ASUS®

RS100-E5-PI2

1U Rackmount Server User Guide

E3648

First Edition V1
March 2008

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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.

> WARNING! 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.

> This symbol of the crossed out wheeled bin indicates that the product (electrical, electronic equipment and mercury-containing button cell battery) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

Safety information

Electrical Safety

- Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

- When adding or removing any additional 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.

- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your dealer.

Operation Safety

- Any mechanical operation on this server must be conducted by certified or experienced engineers.

- Before operating the server, carefully read all the manuals included with the server package.

- Before using the server, make sure all cables are correctly connected and the power cables are not damaged. If any damage is detected, contact your dealer as soon as possible.

- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.

- Avoid dust, humidity, and temperature extremes. Place the server on a stable surface.

This product is equipped with a three-wire power cable and plug for the user's safety. Use the power cable with a properly grounded electrical outlet to avoid electrical shock.

Lithium-Ion Battery Warning

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

CD-ROM Drive Safety Warning

CLASS 1 LASER PRODUCT

Heavy System

CAUTION! This server system is heavy. Ask for assistance when moving or carrying the system.

About this guide

Audience

This user guide is intended for system integrators, and experienced users with at least basic knowledge of configuring a server.

Contents

This guide contains the following parts:

1. **Chapter 1: Product Introduction**

    This chapter describes the general features of the server, including sections on front panel and rear panel specifications.

2. **Chapter 2: Hardware setup**

    This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

3. **Chapter 3: Installation options**

    This chapter describes how to install optional components into the barebone server.

4. **Chapter 4: Motherboard information**

    This chapter gives information about the motherboard that comes with the server. This chapter includes the motherboard layout, jumper settings, and connector locations.

5. **Chapter 5: BIOS information**

    This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.

6. **Chapter 6: RAID configuration**

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

7   **Chapter 7: Driver installation**

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

8. **Appendix: Reference information**

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

Conventions

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>+<Delete>
`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`

References

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

1.   ASUS Server Web-based Management (ASWM) user guide

This manual tells how to set up and use the proprietary ASUS server management utility.

2.   ASUS websites

The ASUS websites worldwide provide updated information for all ASUS hardware and software products. Refer to the ASUS contact information.

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Chapter 1

This chapter describes the general features of the chassis kit. It includes sections on front panel and rear panel specifications.

Product introduction

1.1　System package contents

Check your system package for the following items.

Model Name	RS100-E5-PI2
Chassis	ASUS R09 1U Rackmount Chassis
Motherboard	ASUS P5BV-M/RS100-E5 Server Board
Component	1 x 220W 80+ Single Power Supply 2 x SATA Cables 1 x PCI Express x16 Riser Card (x8 link) 1 x Front I/O Board (ASUS FPB-R9) 1 x USB Board (ASUS USB-R9) 2 x System Fans (2 x 40x28)
Accessories	1 x CPU Heatsink 1 x RS100-E5-PI2 User's Guide 1 x ASUS ASWM 2.0 User's Guide 1 x RS100-E5-PI2 Support CD (including ASWM*) 1 x Bag of Screws 1 x AC Power Cable
Optional Items	Rackmount Rail Kit Slim-type Optical Device CA eTrust Anti-virus Software CD

*ASUS System Web-based Management

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

1.2　Serial number label

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

1.3   System specifications

The ASUS RS100-E5-PI2 is a 1U barebone server system featuring the ASUS P5BV-M/RS100-E5 server board. The server supports Intel® LGA775 Xeon® 3300/3200/3100/3000 Series processors with EM64T technology, plus other latest technologies through the chipsets onboard.

Model Name		RS100-E5-PI2
Processor / System Bus		1 x Socket LGA775
		Intel® Xeon® 3300/3200/3100/3000 Series CPU
		FSB 1333/1066/800
Core Logic		Intel® 3200 MCH Intel® ICH7R
ASUS Features	Smart Fan	Smart Fan III
	ASWM2.0	√
Memory	Total Slots	4 (Dual-Channel)
	Capacity	Maximum up to 8GB
	Memory Type	DDR2 800/667 Unbuffered ECC/Non-ECC DIMM
	Memory Size	512MB, 1GB and 2GB
Expansion Slots	Total PCI/PCI-X/ PCI-E Slots	1
	Slot Type	1 x PCI-E x16 slot (x8 link) (Full-Height/Half-Length)

Storage	SATA Controller	Intel® ICH7R:
		  2 x SATA2 300MB/s ports*
		  Intel Matrix Storage (for Windows only)
		  - Supports software RAID 0 & 1
		  LSI MegaRAID (for Linux/Windows)
		  - Supports software RAID 0 & 1

HDD Bays	I = internal A or S will be hot-swappable	2 x Internal SATA2 HDD Bays
Networking	LAN	2 x Broadcom® BCM5721 PCI-E GbE LAN - Supports 10/100/1000 Mbps transfer rates
Graphic	VGA	XGI® Volari Z9s + 32MB
Auxiliary Storage FDD / CD / DVD		1 x Slim-type Optical Device Bay Options: No Device / DVD-ROM / DVD-RW
Onboard I/O		1 x External Serial Port 3 x RJ-45 ports (2 for GbE and 1 for optional ASMB3-iKVM) 4 x USB 2.0 ports (Front x 2, Rear x 2) 1 x VGA port 1 x PS/2 keyboard port 1 x PS/2 mouse port

(continued on the next page)

Anti-virus Software		CA® eTrust™ anti-virus software (Optional)
Management Solution	Hardware	SM-Bus/ASMB3-SOL or ASMB3-iKVM (Optional)
	Software	ASUS ASWM 2.0®
Dimension (D x W x H)		381mm x 430mm x 43.4mm
Net Weight Kg (CPU, DRAM & HDD not inclu ded)		6.2 Kg
Power Supply		220W 80+ PFC PSU
Environment		Operation temperature: 10°C ~ 35°C / Non operation temperature: -40°C ~ 70°C Non operation humidity: 20% ~ 90% (Non-condensing)

*Specifications are subject to change without notice.

1.4 Front panel features

The barebone server displays a simple yet stylish front panel with easily accessible features. The power and reset buttons, LED indicators, optical drive, and two USB ports are located on the front panel.

Refer to section **1.6.1 Front panel LEDs** for the LED descriptions.

HDD Access LED
LAN2 LED
LAN1 LED
Power LED

USB 2.0 ports
Optical drive
Power button
Reset button

1.5 Rear panel features

The rear panel includes the expansion slots, and system power socket. The middle part includes the I/O shield with openings for the rear panel connectors on the motherboard.

The ports for the PS/2 keyboard, PS/2 mouse, USB, VGA, and Gigabit LAN do not appear on the rear panel if motherboard is not present.

AC power socket
PS/2 mouse port
PS/2 keyboard port
USB 2.0 ports
iKVM port*
Serial port
VGA port
LAN port 2
LAN port 1 (SOL Shared LAN)
Expansion slot
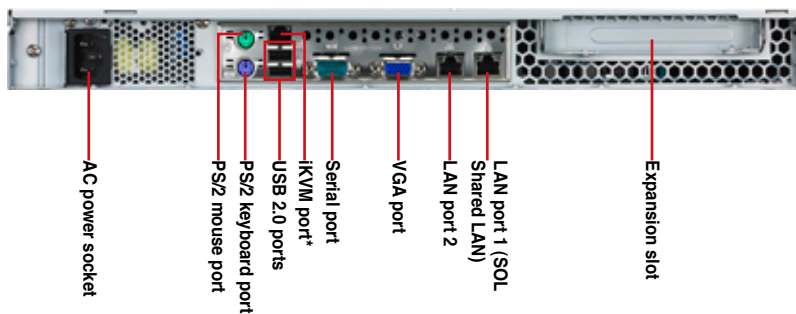
* This port is for ASUS ASMB3-SOL or ASMB3-iKVM controller card only.

1.6   Internal features

The barebone server includes the basic components as shown.
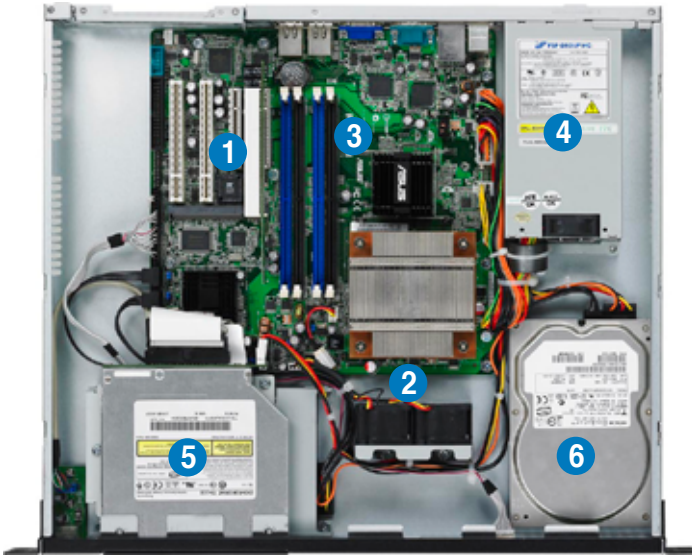
1.   PCI Express x16 Riser Card (at x8 link)
2.   Chassis fans (x 2)
3.   ASUS P5BV-M/RS100-E5 Server Board
4.   Power supply
5.   HDD tray 2 (hidden) and Slim-type Optical
      drive (optional)
6.   HDD tray 1

- •   The barebone server does not include a floppy disk drive. connect a USB floppy disk drive to any of the USB ports on the front or rear panel if you need to use a floppy disk.

- •   Only ASUS CD/DVD-ROMs fit the optical drive bay.

1.7   LED information

1.7.1   Front panel LEDs

HDD Access LED

LAN2 LED

LAN1 LED
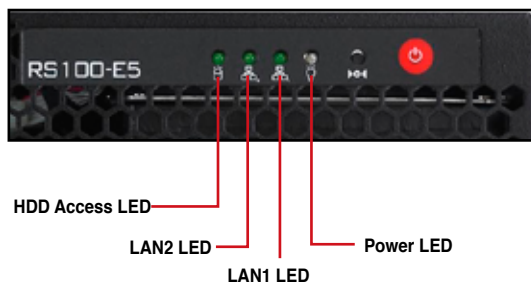
Power LED

LED	Icon	Display status	Description
Power LED		ON	System power ON
HDD Access LED		OFF Blinking	No activity Read/write data into the HDD
LAN LEDs		OFF Blinking ON	No LAN connection LAN is transmitting or receiving data LAN connection is present

1.7.2   LAN (RJ-45) LEDs

SPEED LED

ACT/LINK LED

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

Chapter 2

This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

Hardware setup

2.1 Chassis cover

2.1.1 Removing the cover

1. Use a Phillips screwdriver to remove the screw on the top cover.

2. Firmly hold the cover and slide it toward the rear panel for about half an inch until it is disengaged from the chassis.
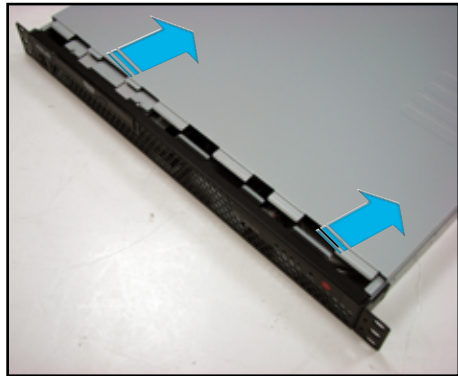
3. Lift the cover from the chassis.

2.1.2   Installing the cover

1.   Position the cover on top of the chassis with the hooks aligned to the side
      tabs of the chassis.
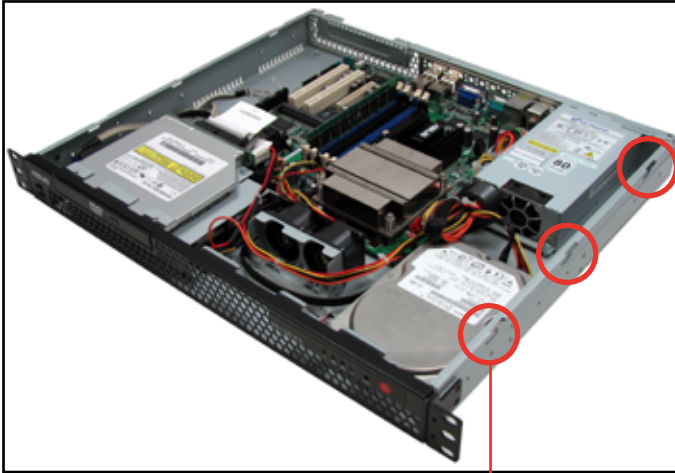
Side tabs

2.   Slide the cover toward the front until it snaps in place.
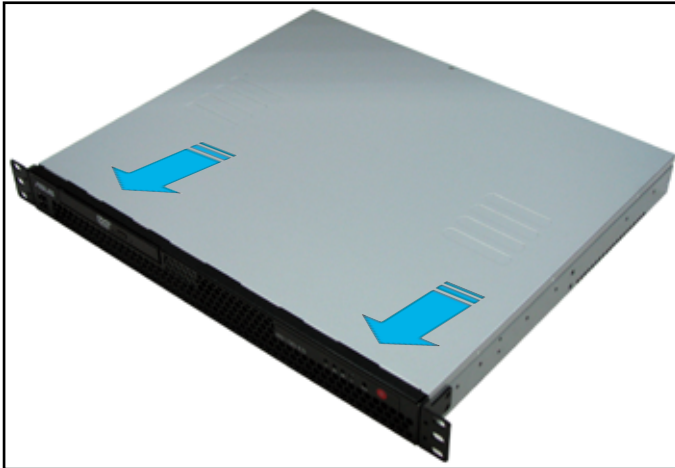
3.   Secure the cover with one screw.

2.2 Motherboard information

Place eight (8) screws into the holes indicated by circles to secure the motherboard to the chassis.

> Refer to **Chapter 4: Motherboard Information** for detailed Information.

Place this side towards the rear of the chassis

P5BV-M/RS100-E5
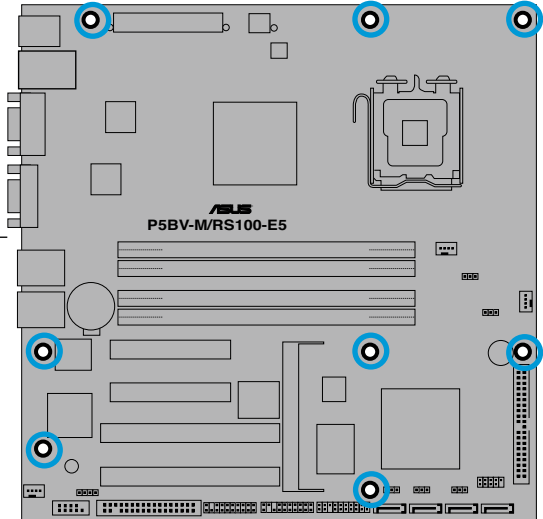
> Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA775 socket designed for the Intel® Xeon® 3300/3200/3100/3000 series processors in the 775-land 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 LGA775 socket.
>
> • 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.
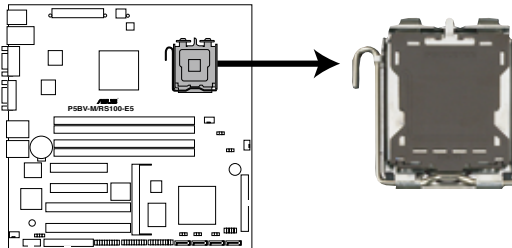
P5BV-M/RS100-E5 CPU Socket 775

> 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.

Retention tab

Load lever

A

B

PnP cap

This side of the socket box should face you.
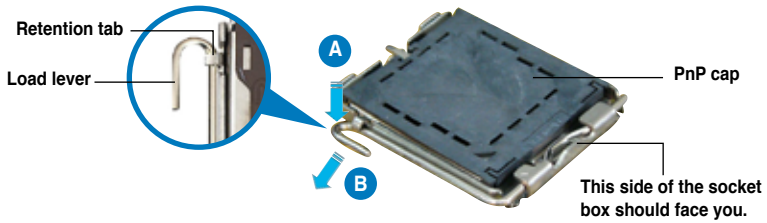
> ⚠ To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

3. Lift the load lever in the direction of the arrow to a 135º angle.
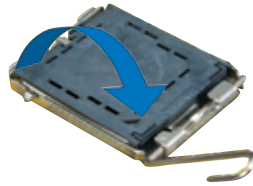
4. Lift the load plate with your thumb and forefinger to a 100º angle (A), then push the PnP cap from the load plate window to remove (B).

B

A

Load plate
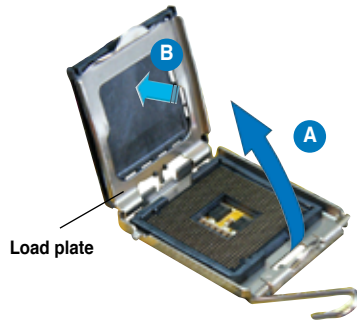
5. Position the CPU over the socket, making sure that the gold triangle is on the bottom-left corner of the socket. The socket alignment key should fit into the CPU notch.

Alignment key

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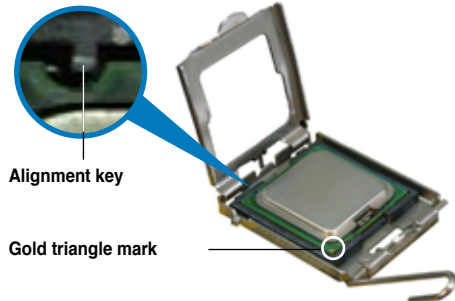
The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!

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

The motherboard supports Intel® Xeon® 3300/3200/3100/3000 series processors with the Intel® Enhanced Memory 64 Technology (EM64T), and Enhanced Intel SpeedStep® Technology (EIST). Refer to the Appendix for more information on these CPU features.

2.3.2   Installing the CPU heatsink

The Intel® Xeon® 3300/3200/3100/3000 series processors require a specially designed heatsink and fan-duct to ensure optimum thermal condition and performance.

Use only qualified CPU heatsink assembly.

To install the CPU heatsink:

1. Place the heatsink on top of the installed CPU, matching the screw holes with the heatsink standoffs.

Make sure that the heatsink grill is parallel to the nozzle of the chassis fans as shown.
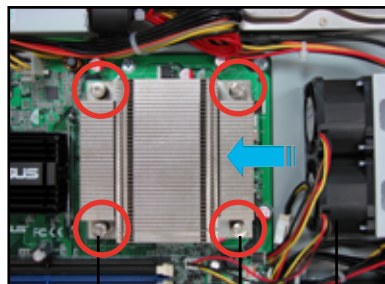
Screws   **Chassis fans**

2. Tighten the screws.
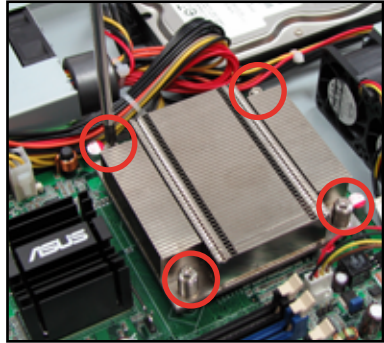
3. Peel the adhesive cover of the heatsink plastic cover and evenly attach to heatsink.
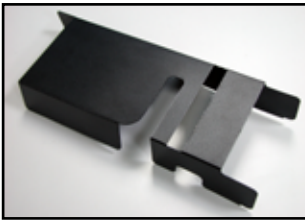
Heatsink plastic cover
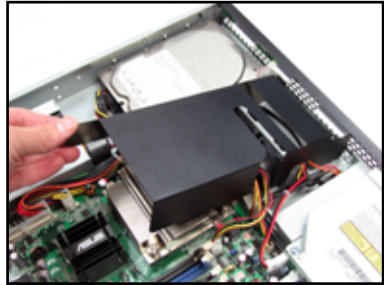
The heatsink plastic cover ensures the linear airflow between the heatsink and chassis fans.
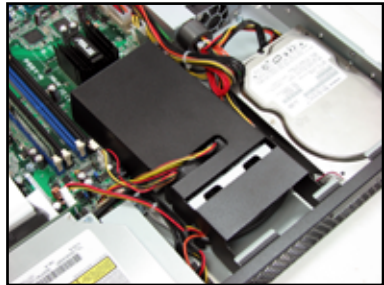
2.4   System memory

2.4.1   Overview

The motherboard comes with four Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets.

