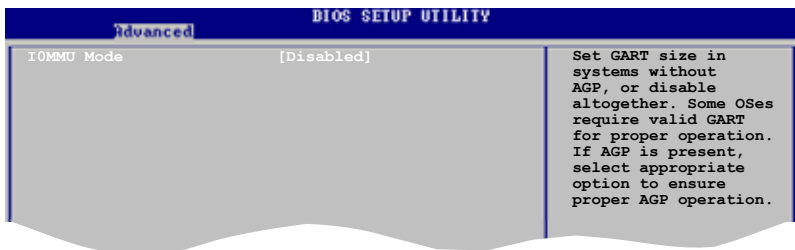
Disables or sets the L2 Cache BG Scrub. This item allows the L2 Data cache RAM to be corrected when idle. Configuration options: [Disabled] [40ns] [80ns] [160ns] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

Data Cache BG Scrub [Disabled]

Disables or sets the Data Cache BG Scrub. This item allows the data cache BG Scrub RAM to be corrected when idle. Configuration options: [Disabled] [40ns] [80ns] [160na] [320ns] [640ns] [1.28us] [2.56us] [5.12us] [10.2us] [20.5us] [41.0us] [81.9us] [163.8us] [327.7us] [655.4us] [1.31ms] [2.62ms] [5.24ms] [10.49ms] [20.97ms] [42.00ms] [84.00ms]

IOMMU Option Menu

IOMMU is supported on LINUX based systems to convert 32-bit IO addresses to 64-bits.



IOMMU Mode [Disabled]

Set GART size in systems without AGP, or disable altogether. Some OSes require valid GART for proper operation. If AGP is present, select appropriate option to ensure proper AGP operation. Configuration options: [AGP Present] [Disabled] [32MB] [64MB] [128MB] [256MB] [512MB] [1GB]

Power Down Control [Auto]

Allows the DIMMs to enter power down mode by deasserting the clock enable signal when DIMMs are not in use. Configuration options: [Auto] [Disabled]

Alternate VID [Auto]

Allows you to specify the alternate VID in low power states. Configuration options: [1.150 V] [1.125 V] [1.100 V] [1.075 V] [1.050 V] [1.025 V] [1.000 V] [0.975 V] [0.900 V] [0.875 V] [0.850 V] [0.825 V] [0.800 V] [Auto]

SouthBridge/MCP55 Chipset Configuration

The SouthBridge Configuration menu allows you to change the SouthBridge settings.



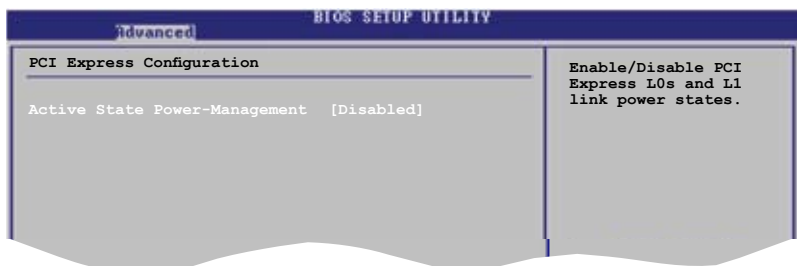
Primary Graphics Adapter [PCI Express -> PCI]

Allows you to select the primary graphics adapter.

Configuration options: [PCI Express -> PCI] [PCI -> PCI Express]

PCI Express Configuration

This menu allows you to configure PCI Express Support.



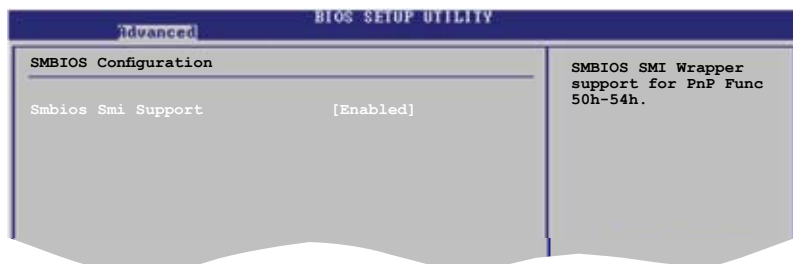
Active State Power-Management [Disabled]

Enables or disables the PCI Express L0s and L1 link power states.

Configuration options: [Disabled] [Enabled]

Smbios Configuration

This menu allows you to configure the SMBIOS.



Smbios Smi Support [Enabled]

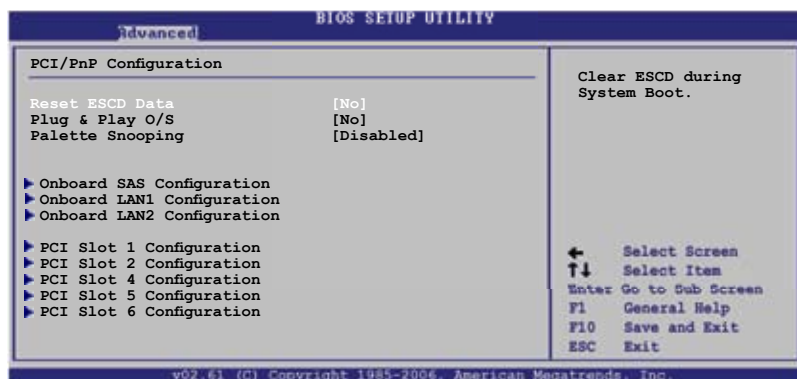
Enables or disables the SMBIOS SMI Wrapper support for PnP Func 50h-54h. Configuration options: [Disabled] [Enabled]

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]

Allows you to clear ESCD during System 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.

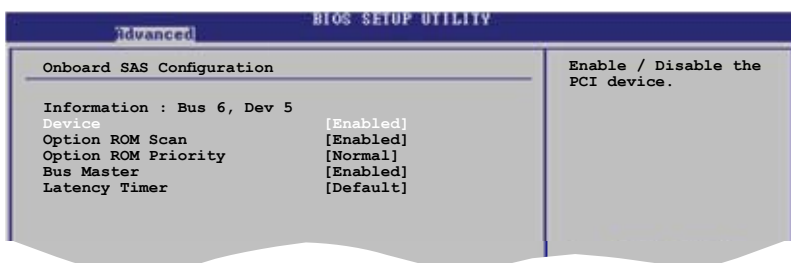
Configuration options: [No] [Yes]

Palette Snooping [Disabled]

When set to [Enabled], the palette 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 SAS/LAN/PCI Slot Configuration

The sub menu allows you to configure the Onboard SAS, LAN, and PCI slots.



Device [Enabled]

Enables or disables the PCI device.

Configuration options: [Disabled] [Enabled]

Option ROM Scan [Enabled]

Enables or disables the initialization of device expansion ROM.

Configuration options: [Disabled] [Enabled]

Option ROM Priority [Normal]

Allows you to set the ROM priority.

Configuration options: [Low] [Normal] [High] [Highest]

Bus Master [Enabled]

Enables or disables the selected device as a PCI bus master.

Configuration options: [Disabled] [Enabled]

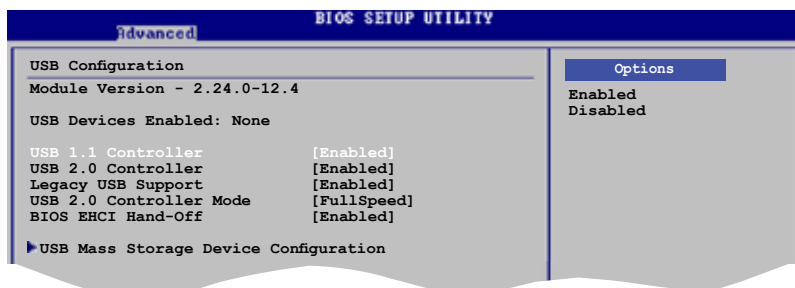
Latency Timer [Default]

Allows you to set the value in units of PCI clocks for PCI device latency timer register.

Configuration options: [Default] [32] [64] [96] [128] [160] [192] [224]

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 1.1 Controller [Enabled]

Enables or disables the USB 1.1 Controller support.

Configuration options: [Enabled] [Disabled]

USB 2.0 Controller [Enabled]

Enables or disables the USB 2.0 Controller support.

Configuration options: [Enabled] [Disabled]

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 [FullSpeed]

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

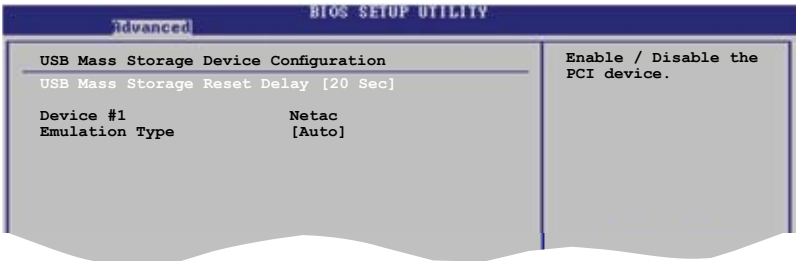
BIOS EHCI Hand-Off [Enabled]

Enables or disables the BIOS EHCI hand-off feature.

Configuration options: [Enabled] [Disabled]

USB Mass Storage Device Configuration

The sub menu allows you to configure the USB Mass Storage Class Devices.



USB Mass Storage Reset Delay [20 Sec]

Number of seconds POST waits for the USB mass storage device after start unit command.

Configuration options: [10 Sec] [20 Sec] [30 Sec] [40 Sec]

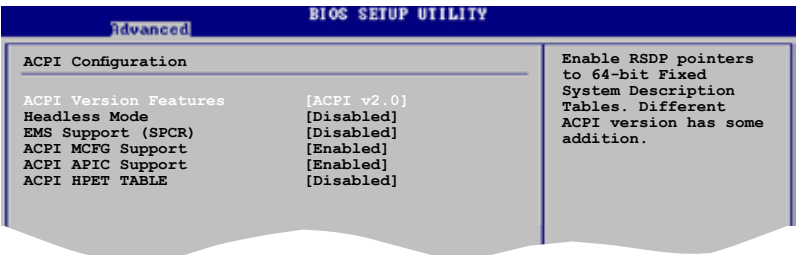
Emulation Type [Auto]

If Auto, USB less than 530MB will be emulated as Floppy and remaining as hard drive. Forced FDD option can be used to force an HDD formatted drive to boot as FDD (ex. ZIP drive).

Configuration options: [Auto] [Floppy] [Forced FDD] [Hard Disk] [CDROM]

4.4.5 ACPI Configuration

This menu shows the Advanced Configuration and Power Interface (ACPI) configuration settings. Select an item then press <Enter> to display the configuration options.



ACPI Version Features [ACPI v2.0]

Allows you to enable RSDP pointers to 64-bit fixed system description tables. Configuration options: [ACPI v1.0] [ACPI v2.0] [ACPI v3.0]

Headless Mode [Disabled]

Allows you to enable or disable the headless operation mode through ACPI.
Configuration options: [Enabled] [Disabled]

EMS Support [Disabled]

Enables or disables EMS support. It includes ACPI SPCR table pointer to RSDT pointer list.
Configuration options: [Disabled] [Enabled]

ACPI MCFG Support [Enabled]

Enables or disables ACPI MCFG table.
Configuration options: [Disabled] [Enabled]

ACPI APIC Support [Enabled]

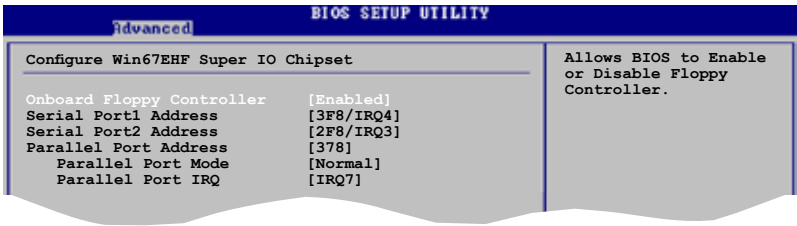
Enables or disables ACPI APIC table. It includes ACPI APIC table pointer to RSDT pointer list.
Configuration options: [Disabled] [Enabled]

ACPI HPET TABLE [Disabled]

Enables or disables High Precision Event Timer.
Configuration options: [Disabled] [Enabled]

4.4.6 Peripheral Devices Configuration

This menu shows the peripheral devices configuration settings. Select an item then press <Enter> to display the configuration options.



Onboard Floppy Controller [Enabled]

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

Serial Port1 Address [3F8/IRQ4]

Allows you to configure Serial Port1 Base Addresses.
Configuration options: [Disabled] [3F8/IRQ4] [3E8/IRQ4] [2E8/IRQ3]

Serial Port2 Address [2F8/IRQ3]

Allows you to configure Serial Port2 Base Addresses.
Configuration options: [Disabled] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

Parallel Port Address [378]

Allows you to configure parallel port base addresses.
Configuration options: [Disabled] [378] [278] [3BC]



The following items appear when Parallel Port is enabled.

Parallel Port Mode [Normal]

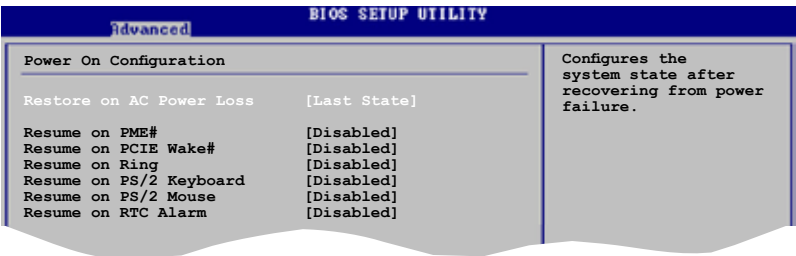
Allows BIOS to select the Parallel Port Mode. Configuration options: [Normal] [Bi-Directional] [ECP] [EPP] [ECP & EPP]

Parallel Port IRQ [IRQ7]

Allows BIOS to select the Parallel Port IRQ. Configuration options: [IRQ5] [IRQ7]

4.4.7 Power On Configuration

This menu shows the power configuration settings. Select an item then press <Enter> to display the configuration options.



Restore on AC Power Loss [Last State]

When set to [Power Off], the system goes into “off state” after an AC power interruption. When set to [Power On], the system turns on automatically after a power interruption. When set to [Last State], the system goes into whatever was the system state (on or off) before the power interruption.

Configuration options: [Power Off] [Power On] [Last State]

Resume On 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 On PCIE Wake# [Disabled]

Enables or disables the PCI-E and PCI-X to generate a wake-up event.

Configuration options: [Disabled] [Enabled]

Resume On Ring [Disabled]

Allows you to enable or disable the RI to generate a wake event.

Configuration options: [Disabled] [Enabled]

Resume On PS/2 Keyboard [Disabled]

Allows you to disable or enable the PS/2 Power-On by keyboard feature.