A DDR2 module has the same physical dimensions as a DDR DIMM but has a 240-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched differently to prevent installation on a DDR DIMM socket.

The figure illustrates the location of the DDR2 DIMM sockets:
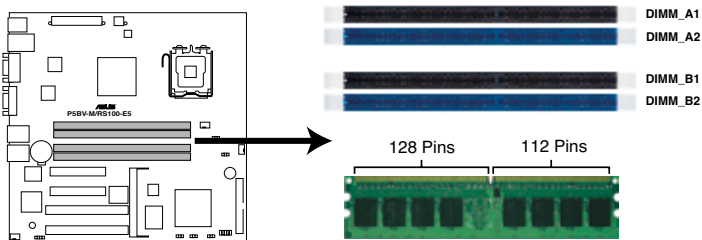
P5BV-M/RS100-E5 240-pin DDR2 DIMM Sockets

2.4.2   Memory configurations

You may install 512 MB, 1 GB, and 2 GB unbuffered ECC or non-ECC DDR2-533/667 DIMMs into the DIMM sockets.

- •   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 on the ASUS web site.

- •   When installing one or two DIMMs, install the DIMM(s) to the blue slots (DIMM_A1/DIMM_B1).

- •   Three DDR2 DIMMs intalled into any three memory sockets will function in single-channel mode.

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.
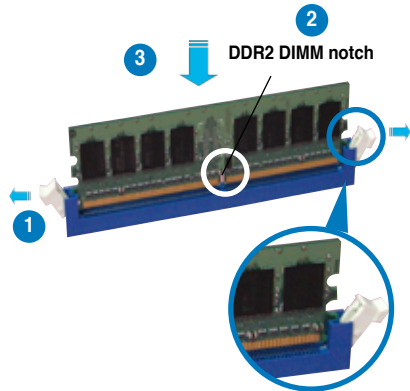
DDR2 DIMM notch

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.

DDR2 DIMM notch
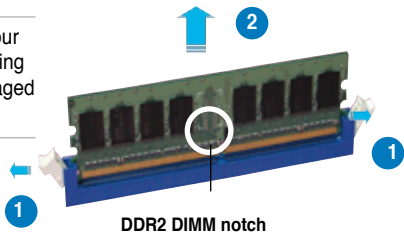
2.   Remove the DIMM from the socket.

2.5 Replaceable components

You may need to replace defective components or remove previously installed system components when installing or removing system devices. This section tells how to install or remove the following components:

1. Chassis fans

2. Serial ATA hard disk drives

3. Optical disk drive

2.5.1 Installing the chassis fans

To install the chassis fans:

1. Locate the chassis fan plate on the chassis.
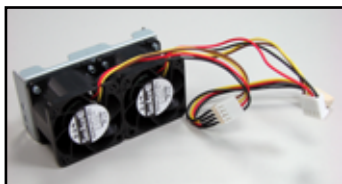
Chassis fans
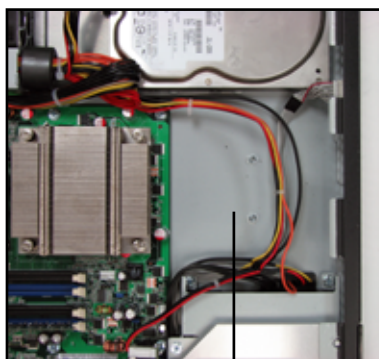
Chassis fan plate

2. Insert the chassis fans into the fan plate.

3. Secure the chassis fans with two screws.

Chassis fan screws
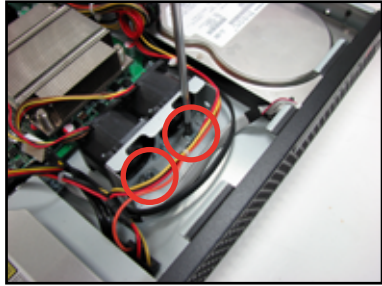
4. Connect the chassis fans cable to the onboard fan connectors labeled CPU_FAN1 and FRNT_FAN1. Refer to the illustration below for the location of CPU_FAN1 and FRNT_FAN1 connectors.

CPU_FAN1

GND
FANPWR2
FAN PWM

FRNT_FAN1

FAN PWM
FANPWR2
GND

P5BV-M/RS100-E5 CPU/Chassis Fan Connectors
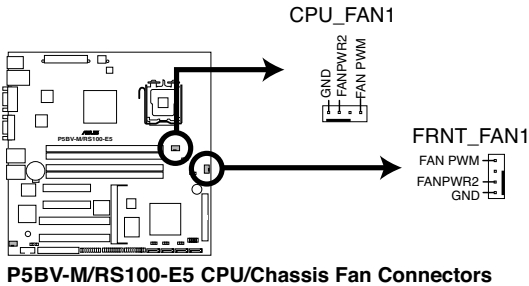
2.5.2 Installing Serial ATA drives

You can install up to two (2) Serial ATA hard disk drives to the system. Follow the succeeding instructions to install each of the drives.

To install primary Serial ATA drive:

1. Locate the Serial ATA drive bay beside the power supply unit. Notice the four standard screw holes.
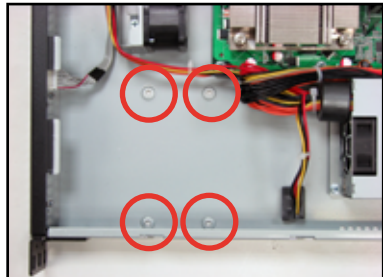
2.   Connect the Serial ATA signal cable
     and ATX power connectors. Use
     the L-type Serial ATA connector to
     connect to the hard drive.

SATA L-type connector

ATX power connector

SATA signal cable

3.   Place the Serial ATA drive into the
     drive bay matching the four screw
     holes with the holes on the disk
     drive.

4.   Secure the hard drive with four
     screws.
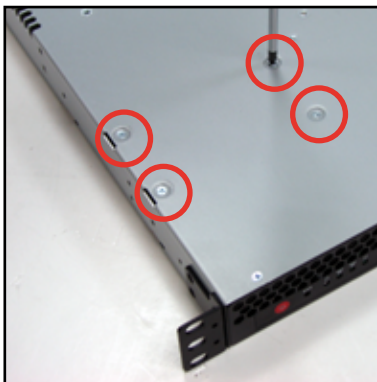
5. Connect the other end of the Serial ATA signal connector to the onboard SATA connector labeled SATA1. Refer to illustration below for the location of SATA1 connector.

SATA1

P5BV-M/RS100-E5 SATA1 Connector
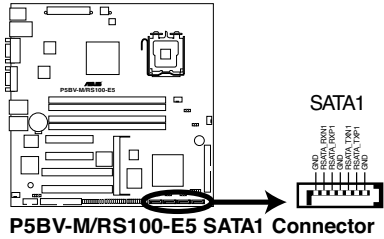
To install secondary Serial ATA drive:

1. If you have an ODD installed, remove the ODD bay first before you install a secondary SATA disk drive.

    To remove, disconnect the ODD cable and power cable then use a screwdriver to remove all two screws.
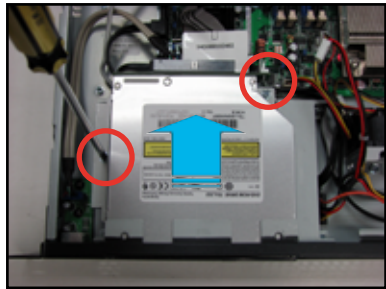
2. Locate the Serial ATA drive plate under the optical disk drive (ODD) bay.

SATA drive plate
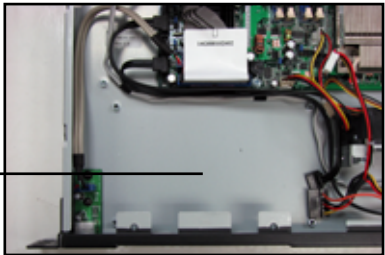
3. Secure the hard disk drive brackets to the HDD with four screws.

HDD bracket

4. Insert the Serial ATA drive into the drive plate as shown.

5. Secure the hard drive with four screws.
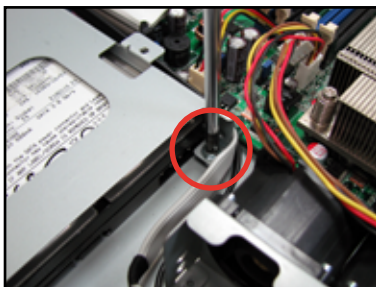
6. Connect the Serial ATA signal cable and ATX power connectors. Use the L-type Serial ATA connector to connect to the hard drive.

SATA L-type connector

ATX power connector

SATA signal cable

7. Connect the other end of the Serial ATA signal connector to the onboard SATA connector labeled SATA3.

P5BV-M/RS100-E5

SATA3

GND
RSATA_RXN1
RSATA_RXP1
GND
RSATA_TXN1
RSATA_TXP1
GND
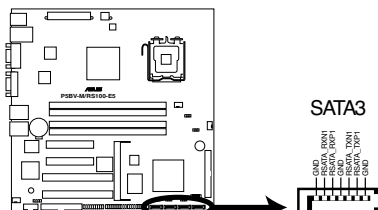
P5BV-M/RS100-E5 SATA3 Connector

2.5.3   Installing optical disk drive (ODD)

To install ODD:

1.   Connect the 80-pin IDE cable blue
      connector to the IDE connector
      onboard.
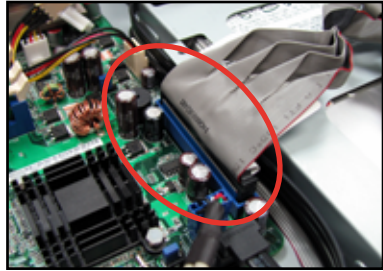
2.   Slide in the optical disk drive into
      the drive slot as shown.

Optical disk drive slot
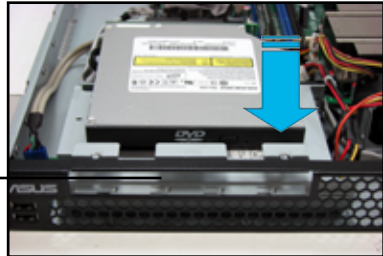
3.   Align the screw hole of the ODD
      bracket with the screw hole on the
      SATA drive bracket, then secure it
      with a screw.

ODD bracket
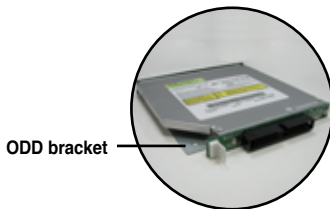
Optical disk drive (optional)

4. Place the ODD side bracket to the ODD, matching the two connectors of the bracket with the holes on the side of the ODD.

Bracket connectors
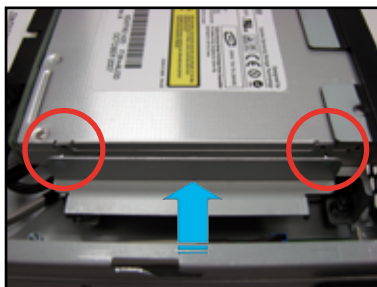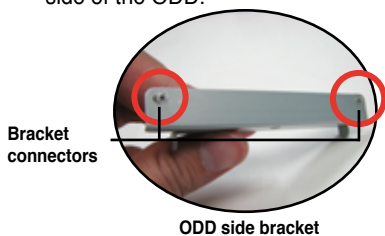
ODD side bracket

5. Secure the ODD side bracket to the Serial SATA drive bracket with a screw.

6. Connect the 80-pin IDE cable black connector and 4-pin ATX power connector to the IDE connector and power connector at the rear of the optical disk drive.
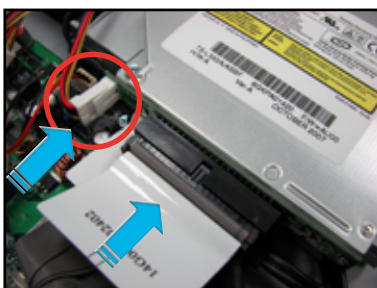
Chapter 3

This chapter describes how to install the optional components and devices into the barebone server.

Installation options

3.1 Rackmount rail kit items

The rackmount rail kit contains two pairs of rails (one pair for each side of the server system), six (6) pieces of inner rail screws, and two (2) pieces of rack screws.

Outer rails

Inner rails

Rack screws **Inner rail screws**
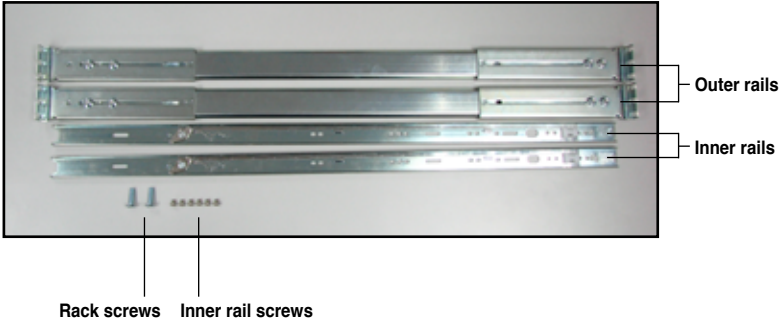
3.1.1 Attaching the rack ears

The bundled rack ears serve as handle when inserting or pulling the server from a rack cabinet.

To attach rack ears:

1. Prepare the bundled pair of rack ears and set of eight (8) screws.
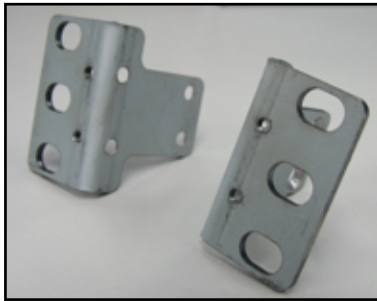
Pair of rack ears

2. Locate the four screw holes on each front-side of the chassis. Select one side for installation.

3. Get one rack ear and match the four screw holes to the screw holes on the chassis. Orient the rack ear as shown.

4. Secure the rack ear to the chassis with four screws.

5. Repeat steps 2 - 4 to attach the other rack ear.

3.1.2   Attaching the rails to the rack

To attach the rack rails:

1. Attach the inner rail to the correspoding side of the chassis and secure with three inner rail screws. Make sure the rail is oriented as shown.
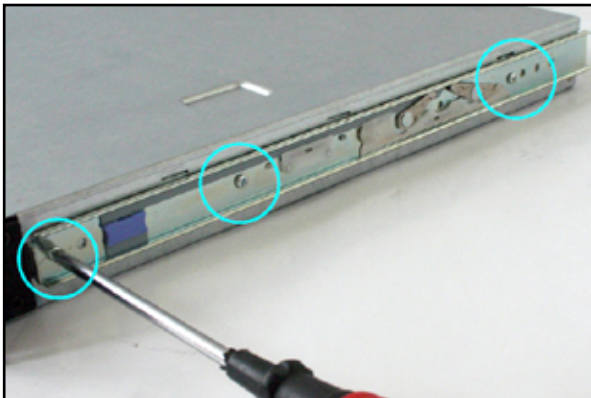
2. Attach the second inner rail to the other side of the chassis and secure with three inner rail screws.

3. Select one unit of space (1U) on the rack where you wish to install the server.

4. Place three (3) nuts on the front and three at the back. Do the same to the corresponding side of the rack.

    Nuts
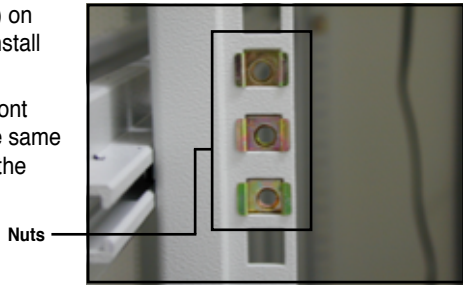
5. Adjust the length of the outer rail to fit the length of the rack cabinet, then fasten the two screws.
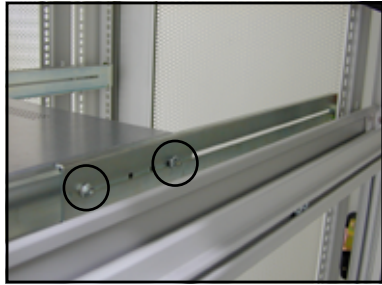
6. Secure the outer rail with two screws at the front and rear of the rack cabinet .

7. Find the corresponding 1U space on the other side of the rack cabinet then repeat steps 5 and 6 to attach the other outer rail.

8. Firmly hold the server on both sides. Slide the latches on the inner rack rails to the direction indicated below. Hold the latches, and insert the rear side of the server to the front end of the outer rack rail.

   Make sure that the inner rails are properly aligned with the outer rails.
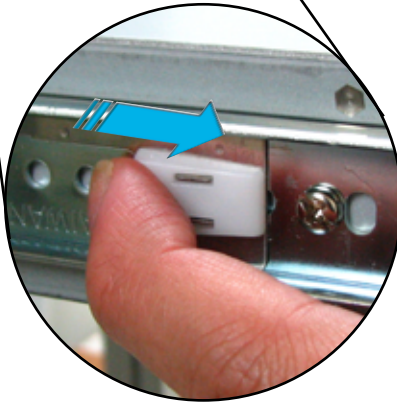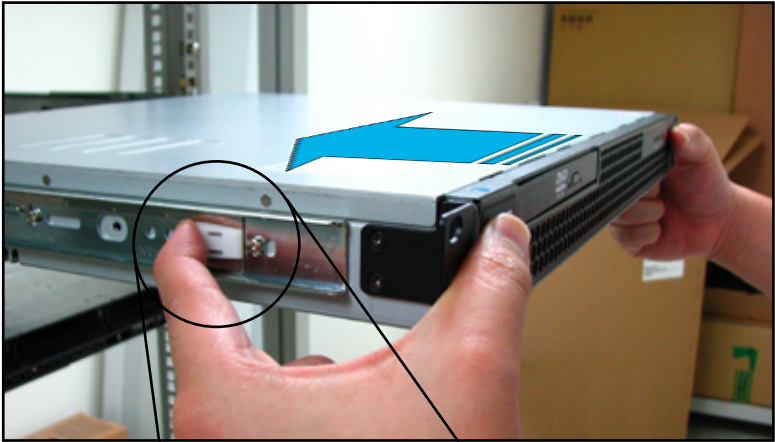
9. Carefully push the server all the way to the back until the front panel fits the front end of the rack.

10. Secure the server to the rack with one rack screw at one side. Secure the other side as well.

Rack screw

3.2 Rackmount bracket kit (Optional)

The rackmount bracket kit provides a convenient and economical way to install the server to the rack cabinet.

3.2.1 Attaching the long rack ears

The long rack ears are used to support the server system in a rack cabinet.

To attach the long rack ears:

1. Prepare the pair of long rack ears and set of twelve (12) screws.

2. Locate the six screw holes on each front-side of the chassis.Select one side for installation.

3. Get one long rack ear and match the six screw holes to the screw holes on the chassis. Orient the rack ear as shown.
4. Secure the rack ear to the chassis with six screws.
5. Repeat steps 2 - 4 to attach the other rack ear.
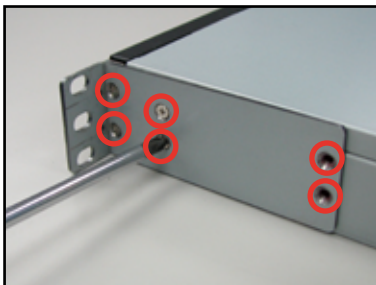
3.2.2 Attaching the server to the rack cabinet

1. Select one unit of space (1U) on the rack where you wish to install the server.

2. Place three (3) nuts on the front and three at the back. Do the same to the corresponding side of the rack.

Nuts
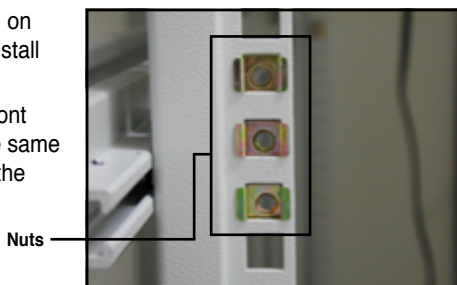
3. Carefully place the server to the desired position on the rack.

4. Secure the server to the rack with two rack screws at one side. Secure the other side as well.
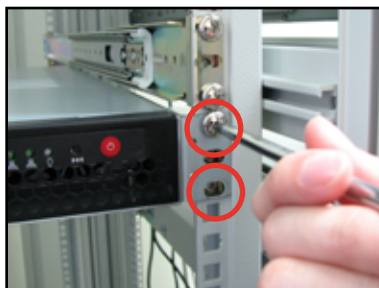
3.3   Front panel cover kit (Optional)

The front panel cover kit provides a convenient way to protect and decorate the front server panel.

1.   Prepare the bundled pair of front panel connectors and a set of twelve (12) screws.

2.   Secure the front panel connector to the rack ear.

3.   Secure the rack ear to the chassis with four screws.
4.   Repeat steps 2 - 3 to attach the other rack ear.

5.   Align the front cover to the pre-
      installed front cover connectors.

6.   Carefully attach the front cover to
      the front cover connectors.

Chapter 4

This chapter gives inforamtion about the motherboard that comes with the server. This chapter includes the motherboard layout, jumper settings, and connector locations.

Motherboard Info

4.1 Motherboard overview
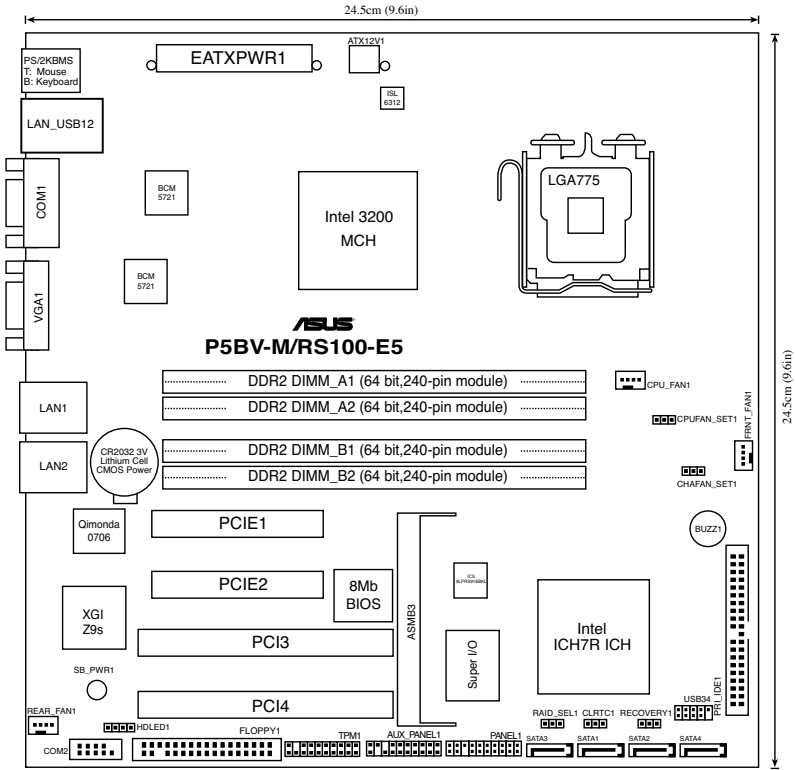
Layout contents

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4.	Fan mode setting (3-pin CPUFAN_SET1 and CHAFAN_SET1)	4-6

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6.	Serial port connector (10-1 pin COM2)	4-12
7.	CPU and system fan connectors (4pin CPU_FAN1, FRNT_FAN1, REAR_FAN1)	4-12
8.	ATX power connectors (24-pin EATXPWR1, 4-pin ATX12V1)	4-13
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10.	System panel auxiliary connector (20-2 pin AUX_PANEL1)	4-15
11.	TPM connector (20-pin TPM)	4-16

4.2 Jumpers

1. Clear RTC RAM (CLRTC)

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. 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.
3. Plug the power cord and turn ON the computer.
4. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

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

> If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.

CLRTC1

1 2   2 3

Normal   Clear CMOS
(Default)

P5BV-M/RS100-E5 Clear RTC RAM
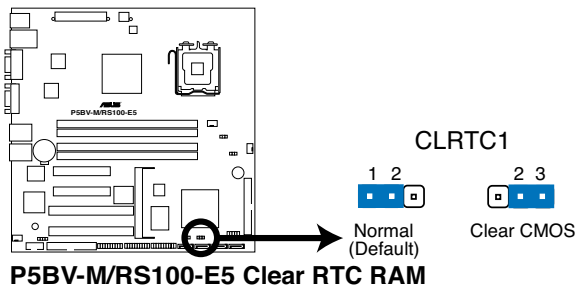
> • You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.
>
> • Due to the chipset limitation, AC power off is required prior using C.P.R. function. You must turn off and on the power supply or unplug and plug the power cord before reboot the system.

2.   **RAID controller selection (3-pin RAID_SEL1)**

This jumper allows you to select the RAID configuration utility to use when you create disk arrays. Place the jumper caps over pins 1-2 if you want to use the LSI Logic Embedded SATA RAID Setup Utility (default); otherwise, place the jumper caps to pins 2-3 to use the Intel® Matrix Storage Manager.

RAID_SEL1

1 2   2 3

LSI RAID ROM   INTEL RAID ROM
(Default)

P5BV-M/RS100-E5 RAID_SEL1 Setting
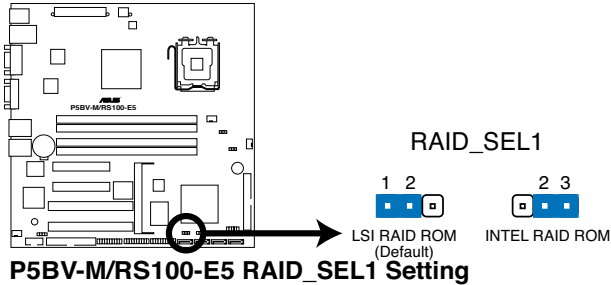
3.   **Force BIOS recovery setting (3-pin RECOVERY1)**

This jumper allows you to quickly update or recover the BIOS when it gets corrupted.

To update the BIOS:

1.   Prepare a floppy disk that contains the latest BIOS for the motherboard (xxxx-xxx.ROM) and the AFUDOS.EXE utility.

2.   Set the jumper to pins 2-3.

3.   Insert the floppy disk then turn on the system to update the BIOS.

4.   Shut down the system.

5.   Set the jumper back to pins 1-2.

6.   Turn on the system.

RECOVERY1

1 2   2 3

Normal   BIOS recovery
(Default)

P5BV-M/RS100-E5 BIOS Recovery Setting
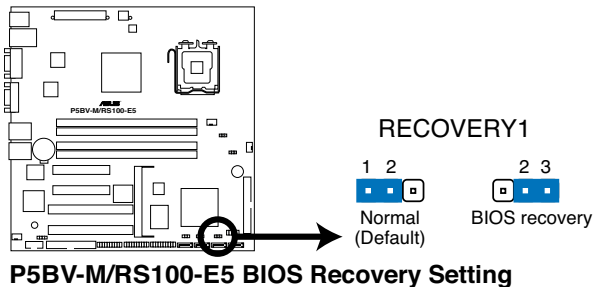
4. **Fan mode setting (3-pin CPUFAN_SET1; CHAFAN_SET1)**

These jumpers allow you to connect either a 3-pin or a 4-pin fan cable plug to the CPU fan or Chasis fan connectors Set these jumpers to pins 1-2 Short PWM mode if you are using a 4-pin fan cable plug, or to pins 2-3 Short DC mode if you are using a 3-pin plug.

CPUFAN_SET1

1 2   2 3

PWM Mode   DC Mode
(Default)

CHAFAN_SET1

1 2   2 3

PWM Mode   DC Mode
(Default)

**P5BV-M/RS100-E5
Fan Mode Setting**
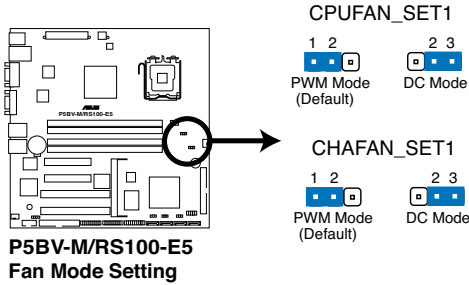
4.3 Connectors

4.3.1 Rear panel connectors
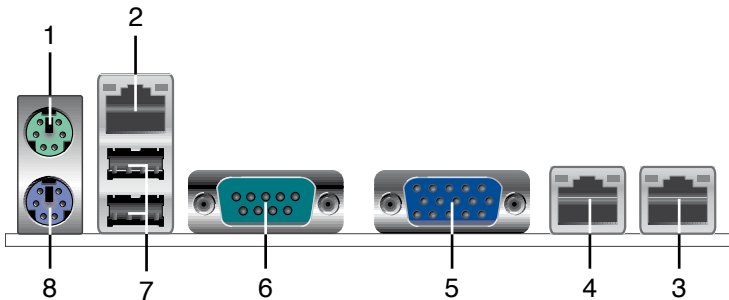
1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.

2. **LAN port for ASMB3 IKVM.**

3. **LAN1 (RJ-45) port.** 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.

4. **LAN2 (RJ-45) port w/i ASF function.** 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.

5. **VGA port.** This port is for a VGA monitor or other VGA-compatible devices.

6. **Serial (COM1) port.** This 9-pin communication port is for pointing devices or other serial devices.

7. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

8. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.

LAN port LED indications

Activity/Link LED		Speed LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
ORANGE	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection

ACT/LINK LED   SPEED LED

LAN port
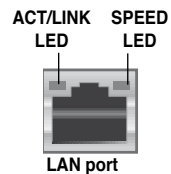
4.3.2 Internal connectors

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.

FLOPPY1

PIN1

NOTE: Orient the red markings on the floppy ribbon cable to PIN 1.

**P5BV-M/RS100-E5
Floppy Disk Drive Connector**

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

2. ICH7R primary IDE connector (40-1 pin PRI_IDE1)

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

PRI_IDE1

PIN 1

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

**P5BV-M/RS100-E5
IDE Connector**
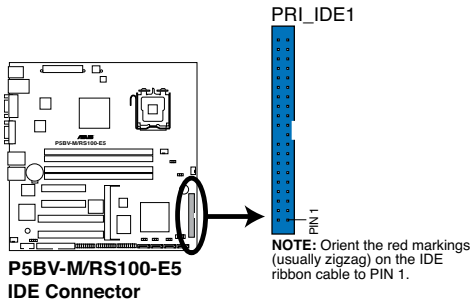
- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.

- Use the 80-conductor IDE cable for Ultra DMA 100/66 IDE devices.

3. **Serial ATA connectors (7-pin SATA1-4)**

    These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.

    If you installed Serial ATA hard disk drives, you can create a RAID 0 and RAID 1 configuration using the Intel® Matrix Storage Technology or the LSI MegaRAID® utility embedded in the Intel® ICH7R Southbridge.

SATA3   SATA1   SATA2   SATA4

P5BV-M/RS100-E5 SATA Connectors
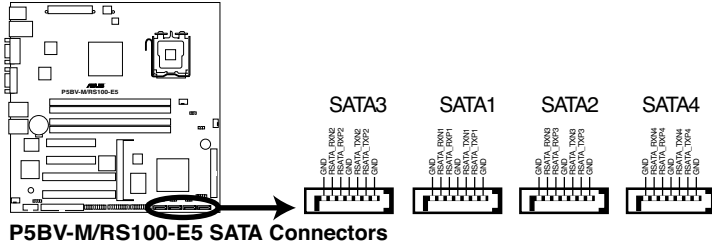
• By default, SATA1 and SATA3 connectors are pre-installed with two SATA cables for Serial ATA hard disk drives.

• These connectors are set **IDE** mode by default. In **IDE** mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the **Configure SATA as** item in the BIOS to [RAID]. See section **4.3.4 IDE Configuration** for details.

Important notes on Serial ATA

• Use only two Serial ATA RAID connectors for each RAID 0 or RAID 1 set.

• When using the connectors in **IDE** mode, connect the primary (boot) hard disk drive to the SATA1 or SATA2 connector. Refer to the table below for the recommended SATA hard disk drive connections.

Serial ATA hard disk drive connection

Connector	Setting	Use
SATA 1/2	Master	Boot disk
SATA 3/4	Slave	Boot/Data disk

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

   This connector supplies power to the hard disk activity LED. The read or write activities of any device connected to the SCSI connectors or the SATA connectors cause this LED to light up.

   HDLED1

   NC
   ADD_IN_CARD_ACT#
   ADD_IN_CARD_ACT#
   NC

   P5BV-M/RS100-E5
   Hard Disk Activity LED Connector
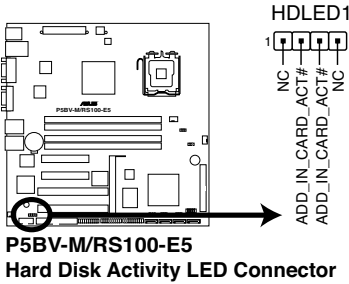
5. **USB connector (10-1 pin USB34)**

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

   USB34

   USB+5V
   USB_P3-
   USB_P3+
   GND

   USB+5V
   USB_P4-
   USB_P4+
   GND
   NC

   P5BV-M/RS100-E5 USB 2.0 Connector
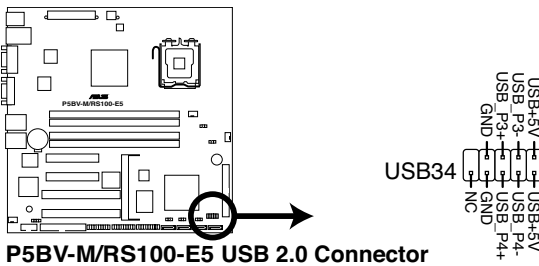
6.   Serial port connector (10-1 pin COM2)

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. The serial port module is purchased separately.

COM2

PIN 1

P5BV-M/RS100-E5 COM2 Port Connector
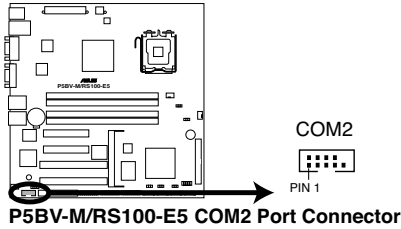
7.   CPU and system fan connectors (4-pin CPU_FAN1, FRNT_FAN1, REAR_FAN1)

The fan connectors support cooling fans of 350 mA ~ 740 mA (8.88 W max.) or a total of 2.1 A ~ 4.44 A (53.28 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.

CPU_FAN1

GND
FANPWR2
FAN PWM

FRNT_FAN1

FAN PWM
FANPWR2
GND

GND
FANPWR2
FAN PWM

P5BV-M/RS100-E5
Fan Connectors

REAR_FAN1
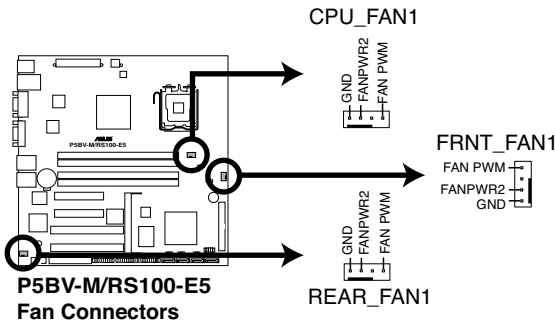
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!

8. ATX power connectors (24-pin EATXPWR1, 4-pin ATX12V1)

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.

EATXPWR1

ATX12V1

P5BV-M/RS100-E5 ATX Power Connector
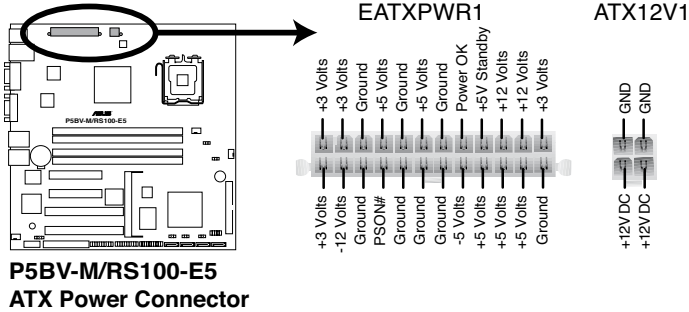
- Use of an ATX 12 V Specification 2.0-compliant power supply unit (PSU) that provides a minimum power of 450 W is recommended for a fully-configured system.

- Do not forget to connect the 4-pin or 8-pin ATX +12 V power plug; otherwise, the system will not boot up.

- We recommend that you use a PSU with a higher power output 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.

9.   **System panel connector (20-1 pin PANEL1)**

This connector supports several chassis-mounted functions.

- **System power LED (Green 3-pin PLED)**
  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.

- **Message LED (Brown 2-pin MLED)**
  This connector is for the message LED cable that connects to the front message LED. The message LED indicates the booting status. The LED blinks when the system is in the boot process until the operating system is loaded.

- **System warning speaker (Orange 4-pin SPEAKER)**
  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

- **Hard disk drive activity LED (Red 2-pin IDE_LED)**
  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.

- **ATX power button/soft-off button (Light Green 2-pin PWRSW)**
  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 RESET)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

P5BV-M/RS100-E5 System Panel Connector
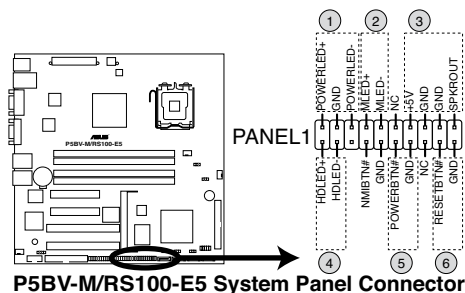
The system panel connector is color-coded for easy connection.

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

This connector supports several server system functions.

AUX_PANEL1

**P5BV-M/RS100-E5
Auxiliary Panel Connector**
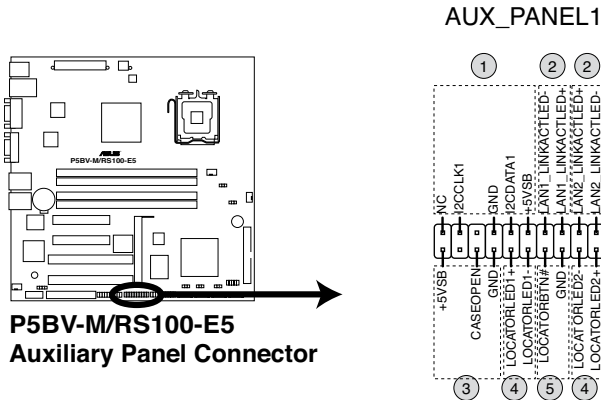
- **Front panel SMB (6-1 pin FPSMB)**

  These leads connect the front panel SMBus cable.