This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Resume On 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 On RTC Alarm [Disabled]

Enables or disables the RTC event to wake-up after a power failure.

Configuration options: [Disabled] [Enabled]



The following items appear when Resume to RTC Alarm is set to Enabled.

RTC Alarm Date [15]

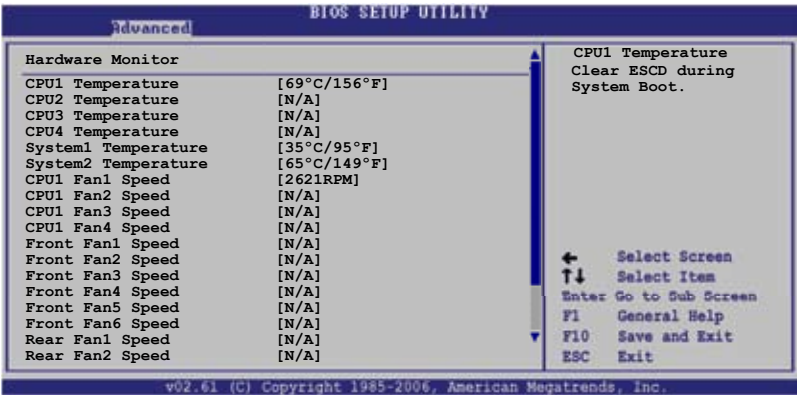
To set the alarm date, select this item and press the <+> or <-> key.

Configuration options: [Everyday] [1] [2] [3]... [31]

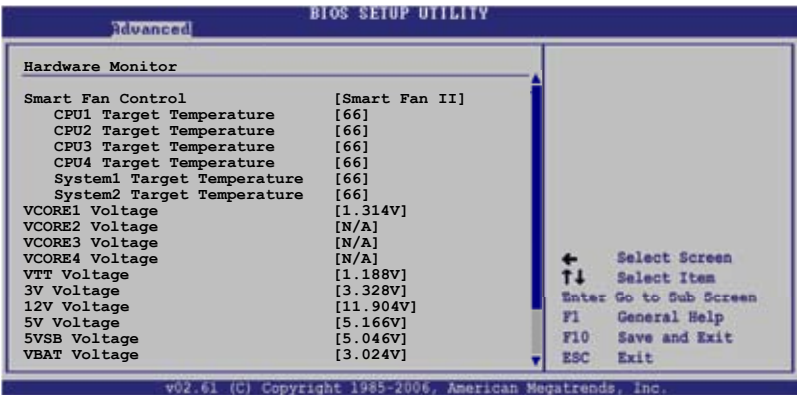
System Time [12:30:30]

To set the alarm time, select this item and press the <+> or <-> key.

4.4.8 Hardware Monitor



Use the arrow down key to display additional items.



CPU1/CPU2/CPU3/CPU4 Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the CPU temperatures. Select [Ignored] if you do not wish to display the detected temperatures.

System 1/2 Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the systems' temperatures. Select [Ignored] if you do not wish to display the detected temperatures.

CPU Fan 1/2/3/4 Speed [xxxxRPM] or [Ignored]
Front Fan 1/2/3/4/5/6 Speed [xxxxRPM] or [Ignored]
Rear Fan 1/2 Speed [xxxxRPM] or [Ignored]

The onboard hardware monitor automatically detects and displays the CPU, front, and rear fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows N/A. Select [Ignored] if you do not wish to display the detected temperatures.

Smart Fan Control [Smart Fan II]

Allows you to enable or disable the Smart Fan feature.
Configuration options: [Disabled] [Smart Fan] [Smart Fan II]



The **CPU Target Temperature** and **System Target Temperature** items appear when you enabled the Smart Fan Control feature.

CPU 1/2/3/4 Target Temperature [66]
System 1/2 Target Temperature [66]

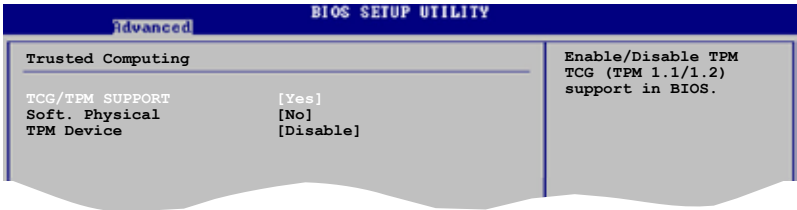
Allows you to set the CPU and system threshold temperature before the Smart Fan Control is disabled. Configuration options: [50] [52] [54] [56] [58] [60] [62] [64] [66] [68] [70] [72] [74] [76] [78] [80]

VCORE1 Voltage, VCORE2 Voltage, VCORE3 Voltage, VCORE4 Voltage, VTT Voltage, 3V Voltage, 12V Voltage, 5V Voltage, 5VSB Voltage, VBAT Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.

4.4.9 Trusted Computing

The menu items allow you to configure Trusted Computing settings.



TCG/TPM SUPPORT [Yes]

Enables or disables the TPM TCG (TPM 1.1/1.2) support in BIOS.
Configuration options: [No] [Yes]

Soft. Physical [No]

Enables or disables the software indication of physical presence.

Configuration options: [No] [Yes]

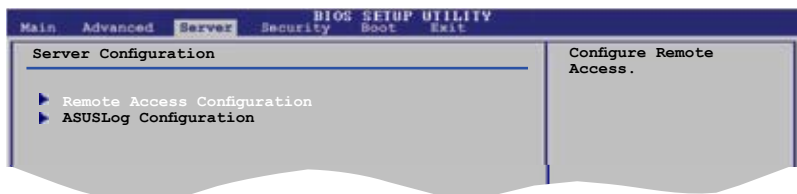
Full Screen Logo [Disable]

Enables or disables the TPM device.

Configuration options: [Disable] [Enable]

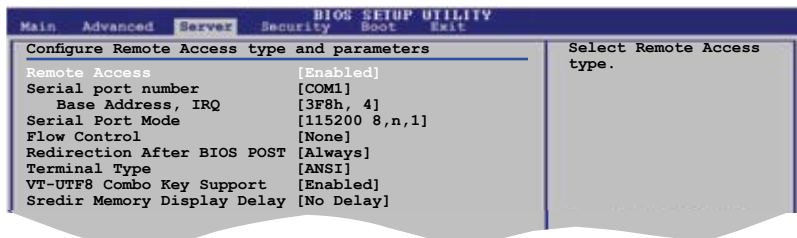
4.5 Server menu

The Server menu items allow you to customize the server features.



4.5.1 Remote Access Configuration

The menu items allow you to configure the Remote Access types and parameters.



When enabled, the following Remote Access types and parameters appear.

Serial port number [COM1]

Allows you to select the serial port for console redirection.

Configuration options: [COM1] [COM2]

Base Address, IRQ [3F8h, 4]

Displays the base address.

Serial Port Mode [115200 8,n,1]

Allows you to select the serial port settings.

Configuration options: [115200 8,n,1] [57600 8,n,1] [38400 8,n,1]
[19200 8,n,1] [9600 8,n,1]

Flow Control [None]

Allows you to select the flow control for console redirection.

Configuration options: [None] [Hardware] [Software]

Redirection After BIOS POST [Disabled]

Allows you to set redirection during or after BIOS POST.

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]

Disables or enables the VT-UTF8 Combination Key Support for ANSI/VT100 terminals. Configuration options: [Disabled] [Enabled]

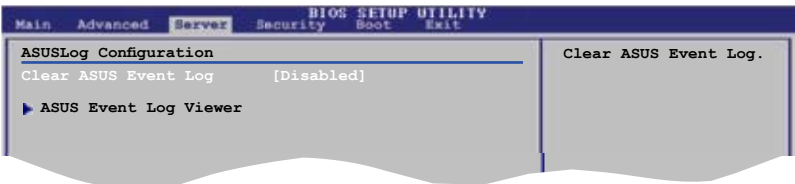
Sredir Memory Display Delay [No Delay]

Allows you to select the delay time (in seconds) to display memory information.

Configuration options: [No Delay] [Delay 1 sec] [Delay 2 sec] [Delay 4 sec]

4.5.2 ASUSLog Configuration

The menu items allow you to configure the ASUS event logs.

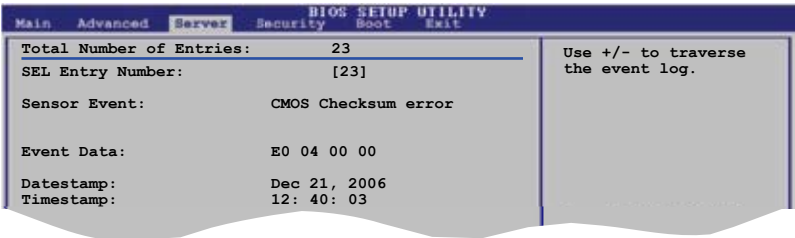


Clear ASUS Event Log [Disabled]

Allows you to enable or disable the Clear ASUS Event Log.
Configuration options: [Disabled] [Enabled]

ASUS Event Log Viewer

This menu allows you to view all events in the ASUS Event Log. It will take a maximum of 15 seconds to read all ASUS Event Log records.



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

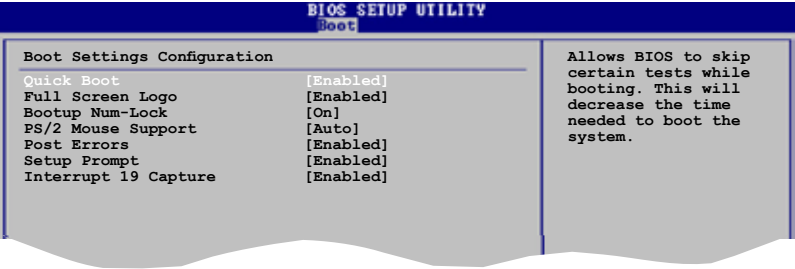
After you have set a supervisor password, the other items appear to allow you to change other security settings.

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 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 Screen Logo [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.

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]

Post Errors [Enabled]

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

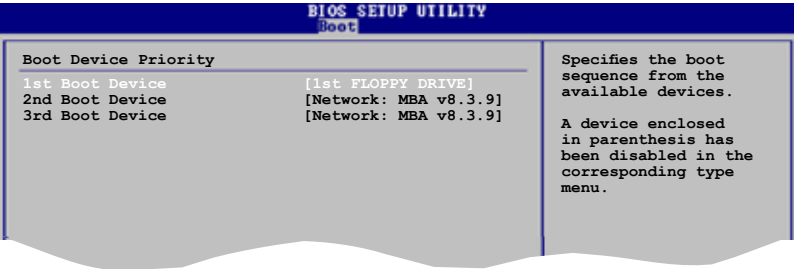
Setup Prompt [Enabled]

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

Interrupt 19 Capture [Enabled]

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

4.7.2 Boot Device Priority

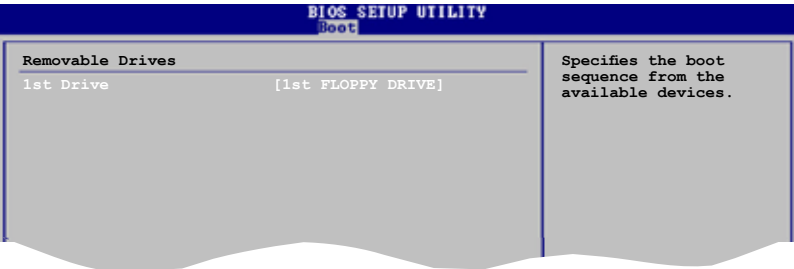


1st ~ xxth Boot Device [1st Floppy Drive]

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]

4.7.3 Hard Disk/Removable/CD/DVD Drives

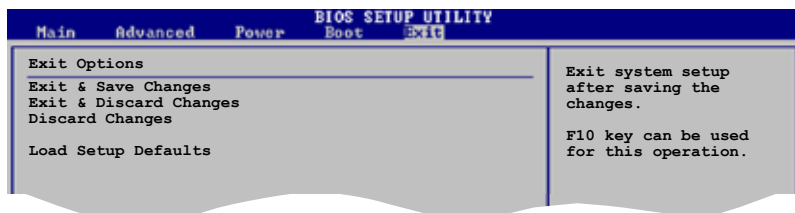


1st Drive [1st FLOPPY DRIVE]

This specifies the boot device priority sequence from the available hard disk, removable, or CD/DVD drives in each drive menu. Configuration options: [1st FLOPPY DRIVE] [Disabled]

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.

Exit & Save Changes

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.

Exit & Discard Changes

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 **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.

This chapter provides information on RAID configurations for this motherboard.

RAID support 5

Chapter summary

5

5.1	Setting up RAID	5-1
5.2	NVIDIA® RAID configurations	5-3
5.3	LSI Logic MPT Setup Utility	5-4

5.1 Setting up RAID

The NVIDIA® nForce chipset comes with a built-in SATA RAID controller that allows you to configure RAID 0, RAID 1, RAID 0+1, JBOD and RAID 5 with SATA hard disk drives.

LSI SAS 1068 PCI-X eight-port, 3.0 Gbit/s SAS/SATA controller supports eight additional SAS/SATA hard drives that allows you to create the Integrated Mirror (RAID 1), Integrated Striping (RAID 0), and Integrated Mirrored Enhanced (RAID IE) configurations.

5.1.1 RAID definitions

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.

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 0+1 is *data striping* and *data mirroring* combined without parity (redundancy data) having to be calculated and written. With the RAID 0+1 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

RAID 5 stripes both data and parity information across three or more hard disk drives. Among the advantages of RAID 5 configuration include better HDD performance, fault tolerance, and higher storage capacity. The RAID 5 configuration is best suited for transaction processing, relational database applications, enterprise resource planning, and other business systems. Use a minimum of three identical hard disk drives for this setup.



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 and SAS (KFN5-Q/SAS model only) hard disk drives for RAID set configuration. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SAS hard disks for RAID configuration:

1. Install the SAS 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 SAS hard disks for RAID configuration (KFN5-Q/SAS model only):

1. Install the SAS hard disks into the drive bays following the instructions in the system user guide.
2. Connect the SAS connector at the back of each drive and the 4-pin power connector on the SAS cable.
3. Connect the mini-SAS connector on the motherboard.



Refer to Chapter 5 for details on entering and navigating through the BIOS Setup.

5.1.3 RAID configuration utility

Depending on the RAID connectors that you use, you can create a RAID set using the utilities embedded in each RAID controller. For example, you may use the LSI1068 SAS Configuration Utility if you installed SAS hard disk drives to the mini-SAS connector(s) supported by the LSI1068 PCI-X SAS controller.

Refer to the succeeding sections for details on how to use each RAID configuration utility.

5.2 NVIDIA® RAID configurations

The motherboard includes a high performance SATA RAID controller integrated in the NVIDIA® MCP55 Professional chip. The RAID controller supports RAID 0, RAID 1, RAID 0+1, RAID 5, and JBOD configurations using the six Serial ATA ports.