- **LAN activity LED (2-pin LAN1_LED, LAN2_LED)**

  These leads are for Gigabit LAN activity LEDs on the front panel.

- **Chassis Intrusion connector (3-pin CASEOPEN)**

  This lead is for a chassis with an intrusion detection feature. This requires an external detection mechanism such as a chassis intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to this lead to record a chassis intrusion event.

- **Locator LED (2-pin LOCATORLED1 and 2-pin LOCATORLED2)**

  These leads are for the locator LED1 and LED2 on the front panel. Connect the Locator LED cables to these 2-pin connector. The LEDs will light up when the Locator button is pressed.

- **Locator Button/Switch (2-pin LOCATORBTN)**

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

11. TPM connector (20- pin TPM)

This connector is used to connect a Trusted Platform Module (TPM) Card. You need to install ASUS TPM card to use this feature function.

P5BV-M/RS100-E5 TPM Connector
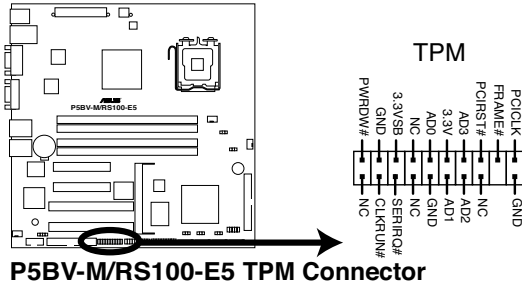
The TPM module is purchased separately.

Chapter 5

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

BIOS Setup

5.1   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 3** (Updates the BIOS using a bootable floppy or USB Flash disk when the BIOS file fails or gets corrupted.)

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.

5.1.1   Creating a bootable floppy disk

To create a bootable floppy disk in a DOS environment:

    a.   Insert a 1.44MB floppy disk into the drive.

    b.   At the DOS prompt, type `format` **A:/S** then press <Enter>.

5.1.2 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 1024 KB 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 /irs100e5.rom
   ```

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

   ```
   A:\>afudos /irs100e5.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 ...... 0x0008CC00 (9%)
   ```

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

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

```
A:\>afudos /irs100e5.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:\>
```

Updating the BIOS file using a USB flash drive

If you have not purchased a USB floppy disk drive, you may update the BIOS
file using a USB flash drive. Format the USB flash drive to FAT16 or 32 system
file before updating the BIOS.

To format the USB flash drive to a FAT32/16 system file:

1.   Insert the USB flash drive to an available USB port.

2.   From the Windows desktop, click **Start**, then select **My computer**.

3.   Right-click the USB flash drive icon, then select **Format** from the menu.

4.   From the **File system** field, select **FAT32** or **FAT16**, then click the **Start**
     button.

To update the BIOS file:

1.   Copy the original or the latest BIOS file and the AFUDOS utility (afudos.
     exe) to the USB flash drive.

2.   Insert the USB flash drive to an available USB port, then place the
     motherboard support CD to the optical drive.

3.   Boot the system from the support CD, then select the **FreeDOS
     command prompt**.

4.   At the DOS prompt, replace the prompt with the USB flash disk drive
     letter, then type: `afudos /i[filename]`

5.   Follow the instructions in the previous section to update the BIOS file.

5.1.3 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 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 USB flash disk, or the floppy disk that contains the updated BIOS file.

> • Prepare a USB flash disk or a floppy disk containing the updated motherboard BIOS before using this utility.
>
> • Ensure that you rename the original or updated BIOS file in the floppy disk or the USB flash disk.
>
> • Visit ASUS website (www.asus.com) to download the latest BIOS file.

Recovering the BIOS from the USB flash disk

To recover the BIOS from the USB flash disk:

1. Insert the USB flash disk that contains BIOS file to the USB port.
2. Turn on the system.
3. The utility will automatically checks the devices for the BIOS file when found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.
4. Restart the system after the utility completes the updating process.

> • Only the USB flash disk with FAT 32/16 format and single partition can support ASUS CrashFree BIOS 3. The device size should be smaller than 8GB.
>
> • DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

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 "rs100e5.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.

5.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section **5.1 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 <Delete> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

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

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

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit Menu. See section **5.7 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.

5.2.1   BIOS menu screen

Menu items   Menu bar   Configuration fields   General help

```
                              BIOS SETUP UTILITY
  Main    Advanced    Power      Boot    Exit

  System Time                     [19:10:19]              Use [ENTER]. [TAB],
  System Date                     [Mon 01/28/2008]        or [SHIFT-TAB] to
  Legacy Diskette A               [Disabled]              select a field.

                                                          Use [+] or [-] to
  ▶  Primary IDE Master    :      [Not Detected]          configure system
  ▶  Primary IDE Slave     :      [TSSTcorpDVD-ROM TS]    time.
  ▶  SATA 1                :      [Hitachi HDS721616P]
  ▶  SATA 2                :      [Not Detected]
  ▶  SATA 3                :      [Not Detected]          ←→Select Screen
  ▶  SATA 4                :      [Hitachi HDS721616P]    ↑↓ Select Item
  ▶  IDE Configuration                                    +- Change Option
                                                          F1 General Help
  ▶  System Information                                   F10Save and Exit
                                                          ESCExit

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```

Sub-menu items   Navigation keys

5.2.2   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
Power	For changing the Advanced Power Management (APM) configuration
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.

5.2.3   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.

5.2.4   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.
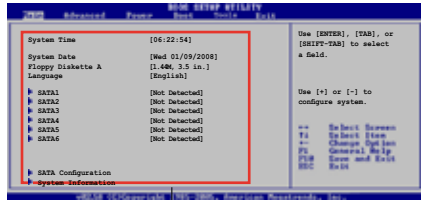
Main menu items

5.2.5   Sub-menu items

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

5.2.6   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."

5.2.7   Pop-up window

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

5.2.8   Scroll bar

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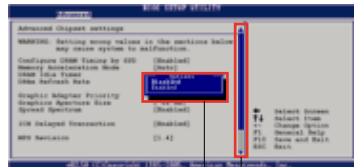
Pop-up window

Scroll bar

5.2.9   General help

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

5.3   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 **5.2.1 BIOS menu screen** for information on the menu screen items and how to navigate through them.

```
                              BIOS SETUP UTILITY
  Main      Advanced      Power      Boot    Exit

  System Time                    [11:10:19]              Use [ENTER]. [TAB],
  System Date                    [Mon 01/28/2008]        or [SHIFT-TAB] to
  Legacy Diskette A              [Disabled]              select a field.

                                                         Use [+] or [-] to
▶  Primary IDE Master     :   [Not Detected]             configure system time.
▶  Primary IDE Slave      :   [TSSTcorpDVD-ROM TS]
▶  SATA 1                 :   [Hitachi HDS721616P]
▶  SATA 2                 :   [Not Detected]
▶  SATA 3                 :   [Not Detected]
▶  SATA 4                 :   [Hitachi HDS721616P]
▶  IDE Configuration                                   ◀▶ Select Screen
                                                       ↑↓ Select Item
▶  System Information                                  +- Change Option
                                                       Tab Select Field
                                                       F1  General Help
                                                       F10 Save and Exit
                                                       ESC Exit

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```

5.3.1   System Time [xx:xx:xx]

Allows you to set the system time.

5.3.2   System Date [Day xx/xx/xxxx]

Allows you to set the system date.

5.3.3   Legacy Diskette A [Disabled]

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.]

5.3.4 Primary IDE Master/Slave, SATA1-4

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

```
                              BIOS SETUP UTILITY
  Main

 Primary IDE Master                                  Select the type of
                                                     device connected to
 Device        : Not Detected                        the system.

 Type                         [Auto]
 LBA/Large Mode               [Auto]
 Block(Multi-Sector Transfer)M [Auto]
 PIO Mode                     [Auto]
 DMA Mode                     [Auto]
 SMART Monitoring             [Auto]
 32Bit Data Transfer          [Enabled]

                                                  ←→ Select Screen
                                                  ↑↓ Select Item
                                                  +- Change Option
                                                  F1 General Help
                                                  F10Save and Exit
                                                  ESCExit

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```

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

Type [Auto]

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

LBA/Large Mode [Auto]

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

Block (Multi-sector Transfer) M [Auto]

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

PIO Mode [Auto]

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

DMA Mode [Auto]

Selects the DMA mode.
Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0]
[MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]

SMART Monitoring [Auto]

Allows you to enable or disable the HDD Self-Monitoring Analysis and Reporting
Technology (SMART) feature.
Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Enabled]

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

5.3.5   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.

```
                            BIOS SETUP UTILITY
  Main

  IDE Configuration

  ATA/IDE Configuration        [Enhanced]
     Configure SATA as         [IDE]             Disable
                                                 Compatible
                                                 Enabled
  Hard Disk Write Protect      [Disabled]
  IDE Detect Time Out (Sec)    [35]
  ATA(PI) 80Pin Cable Detection [Host]




                                                 ←→ Select Screen
                                                 ↑↓ Select Item
                                                 +- Change Option
                                                 F1 General Help
                                                 F10 Save and Exit
                                                 ESC Exit

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```
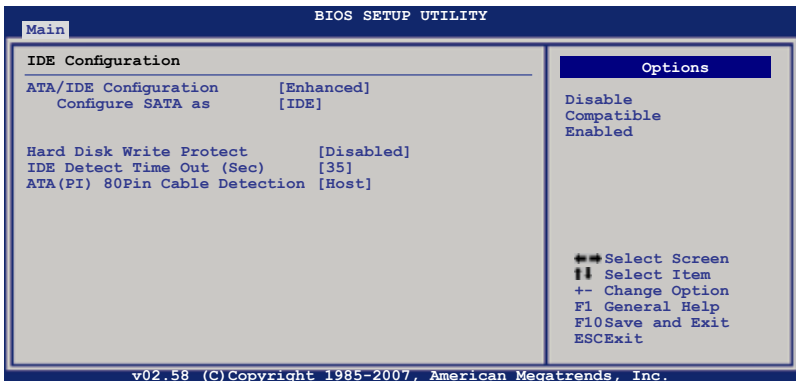
ATA/IDE Configuration [Enhanced]

Set the ATA/IDE Configuration.
Configuration options: [Disabled] [Compatible] [Enhanced]

> *Configure SATA as [IDE]*
> This sub-item appears only when you set the **ATA/IDE Configuration** item to
> [Enhanced] and allows you to set the SATA configuration.
> Configuration options: [IDE] [RAID] [AHCI]

Legacy IDE Channels [PATA Pri, SATA Sec]

This sub-item appears only when you set the **ATA/IDE Configuration** item to [Compatible] and allows you to set the legacy IDE channels.
Configuration options: [SATA Only] [PATA Pri, SATA Sec] [SATA Pri, PATA Sec] [PATA Only]

> • If you want to use the Serial ATA hard disk drives as Parallel ATA physical storage devices, keep the default setting [IDE].
>
> • If you want the Serial ATA hard disk drives to use the Advanced Host Controller Interface (AHCI), set this item to [AHCI]. The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.
>
> • If you want to create a RAID 0, RAID 1, RAID 5, RAID 10, or the Intel® Matrix Storage Technology configuration from the Serial ATA hard disk drives, set this item to [RAID].

Hard Disk Write Protect [Disabled]

Enables or disables the device write protection. This will be effective only if device is accessed through BIOS.
Configuration options: [Disabled] [Enabled]

IDE Detect Time Out (Sec) [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]

5.3.6 System Information

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

```
                          BIOS SETUP UTILITY
 Main

 AMIBIOS
 Version    : 0104
 Build Date: 10/25/07

 Processor
 Type      : Intel(R) Xeon(R) CPU X3230 @ 2.66GHz
 Speed     : 2666MHz
 Count     : 4

 System Memory
 Usable Size   : 2048MB
                                                    ◄►Select Screen
                                                    ↑↓ Select Item
                                                    +- Change Option
                                                    F1 General Help
                                                    F10Save and Exit
                                                    ESCExit

        v02.58 (C)Copyright 1985-2007, American Megatrends, Inc.
```
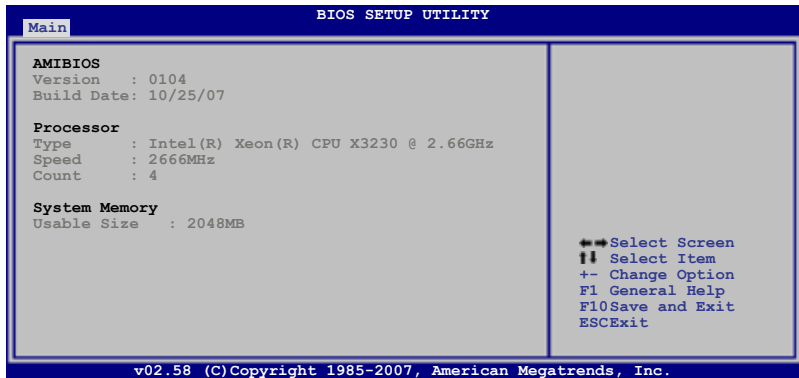
AMI BIOS

Displays the auto-detected BIOS information.

Processor

Displays the auto-detected CPU specification.

System Memory

Displays the auto-detected total system memory.

> The System information screen may be not exactly match the information on your screen. It will change according to your actual system configuration.

5.4 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.

```
                         BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit
┌────────────────────────────────────────────┬──────────────────────┐
│ ▶  USB Configuration                        │  Configure the USB   │
│ ▶  Remote Access Configuration              │  support.            │
│ ▶  Trusted Computing                        │                      │
│ ▶  MPS Configuration                        │                      │
│                                             │                      │
│ ▶  CPU Configuration                        │                      │
│ ▶  Chipset                                  │                      │
│ ▶  Onboard Devices Configuration            │                      │
│ ▶  PCIPnP                                   │                      │
│                                             │                      │
│                                             │  ←→  Select Screen   │
│                                             │  ↑↓  Select Item     │
│                                             │  +-  Change Option   │
│                                             │  F1  General Help    │
│                                             │  F10 Save and Exit   │
│                                             │  ESC Exit            │
├────────────────────────────────────────────┴──────────────────────┤
│     v02.58 (C)Copyright 1985-2007, American Megatrends, Inc.       │
└────────────────────────────────────────────────────────────────────┘
```

5.4.1 USB Configuration

```
                         BIOS SETUP UTILITY
  Advanced
┌────────────────────────────────────────────┬──────────────────────┐
│ USB Configuration                           │                      │
│                                             │  ┌────────────────┐  │
│ Module Version - 2.24.3-13.4                │  └────────────────┘  │
│                                             │  Disabled            │
│ USB Devices Enabled:                        │  Enabled             │
│    1 Mouse                                  │                      │
│                                             │                      │
│ USB Functions            [Enabled]          │                      │
│ USB2.0 Controller        [Enabled]          │                      │
│ Legacy USB Support       [Auto]             │                      │
│ USB2.0 Controller Mode   [HiSpeed]          │                      │
│ BIOS EHCI Hand-Off       [Enabled]          │                      │
│                                             │  ←→  Select Screen   │
│                                             │  ↑↓  Select Item     │
│                                             │  +-  Change Option   │
│                                             │  F1  General Help    │
│                                             │  F10 Save and Exit   │
│                                             │  ESC Exit            │
├────────────────────────────────────────────┴──────────────────────┤
│     v02.58 (C)Copyright 1985-2007, American Megatrends, Inc.       │
└────────────────────────────────────────────────────────────────────┘
```

USB Function [Enabled]

Allows you to enable a specific number of USB ports, or disable the USB function. Configuration options: [Disabled] [Enabled]

📝 The following items appear only when the **USB Functions** item is set to [Enabled] .

USB 2.0 Controller [Enabled]

Allows you to enable or disable the USB 2.0 controller.
Configuration options: [Enabled] [Disabled]

Legacy USB Support [Auto]

Allows you to enable or disable support for legacy USB. The AUTO option disables legacy support if there is no USB device connected.
Configuration options: [Disabled] [Enabled] [Auto]

USB2.0 Controller mode [HiSpeed]

Allows you to select the USB2.0 controller mode.
Configuration options: [HiSpeed] [FullSpeed]

BIOS EHCI Hand-Off [Enabled]

Allows yout to enable or disable the BIOS EHCI Hand-Off support function.
Configuration options: [Disabled] [Enabled]

5.4.2   Remote Access Configuration

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

```
                            BIOS SETUP UTILITY
        Advanced

Configure Remote Access type and parameters              Select Remote Access
                                                         type.
Remote Access              [Disabled]
```

Remote Access [Disabled]

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

The following items appear only when the **Remote Access** item is set to [Enabled].

Serial port number [COM1]

Allows you to select a serial port for console redirection.
Configuration options: [COM1] [COM2]

Serial Port Mode [115200 8, n,1]

Allows you to select a serial port mode.
Configuration options: [115200 8,n,1] [57600 8,n,1] [38400 8,n,1] [19200 8,n,1] [09600 8,n,1]

Flow Control [None]

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

Redirection After BIOS POST [Always]

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

Terminal Type [ANSI]

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

VT-UTF8 Combo Key Support [Enabled]

Allows you to enable or disable VT-UTF8 Combination Key Support for ANSI/
VT100 terminals.
Configuration options: [Enabled] [Disabled]

5.4.3   Trusted Computing

```
                        BIOS SETUP UTILITY
        Advanced

    Trusted Computing                          Enable/Disable TPM
                                               TCG (TPM 1.1/1.2) supp
    TCG/TPM SUPPORT            [No]            in BIOS
```

TCG/TPM SUPPORT [No]

Allows you to set the TCG/TPM SUPPORT.
Configuration options: [No] [Yes]

5.4.4   MPS Configuration

```
                        BIOS SETUP UTILITY
        Advanced

    MPS Configuration                          Select MPS
                                               Revision.
    MPS Revision              [1.4]
```

MPS Revision [1.4]

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

5.4.5   CPU Configuration

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

```
                         BIOS SETUP UTILITY
          Advanced

Configure advanced CPU settings                      This should be enabled
Module Version: 3D.06                                in order to enable or
                                                     disable the "Enhanced
Manufacturer: Intel                                  Halt State".
Brand String: Intel(R) Xeon(R) CPU X3230 @ 2.66GHz
Frequency   : 2.66GHz
FSB Speed   : 1066MHz
Cache L1    : 128 KB
Cache L2    : 8192 KB
Ratio Status: Unlocked (Max:10, Min:06)
Ratio Actual Value  :10
CPUID       :6FB

C1E Support                 [Enabled]              ←→Select Screen
Max CPUID Value Limit:      [Disabled]             ↑↓ Select Item
Vanderpool  Technology      [Enabled]              +- Change Option
CPU TM function:            [Enabled]              F1 General Help
Execute Disable Bit         [Enabled]              F10Save and Exit
                                                   ESCExit

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```

The CPU configuration screen may be not exactly match the information on your screen, it will change according to your actual CPU type.

C1E Support [Enabled]

Allows you to enable or disable the Enhanced Halt State.
Configuration options: [Disabled] [Enabled]

Max CPUID Value Limit [Disabled]

Enable this item to boot legacy operating systems that cannot support CPUs with extended CPUID functions.
Configuration options: [Disabled] [Enabled]

Vanderpool Technology [Enabled]

The Vanderpool Technology allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.
Configuration options: [Disabled] [Enabled]

CPU TM function: [Enabled]

This function enables the overheated CPU to throttle the clock speed to cool down.
Configuration options: [Disabled] [Enabled]

Execute Disable Bit [Enabled]

Allows you to enable or disable the No-Execution Page Protection Technology. Setting this item to [Disabled] forces the XD feature flag to always return to zero (0).
Configuration options: [Disabled] [Enabled]

5.4.6   Chipset Configuration

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

```
                         BIOS SETUP UTILITY
         Advanced

  Advanced Chipset Settings                      Configure North Bridge
                                                 features.
  WARNING: Setting wrong values in below sections
           may cause system to  malfunction.

  ▶  North Bridge Configuration
  ▶  South Bridge Configuration
```

North Bridge Configuration

```
                         BIOS SETUP UTILITY
         Advanced

  North Bridge chipset Configuration              ENABLE: Allow
                                                  remapping of
  Memory Remap Feature        [Enabled]           overlapped PCI memory
     PCI MMIO Allocation: 4GB To 3584MB           above the total
  DRAM Frequency              [Auto]              physical memory.
  Configure DRAM Timing by SPD   [Enabled]
                                                  DISABLE: Do not allow
  Initiate Graphic Adapter     [PEG/PCI]          remapping of memory.

  PEG Port Configuration
     PEG Port                  [Auto]
```

Memory Remap Feature [Enabled]

Allows you to enable or disable the remapping of the overlapped PCI memory above the total physical memory. Enable this option only when you install 64-bit operating system.
Configuration options: [Disabled] [Enabled]

DRAM Frequency [Auto]

Allows you to set the DDR operating frequency.
Configuration options: [Auto] [667 MHz] [800 MHz]

Configure DRAM Timing by SPD [Enabled]

When this item is enabled, the DRAM timing parameters are set according to the DRAM SPD (Serial Presence Detect). When disabled, you can manually set the DRAM timing parameters through the DRAM sub-items.
Configuration options: [Enabled] [Disabled]

Initiate Graphic Adapter [PEG/PCI]

Allows you to select the graphics controller as the primary boot device.
Configuration options: [PCI/PEG] [PEG/PCI]

PEG Port Configuration

PEG Port [Auto]
Configuration options: [Auto] [Disabled]

South Bridge Configuration

```
                        BIOS SETUP UTILITY
          Advanced

  South Bridge chipset Configuration

  SMBUS Controller              [Enabled]

  SLP_S4# Min. Assertion Width   [1 to 2 seconds]
```
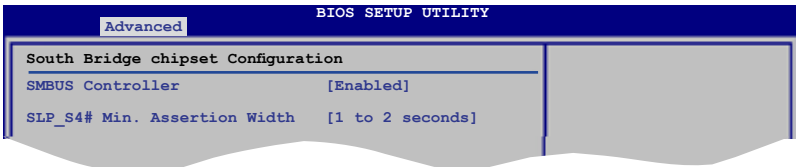
SMBUS Controller [Enabled]

Allows you to enable or disable the SMBUS Controller.
Configuration options: [Disabled] [Enabled]

SLP_S4# Min. Assertion Width [1 to 2 seconds]

Allows you to select the SLP_S4# Min. Assertion Width.
Configuration options: [4 to 5 seconds] [3 to 4 seconds] [2 to 3 seconds] [1 to 2 seconds]

5.4.7 Onboard Devices Configuration

The Onboard Devices Configuration menu allows you to change the onboard devices settings. Select an item then press <Enter> to display the sub-menu.

```
                        BIOS SETUP UTILITY
          Advanced

  Configure Win83627EHG-A Super IO Chipset      Allows BIOS to Select
                                                Serial Port1 Base
  Serial Port1 Address          [3F8/IRQ4]      Addresses.
  Serial Port2 Address          [2F8/IRQ3]
    Serial Port2 Mode           [Normal]

  PCIE LAN-5721A                [Enabled]
   LAN5721A Boot ROM            [Disabled]
  PCIE LAN-5721B                [Enabled]
   LAN5721B Boot ROM            [Disabled]
```
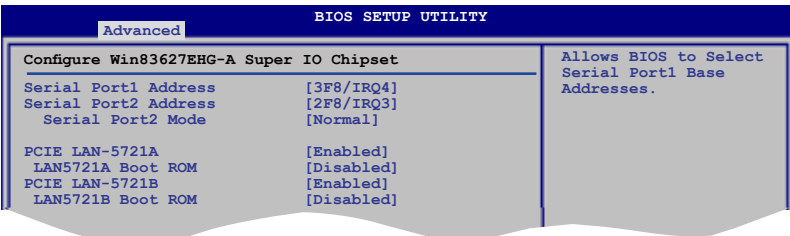
Serial Port1 Address [3F8/IRQ4]

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

Serial Port2 Address [2F8/IRQ3]

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

> *Serial Port2 Mode [Normal]*
> Allows you to select the Serial Port2 mode.
> Configuration options: [Normal] [IrDA] [ASK IR]

PCIE LAN-5721A/B [Enabled]

Allows you to hide or active PCIE LAN-5721A/B. LAN A is LAN port 2 supporting ASF, and LAN B is LAN port 1 not supporting ASF.
Configuration options: [Disabled] [Enabled]

LAN5721A/B Boot ROM [Disabled]

Allows you to Configure LAN5721A/B Boot ROM.
Configuration options: [Disabled] [Enabled]

5.4.8   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.

```
                              BIOS SETUP UTILITY
        Advanced

    Advanced PCI/PnP Settings                          NO: Lets the BIOS
                                                       configue all the
    WARNING: Setting wrong values in below sections    devices in the system.
             may cause system to malfunction.          YES: Lets the
                                                       operating system
    Plug And Play O/S          [No]                     configure Plug and Play
    PCI Latency Timer          [64]                     (PnP) devices not
    Allocate IRQ to PCI VGA    [Yes]                    required for boot if
    Palette Snooping           [Disabled]               your system has a Plug
                                                       and Play operating
    IRQ-3  assigned to         [PCI Device]             system.
    IRQ-4  assigned to         [PCI Device]
    IRQ-5  assigned to         [PCI Device]
    IRQ-7  assigned to         [PCI Device]            ←→  Select Screen
    IRQ-9  assigned to         [PCI Device]            ↑↓  Select Item
    IRQ-10 assigned to         [PCI Device]            +-  Change Option
    IRQ-11 assigned to         [PCI Device]            F1  General Help
    IRQ-14 assigned to         [PCI Device]            F10 Save and Exit
    IRQ-15 assigned to         [PCI Device]            ESC Exit

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```

Plug And Play O/S [No]

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

PCI Latency Timer [64]

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

Allocate IRQ to PCI VGA [Yes]

When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested.
Configuration options: [No] [Yes]

Palette Snooping [Disabled]

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

IRQ-xx assigned to [PCI Device]

When set to [PCI Device], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices.
Configuration options: [PCI Device] [Reserved]

5.5 Power Configuration

The Power Configuration menu items allow you to change the settings for the ACPI and Advanced Power Management (APM) features. Select an item then press <Enter> to display the configuration options.

```
                              BIOS SETUP UTILITY
  Main     Advanced     Power     Boot     Exit

  ACPI 2.0 Support              [Disabled]          Add additional tables
  ACPI APIC Support             [Enabled]           as per ACPI 2.0
                                                    specifications.
  ▶  APM Configuration
  ▶  Hardware Monitor




                                                    ←→ Select Screen
                                                    ↑↓ Select Item
                                                    +- Change Option
                                                    F1 General Help
                                                    F10Save and Exit
                                                    ESCExit

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```
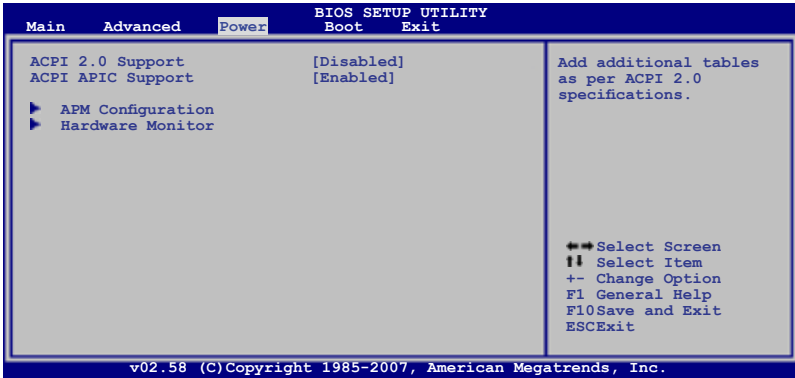
ACPI 2.0 Support [Disabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) 2.0 Support.
Configuration options: [Disabled] [Enabled]

ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list.
Configuration options: [Disabled] [Enabled]

5.5.1   APM Configuration

```
                    Power

APM Configuration                              <Enter> to select
                                               whether or not to
Restore on AC Power Loss  [Last State]         restart the system
                                               after AC power loss.
Resume On Ring            [Disabled]
Resume On PME#            [Disabled]
Resume On RTC Alarm       [Disabled]
```
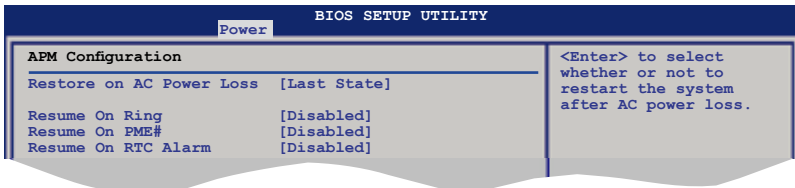
Restore on AC Power Loss [Last State]

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

Resume On Ring [Disabled]

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

Resume On PME# [Disabled]

Allows you to enable or disable the Resume On PME# function.
Configuration options: [Disabled] [Enabled]

Resume On RTC Alarm [Disabled]

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

> The following items appear only when the **Resume On RTC Alarm** item is set
> to Enabled.

RTC Alarm Date [15]
To set the alarm date, highlight this item and press the <+> or <-> key to
make the selection.
Configuration options: [Everyday] [1] [2] [3]...[31]

RTC Alarm Hour [12]
To set the alarm hour, highlight this item and press the <+> or <-> key to
make the selection.
Configuration options: [00] [01] [02] [03]...[23]

RTC Alarm Minute (Second) [30]
To set the alarm minute (second≠), highlight this item and press the <+> or
<-> key to make the selection.
Configuration options: [00] [01] [02] [03]...[59]

5.5.2   Hardware Monitor

```
                                      BIOS SETUP UTILITY
                        Power

  Hardware Monitor                                                CPU Temperature

  CPU Temperature              [43°C/109°F]
  MB Temperature               [35°C/95°F]

  CPU_Fan1 Speed               [8544RPM]
  CPU Smart Fan Control        [Enabled]
  CPU Fan Ratio                [Auto]
  CPU Target Temperature       [50°C]
  FRNT_Fan1 Speed              [8544RPM]
  REAR_Fan1 Speed              [N/A]

  VCORE Voltage                [1.288V]
  3.3V Voltage                 [3.248V]
  5V Voltage                   [4.608V]
  12V Voltage                  [11.352V]
  VBAT Voltage                 [3.152V]
```

CPU Temperature [xxxºC/xxxºF]
MB Temperature [xxxºC/xxxºF]

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

CPU_Fan1 Speed [xxxxRPM] or [N/A]
FRNT_Fan1 Speed [xxxxRPM] or [N/A]
REAR_Fan1 Speed [xxxxRPM] or [N/A]

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.

CPU Smart Fan Control [Enabled]

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

> The **CPU Fan Ratio** and **CPU Target Temperature** items appear only when you set the **CPU Smart Fan Control** item to [Enabled].

CPU Fan Ratio [Auto]

Allows you to select the fan speed ratio so that the fans operate at a low CPU temperature. Setting a very low ratio may cause a dramatical fan speed drop and trigger a hardware monitor warning message.
Configuration options: [Auto] [90%] [80%] [70%] [60%] [50%] [40%] [30%] [20%]

CPU Target Temperature [50ºC]

The CPU fan speed will be adjusted to maintain the CPU temperature as low as the selected temperature.
Configuration options: [35ºC] [38ºC] [41ºC] [44ºC] [47ºC] [50ºC] [53ºC] [56ºC] [59ºC] [62ºC] [65ºC]

VCORE Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage, VBAT Voltage

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

5.6 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.

```
                          BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit
 ┌──────────────────────────────────────────┐ ┌──────────────────────────┐
 │  Boot Settings                            │ │ Specifies the Boot       │
 │                                           │ │ Device Priority          │
 │ ▶  Boot Device Priority                   │ │ sequence.                │
 │                                           │ │                          │
 │ ▶  Boot Settings Configuration            │ │ A virtual floppy disk    │
 │ ▶  Security                               │ │ drive (Floppy Drive B:)  │
 │                                           │ │ may appear when you set  │
 │                                           │ │ the CD-ROM drive as the  │
 │                                           │ │ first boot device.       │
 │                                           │ │                          │
 │                                           │ │                          │
 │                                           │ │                          │
 │                                           │ │ ◄► Select Screen         │
 │                                           │ │ ↑↓ Select Item           │
 │                                           │ │ +- Change Option         │
 │                                           │ │ F1 General Help          │
 │                                           │ │ F10 Save and Exit        │
 │                                           │ │ ESC Exit                 │
 └──────────────────────────────────────────┘ └──────────────────────────┘
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```

5.6.1 Boot Device Priority

```
                          BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit
 ┌──────────────────────────────────────────┐ ┌──────────────────────────┐
 │  Boot Device Priority                     │ │ Specifies the boot       │
 │                                           │ │ sequence from the        │
 │ 1st Boot Device      [1st FLOPPY DRIVE]   │ │ available devices.       │
 │ 2nd Boot Device      [ATAPI CD-ROM]       │ │                          │
 │ 3rd Boot Device      [Hard Drive]         │ │ A device enclosed        │
 │                                           │ │ in parenthesis has       │
 │                                           │ │ been disabled in the     │
 │                                           │ │ corresponding type       │
 │                                           │ │ menu.                    │
```

1st Boot Device [1st FLOPPY DRIVE]
2nd Boot Device [ATAPI CD-ROM]
3rd Boot Device [Hard Drive]
These items specify the boot device priority sequence from the available devices.
Configuration options: [1st FLOPPY DRIVE] [ATAPI CD-ROM] [Hard Drive]
[Disabled]

5.6.2   Boot Settings Configuration

```
                              BIOS SETUP UTILITY
                              Boot
 ──────────────────────────────────────────────────────────────────────────
   Boot Settings Configuration                          Allows BIOS to skip
 ─────────────────────────────────────────             certain tests while
   Quick Boot                 [Enabled]                 booting. This will
   Full Screen Logo           [Enabled]                 decrease the time
   AddOn ROM Display Mode      [Force BIOS]              needed to boot the
   Bootup Num-Lock            [On]                       system.
   PS/2 Mouse Support          [Auto]
   Wait For 'F1' If Error      [Enabled]
   Hit 'DEL' Message Display   [Enabled]
   Interrupt 19 Capture        [Enabled]
```

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.

AddOn ROM Display Mode [Force BIOS]

Allows you to set display mode for optional ROM.
Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

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

PS/2 Mouse Support [Auto]

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

Wait for 'F1' If Error [Enabled]

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

Hit 'DEL' Message Display [Enabled]

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

Interrupt 19 Capture [Enabled]

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

5.6.3   Security

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

```
                    BIOS SETUP UTILITY
                       Boot

  Security Settings                            <Enter> to change
                                               password.
  Supervisor Password   : Not Installed        <Enter> again to
  User Password         : Not Installed        disable password.

  Change Supervisor Password
  Change User Password
```
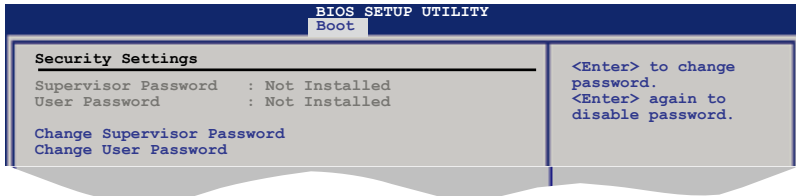
Change Supervisor Password

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 and 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 Jumper** 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.

```
                              BIOS SETUP UTILITY
                          Boot

  Security Settings                                    <Enter> to change
                                                       password.
  Supervisor Password    : Installed                   <Enter> again to
  User Password          : Not Installed               disable password.

  Change Supervisor Password
  User Access Level              [Full Access]
  Change User Password
  Clear User Password
  Password Check                 [Setup]
```
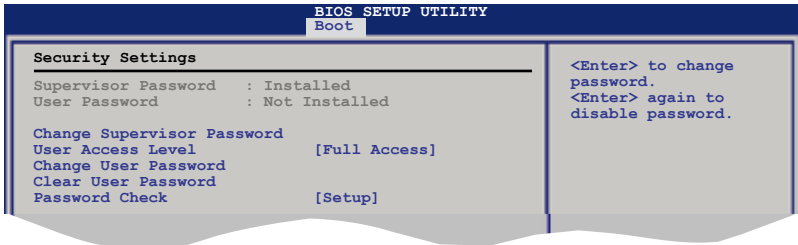
User Access Level [Full Access]

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

> **No Access** prevents user access to the Setup utility.

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

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

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

Change User Password

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

To set a User Password:

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

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

Clear User Password

Select this item to clear the user password.

Password Check [Setup]

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

5.7   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.

```
                          BIOS SETUP UTILITY
  Main     Advanced     Power      Boot    Exit

  Exit Options                                    Exit system setup
  ─────────────────────────────                   after saving the
  Exit & Save Changes                             changes.
  Exit & Discard Changes
  Discard Changes                                 F10 key can be used
                                                  for this operation.
  Load Setup Defaults



                                                  ◄► Select Screen
                                                  ↑↓ Select Item
                                                  +- Change Option
                                                  F1 General Help
                                                  F10 Save and Exit
                                                  ESC Exit

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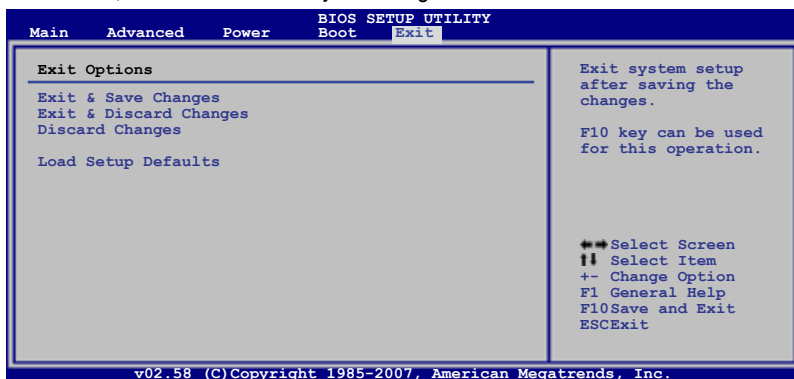
> Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

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 PC is turned off. When you select this option, a confirmation window appears. Select YES to save 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

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

Load Setup Defaults

This option 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 YES to load default values. Select Exit & Save Changes or make other changes before saving the values to the non-volatile RAM.

Chapter 6

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

RAID Configuration

6.1 RAID configurations

The server system/motherboard comes with the Intel® ICH7R and the LSI Software RAID technology built-in the Intel® ICH7R SouthBridge chipset that allows you to configure IDE and Serial ATA hard disk drives as RAID sets. The motherboard supports the following RAID configurations:

6.1.1 RAID definitions

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

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

Intel® Matrix Storage. The Intel® Matrix Storage technology supported by the ICH7R chip allows you to create a RAID 0 and a RAID 1 set using only two identical hard disk drives. The Intel® Matrix Storage technology creates two partitions on each hard disk drive to create a virtual RAID 0 and RAID 1 sets. This technology also allows you to change the hard disk drive partition size without losing any data.

> 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 section **7.1 RAID driver installation** for details.

6.1.2 Installing Serial ATA hard disks

The motherboard supports Serial ATA hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SATA hard disks for a RAID configuration:

1.   Install the SATA hard disks into the drive bays.
2.   Connect the SATA signal cables.
3.   Connect a SATA power cable to the power connector on each drive.