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 **nVidia 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.

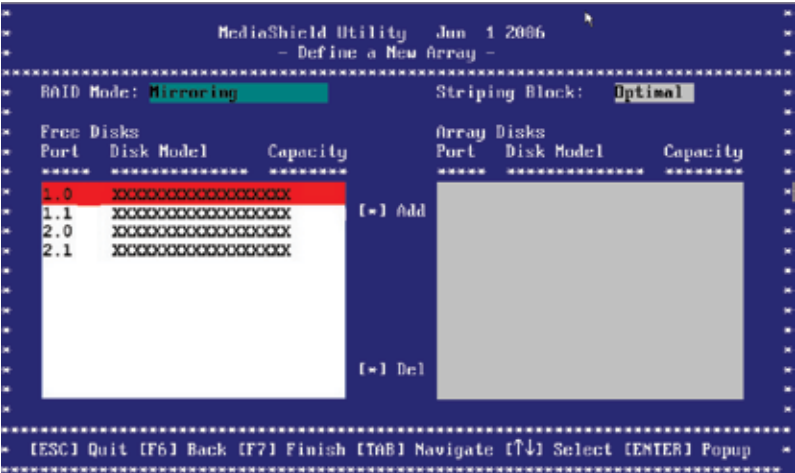


-
- Refer to Chapter 4 for details on entering and navigating through the BIOS Setup.
 - The RAID BIOS setup screens shown in this section are for reference only, and may not exactly match the items on your screen.
-

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.

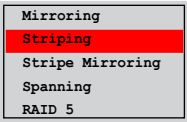


The navigation keys vary depending on the menu level or option.

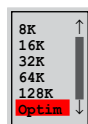
5.2.3 Creating a RAID 0 set (Stripe)

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 128KB. You must choose the stripe size value based on the projected drive usage. For low disk usage, select 8KB/16KB. For typical disk usage, select 64KB. Select 128KB for performance disk usage.

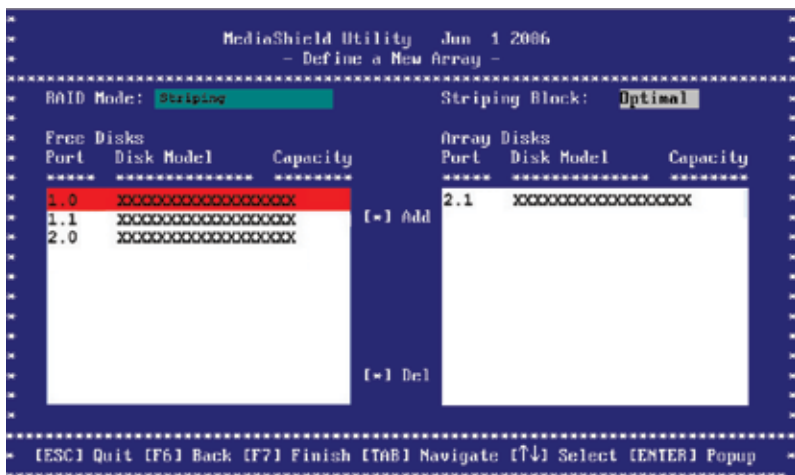


TIP: For server systems, we recommend using a lower array block size. For multimedia computer systems used mainly for audio and video editing, we recommend a higher array block size for optimum performance.

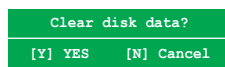
5. Press <TAB> to move to the Free Disks section.
6. Highlight the hard disk drives that you want to add in the RAID set, then press the right arrow key to select. The selected hard disk drives appear in the Array Disks section. Repeat the process until all desired hard disk drives are added.



RAID0 requires a single to multiple hard disks.



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

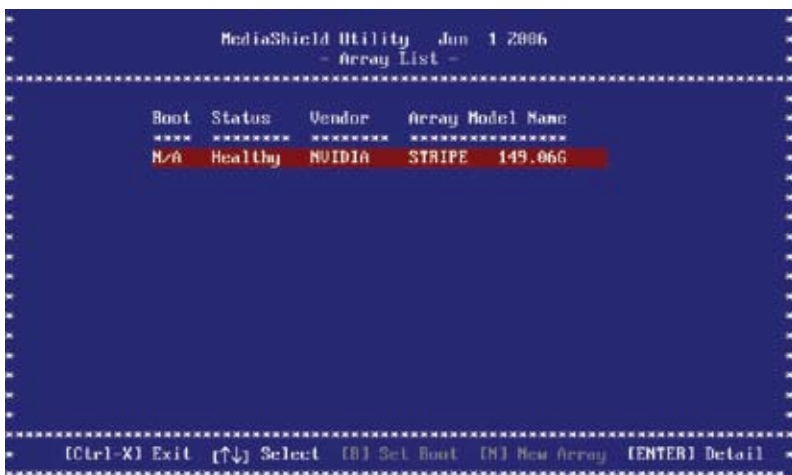


- Press <Y> to delete all data from the hard disk drives, or <N> to continue creating the RAID set without deleting the data on the disks.



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

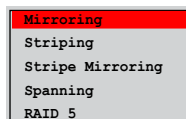
- The utility displays the created RAID 0 set. Press <Ctrl> + <X> to save your settings and exit the utility.



5.2.4 Creating a RAID 1 set (Mirror)

To create a RAID 1 set:

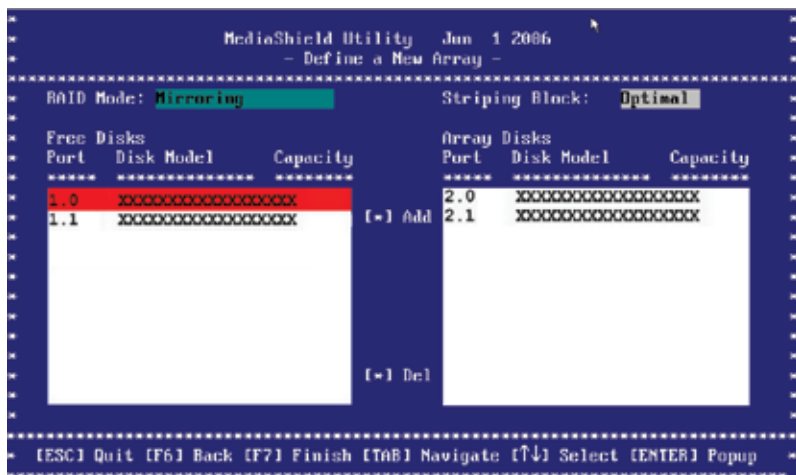
- From the Define a New Array menu, select **RAID Mode**, then press <Enter>. A pop-up menu appears.
- Use the up or down arrow keys to select **Mirroring**, then press <Enter>.



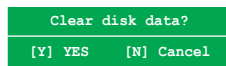
- Press <TAB> to move to the Free Disks section.
- Highlight the hard disk drives that you want to add in the RAID set, then press the right arrow key to select. The selected hard disk drives appear in the Array Disks section. Repeat the process until all desired hard disk drives are added.



RAID 1 requests for two hard disks.



- After selecting the hard disk drives, press <F7> to create the RAID 1 set. A pop-up window appears.
- Press <Y> to delete all data from the hard disk drives and continue creating the RAID set. Press <N> to backup existing data to a target hard disk drive.



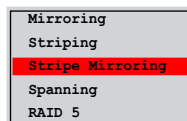
You will lose all data on the drives if you clear the disk data!

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

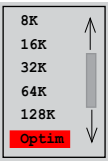
5.2.5 Creating a RAID 10 set (Stripe Mirroring)

To create a RAID 10 set:

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



3. Press <TAB> to move to the Striping Block option, then press <Enter>.

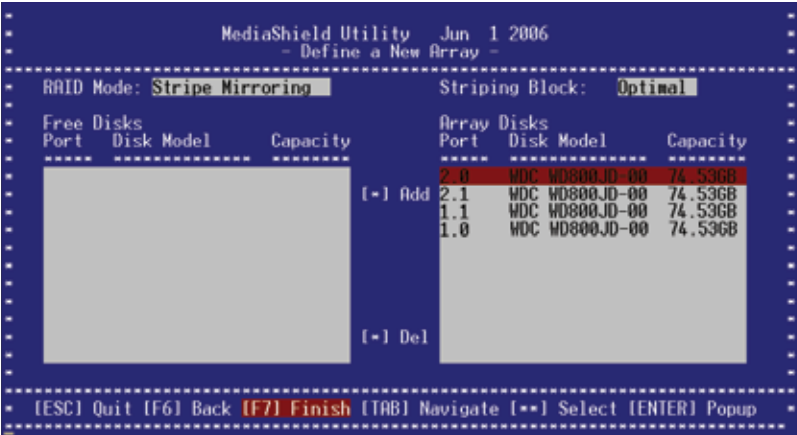


4. Use the up or down arrow keys to select the stripe block size appropriate to your drive usage, then press <Enter>.
- The available stripe size values range from 8KB to 128KB. The default stripe size is Optimal. You must choose the stripe size value based on the projected drive usage. For low disk usage, select 8KB/16KB. For typical disk usage, select 64KB. Select 128KB for performance disk usage.

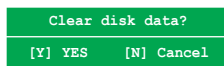


For server systems, we recommend using a lower array block size. For multimedia computer systems used mainly for audio and video editing, we recommend a higher array block size for optimum performance.

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. The Stripe Mirroring (RAID 10) requires four hard disk drives.



- After selecting the hard disk drives, press <F7> to create the RAID 10 set. A pop-up window appears.
- Press <Y> to delete all data from the hard disk drives and continue creating the RAID set.



You will lose all data in the drives if you clear the disk data.

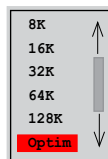
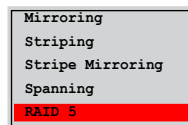
- The utility displays the created RAID10 set. Press <Ctrl> + <X> to save your settings and exit the utility.



5.2.6 Creating a RAID 5 set (Stripe)

To create a RAID 5 set:

- From the Define a New Array menu, select **RAID Mode**, then press <Enter>. A pop-up menu appears.
- Use the up or down arrow keys to select **RAID5**, then press <Enter>.
- 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 Optimal. You must choose the stripe size value based on the projected drive usage. For low disk usage, select 8KB/16KB. For typical disk usage, select 64KB. Select 128KB for performance disk usage.



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. RAID 5 requires three to six hard disk drives.

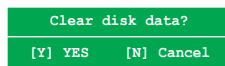
```
MediaShield Utility   Jun  1 2006
- Define a New Array -

RAID Mode: RAID 5           Striping Block: Optimal

Free Disks              Array Disks
Port  Disk Model         Capacity  Port  Disk Model         Capacity
-----
[+] Add
[+] Del

[ESC] Quit [F6] Back [F7] Finish [TAB] Navigate [++] Select [ENTER] Popup
```

7. After selecting the hard disk drives, press <F7> to create the RAID 5 set. A pop-up window appears.
8. Press <Y> to delete all data from the hard disk drives and continue creating the RAID set.



You will lose all data in the drives if you clear the disk data.

9. The utility displays the created RAID5 set. Press <Ctrl> + <X> to save your settings and exit the utility.

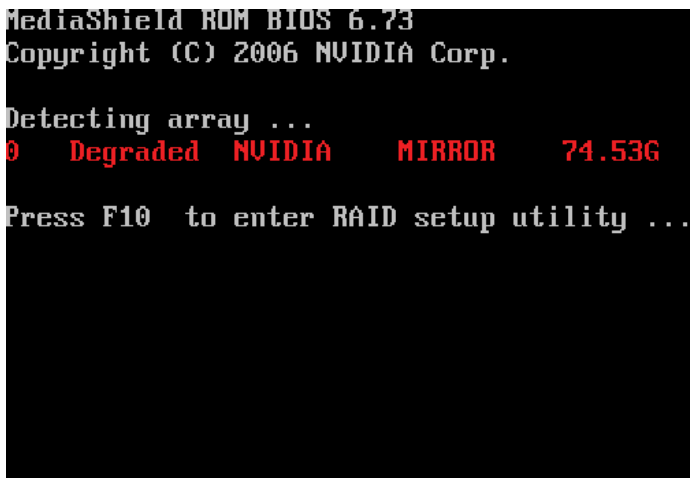


5.2.5 Rebuilding a RAID set

Rebuilding function only applies to RAID1 (Mirroring), RAID0+1 (Stripe Mirroring), or RAID5 Arrays. This function does not apply to RAID0 (Striping) or JBOD (Spanning).

To rebuild a RAID set:

1. If the BIOS detects that one hard disk failed, and causes RAID1, RAID0+1 or RAID5 to be degraded, press the <F10> hot key to enter the NVIDIA® nForce MediaShield utility.



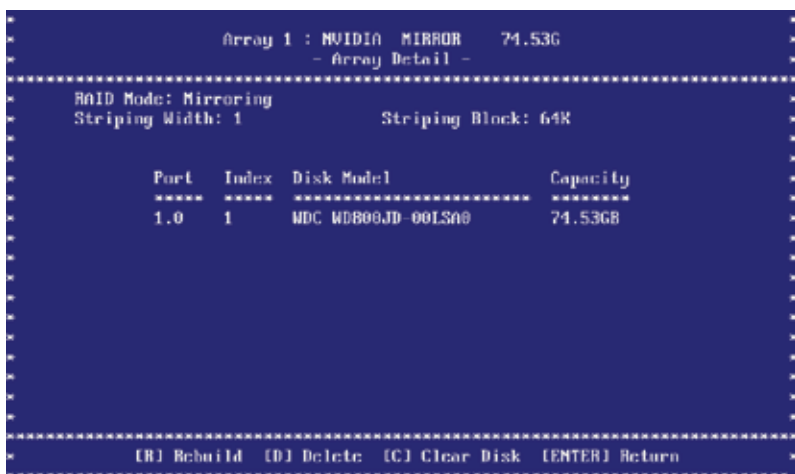
```
MediaShield ROM BIOS 6.73
Copyright (C) 2006 NVIDIA Corp.

Detecting array ...
0  Degraded  NVIDIA  MIRROR  74.53G

Press F10  to enter RAID setup utility ...
```

2. 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.

3. Then, press <R> under the [Array Detail] menu.



4. Use the up or down arrow keys to select the free disk you want to join with RAID1, then press <A> to add it. A confirmation message appears.



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

Rebuild array?	
[Enter] OK	[Esc] Cancel

MediaShield Utility Jun 1 2006				
- Array List -				
Boot	Status	Vendor	Array Model Name	
N/A	Rebuild	NVIDIA	MIRROR	74.53G
[Ctrl-X] Exit [++] Select [B] Set Boot [N] New Array [ENTER] Detail				

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.