6.1.3 Setting the RAID item in BIOS

You must set the RAID item in the BIOS Setup before you can create a RAID set(s). To do this:

1.   Enter the BIOS Setup during POST.
2.   Go to the **Main** menu, select **IDE Configuration**, then press <Enter>.
3.   Select the item **Configure SATA As**, then press <Enter> to display the configuration options.
4.   Select **RAID** from the **Configure SATA As** item options, then press <Enter>.
5.   Save your changes, then exit the BIOS Setup.

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

6.1.4 RAID configuration utility

Depending on the RAID_SEL1 jumper setting and the operating system, you can select a utility to create a RAID set. Refer to section **4.2 Jumpers** for details on the RAID_SEL1 jumper settings.

Use the Intel® Matrix Storage Manager to create a RAID 0 or RAID 1 set under Windows® Server operating system.

Use the LSI Software RAID Configuration Utility to create a RAID 0 or RAID 1 under Windows® Server or Red Hat® Enterprise operating system.

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

6.2 Intel® Matrix Storage Manager Option ROM Utility

The Intel® Matrix Storage Manager Option ROM utility allows you to create RAID 0 or RAID 1 from Serial ATA hard disk drives that are connected to the Serial ATA connectors supported by the Southbridge.

To enter the Intel® Matrix Storage Manager Option ROM utility:

1. Install all the Serial ATA hard disk drives.

2. Turn on the system.

3. During POST, press <Ctrl> + <I> to display the utility main menu.

```
        Intel(R) Matrix Storage Manager Option ROM v5.6.2.1002 ICH7R wRAID5
               Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.
   ============================[ MAIN MENU ]============================
                           1. Create RAID Volume
                           2. Delete RAID Volume
                           3. Reset Disks to Non-RAID
                           4. Exit

   ======================[ DISK/VOLUME INFORMATION ]=====================
    RAID Volumes:
    None defined.

    Physical Disks:
    Port Drive Model       Serial #           Size      Type/Status(Vol ID)
    0    Hitachi HDS72161   PVB300Z2R93D3D     153.4GB   Non-RAID Disk
    3    Hitachi HDS72161   PVB300Z2R93D3D     153.4GB   Non-RAID Disk




         [↑↓]-Select          [ESC]-Exit           [ENTER]-Select Menu
```

The navigation keys at the bottom of the screen allow you to move through the menus and select the menu options.

> The RAID BIOS setup screens shown in this section are for reference only and may not exactly match the items on your screen.

6.2.1 Creating a RAID 0 set (striped)

To create a RAID 0 set:

1. From the utility main menu, select **1. Create RAID Volume**, then press <Enter>. This screen appears.

```
        Intel(R) Matrix Storage Manager Option ROM v5.6.2.1002 ICH7R wRAID5
           Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.
   ═══════════════════════[ CREATE ARRAY MENU ]═══════════════════════

                      Name:   Volume0
                RAID Level:   RAID0(Stripe)
                     Disks:   Select Disks
                Strip Size:   128KB
                  Capacity:   306.8 GB

                            Create Volume


   ══════════════════════[ DISK/VOLUME INFORMATION ]══════════════════════


           Enter a string between 1 and 16 characters in length that can be used
           to uniquely identify the RAID volume. This name is case sensitive and
                           cannot contain special characters.




      [↑↓]-Change      [TAB]-Next      [ESC]-Previous Menu      [Enter]-Select
```

2. Enter a name for the RAID 0 set, then press <Enter>.
3. When the **RAID Level** item is highlighted, press the up/down arrow key to select **RAID 0(Stripe)**, then press <Enter>.
4. Use the up/down arrow key to select the stripe size for the RAID 0 array, then press <Enter>. The available stripe size values range from 8 KB to 128 KB. The default stripe size is 128 KB.

> We recommend a lower stripe size for server systems, and a higher stripe size for multimedia computer systems used mainly for audio and video editing.

5. Key in the RAID volume capacity that you want, then press <Enter>. The default value indicates the maximum allowed capacity.
6. Press <Enter> when the **Create Volume** item is highlighted. This warning message appears.

```
            WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

            Are you sure you want to create this volume? (Y/N):
```

7. Press <Y> to create the RAID volume and return to the main menu, or <N> to go back to the Create Volume menu.

6.2.2 Creating a RAID 1 set (mirrored)

To create a RAID 1 set:

1. From the utility main menu, select **1. Create RAID Volume**, then press
    <Enter>. This screen appears.

```
         Intel(R) Matrix Storage Manager Option ROM v5.6.2.1002 ICH7R wRAID5
              Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.
    ═══════════════════════════[ CREATE ARRAY MENU ]═══════════════════════════

                             Name:  Volume1
                       RAID Level:  RAID1(Mirror)
                            Disks:  Select Disks
                       Strip Size:  N/A
                         Capacity:  XX.X  GB

                                    Create Volume


    ═══════════════════════════════════[ HELP ]════════════════════════════════


         Enter a string between 1 and 16 characters in length that can be used
         to uniquely identify the RAID volume. This name is case sensitive and
                          cannot contain special characters.



       [↑↓]-Change     [TAB]-Next      [ESC]-Previous Menu     [Enter]-Select
```

2. Enter a name for the RAID 1 set, then press <Enter>.

3. When the **RAID Level** item is highlighted, press the up/down arrow key to
    select **RAID 1(Mirror)**, then press <Enter>.

4. When the **Capacity** item is highlighted, key in the RAID volume capacity
    that you want, then press <Enter>. The default value indicates the maximum
    allowed capacity.

5. Press <Enter> when the **Create Volume** item is highlighted. This warning
    message appears.

```
                   WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.

               Are you sure you want to create this volume? (Y/N):
```
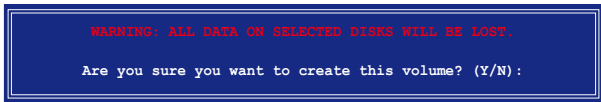
6. Press <Y> to create the RAID volume and return to main menu or <N> to go
    back to Create Volume menu.

6.2.3   Deleting a RAID set

⚠ Take caution when deleting a RAID set. You will lose all data on the hard disk drives when you delete a RAID set.

To delete a RAID set:

1.   From the utility main menu, select **2. Delete RAID Volume**, then press
      <Enter> to display this screen.

```
       Intel(R) Matrix Storage Manager Option ROM v5.6.2.1002 ICH7R wRAID5
           Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.
                            =[ DELETE VOLUME MENU ]=
   Name              Level           Drives    Capacity   Status        Bootable
   Volume0           RAID0(Stripe)   2         306.8GB    Normal             Yes




                                  =[ HELP ]=




         Deleting a volume will destroy the volume data on the drive(s) and
             cause any member disks to become available as non-RAID disks.

       WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.




           [↑↓]-Select          [<ESC>]-Previous Menu       [<Del>]-Delete Volume
```

2.   Use the up/down arrow key to select the RAID set you want to delete, then
      press <Del>. This window appears.

```
                     =[ DELETE VOLUME VERIFICATION ]=

                     ALL DATA IN THE VOLUME WILL BE LOST!

          Are you sure you want to delete volume "Volume0"? (Y/N):
```

3.   Press <Y> to delete the RAID set and return to the utility main menu;
      otherwise, press <N> to return to the Delete Volume menu.

6.2.4 Resetting Disks to Non-RAID

⚠ Take caution before you reset a RAID volume HDD to non-RAID. Resetting a RAID volume HDD deletes all internal RAID structure on the drive.

To reset a RAID set hard disk drive:

1. From the utility main menu, select **3. Reset Disks to Non-RAID**, then press <Enter> to display this screen.

```
============[ RESET RAID DATA ]============

    Resetting RAID data will remove internal RAID structures
    from the selected RAID disks. By removing these structures,
    the drive will revert back to a non-RAID disk.

WARNING: Resetting a disk causes all data on the disk to be lost.

Port Drive Model          Serial #            Size Status
    0 XXXXXXXXXXXX         XXXXXXXX            XX.XGB Member Disk
    1 XXXXXXXXXXXX         XXXXXXXX            XX.XGB Member Disk


            Select the disks that should be reset.

===[↑↓]-Previous/Next  [SPACE]-Selects  [ENTER]-Selection Complete===
```

2. Use the up/down arrow key to highlight the RAID set drive you want to reset, then press <Space> to select.

3. Press <Enter> to reset the RAID set drive. A confirmation message appears.

4. Press <Y> to reset the drive or press <N> to return to the utility main menu.

5. Follow steps 2 to 4 to select and reset other RAID set drives.

6.2.5 Exiting the Intel® Matrix Storage Manager utility

To exit the utility:

1. From the utility main menu, select **4. Exit**, then press <Enter>. This window appears.

```
==========[ CONFIRM EXIT ]==========

        Are you sure you want to exit? (Y/N):

```

2. Press <Y> to exit or press <N> to return to the utility main menu.

6.2.6 Rebuilding the RAID

This option is only for the RAID 1 set.

Rebuilding the RAID with other non-RAID disk

If any of the SATA hard disk drives included in the RAID array failed, the system displays the status of the RAID volume as "**Degraded**" during POST. You can rebuild the RAID array with other installed non-RAID disks.

To rebuild the RAID with other non-RAID disk:

1. At the prompt, press <Ctrl> + <I> to enter the Intel Matrix Storage Manager RAID configuration.

2. If there is a non-RAID SATA Hard Disk available, the utility will prompt to rebuild the RAID. Press <Enter>, then use up/down arrow keys to select the destination disk or press <ESC> to exit.

```
===================[ DEGRADED VOLUME DETECTED ]===================

"Degraded" volume and disk available for rebuilding detected.
Selecting a disk initiates a rebuild. Rebuild completes in the
operating system.

     Select the port of destination disk for rebuilding (ESC to exit):

          Port Drive Model       Serial#            Size
          3HDS722580VLSA80       VN6Bxxxx           76.7GB


=======[↑↓]-Previous/Next   [SPACE]-Selects   [ENTER]-Selection Complete =======
```

Select a destination disk with the same size as the original hard disk.

3. The utilty immediately starts rebuilding after the disk is selected. The status of the degraded RAID volume is changed to **"Rebuild"**.

```
       Intel(R) Matrix Storage Manager Option ROM v5.6.2.1002 ICH7R wRAID5
             Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.
       =============================[ MAIN MENU ]=============================

                      1. Create RAID Volume
                      2. Delete RAID Volume
                      3. Reset Disks to Non-RAID
                      4. Exit


       =====================[ DISK/VOLUME INFORMATION ]=====================

        RAID Volumes:
        ID   Name          Level         Strip  Size    Status    Bootable
        0    Volume0       RAID0(Stripe) 128KB  306.8GB  Rebuild  Yes


        Physical Disks:
        Port Drive Model      Serial #        Size     Type/Status(Vol ID)
        0    Hitachi HDS72161 PVB300Z2R93D3D  153.4GB  Non-RAID Disk
        3    Hitachi HDS72161 PVB300Z2R93D3D  153.4GB  Non-RAID Disk




             [↑↓]-Select       [ESC]-Exit        [ENTER]-Select Menu
```

4.   Exit the RAID configuration utility and reboot the system.

5.   Select **Start > Programs > Intel Matrix Storage > Intel Matrix Storage Console** or click the **Intel Matrix Storage Manager** tray icon to load the Intel Matrix Stroage Manager utility.

6.   From the **View** menu, select **Advanced Mode** to display the details of the Intel Matrix Storage Console.

7.   From the **Volumes view** option, select **RAID volume** to view the rebuilding status. When finished, the status is changed to "**Normal**".

Rebuilding the RAID with a new hard disk

If any of the SATA hard disk drives included in the RAID array failed, the system displays the status of the RAID volume as "**Degraded**" during POST. You may replace the disk drive and rebuild the RAID array.

To rebuild the RAID with a new hard disk:

1.   Remove the failed SATA hard disk and install a new SATA hard disk of the same specification into the same SATA Port.

> Select a destination disk with the same size as the original hard disk.

2.   Reboot the system and then follow the steps in section **Rebuilding the RAID with other non-RAID disk** on page 6-9.

6.2.7   Setting the Boot array in the BIOS Setup Utility

You can set the boot priority sequence in the BIOS for your RAID arrays when creating multi-RAID using the Intel® Matrix Storage Manager.

To set the boot array in the BIOS:

> Set at least one of the arrays bootable to boot from the hard disk.

1.   Reboot the system and press <Del> to enter the BIOS setup utility during POST.

2.   Go to the **Boot** menu and select the option **Boot Device Priority**.

3.   Use up/down arrow keys to select the boot priority and press <Enter>. Refer to **5.6.1 Boot Device Priority** for details.

4.   From the **Exit** menu, select **Exit & Save Changes**, then press <Enter>.

5.   When the confirmation window appears, select **OK**, then press <Enter>.

6.3   LSI Software RAID Configuration Utility

The LSI Software RAID Configuration Utility allows you to create RAID 0 or RAID 1 set(s) from SATA hard disk drives connected to the SATA connectors supported by the motherboard Southbridge chip.

To enter the LSI Software RAID Configuration Utility:

1.   Turn on the system after installing all the SATA hard disk drives.

2.   During POST, the LSI Software RAID Configuration Utility automatically detects the installed SATA hard disk drives and displays any existing RAID set(s). Press <Ctrl> + <M> or <Enter> to enter the utility.

```
LSI MegaRAID Software RAID BIOS Version A.05.090611342R
LSI SATA RAID Found at PCI Bus No:00 Dev No:1F
Device present at port 0  Hitachi HDS721616P       156554MB
Device present at port 3  Hitachi HDS721616P       156554MB
Press Ctrl-M or Enter to run LSI Software RAID Setup Utility.
-
```

> •   The LSI Software RAID Configuration Utitlity auto configures to RAID 1 when the SATA to RAID Mode is enabled.
>
> •   The RAID setup screens shown in this section are for reference only and may not exactly match the items on your screen due to the controller version difference.

3.   The utility main window appears. Use the arrow keys to select an option from the **Management Menu**, then press <Enter>. Refer to the Management Menu descriptions on the next page.

At the bottom of the screen is the legend box. The keys on the legend box allow you to navigate through the setup menu options or execute commands. The keys on the legend box vary according to the menu level.

```
LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007

    ┌─Management Menu─┐
    │ Configure       │
    │ Initialize      │
    │ Objects         │
    │ Rebuild         │
    │ Check           │
    │ Consistency     │
    └─────────────────┘



                    ┌──────────────┐
                    │ Configure VD(s) │
                    └──────────────┘
Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```
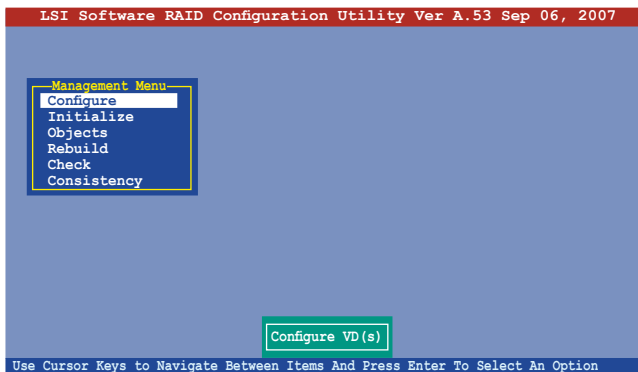
Menu	Description
Configure	Allows you to create RAID 0 or RAID 1 set using the Easy Configuration or the New Configuration command. This menu also allows you to view, add, or clear RAID configurations or select the boot drive
Initialize	Allows you to initialize the virtual drive of a created RAID set
Objects	Allows you to initialize virtual drive or change the virtual drive parameters
Rebuild	Allows you to rebuild failed drives
Check Consistency	Allows you to check the data consistency of the virtual drive of a created RAID set

6.3.1   Creating a RAID 0 or RAID 1 set

The LSI Software RAID Configuration Utility allows you to create a RAID 0 or RAID 1 set using two types of configurations: **Easy** and **New**.

In **Easy Configuration**, the virtual drive parameters are set automatically including the size and stripe size (RAID 1 only).

In **New Configuration**, you manually set the virtual drive parameters and assign the set size and stripe size (RAID 1 only).

Using Easy Configuration

To create a RAID set using the Easy Configuration option:

1.   From the utility main menu, highlight **Configure**, then press <Enter>.

2.   Use the arrow keys to select **Easy Configuration**, then press <Enter>.

```
        LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007
                          Configuration Menu
                          Easy Configuration
            Management    New Configuration
         Configure        View/Add Configuration
         Initialize       Clear Configuration
         Objects          Select Boot Drive
         Rebuild
         Check Consistency




              Defines Physical Arrays. An Array Will Automatically Become A VD
        Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

3. The **ARRAY SELECTION MENU** displays the available drives connected to the SATA ports. Select the drives you want to include in the RAID set, then press <SpaceBar>. When selected, the drive indicator changes from **READY** to **ONLIN A[X]-[Y]**, where X is the array number, and Y is the drive number.
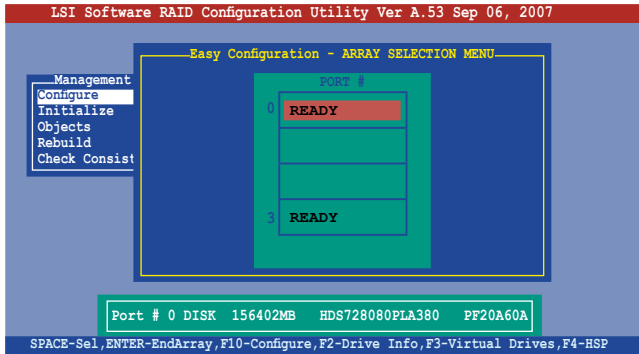
The information of the selected hard disk drive displays at the bottom of the screen.

4. Select all the drives required for the RAID set, then press <Enter> to end array. The configurable array appears on screen.
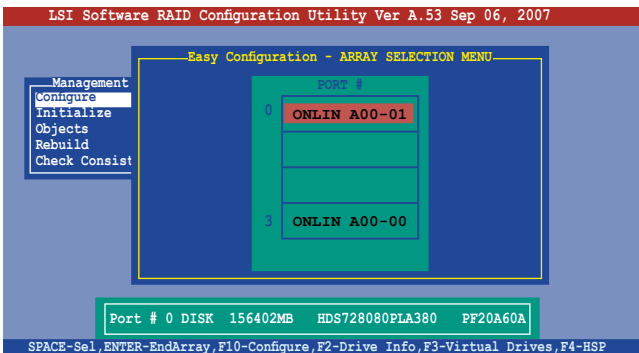
5.   Press <F10>, select the configurable array, then press <SpaceBar>.

```
LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007

              Easy Configuration - ARRAY SELECTION MENU
                          Select Configurable Array(s)
      Management         A-0
     Configure          SPAN-1
     Initialize
     Objects
     Rebuild
     Check Consist






Cursor Keys, SPACE-(De)Select F2-ChIdInfo F3-SlotInfo F10-Configure Esc-Quit
```
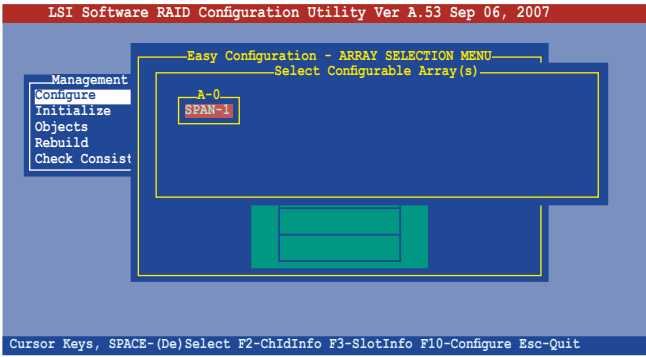
Press <F10> again, the virtual drive information appears including a **Virtual Drive** menu that allows you to change the virtual drive parameters.

```
LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007
                         Virtual Drive(s) Configured
      LD    RAID    Size    #Stripes    StripSz    Status
      0     1       156402MB    2       64 KB      ONLINE
     Manager
     Configure
     Initializ
     Objects
     Rebuild
     Check Cor
          Virtual Drive 0
         RAID = 1
         Size = 156402MB
         DWC  = Off
         RA   = On
         Accept
         SPAN = NO

             Choose RAID Level For This VD
Use Cursor Keys To Navigate Between Items And Press Enter To Select An Option
```
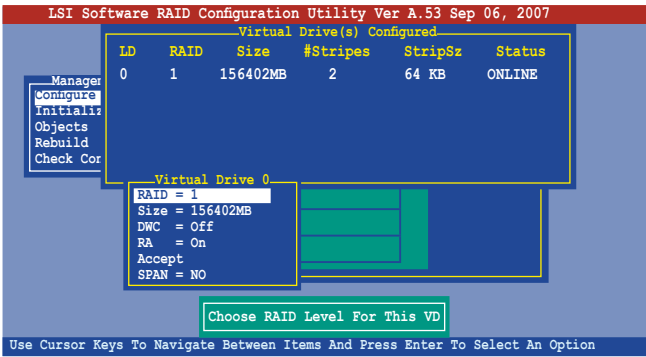
6.   Select **RAID** from the **Virtual Drive** menu, then press <Enter>.

7.   Select the **RAID level** from the menu, then press <Enter>.

> You need at least two identical hard disk drives when creating a RAID 1 set.

```
LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007
                    Virtual Drive(s) Configured
      LD    RAID    Size    #Stripes    StripSz    Status
      0     1     156402MB     2         64 KB     ONLINE

  Manager
 Configure
 Initializ
 Objects
 Rebuild
 Check Cor
        Virtual Drive 0        RAID Level
        RAID = 1               RAID 0
        Size = 156402MB        RAID 1
        DWC  = Off
        RA   = On
        Accept
        SPAN = NO

            Choose RAID Level For This VD
 Use Cursor Keys To Navigate Between Items And Press Enter To Select An Option
```

8.   When creating a **RAID 1** set, select **DWC** from the **Virtual Drive** menu, then press <Enter>.

      When creating a **RAID 0** set, proceed to step 10.

9.   Select **On** to enable the **Disk Write Cache** setting, then press <Enter>.

```
LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007
                    Virtual Drive(s) Configured
      LD    RAID    Size    #Stripes    StripSz    Status
      0     1     156402MB     2         64 KB     ONLINE

  Manager
 Configure
 Initializ
 Objects
 Rebuild                          Change DWC
 Check Cor                        O    f
                                  On
        Virtual Drive 0
        RAID = 1
        Size = 156402MB
        DWC  = Off
        RA   = On
        Accept
        SPAN = NO

            Disk Write Cache Setting Of VD
 Use Cursor Keys To Navigate Between Items And Press Enter To Select An Option
```

> Enabling DWC can improve the performance, but with the risk of data loss.

10. When finished setting the selected virtual drive configuration, select **Accept** from the menu, then press <Enter>.

```
┌─ LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007 ─┐
│                  ┌──── Virtual Drive(s) Configured ────┐        │
│           LD   RAID   Size     #Stripes    StripSz   Status     │
│   ┌Manager 0    1    156402MB     2          64 KB    ONLINE    │
│   │Configure                                                    │
│   │Initializ                                                    │
│   │Objects                                                      │
│   │Rebuild     ┌──── Virtual Drive 0 ────┐                      │
│   │Check Con   │RAID = 1                 │                      │
│               │Size = 156402MB          │                      │
│               │DWC  = On                │                      │
│               │RA   = On                │                      │
│               │Accept                   │                      │
│               │SPAN = NO                │                      │
│               └─────────────────────────┘                      │
│         ┌──────────────────────────────────────────────┐       │
│         │ Accept This VD Configuration And Go To Next VD │      │
│         └──────────────────────────────────────────────┘       │
│ Use Cursor Keys To Navigate Between Items And Press Enter To Select An Option │
└──────────────────────────────────────────────────────────────┘
```

11. Press <Esc> to exit the virtual drive configuration. When prompted, save the configuration, then press <Esc> to return to the **Management Menu**.

```
┌─ LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007 ─┐
│         ┌──── Configuration Menu ────┐   ┌─ Save Configuration? ─┐│
│         │Easy Configuration          │   │Yes                    ││
│   ┌Management│New Configuration       │   │No                     ││
│   │Configure │View/Add Configuration  │   └───────────────────────┘│
│   │Initializ └────────────────────────┘                          │
│   │Objects       ┌──── Virtual Drive(s) Configured ────┐          │
│   │Rebuild   LD   RAID   Size     #Stripes   StripSz  Status      │
│   │Check Con  0    1    156402MB    2         64 KB   ONLINE      │
│                                                                  │
│                                                                  │
│                                                                  │
│              ┌──────────────────┐                                │
│              │ Select Yes Or No │                                │
│              └──────────────────┘                                │
│ Use Cursor Keys To Navigate Between Items And Press Enter To Select An Option │
└──────────────────────────────────────────────────────────────┘
```

Using New Configuration

When a RAID set is already existing, using the **New Configuration** command erases the existing RAID configuration data. If you do not want to delete the existing RAID set, use the **View/Add Configuration** command to view or create another RAID configuration.

To create a RAID set using the **New Configuration** option:

1. From the utility main menu, highlight **Configure**, then press <Enter>.

2. Use the arrow keys to select **New Configuration**, then press <Enter>.

```
        LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007

                         ┌─────Configuration Menu─────┐
                         │ Easy Configuration         │
          ┌──Management──┤ New Configuration          │
          │ Configure    │ View/Add Configuration     │
          │ Initialize   │ Clear Configuration        │
          │ Objects      │ Select Boot Drive          │
          │ Rebuild      └────────────────────────────┘
          │ Check Consistency│
          └──────────────────┘




              ┌─────────────────────────────────────────────────────┐
              │ Clear Existing Configuration And Start A New Configuration │
              └─────────────────────────────────────────────────────┘
    Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

3. Follow steps 3 to 7 of the previous section.

4. Select **Size** from the **Virtual Drive** menu, then press <Enter>.

5. Key-in the desired virtual drive size, then press <Enter>.

```
        LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007
                     ┌────Virtual Drive(s) Configured────┐
              LD     RAID    Size    #Stripes   StripSz   Status
              0      1       156402MB   2        64 KB     ONLINE
        ┌──Manager─┤
        │ Configure │
        │ Initializ │
        │ Objects   │
        │ Rebuild   │
        │ Check C── │
             ┌─Enter VD Size (MB): 156402──┐
             └─────────────────────────────┘
             ┌─RAID = 1───────┐
             │ Size = 156402MB │
             │ DWC   = Off     │
             │ RA    = On      │
             │ Accept          │
             │ SPAN  = NO      │
             └─────────────────┘
                         ┌──────────────────────┐
                         │ Enter VD Size (MB):  │
                         └──────────────────────┘
    Use Cursor Keys To Navigate Between Items And Press Enter To Select An Option
```

6. Follow steps 8 to 13 of the previous section to create the RAID set.

6.3.2   Initializing the virtual drives

After creating the RAID set, you must initialize the virtual drives. You may initialize the virtual drives of a RAID set using the **Initialize** or **Objects** command on the **Management Menu**.

Using the Initialize command

To initialize the virtual drive using the Initialize command:

1.   From the **Management Menu**, highlight **Initialize**, then press <Enter>.

```
  LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007


    ┌──Management Menu──┐
    │ Configure         │
    │ Initialize        │
    │ Objects           │
    │ Rebuild           │
    │ Check Consistency │
    └───────────────────┘




                ┌─────────────────────────────┐
                │  Initialize Virtual Drive(s) │
                └─────────────────────────────┘
  Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```
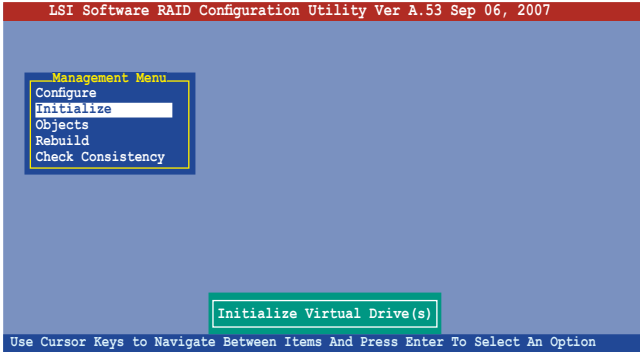
2.   The screen displays the available RAID set and prompts you to select the virtual drive to initialize. Use the arrow keys to select the virtual drive from the **Virtual Drive** selection, then press the <SpaceBar>.

```
  LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007


                        ┌──────Virtual Drive(s) Configured──────┐
    ┌──Management Menu──┐│ LD    RAID    Size    #Stripes    StripSz    Status │
    │ Configure         ││ 0     10    154494MB     4         64 KB     ONLINE │
    │ Initialize        ││                                                     │
    │ Objects           ││                                                     │
    │ Rebuild           ││                                                     │
    │ Check Consistency ││                                                     │
    └───────────────────┘│                                                     │
                         └─────────────────────────────────────────────────────┘
    ┌──Virtual Drives──┐
    │ Loical Drive 0   │
    └──────────────────┘


                        ┌───────────┐
                        │ Select VD │
                        └───────────┘
              SPACE-(De)Select, F10-Check Consistency
```
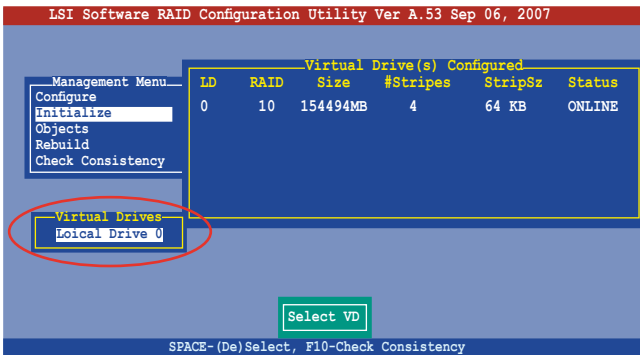
3. Press <F10> and select Yes from the **Initialize?** dialog box, then press <Enter>.

```
┌─────────────────────────────────────────────────────────────────────┐
│  LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007       │
├─────────────────────────────────────────────────────────────────────┤
│                          ──Virtual Drive(s) Configured──             │
│   ┌─Management Menu─┐  LD    RAID    Size    #Stripes   StripSz   Status │
│   │Configure        │  0     1    154494MB    2         64 KB    ONLINE │
│   │Initialize       │                                               │
│   │Objects          │                                               │
│   │Rebuild          │          ┌──Initialize?──┐                    │
│   │Check Consistency│          │Yes            │                    │
│   └─────────────────┘          │No             │                    │
│                                └───────────────┘                    │
│   ┌─Virtual Drives──┐                                               │
│   │Loical Drive 0   │                                               │
│   └─────────────────┘                                               │
│                                                                     │
│          ┌────────────────────────────────────────────┐            │
│          │ Initilize Will Destroy Data On Selected VD(s) │          │
│          └────────────────────────────────────────────┘            │
│              SPACE-(De)Select, F10-Check Consistency                │
└─────────────────────────────────────────────────────────────────────┘
```
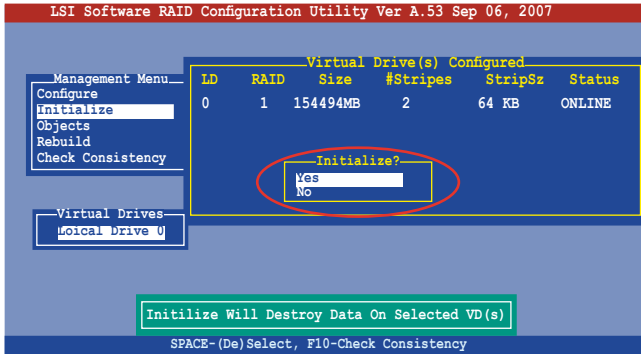
⚠ Initializing a virtual drive(s) erases all data on the drive.

4. A progress bar appears on screen. If desired, press <Esc> to abort initialization.

```
┌─────────────────────────────────────────────────────────────────────┐
│  LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007       │
├─────────────────────────────────────────────────────────────────────┤
│                          ──Virtual Drive(s) Configured──             │
│   ┌─Management Menu─┐  LD    RAID    Size    #Stripes   StripSz   Status │
│   │Configure        │  Initialization Of LD Is In Process      ONLINE │
│   │Initiali         │  ┌──────────────────────────────────────┐     │
│   │Objects          │  │ LD 0 Initialization. Press Esc to Abort. │  │
│   │Rebuild          │  │                                        │     │
│   │Check Co         │  │ ┌────────────────────────────────┐     │     │
│   └─────────────────┘  │ │ 85 % Completed                 │     │     │
│   ┌─Virtu──┐           └──────────────────────────────────────┘     │
│   │Loical Drive 0   │                                               │
│   └─────────────────┘                                               │
│                                                                     │
│              SPACE-(De)Select, F10-Initialize                       │
└─────────────────────────────────────────────────────────────────────┘
```

5.   When initialization is completed, press <Esc>.


```
        LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007

                               Virtual Drive(s) Configured
      __Management Menu__   LD    RAID    Size    #Stripes   StripSz   Status
     Configure              Initialization Of LD Is In Process         ONLINE
     Initial
     Objects                   LD 0 Initialization Complete. Press Esc..
     Rebuild
     Check Co
                              ┊ 100 % Completed

      __Virtua
       Loical Drive 0



                      SPACE-(De)Select, F10-Initialize
```

Using the Objects command

To initialize the virtual drive using the **Objects** command:

1.   From the **Management Menu**, highlight **Objects**, then press <Enter>.


```
        LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007


      __Management Menu__
     Configure
     Initialize
     Objects
     Rebuild
     Check Consistency




                       Configure Objects Like Adapter Parameters
     Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```
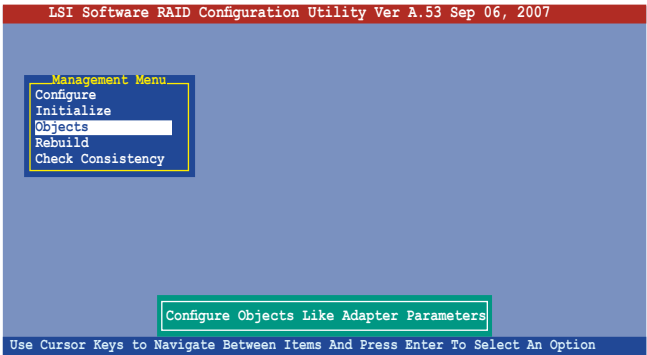
2. Select **Virtual Drive** from the **Objects** sub-menu, then press <Enter>.
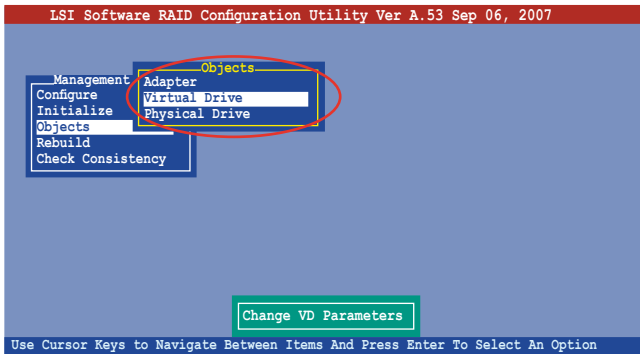
3. Select the virtual drive to initialize from the **Virtual Drives** sub-menu, then press <Enter>.
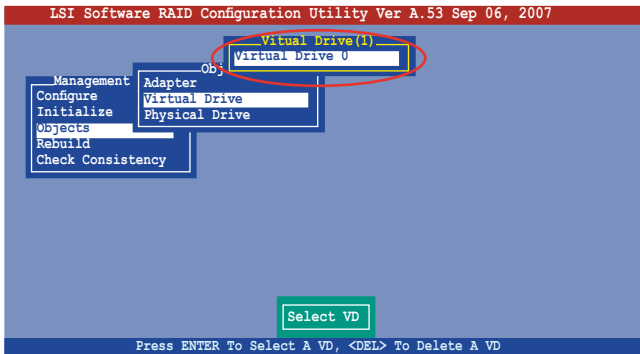
4. Select **Initialize** from the pop-up menu, then press <Enter> to start initialization.
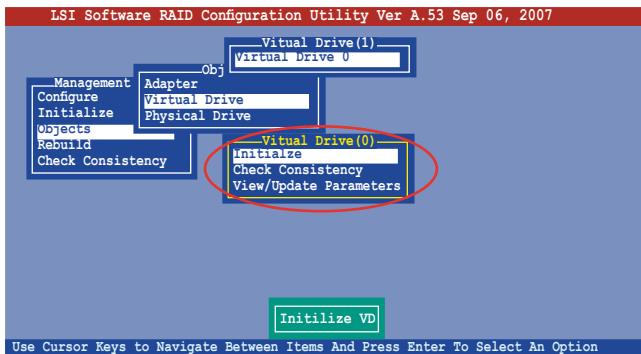
5. When prompted, select **Yes** from the **Initialize?** dialog box, then press <Enter>.


```
       LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007
                           ┌─────Vitual Drive(1)─────┐
                           │ Virtual Drive 0          │
                      ┌──Obj───┐
         ┌─Management──┐ Adapter
         │ Configure   │ Virtual Drive
         │ Initialize  │ Physical Drive
         │ Objects     │           ┌─────Vitual Drive(0)─────┐
         │ Rebuild     │           │ Initialze               │
         │ Check Consistency       │ Check Con ┌─Initialize?─┐
                                   │ View/Upda │ Yes         │
                                   │           │ No          │

                  ┌──────────────────────────────────────────────┐
                  │ Initilize Will Destroy Data On Selected VD(s) │
                  └──────────────────────────────────────────────┘
       Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

6. A progress bar appears on screen. If desired, press <Esc> to abort initialization.


```
          LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007
                             ┌─────Vitual Drive(1)─────┐
                             │ Virtual Drive 0          │
                        ┌──Obj───┐
           ┌─Management──┐ A  d  a  p  t  e  r
           │ C o n f i   │ Virtual Drive
           │ I n i t i   ┌─Initialization Of VD Is In Process─┐
           │ O  b  j     │                                     │
           │ R  e  b     │    VD 0 Initialization. Press Esc to Abort. │
           │ Check Cor   │                                     │
                         │  ┌────────────────────────────┐     │
                         │  │          55 % Completed     │     │
                         └─────────────────────────────────────┘

          Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

7. When initialization is completed, press <Esc>.


```
          LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007
                             ┌─────Vitual Drive(1)─────┐
                             │ Virtual Drive 0          │
                        ┌──Obj───┐
           ┌─Management──┐ Adapter
           │ Configure   │ Virtual Drive
           │ Initializ   ┌─Initialization Of VD Is In Process─┐
           │ Objects     │                                     │
           │ Rebuild     │    VD 0 Initialization Complete. Press Esc.. │
           │ Check Cor   │                                     │
                         │  ┌────────────────────────────┐     │
                         │  │          100 % Completed    │     │
                         └─────────────────────────────────────┘

          Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

6.3.3 Rebuilding failed drives

You can manually rebuild failed hard disk drives using the **Rebuild** command in the **Management Menu**.