Array 6 : NVIDIA_MIRROR 74.53G			
- Array Detail -			
RAID Mode: Mirroring		Striping Block: 64K	
Striping Width: 1			
Port	Index	Disk Model	Capacity
3.0	0	ST380013AS	74.53GB
3.1	1	ST380013AS	74.53GB
[R] Rebuild [D] Delete [C] Clear Disk [ENTER] Return			

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.

Delete this array?
[Y] Yes [N] Cancel



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

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.

Array 6 : NVIDIA MIRROR 74.53G			
- Array Detail -			
RAID Mode: Mirroring		Striping Block: 64K	
Striping Width: 1			
Port	Index	Disk Model	Capacity
3.0	0	ST380013AS	74.53GB
3.1	1	ST380013AS	74.53GB
[R] Rebuild [D] Delete [C] Clear Disk [ENTER] Return			

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.

Clear disk data?	
[Y] Yes	[N] Cancel



For RAID0, clearing one member disk would erase all data in the array.

5.3 LSI Logic MPT Setup Utility

(For KFN5-Q/SAS only)

The **LSI Logic MPT Setup Utility** is an integrated RAID solution that allows you to create the following RAID set(s) from SAS hard disk drives supported by the LSI1068 PCI-X SAS controller:

- RAID 1 (Integrated Mirroring)
- RAID 1E (Integrated Mirroring Enhanced)
- RAID 0 (Integrated Stripping)

5.3.1 Integrated Mirroring

Overview

The Integrated Mirroring (IM) feature supports simultaneous mirrored volumes with two disks (IM). Integrated Mirroring Enhanced (IME) supports three to eight disks, or seven mirrored disks plus a hot spare disk.

The IM feature supports hot swap capability. When a disk in an IM volume fails, you can easily restore the volume, and the swapped disk is automatically re-mirrored.

Creating Integrated Mirroring Volumes



- You may use disks of different sizes in IM and IME volumes; however, the size of the smallest disk determines the “logical” size of each member disk.
- Do not combine Serial ATA and SAS disks in one volume.
- The RAID and BIOS setup screens shown in these sections are for reference only and may not exactly match the items on your screen.

To create an IM volume

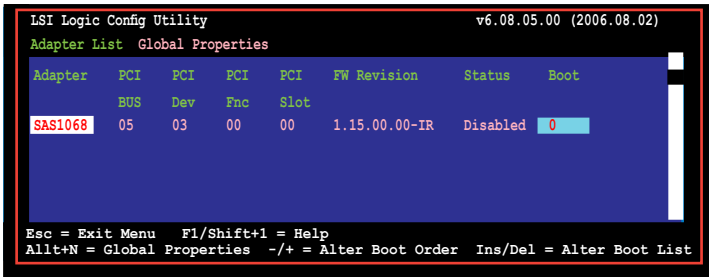
1. Turn on the system after installing all SAS hard disk drives.
2. During POST, press **<Ctrl+C>** to enter the SAS configuration utility.

```
LSI Logic Corp MPT SAS BIOS
MPTBIOS-6.08.05.00 (2006.08.02)
Copyright 2000-2006 LSI Logic Corp

Adapter(s) disabled by user

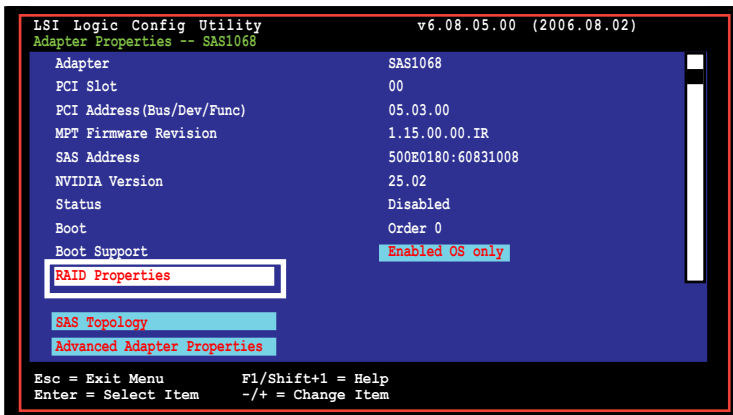
Press Ctrl+C to start LSI Logic Configuration Utility...
```


- The following screen appears. Select a channel and press <Enter> to enter the setup.

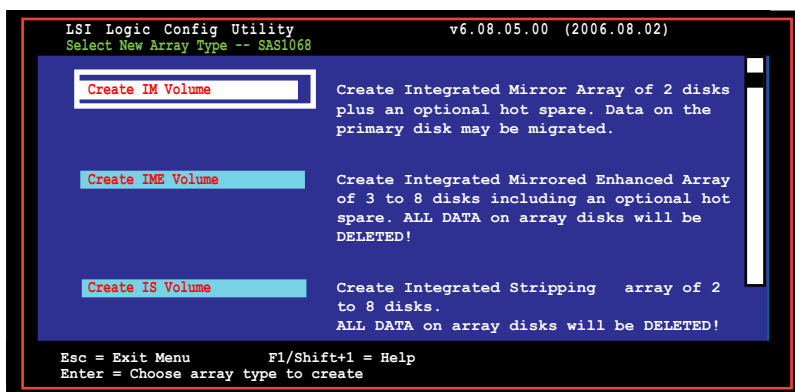


The numbers of the channel depend on the controller.

- The **Adapter Properties** screen appears.
Use the arrow keys to select **RAID Properties**, then press <Enter>.

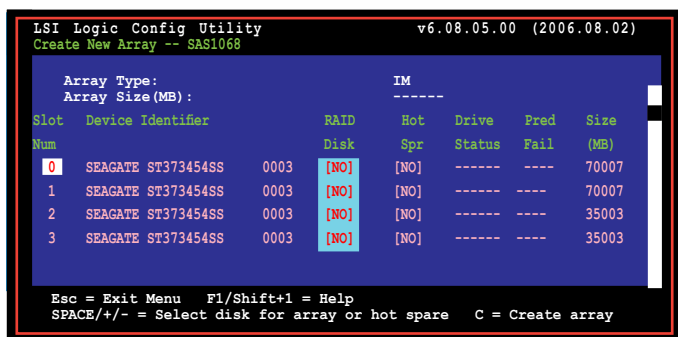


- The **Select New Array Type** screen appears.
Use the arrow keys to select **Create IM Volume**, then press <Enter>.



6. The Create New Array screen shows the disks you can add to make up the IM volume. Use the arrow key to select a disk, then move the cursor to the RAID Disk column. To include this disk in the array, press <+>, <->, or <Space>.

You may also specify the Hot Spare disk here. Select the disk, then move the cursor to the Hot Spr column, then press <+>, <->, or <Space>.



By default, the RAID Disk field shows No before array creation. This field is grayed out under the following conditions:

- The disk does not meet the minimum requirements for use in a RAID array.
- The disk is not large enough to mirror existing data on the primary drive.
- The disk has been selected as the Hot Spare for the RAID array.
- The disk is already part of another array.

7. A confirmation screen appears.

Press <M> to keep existing data on the first disk. If you choose this option, data on the first disk will be mirrored on the second disk that you will add to the volume later. Make sure the data you want to mirror is on the first disk.

Press <D> to overwrite any data and create the new IM array.

```
LSI Logic Config Utility                                v6.08.05.00 (2006.08.02)
Create New Array Type -- SAS1068

  M  -  Keep existing data, migrate to an IM array.
        Synchronization of disk will occur.

  D  -  Overwrite existing data, create a new IM array.
        ALL DATA on ALL disk in the array will be DELETED!!
        No Synchronization performed.

Esc = Exit Menu    F1/Shift+1 = Help
SPACE/+/- = Select disk for array or hot spare    C = Create array
```

8. Repeat steps 5 and 6 to add the second disk to the volume.
9. When done, press <C> to create the array, then select **Save changes then exit this menu** then exit this menu.

```
Create and save new array?
Cancel Exit
Save changes then exit this menu
Discard changes then exit this menu
Exit the Configuration Utility and Reboot
```

10. The utility creates the array.

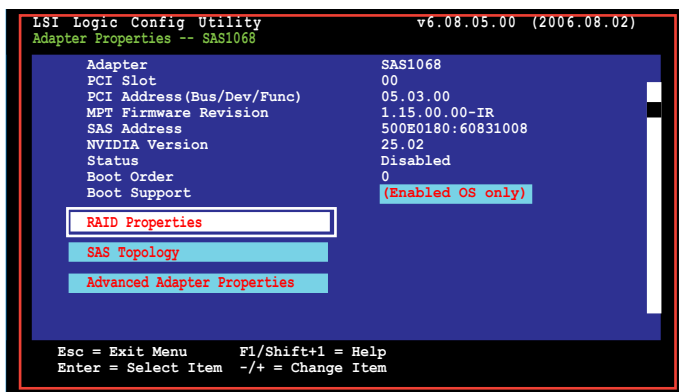
```
LSI Logic Config Utility                                v6.08.05.00 (2006.08.02)

Processing...may take up 1 minute
Creating RAID array
```

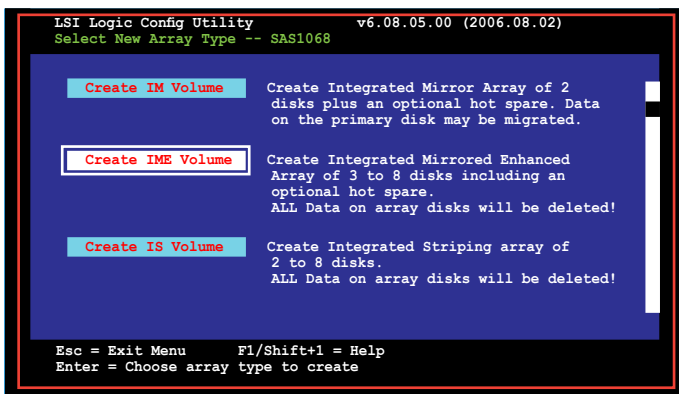
5.3.2 Integrated Mirroring Enhanced

To create an IME volume:

1. The **Adapter Properties** screen appears.
Use the arrow keys to select **RAID Properties**, then press <Enter>.



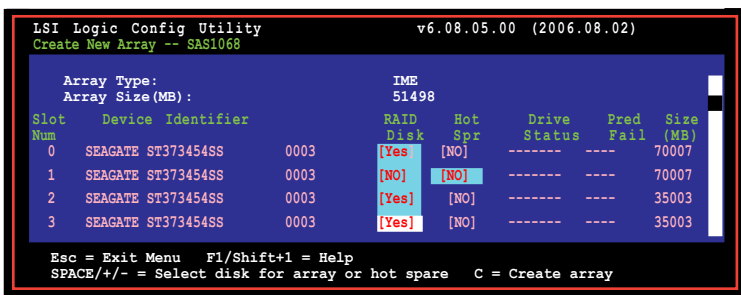
2. The **Select New Array Type** screen appears.
Use the arrow keys to select **Create New IME Volume**, then press <Enter>.



3. The **Create New Array** screen shows the disks you can add to make up the IME volume.

Integrated Mirroring Enhanced (IME) supports three to eight disks, or seven mirrored disks plus a hot spare disk. Use the arrow key to select a disk, then move the cursor to the RAID Disk column. To include this disk in the array, press <+>, <->, or <Space>.

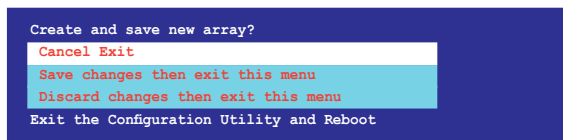
You may also specify the Hot Spare disk here. Select the disk, then move the cursor to the Hot Spr column, then press <+>, <->, or <Space>.



By default, the RAID Disk field shows No before array creation. This field is grayed out under the following conditions:

- The disk does not meet the minimum requirements for use in a RAID array.
- The disk is not large enough to mirror existing data on the primary drive.
- The disk has been selected as the Hot Spare for the RAID array.
- The disk is already part of another array.

4. Repeat step 5 to add the other disks to the volume.
5. When done, press <C> to create the array, then select **Save changes then exit this menu**.



6. The utility creates the array.



5.3.3 Integrated Striping (IS) Volume

Overview

The Integrated Striping (IS) feature provides RAID 0 functionality, supporting volumes with two to eight disks. You may combine an IS volume with an IM or IME volume.

Creating Integrated Striping volumes



Do not combine Serial ATA and SAS disks in one volume.

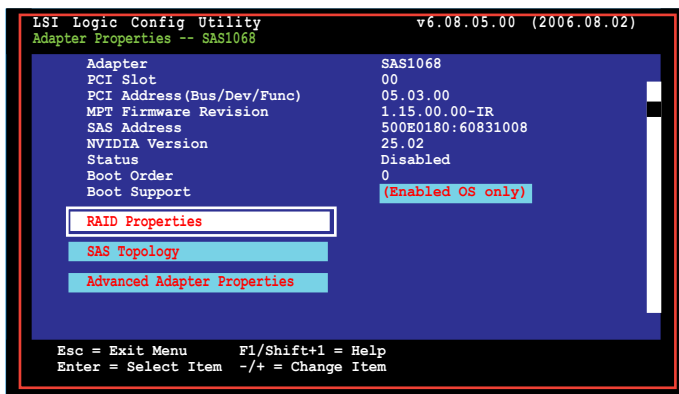
To create an IS volume

1. Turn on the system after installing all SAS hard disk drives.
2. During POST, press <Ctrl+C> to enter the SAS configuration utility.

```
LSI Logic Corp MPT SAS BIOS
MPTBIOS-6.08.05.00 (2006.08.02)
Copyright 2000-2006 LSI Logic Corp

Adapter(s) disabled by user
Press Ctrl-C to start LSI Logic Configuration Utility...
```

3. The **Adapter Properties** screen appears.
Use the arrow keys to select **RAID Properties**, then press <Enter>.



4. The **Select New Array** screen appears.
Use the arrow keys to select **Create IS Volume**, then press <Enter>.

```

LSI Logic Config Utility                                v6.08.05.00 (2006.08.02)
Select New Array Type -- SAS1068

  Create IM Volume      Create Integrated Mirror Array of 2
                        disks plus an optional hot spare. Data
                        on the primary disk may be migrated.

  Create IME Volume     Create Integrated Mirrored Enhanced
                        Array of 3 to 8 disks including an
                        optional hot spare.
                        ALL Data on array disks will be deleted!

  Create IS Volume      Create Integrated Striping array of
                        2 to 8 disks.
                        ALL Data on array disks will be deleted!

Esc = Exit Menu      F1/Shift+l = Help
Enter = Choose array type to create
  
```

5. The **Create New Array** screen shows the disks you can add to make up the IS volume. Use the arrow key to select a disk, then move the cursor to the RAID Disk column. To include this disk in the array, press <+>, <->, or <Space>.

```

LSI Logic Config Utility                                v6.08.05.00 (2006.08.02)
Create New Array -- SAS1068

Array Type:      IM
Array Size (MB) : -----

Slot  Device Identifier      RAID  Hot  Drive  Pred  Size
Num                                     Disk Spr Status Fail (MB)
1      SEAGATE ST373454SS      0003  [Yes] [NO]  -----  ----  70007
1      SEAGATE ST373454SS      0003  [NO]  [NO]  -----  ----  70007
2      SEAGATE ST373454SS      0003  [Yes] [NO]  -----  ----  35003
3      SEAGATE ST373454SS      0003  [Yes] [NO]  -----  ----  35003

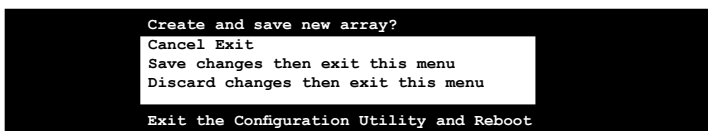
Esc = Exit Menu      F1/Shift+l = Help
SPACE/+/- = Select disk for array or hot spare  C = Create array
  
```



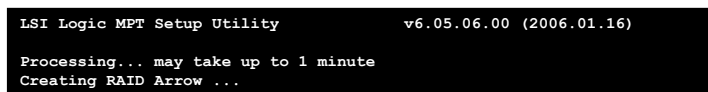
By default, the RAID Disk field shows No before array creation. This field is grayed out under the following conditions:

- The disk does not meet the minimum requirements for use in a RAID array.
- The disk is not large enough to mirror existing data on the primary drive.
- The disk has been selected as the Hot Spare for the RAID array.
- The disk is already part of another array.

- Repeat step 5 to add the other disks to the volume.
- When done, press <C> to create the array, then select **Save changes then exit this menu**.



- The utility creates the array.



5.3.4 Managing Arrays

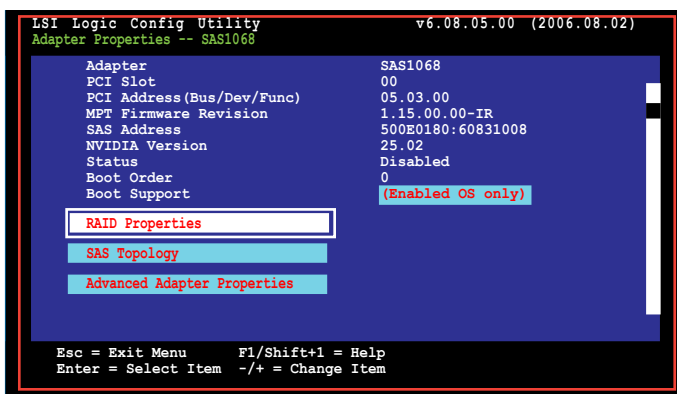
The LSI Logic MPT Setup Utility allows you to perform other tasks related to configuring and maintaining IM and IME volumes.

Refer to this section to view volume properties, manage the hot spare disk, synchronize the array, activate the array, and delete the array.

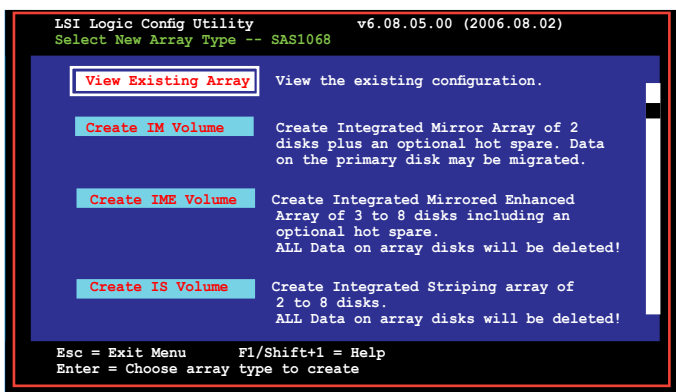
Viewing volume properties

To view volume properties

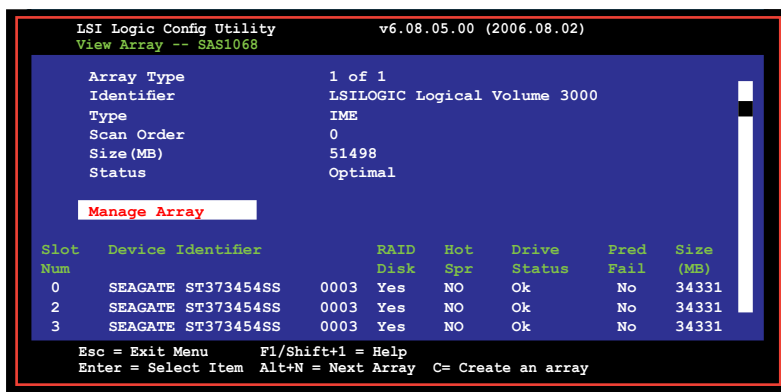
- On the main menu, select **RAID Properties**.



- On the next screen that appears, select **View Existing Array**.



- The **View Array** screen appears. Here you can view properties of the RAID array(s) created. If you have configured a hot spare, it will also be listed. If you created more than one array, you may view the next array by pressing <Alt+N>.



Managing hot spares

You may configure one disk as a global hot spare to protect critical data on the IM/IME volume(s). You may create the hot spare disk at the same time you create the IM/IME volume. Refer to this section when adding a hot spare on an existing volume.



If a disk on IM/IME volume fails, the utility automatically rebuilds the failed disk data on the hot spare. When the failed disk is replaced, the utility assigns the replacement as the new hot spare.

To create a hot spare

1. Follow steps 1 ~ 3 of section “**Viewing Volume Properties**”.
2. From the **View Array** screen, select **Manage Array**, then press <Enter>.

```
LSI Logic Config Utility          v6.08.05.00 (2006.08.02)
View Array -- SAS1068

  Array Type          1 of 1
  Identifier          LSILOGIC Logical Volume 3000
  Type               IME
  Scan Order         0
  Size (MB)         51498
  Status             Optimal

  Manage Array

Slot  Device Identifier  RAID  Hot  Drive  Pred  Size
Num   Num              Disk  Spr  Status Fail  (MB)
0      SEAGATE ST373454SS 0003  Yes  NO    Ok    No   34331
2      SEAGATE ST373454SS 0003  Yes  NO    Ok    No   34331
3      SEAGATE ST373454SS 0003  Yes  NO    Ok    No   34331

Esc = Exit Menu      F1/Shift+1 = Help
Enter = Select Item  Alt+N = Next Array  C= Create an array
```

3. From the **Manage Array** screen, select **Manage Hot Spare**, then press <Enter>.

```
LSI Logic Config Utility          v6.08.05.00 (2006.08.02)
Manage Array -- SAS1068

  Identifier          LSILOGIC Logical Volume 3000
  Type               IME
  Scan Order         0
  Size (MB)         51498
  Status             Optimal

  Manage Hot Spare
  Synchronize Array
  Activate Array
  Delete Array

Esc = Exit Menu      F1/Shift+1 = Help
Enter = Select Item
```

- Use the arrow key to select the disk you would want to configure as hot spare, then move the cursor to the Hot Spr column. Press <+>, <->, or <Space>. The Drive Status column field now shows Hot Spare. Press <C> to commit the changes.

```

LSI Logic Config Utility                               v6.08.05.00 (2006.08.02)
Manage Hot Spare -- SAS1068

Identifier      LSILOGIC Logical Volume 3000
Type            IME
Scan Order      0
Size (MB)       51498
Status          Optimal

Slot  Device Identifier      Hot   Drive   Pred   Size
Num   Num                   Spr   Status  Fail   (MB)
0     SEAGATE ST373454SS     0003 [NO]   Ok    No    34331
1     SEAGATE ST373454SS     0003 [NO]   Ok    No    34331
2     SEAGATE ST373454SS     0003 [NO]   Ok    No    34331
3     SEAGATE ST373454SS     0003 [Yes]  Hot Spare No    35003
      [----] ----- --
Esc = Exit Menu      Fl/Shift+l = Help
Space/+/- = Change Item  C = Commit Changes
  
```

Synchronizing the array

Synchronizing the array allows the utility to resynchronize data on the mirrored disk in the array. This procedure is seldom required because data synchronization is automatically done during manual operation.

To synchronize the array

- Follow steps 1 ~ 3 of the section “**Viewing Volume Properties**” and step 2 of the section “**Managing hot spares**”.
- From the **Manage Array** screen, select **Synchronize Spare**, then press <Enter>.

```

LSI Logic Config Utility                               v6.08.05.00 (2006.08.02)
Manage Array -- SAS1068

Identifier      LSILOGIC Logical Volume 3000
Type            IME
Scan Order      0
Size (MB)       51498
Status          Optimal

Manage Hot Spare
Synchronize Array
Activate Array
Delete Array

Esc = Exit Menu      Fl/Shift+l = Help
Enter = Select Item
  
```

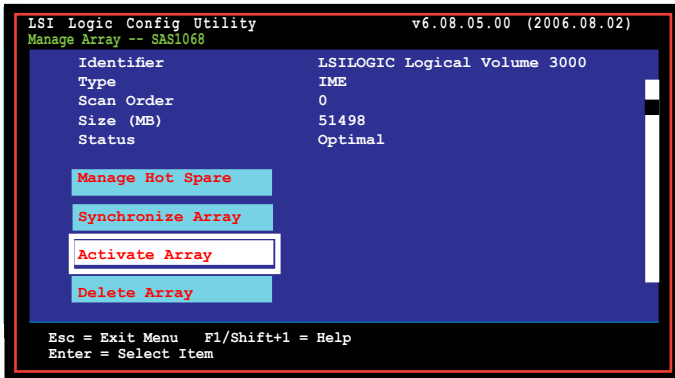
- Press <Y> to begin the synchronization, or <N> to cancel.

Activating an array

If an array is removed from one controller/computer or moved to another, the array is considered inactive. When you add the array back to the system, you may reactivate the array.

To activate the array

1. From the **Manage Array** screen, select **Activate Array**, then press <Enter>.



2. Press <Y> to activate, or <N> to cancel.

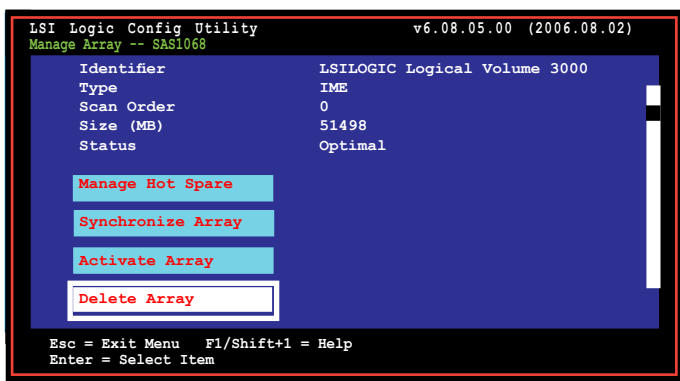
Deleting an array



- You cannot recover lost data if you delete an array. Make sure you back up important data before deleting an array.
- If you delete an IM (RAID 1) volume, the data is preserved on the primary disk.

To delete an array

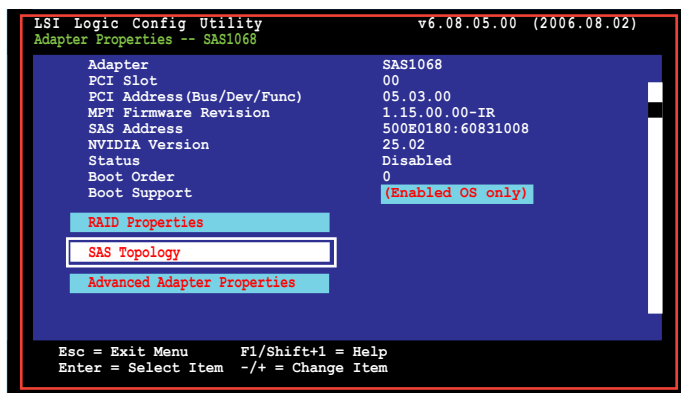
1. From the **Manage Array** screen, select **Delete Array**, then press <Enter>.



2. Press <Y> to activate, or <N> to cancel.

Viewing SAS topology

1. From the **Adapter Properties** screen, select **SAS Topology**.



Press <Alt+D> to display device properties, or <Alt+M> to display more keys.

```
More keys for the SAS Topology display:

C = Clear Device Mappings for Non-Present Devices
R = Refresh SAS Topology
Enter = On a SAS Enclosure or Expander - Expand or Collapse Item
Enter = On a Disk Drive - Turn on the Locate LED (next key press turns off)
```

2. Information about the volume and its member-disks are then displayed.

```
LSI Logic Config Utility                                v6.08.05.00 (2006.08.02)
SAS Topology -- SAS1068

SAS1068105:03:001
├─Enclosure
│   ├── Direct Attach Drives
│   ├── Bay 0 RAID Physical Disk
│   ├── Bay 1 SEAGATE ST373454SS 0003
│   ├── Bay 2 RAID Physical Disk
│   ├── Bay 3 RAID Physical Disk
│   └─IS VOL LSILOGICLogical Volume 3000
└─Device Identifier
    ├── Device Info
    ├── Controller
    ├── SAS
    ├── SAS
    ├── SAS
    └─SAS

Esc = Exit Menu    F1 = Help
Alt+D = Device Properties    Alt+N = More Keys
```

5.3.5 Selecting a boot disk

You can select a boot disk in the **SAS Topology** screen. This disk is then moved to scan ID 0 on the next boot, and remains at this position. This makes it easier to set BIOS boot device options and to keep the boot device constant during device additions and removals. There can be only one boot disk.

Follow these steps to select a boot disk:

1. In the **SAS BIOS CU**, select an adapter from the **Adapter List**.
2. Select the **SAS Topology** option.
The current topology is displayed. If the selection of a boot device is supported, the bottom of the screen lists the **Alt+B** option. This is the key for toggling the boot device. If a device is currently configured as the boot service, the **Device Info** column on the **SAS Topology** screen will show the word "Boot".
3. To select a boot disk, move the cursor to the disk and press **Alt+B**.

4. To remove the boot designator, move the cursor to the disk and press **Alt+B**. This controller will no longer have a disk designated as boot.
5. To change the boot disk, move the cursor to the new boot disk and press **Alt+B**. The boot designator will move to this disk.



The firmware must be configured correctly in order for the **Alt+B** feature to work.

5.3.6 Global_Properties

From the Setup Utility screen, press <Ctrl+C> to enter the LSI Logic Configuration, then select Global Properties. The Global Properties menu allows you to change related settings.

```

LSI Logic Config Utility                                v6.08.05.00 (2006.08.02)
Adapter List Global Properties

Adapter  PCI      PCI      PCI      PCI      FW Revision  Status  Boot
        BUS      Dev      Fnc      Slot
SAS1068  05      03      00      00      1.15.00.00-IR Disabled  0

Esc = Exit Menu      F1/Shift+1 = Help
Alt+N = Global Properties  -/+ = Alter Boot Order  Ins/Del = Alter Boot List
  
```

Pause When Boot Alert Displayed

Sets whether to pause when the boot alert displays.
Configuration options: [Yes] [No]

```

LSI Logic Config Utility                                v6.08.05.00 (2006.08.02)
Adapter List Global Properties

Pause When Boot Alert Displayed  [No]
Boot Information Display Mode    [Display adapters & installed devices]
Support Interrupt                [Hook interrupt, the Default]

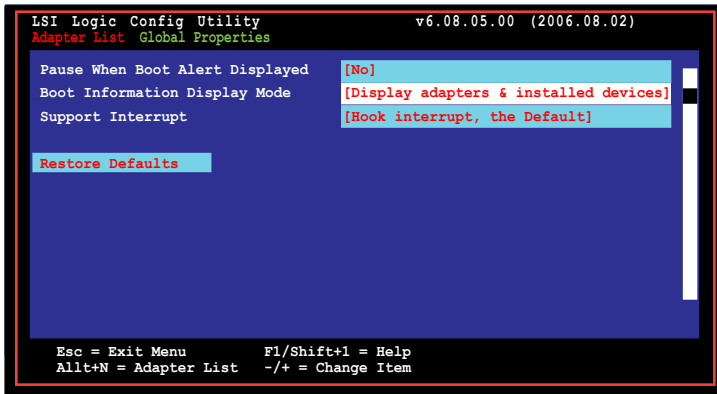
Restore Defaults

Esc = Exit Menu      F1/Shift+1 = Help
Alt+N = Adapter List  -/+ = Change Item
  
```

Boot Information Display Mode

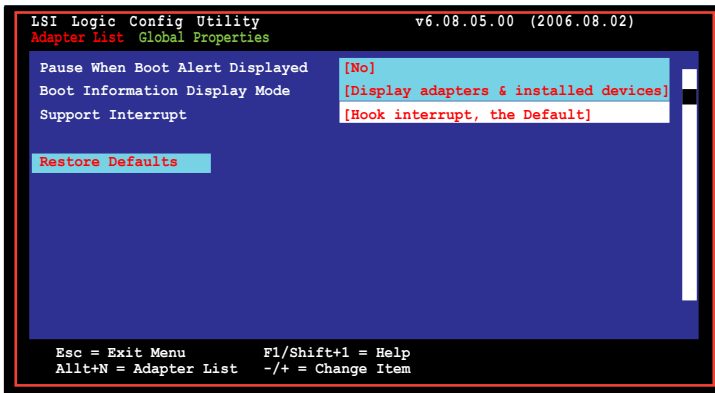
Sets the disk information display mode.

Configuration options: [Display adapters & installed devices] [Display adapters only]



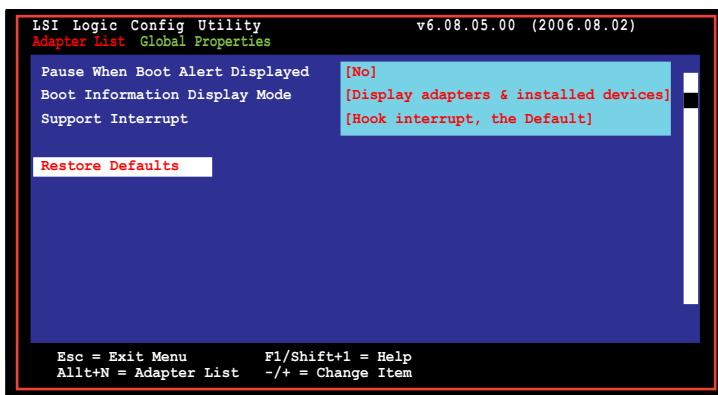
Support Interrupt

Configuration options: [Hook Interrupt, the Default] [Bypass interrupt hook]



Restore Defaults

This option allows you to discard the selections you made and restore the system defaults.



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

Driver installation

6

6.1	RAID driver installation.....	6-1
6.2	NVIDIA® nForce 3600 Professional (MCP55) driver installation.....	6-14
6.3	LAN driver installation	6-17
6.4	VGA driver installation.....	6-20
6.5	AMD processor driver installation.....	6-23
6.6	Management applications and utilities installation.....	6-26

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.

6.1.1 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 or Red Hat® Enterprise AS3.0 update 7/SuSE 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).

To create a RAID driver disk in DOS environment:

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. Restart the computer.
5. Press any key when prompted to boot from 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 MCP55 RAID for Windows 2000 Driver Disk  
C) Create NVIDIA nForce MCP55 RAID for Windows 2003 Driver Disk  
D) Create NVIDIA nForce MCP55 RAID for Windows 2003 64 bit Driver Disk  
E) Create NVIDIA nForce MCP55 SATA for RHEL AS4.0 UP2 64 bit Driver Disk  
F) Create NVIDIA nForce MCP55 SATA for RHEL AS4.0 UP2 32 bit Driver Disk  
G) Create NVIDIA nForce MCP55 SATA for RHEL AS3.0 UP6 64 bit Driver Disk  
H) Create NVIDIA nForce MCP55 SATA for RHEL AS3.0 UP6 32 bit Driver Disk  
I) Create LSI 1068 SAS for Win2K/Win2K3 32 bit Driver Disk  
J) Create LSI 1068 SAS for Win2K3 64 bit Driver Disk  
K) Create LSI 1068 SAS for RHEL AS4.0 UP2 64 bit Driver Disk  
L) Create LSI 1068 SAS for RHEL AS4.0 UP2 32 bit Driver Disk  
M) Create LSI 1068 SAS for RHEL AS3.0 UP2 64 bit Driver Disk  
N) Create LSI 1068 SAS for RHEL AS3.0 UP2 32 bit Driver Disk  
O) Broadcom ASF Firmware Update  
P) Flash AMI BIOS for KFN5-Q/SAS MB  
Please choose A to P:
```

6. Place a blank, high-density floppy disk to the floppy disk drive, then select the type of RAID driver disk you want to create by typing the number before the option
7. Press <Enter>.
8. Follow screen instructions to create the driver disk.

Windows® 2000/2003 Server

To create a RAID driver disk in Windows® 2000/2003 Server environment:

1. Restart the system from the hard disk drive, then place the system/motherboard support CD in the optical drive.
2. Browse the contents of the support CD to locate the driver disk utility.

- The Windows 2000 driver disk for the NVIDIA™ nForce SATA RAID are located in:

```
\Drivers\nvidia\mcp55\Makedisk\W2K.exe
\Drivers\nVIDIA MCP55\Windows\32bit\W2K_XP\IDE\Win2K\sataraid
```

- The Windows 2003 Server 32-bit driver disk for the NVIDIA™ nForce SATA RAID are located in:

```
\Drivers\nVIDIA MCP55\makedisk\w2k3.exe
\Drivers\nVIDIA MCP55\Windows\32bit\W2K3\IDE\WinXP\sataraid
```

- The Windows 2003 Server 64-bit driver disk for for the NVIDIA™ nForce SATA RAID are located in:

```
\Drivers\nVIDIA MCP55\makedisk\w2k3_64.exe
\Drivers\nVIDIA MCP55\Windows\64bit\W2K3\IDE\WinXP\sataraid
```

- The Windows 2000 and 2003 Server 32-bit driver disk for the LSI 1068 SAS is located in:

```
\Drivers\LSI 1068\Driver\makedisk\2k_2k3.exe
\Drivers\LSI 1068\Driver\Windows\W2K_W2K3_32\
```

- The Windows 2003 64-bit OS RAID driver disk for the LSI 1068 SAS controller is located in:

```
\Drivers\LSI 1068\Driver\makedisk\2k364.exe
\Drivers\LSI 1068\Driver\Windows\W2k3_64
```

3. Insert a formatted high-density floppy disk to the floppy disk drive.
4. Follow screen instructions to complete the process.
5. After creating a RAID driver disk, eject the floppy disk, then write-protect it to prevent computer virus infection.

Red Hat® Enterprise Linux/SuSE Linux Enterprise Server

To create a RAID driver disk in Red Hat® Enterprise Linux / SUSE Linux Enterprise server environment:

1. Insert a blank formatted high-density floppy disk to the floppy disk drive.
2. Decompress the file into the floppy disk from the following path in the support CD:
 - For NVIDIA™ nForce SATA RAID Driver:
`\Drivers\nVIDIA MCP55\makedisk\`
 - For LSI 1068 SAS RAID RAID Driver:
`\Drivers\LSI 1068\Driver\makedisk\`
3. Eject the floppy disk.



For systems with other Linux versions that are not listed in the Makedisk menu, explore the support CD and copy the driver file from the following path:

For NVIDIA™ nForce SATA RAID Driver: `\Drivers\nVIDIA MCP55\Linux\`.
For LSI 1068 SAS RAID Driver: `\Drivers\LSI 1068\Linux\`.

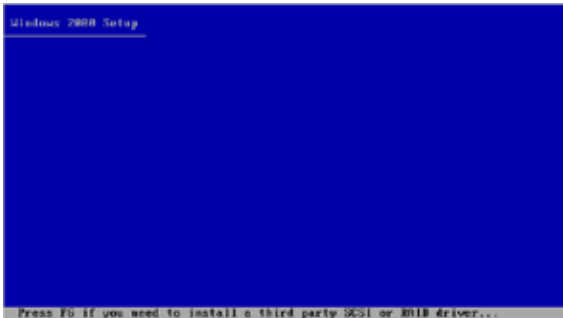
6.1.2 Installing the RAID controller driver

Windows® 2000/2003 Server OS

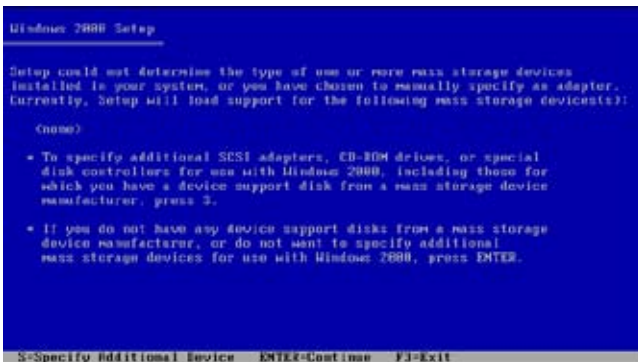
During Windows® 2000/2003 Server OS installation

To install the RAID controller driver when installing Windows® 2000/2003 Server OS:

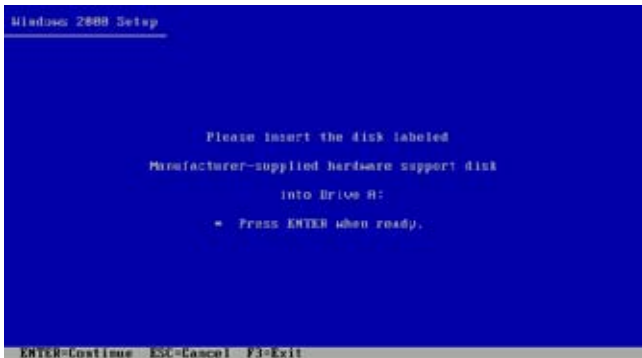
1. Boot the computer using the Windows® 2000/2003 Server installation CD. The Windows® 2000/2003 Setup starts.



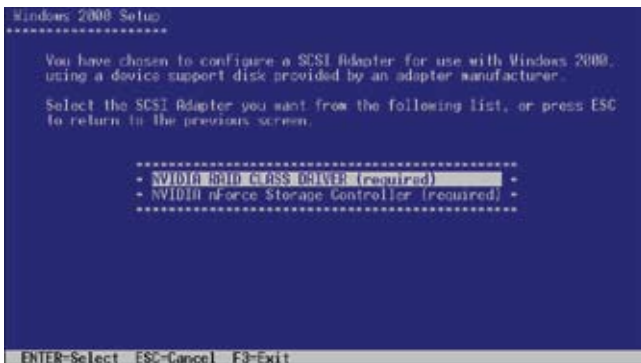
2. Press <F6> when the message “Press F6 if you need to install a third party SCSI or RAID driver...” appears at the bottom of the screen.
3. When prompted, press <S> to specify an additional device.

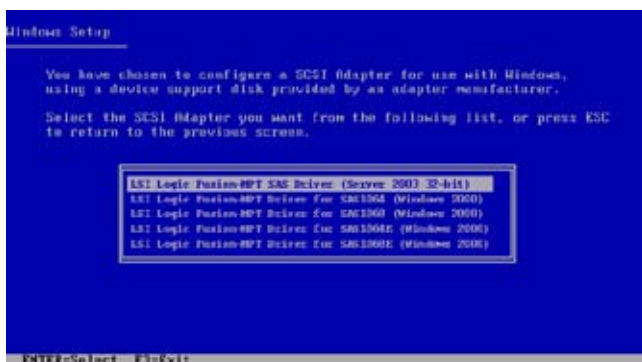


4. Insert the RAID driver disk you created earlier to the floppy disk drive, then press <Enter>.



5. Select the RAID controller driver from the list, then press <Enter>.
For NVIDIA® RAID driver, select **NVIDIA RAID CLASS DRIVER** (required).
Then, press <S> key, and select **NVIDIA nForce Storage Controller** (required).



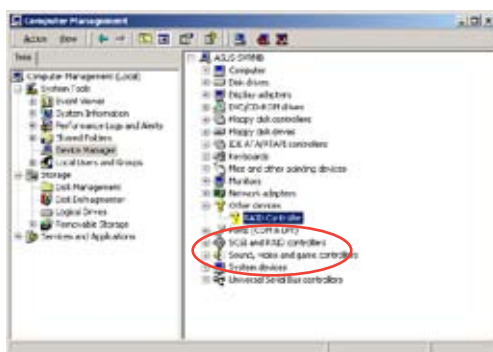


- LSI1068 PCI-X SAS controller driver:
 - For Windows 2000, select LSI Logic Fusion-MPT Drivers for SAS 1068 (Windows 2000).
 - For 32bit Windows Server 2003, select LSI Logic Fusion-MPT SAS Driver (Server 2003 32-bit).
 - For 64bit Windows Server 2003, select LSI Logic Fusion-MPT SAS Driver (Server 2003 x64).
- 6. The Windows® 2000/2003 Setup loads the RAID controller drivers from the RAID driver disk. When prompted, press <Enter> to continue installation.
- 7. Setup then proceeds with the OS installation. Follow screen instructions to continue.

To an existing Windows® 2000/2003 Server OS

To install the RAID controller driver on an existing Windows® 2000/2003 Server OS:

1. Restart the computer, then log in with Administrator privileges.
2. Windows® automatically detects the RAID controller and displays a New Hardware Found window. Click Cancel.
3. Right-click the My Computer icon on the Windows® desktop , then select Properties from the menu.
4. Click the Hardware tab, then click the Device Manager button to display the list of devices installed in the system.

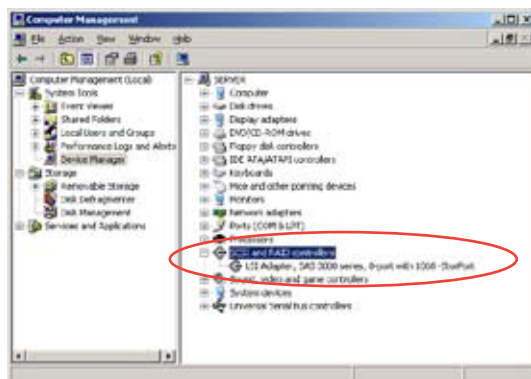


5. Right-click the RAID controller item, then select Properties.
6. Click the Driver tab, then click the Update Driver button.
7. The Upgrade Device Driver Wizard window appears. Click Next.
8. Insert the RAID driver disk you created earlier to the floppy disk drive.
9. Select the option "Search for a suitable driver for my device (recommended)", then click Next.
10. The wizard searches the RAID controller drivers. When found, click Next to install the drivers.
11. Click Finish after the driver installation is done.



To verify the RAID controller driver installation:

1. Right-click the My Computer icon on the Windows® desktop , then select Properties from the menu.
2. Click the Hardware tab, then click the Device Manager button.
3. Click the “+” sign before the item SCSI and RAID controllers, then the LSI Adapter, SAS 3000 series, 8-port with 1068-StorPort item should appear.



4. Right-click the RAID controller driver item, then select Properties from the menu.
5. Click the Driver tab, then click the Driver Details button to display the RAID controller drivers.
6. Click OK when finished.

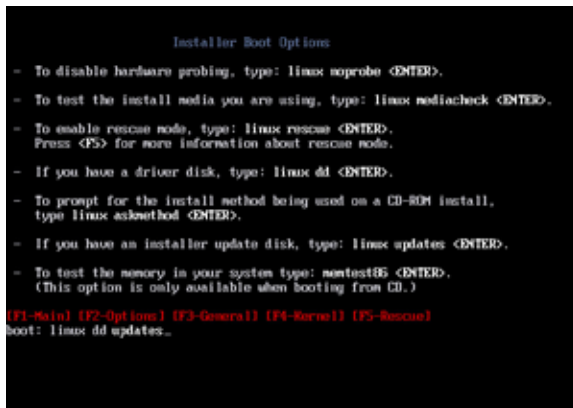
Red Hat® Enterprise Linux

To install the RAID controller driver when installing Red Hat® Enterprise Linux OS:

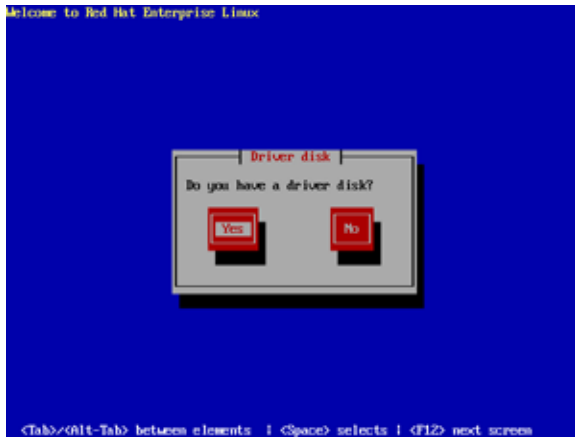
1. Boot the system from the Red Hat® Installation CD.



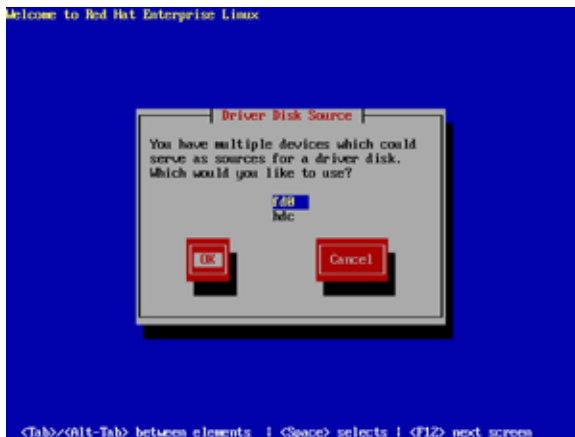
2. At the boot:, type `linux dd` updates for LSI 1068 SAS RAID driver installation. For NVIDIA® nForce SATA RAID driver, type `linux dd`. Then, press <Enter>.



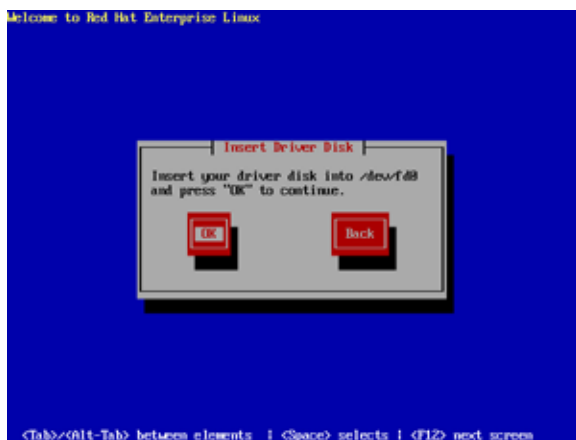
3. Select Yes using the <Tab> key when asked if you have the driver disk. Press <Enter>



4. Select fd0 using the <Tab> key when asked to select the driver disk source. Press <Tab> to move the cursor to OK, then press <Enter>.

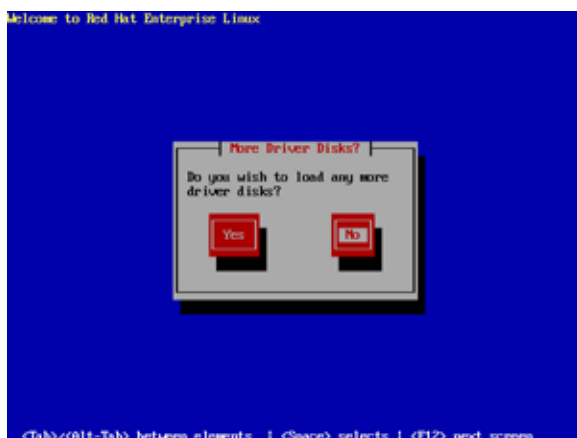


5. When prompted, insert the Red Hat® Enterprise ver. 3.0 RAID driver disk to the floppy disk drive, select OK, then press <Enter>.



The drivers for the RAID controller are installed to the system.

6. When asked if you will load additional RAID controller drivers, select **Yes**, then install the additional RAID controller drivers.

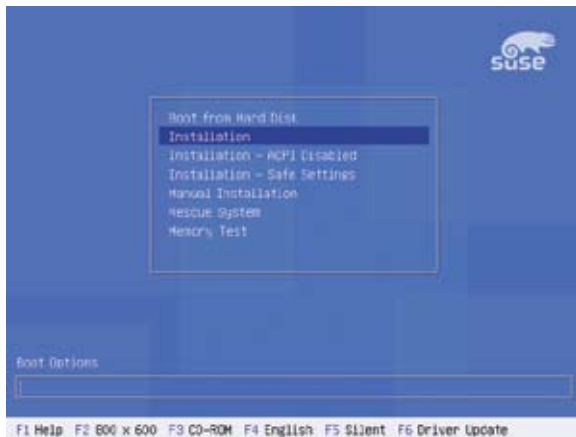


7. Follow screen instructions to continue the OS installation.

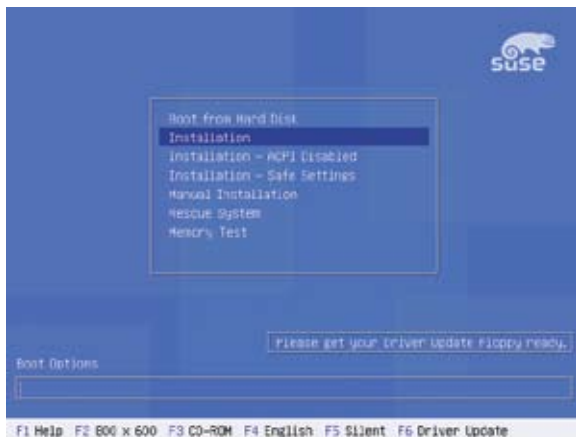
SuSE Linux

To install the RAID controller driver when installing SuSE Linux OS:

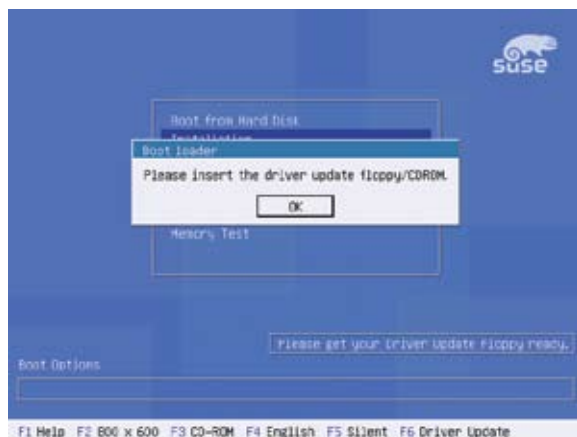
1. Boot the system from the SuSE Installation CD.
2. Select Installation from the Boot Options menu, then press <Enter>.



3. A message instructs you to prepare the RAID driver disk. Press <F6>.



4. When prompted, insert the RAID driver disk to the floppy disk drive, then press <Enter>.



5. When prompted, select the floppy disk drive (fd0) as the driver update medium, select OK, then press <Enter>.



The drivers for the RAID controller are installed to the system.

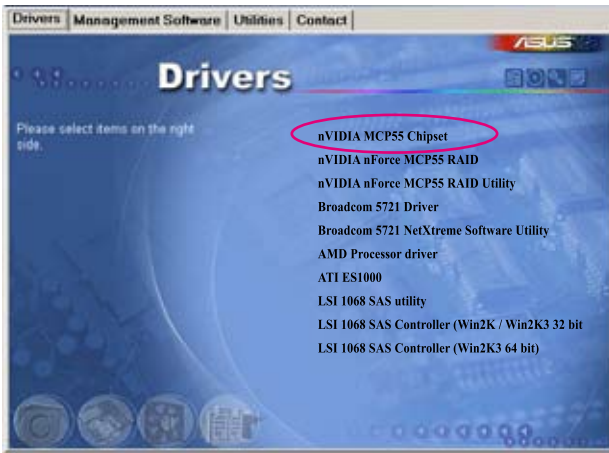
6.2 NVIDIA® nForce 3600 Professional (MCP55) driver installation

This section provides instructions on how to install the NVIDIA nForce 3600 Professional (MCP55) chipset drivers.

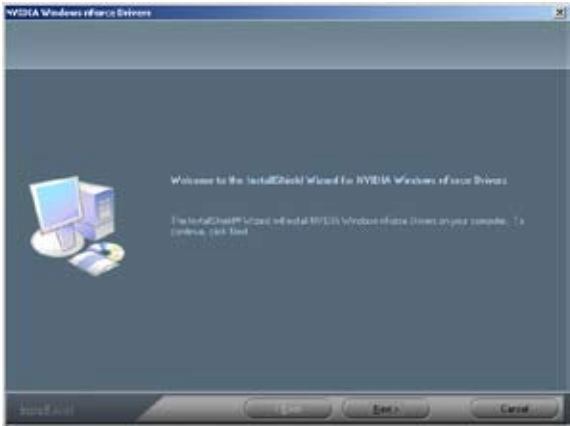
6.2.1 Windows® 2000/2003 Server

To install the NVIDIA™ nForce 3600 Professional driver on a Windows® 2000/2003 Server OS:

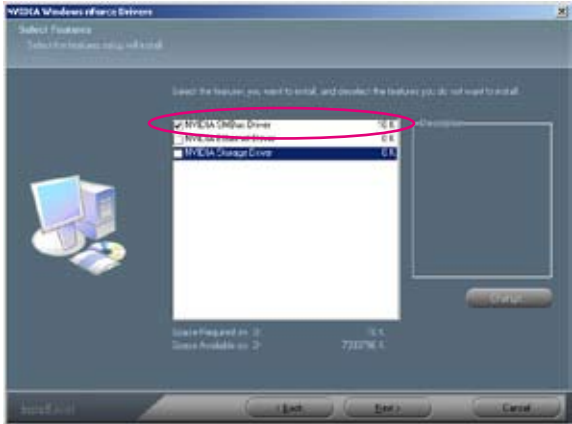
1. Restart the computer, then log on with Administrator privileges.
2. Insert the motherboard/system support CD to the optical drive. The CD automatically displays the Drivers menu if Autorun is enabled in your computer.
3. Click the **nVIDIA MCP55 Chipset** option to begin installation.



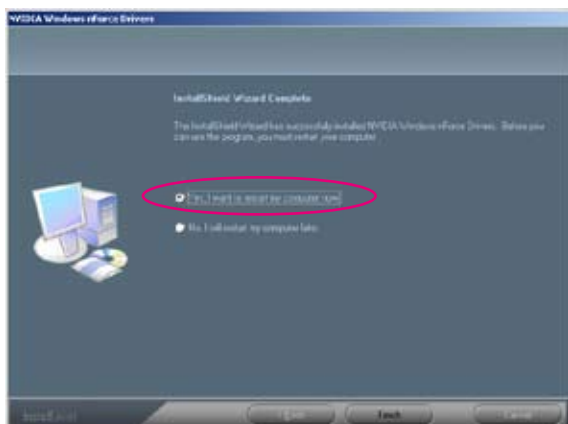
4. Click **Next** when the InstallShield Wizard window appears. Follow screen instructions to continue installation.



5. The Select Feature window appears. Choose **NVIDIA SMBus Driver** option, then Click **Next** to continue installation.



6. The InstallShield Wizard Complete window appears. Click **Yes, I want to restart my computer** to restart the computer.



6.3 LAN driver installation

This section provides instructions on how to install the Broadcom® Gigabit LAN controller drivers.

6.3.1 Windows® 2000/2003 Server

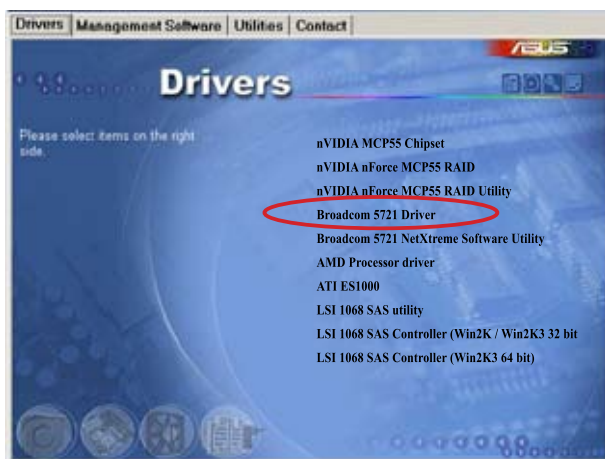
To install the Broadcom® Gigabit LAN controller driver on a Windows® 2000/2003 Server OS:

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.



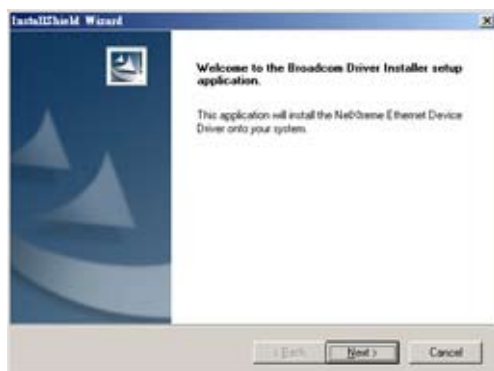
- Windows® automatically detects the LAN controllers and displays a New Hardware Found window. Click Cancel to close this window.
- If Autorun is NOT enabled in your computer, browse the contents of the support CD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run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

3. Click the Broadcom 5721 Driver option to begin installation.



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

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



6.3.2 Red Hat® Enterprise Linux

Follow these instructions when installing the Broadcom® Gigabit LAN controller base driver for the Red Hat® Enterprise operating system.

Prepare the LAN driver installation

Install first the Kernel Development tools before building the driver from the TAR file. To install the kernel development application:

1. Insert the Linux OS installation CD disk 1 to the optical drive.
2. Double click Application > System setting > Add/Remove application.
3. Select Kernel Development from the development tools.
4. Follow the instructions on the screen to finish installation.

Building the driver from the TAR file

1. Insert the motherboard/system support CD to the optical drive. Then select optional device on the Linux OS platform.
2. Copy the base driver tar files from the support CD to the client HDD. The file name: tg3-<Version>.tar.gz
Example: If the driver version is 3.58, then the file name should be tg3-3.58.tar.gz

The Broadcom LAN driver for Linux OS is located in :

`\Drivers\BCM5721 LAN\B57BCMCD_SV_943\Linux\Driver\`

3. To unzip tar or tar zip file:
`tar xzf tg3-x.x.tar.gz`
4. Change to driver folder:
`cd tg3-x.x/`
5. Use the make install command to finish driver install :
`make install`
6. Use the **insomd tg3.o** to load driver; OR
Restart the system to auto detect the new hardware. If needed, refer to the Red Hat distribution documentation to configure the network protocol and address.

6.4 VGA driver installation

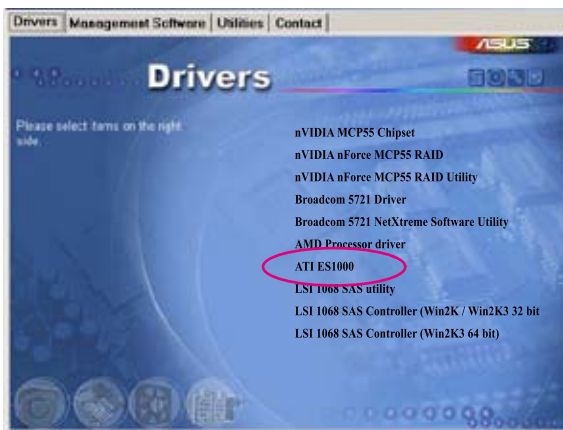
This section provides instructions on how to install the ATI® ES1000 Video Graphics Adapter (VGA) driver.

6.4.1 Windows 2000/2003 Server

You need to manually install the ATI® ES1000 VGA driver on a Windows 2000 / Server 2003 operating system. To install the ATI® ES1000 VGA driver:

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

The Drivers menu if Autorun is enabled in your computer.




3. Click the item ATI ES1000 from the menu.

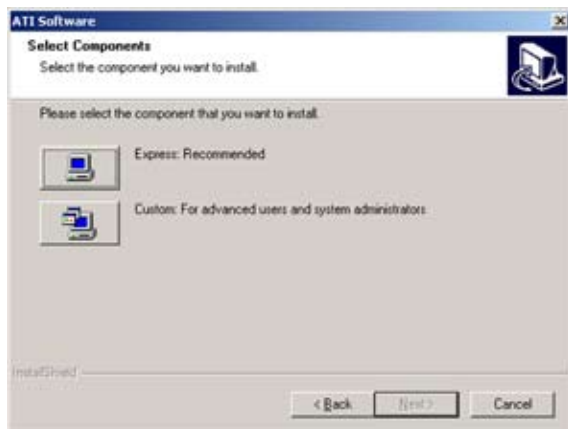
4. The ATI Software window appears. Follow the screen instructions to complete installation.



5. Select Yes to accept the terms of the License Agreement and continue the process.



6. Press the  button to activate quick installation.



7. After completing the installation, restart the computer.



6.5 AMD processor driver installation

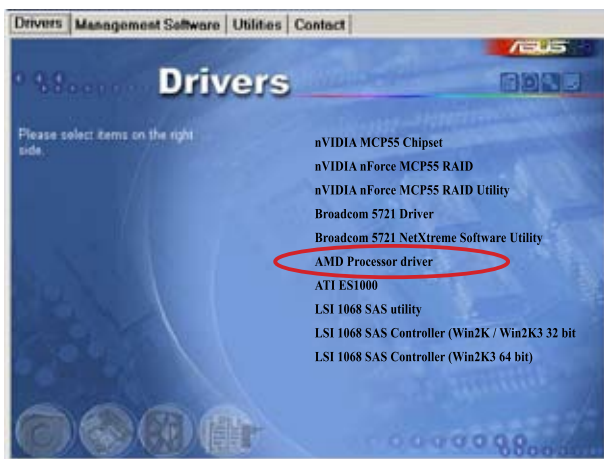
This section provides instructions on how to install the AMD Processor driver for AMD PowerNow!™ and Cool'n'Quiet™ technologies. This driver can allow the system to dynamically and automatically select the processor speed, voltage and power combination that match the instantaneous user performance need.

Windows XP 32bit/64bit and 2003 Server 32bit/64bit

The AMD Processor driver is only for Windows XP 32bit/64bit and 2003 Server 32bit/64bit OS. You need to manually install the AMD Processor Driver on a Windows XP and Server 2003 32bit / 64bit operating system.

To install the AMD® Processor driver:

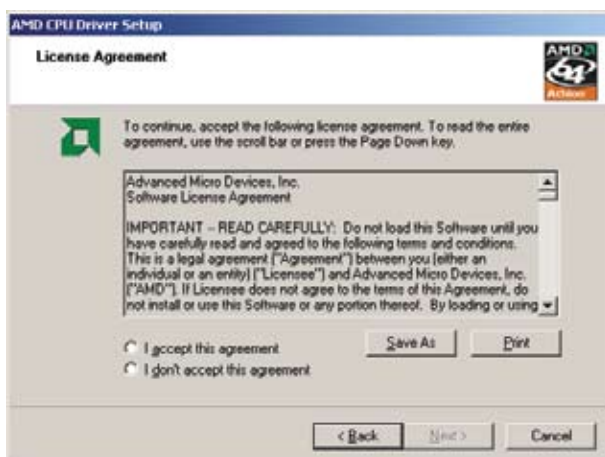
1. Restart the computer, then log on with Administrator privileges.
2. Insert the motherboard/system support CD to the optical drive. The support CD automatically displays the Drivers menu if Autorun is enabled in your computer.
3. Click the item AMD Processor driver.

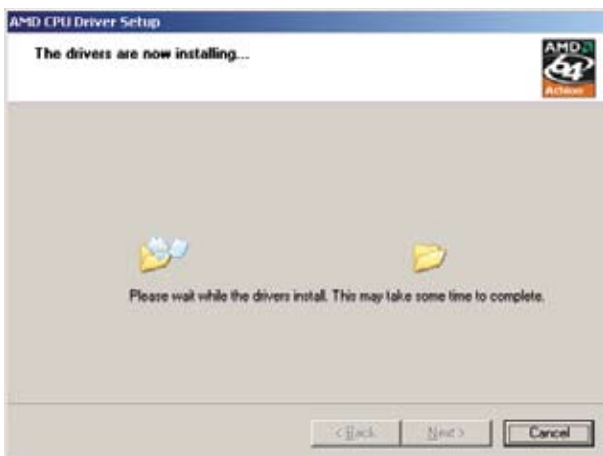


4. The AMD Processor driver window appears. Follow the screen instructions to complete installation.

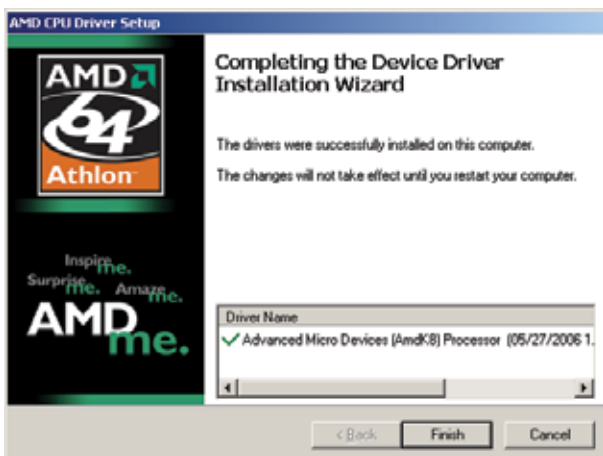


5. Select "I accept the this agreement" and click the "Next" button to continue the process.





6. After completing the device driver installation, press “finish” button to close the software.



6.6 Management applications and utilities installation

The support CD that came with the motherboard package contains the drivers, management 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.

6.6.1 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.



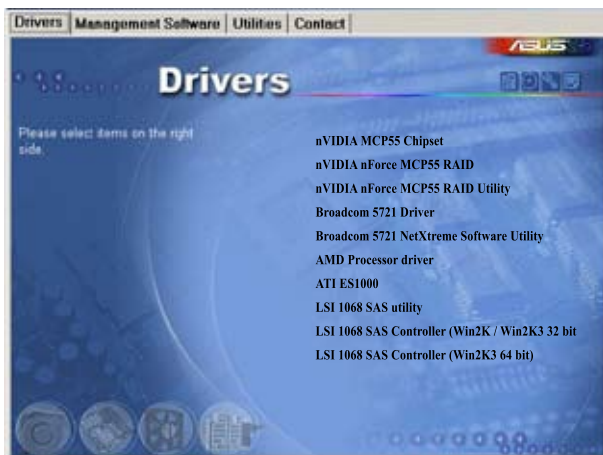
If Autorun is NOT enabled in your computer, browse the contents of the support CD to locate the file ASSETUP.EXE from the BIN folder. Double-click the ASSETUP.EXE to run the CD.

6.6.2 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.



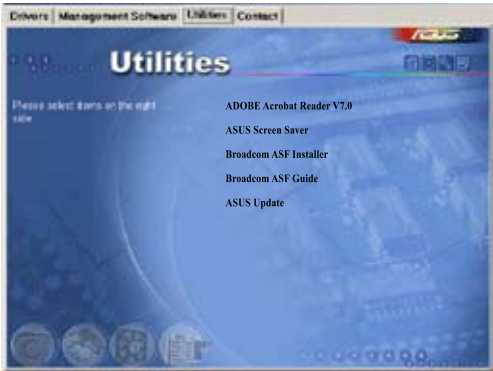
6.6.3 Management Software menu

The Management Software menu displays the available network and server monitoring applications. Click on an item to install.



6.6.4 Utilities menu

The Utilities menu displays the software applications and utilities that the motherboard supports. Click on an item to install.



6.6.5 Contact information

Click the Contact tab to display the ASUS contact information. You can also find this information on the inside front cover of this user guide.



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

Reference information

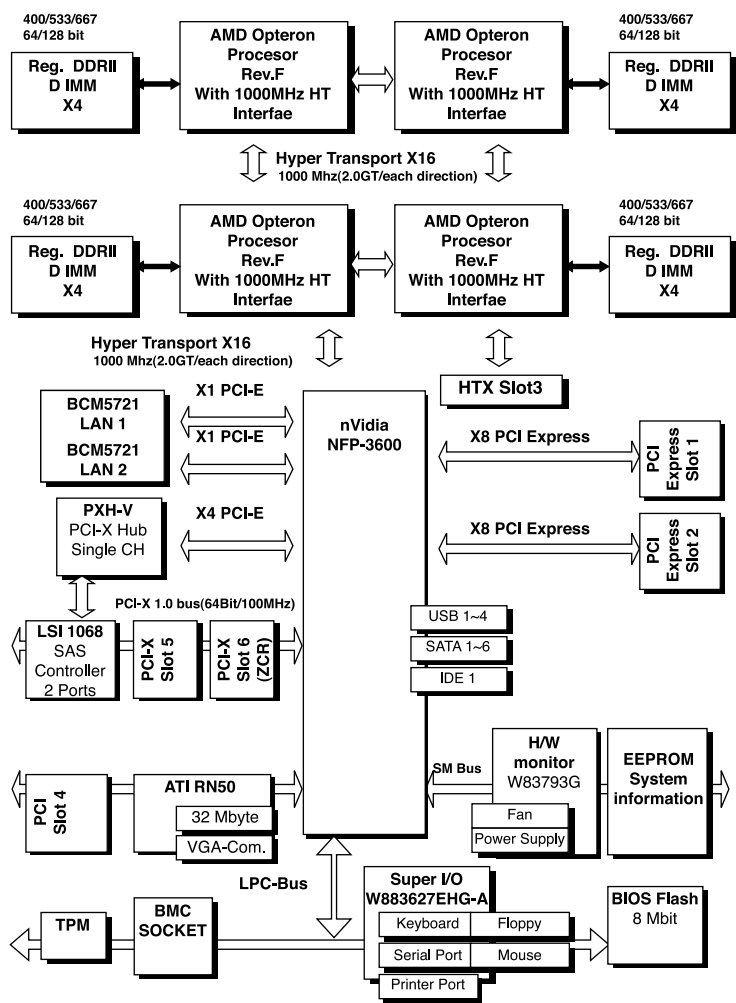
A large, light gray letter 'A' is positioned behind the text 'Reference information', partially overlapping it.

Chapter summary



A.1	KFN5-Q model block diagram	A-1
A.2	KFN5-Q/SAS model block diagram	A-2
A.3	KFN5-Q/1U model block diagram	A-3

A.2 KFN5-Q/SAS model block diagram



A.3 KFN5-Q/1U model block diagram