To rebuild a failed hard disk drive:

1. From the **Management Menu**, highlight **Rebuild**, then press <Enter>.

```
   LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007


        Management Menu
     Configure
     Initialize
     Objects
     Rebuild
     Check Consistency




                              Rebuild PD(s)
   Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```
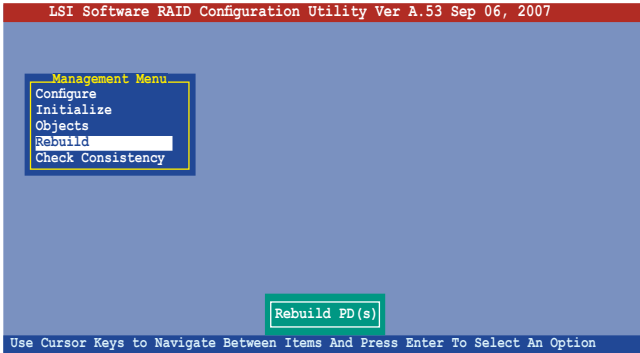
2. The **PHYSICAL DRIVES SELECTION MENU** displays the available drives connected to the SATA ports. Select the drive you want to rebuild, then press <SpaceBar>.

```
   LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007

              REBUILD - PHYSICAL DRIVES SELECTION MENU
        Management          PORT #
     Configure
     Initialize
     Objects
     Rebuild           0   ONLIN A00-01
     Check Consist



                       3   ONLIN A00-00


        Port # 1 DISK   156402MB   HDS728080PLA380
        PF20A60A
   SPACE-Sel,ENTER-EndArray,F10-Configure,F2-Drive Info,F3-Virtual Drives,F4-HSP
```
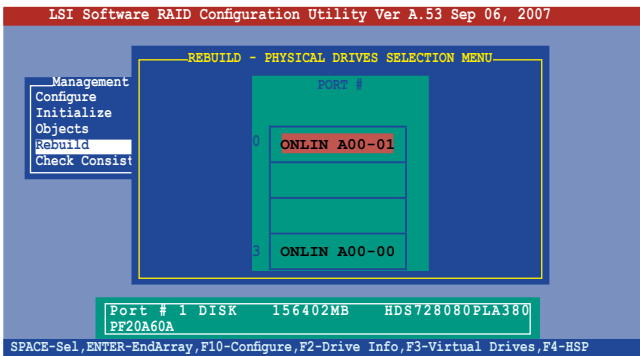
3. After selecting the drive to rebuild, press <F10>. The indicator for the selected drive now shows **RBLD**.


```
     LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007

                ┌─REBUILD - PHYSICAL DRIVES SELECTION MENU─┐
   ┌Management┐              PORT #
   │Configure │
   │Initialize│
   │Objects   │       0   ONLIN A00-01
   │Rebuild   │
   │Check Consist│
                      3   ONLIN A00-00


   │Port # 1 DISK  156402MB   HDS728080PLA380   PF20A60A│
SPACE-(De)Select,F10-Start Rebuild,F2-Drive Information,F3-View Virtual Drives
```
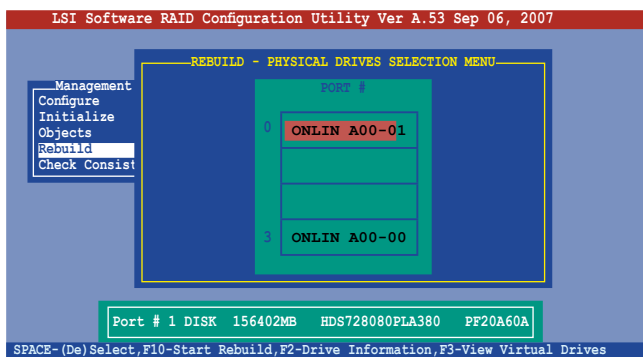
4. When prompted, press <Y> to to rebuild the drive.


```
     LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007

                ┌─REBUILD - PHYSICAL DRIVES SELECTION MENU─┐
   ┌Management┐              PORT #
   │Configure │
   │Initialize│       0   ONLIN A00-01
   │Objects   │
┌──────────────────────────────────────────────────────────────┐
│Rebuilding Of Drive Will Take A Few Minutes. Start Rebuilding Drive (Y/N)?│
└──────────────────────────────────────────────────────────────┘
                          ONLIN A00-00


   │Port # 1 DISK  156402MB   HDS728080PLA380   PF20A60A│
SPACE-(De)Select,F10-Start Rebuild,F2-Drive Information,F3-View Virtual Drives
```

5. When rebuild is complete, press any key to continue.

6.3.4 Checking the drives for data consistency

You can check and verify the accuracy of data redundancy in the selected virtual drive. The utility can automatically detect and/or detect and correct any differences in data redundancy depending on the selected option in the **Objects > Adapter** menu.

The Check Consistency command is available only for virtual drive included in a RAID 1 set.

Using the Check Consistency

To check data consistency using the Check Consistency command:

1. From the **Management Menu**, select **Check Consistency**, then press <Enter>.

```
┌──────────────────────────────────────────────────────────────────────┐
│       LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007    │
├──────────────────────────────────────────────────────────────────────┤
│                                                                        │
│    ┌─Management Menu─┐                                                 │
│    │ Configure       │                                                 │
│    │ Initialize      │                                                 │
│    │ Objects         │                                                 │
│    │ Rebuild         │                                                 │
│    │ Check Consistency │                                               │
│    └─────────────────┘                                                 │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                            ┌─────────────┐                             │
│                            │ CC Of VD(s) │                             │
│                            └─────────────┘                             │
├──────────────────────────────────────────────────────────────────────┤
│    Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option │
└──────────────────────────────────────────────────────────────────────┘
```
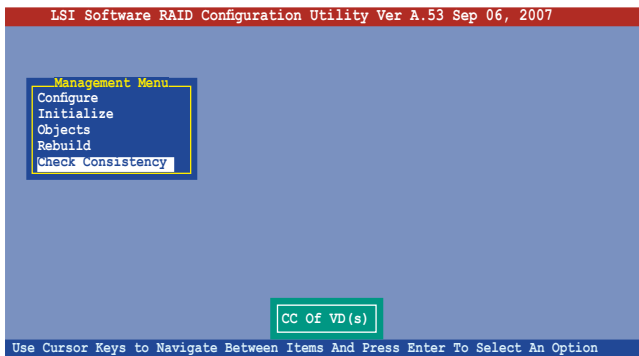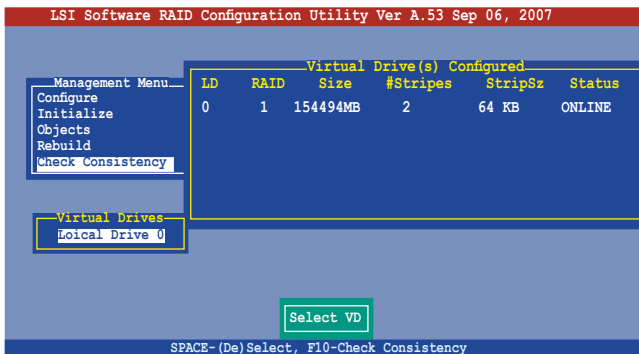
2. The screen displays the available RAID set(s) and prompts you to select the virtual drive to check. Press the <Spacebar> to select the virtual drive from the **Virtual Drive** selection, then press <F10>.

```
┌──────────────────────────────────────────────────────────────────────┐
│       LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007    │
├──────────────────────────────────────────────────────────────────────┤
│                         ┌────Virtual Drive(s) Configured────────────┐  │
│    ┌─Management Menu─┐  │ LD   RAID   Size    #Stripes  StripSz Status│  │
│    │ Configure       │  │ 0    1    154494MB    2       64 KB   ONLINE │  │
│    │ Initialize      │  │                                            │  │
│    │ Objects         │  │                                            │  │
│    │ Rebuild         │  │                                            │  │
│    │ Check Consistency │ │                                           │  │
│    └─────────────────┘  │                                            │  │
│                         │                                            │  │
│    ┌─Virtual Drives─┐   │                                            │  │
│    │ Loical Drive 0 │   └────────────────────────────────────────────┘  │
│    └────────────────┘                                                 │
│                            ┌───────────┐                              │
│                            │ Select VD │                              │
│                            └───────────┘                              │
├──────────────────────────────────────────────────────────────────────┤
│           SPACE-(De)Select, F10-Check Consistency                     │
└──────────────────────────────────────────────────────────────────────┘
```

3. When prompted, use the arrow keys to select **Yes** from the **Consistency Check** dialog box, then press <Enter>. You may also press <F10> to check the drive consistency.
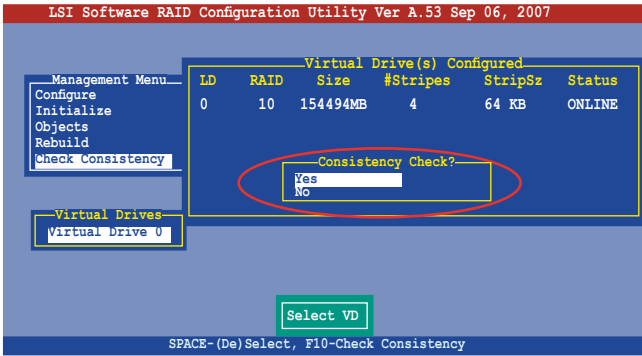
A progress bar appears on screen.
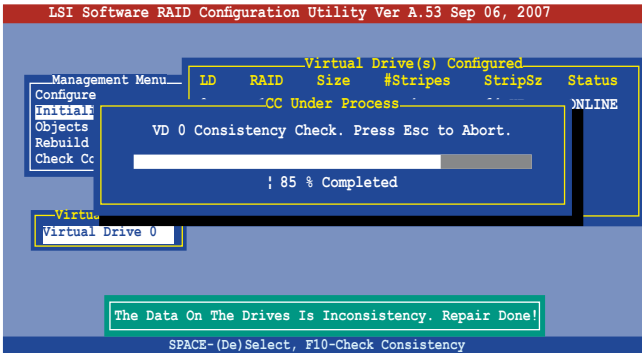
4. While checking the disk consistency, press <Esc> to display the following options.

   • **Stop**: Stops the consistency check. The utility stores the percentage of disk checked, When you restart checking, it continues from the last percentage completed rather than from zero percent.

   • **Continue**: Continues the consistency check.

   • **Abort**: Aborts the consistency check. When you restart checking, it continues from zero percent.

5. When checking is complete, press any key to continue.
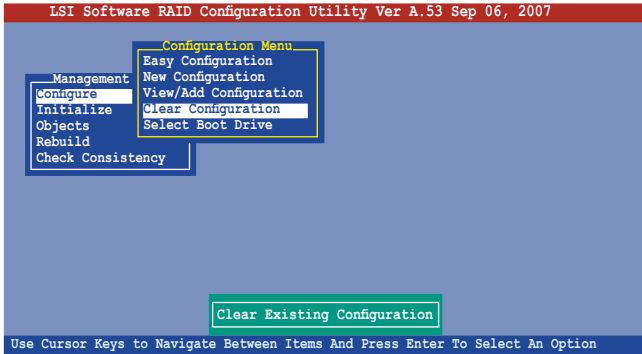
Using the Objects command

To check data consistency using the **Objects** command:

1. From the **Management Menu**, select **Objects**, then select **Virtual Drive** from the menu.
2. Use the arrow keys to select the virtual drive you want to check, then press <Enter>.
3. Select **Check Consistency** from the pop-up menu, then press <Enter>.
4. When prompted, use the arrow keys to select **Yes** from the dialog box to check the drive.
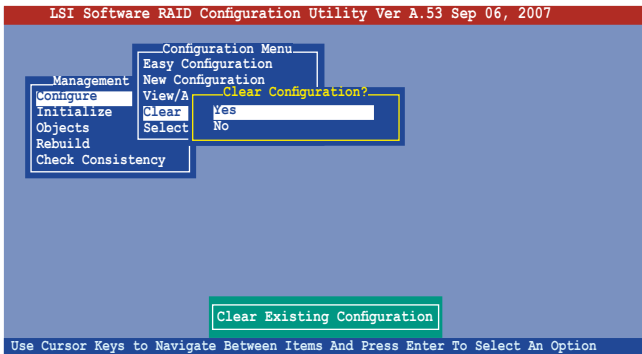5. When checking is complete, press any key to continue.

6.3.5   Deleting a RAID configuration

To delete a RAID configuration:

1.   From the **Management Menu**, select **Configure > Clear Configuration**,
      then press <Enter>.

```
     LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007

                      ┌─Configuration Menu─┐
                      │ Easy Configuration   │
         ┌─Management─┐│ New Configuration    │
         │ Configure  ││ View/Add Configuration│
         │ Initialize ││ Clear Configuration   │
         │ Objects    │└──────────────────────┘
         │ Rebuild    │
         │ Check Consistency │
         └────────────┘



                         ┌──────────────────────────────┐
                         │ Clear Existing Configuration  │
                         └──────────────────────────────┘
     Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

2.   When prompted, use the arrow keys to select **Yes** from the **Clear
      Configuration?** dialog box, then press <Enter>.

```
     LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007

                      ┌─Configuration Menu─┐
                      │ Easy Configuration   │
         ┌─Management─┐│ New Configuration    │
         │ Configure  ││ View/A┌─Clear Configuration?─┐
         │ Initialize ││ Clear │ Yes                   │
         │ Objects    ││ Select│ No                    │
         │ Rebuild    │└───────└──────────────────────┘
         │ Check Consistency │
         └────────────┘



                         ┌──────────────────────────────┐
                         │ Clear Existing Configuration  │
                         └──────────────────────────────┘
     Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

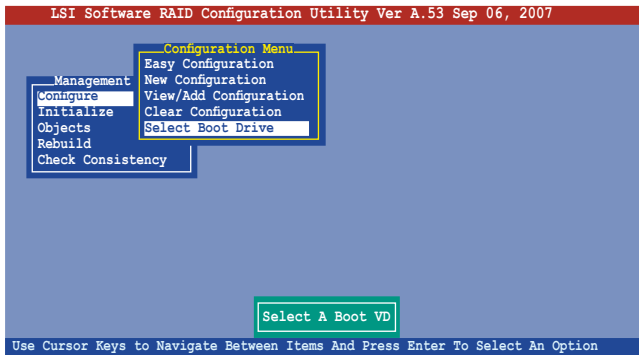   The utility clears the current array.

3.   Press any key to continue.
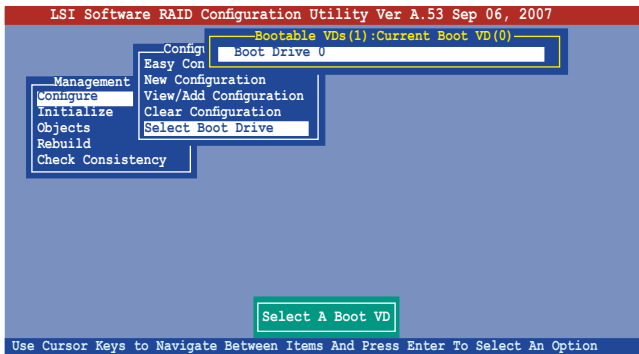
6.3.6 Selecting the boot drive from a RAID set

You must have created a new RAID configuration before you can select the boot drive from a RAID set. Refer to the **Creating a RAID set: Using New Configuration** section for details.

To select the boot drive from a RAID set:

1. From the **Management Menu**, select **Configure > Select Boot Drive**, then press <Enter>.

```
        LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007

                        ┌─Configuration Menu─┐
                        │ Easy Configuration  │
          ┌─Management─┐│ New Configuration   │
          │ Configure  ││ View/Add Configuration│
          │ Initialize ││ Clear Configuration │
          │ Objects    ││ Select Boot Drive   │
          │ Rebuild    │└─────────────────────┘
          │ Check Consistency │
          └────────────┘




                           ┌──────────────────┐
                           │ Select A Boot VD │
                           └──────────────────┘
        Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

2. When prompted, use the arrow keys to select the bootable virtual drive from the list, then press <Enter>.

```
        LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007
                           ┌─Bootable VDs(1):Current Boot VD(0)─┐
                   ┌─Config│ Boot Drive 0                        │
                   │ Easy Con└───────────────────────────────────┘
          ┌─Management─┐│ New Configuration   │
          │ Configure  ││ View/Add Configuration│
          │ Initialize ││ Clear Configuration │
          │ Objects    ││ Select Boot Drive   │
          │ Rebuild    │└─────────────────────┘
          │ Check Consistency │
          └────────────┘




                           ┌──────────────────┐
                           │ Select A Boot VD │
                           └──────────────────┘
        Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

3. The virtual drive is selected as boot drive. Press any key to continue.
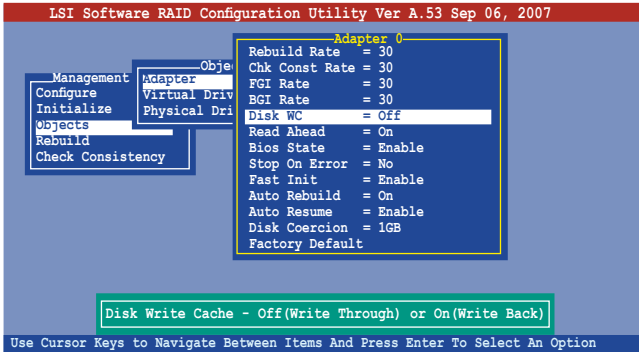
6.3.7   Enabling the WriteCache

You may enable the RAID controller's WriteCache option to improve the data transmission performance.

When you enable **WriteCache**, you may lose data when a power interruption occurs while transmitting or exchanging data among the drives.

To enable WriteCache:

1.   From the **Management Menu**, select **Objects > Adapter**, then press <Enter> to display the adapter properties.

2.   Select **Disk WC**, then press <Enter> to turn the option On (enabled).

```
      LSI Software RAID Configuration Utility Ver A.53 Sep 06, 2007
                                    Adapter 0
                              Rebuild Rate    = 30
                              Chk Const Rate = 30
                       Obje   FGI Rate        = 30
      Management   Adapter    BGI Rate        = 30
  Configure        Virtual Driv Disk WC       = Off
  Initialize       Physical Dri Read Ahead    = On
  Objects                      Bios State      = Enable
  Rebuild                      Stop On Error   = No
  Check Consistency            Fast Init       = Enable
                              Auto Rebuild    = On
                              Auto Resume     = Enable
                              Disk Coercion   = 1GB
                              Factory Default


           Disk Write Cache - Off(Write Through) or On(Write Back)

    Use Cursor Keys to Navigate Between Items And Press Enter To Select An Option
```

3.   When finished, press any key to continue.

Chapter 7

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

Driver installation

7.1 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.

7.1.1 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® Server or Red Hat® Enterprise / 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.

```
Create Driver Diskette Menu
ICH7R INTEL RAID Driver
ICH7R LSI RAID Driver
Broadcom ASF Firmware Update
Write DMI
FreeDOS command prompt
```

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.

ICH7R INTEL RAID Driver

```
ICH7R INTEL RAID Driver
Windows 32 bit
Windows 64 bit
Back
Exit
```

ICH7R LSI RAID Driver

```
ICH7R LSI RAID Driver
Windows Server 2003 32 bit
Windows Server 2003 64 bit
RHEL AS3 UP8 32/64 bit
RHEL AS4 UP5 32/64 bit
RHEL 5 32/64 bit
SLES 9.0 SP3 32 bit
SLES 9.0 SP3 64 bit
SLES 10 32 bit
SLES 10 64 bit
Back
Exit
```

Broadcom ASF Firmware Update

```
Broadcom ASF Firmware Update
RS100-E5-PI2 system
Back
Exit
```

Write DMI

```
            Write DMI
RS100-E5-PI2 system
Back
Exit
```

For systems with Red Hat® Enterprise versions that are not listed in the Makedisk menu, explore the support CD and copy the RAID driver disk from the following path: **\ICH7R LSI RAID\Driver\Linux.**

7.1.2 Installing the RAID controller driver

Windows® Server OS

During Windows® Server OS installation
To install the RAID controller driver when installing Windows® Server OS:

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

```
Windows Setup




















Press F6 if you need to install a third party SCSI or RAID driver...
```
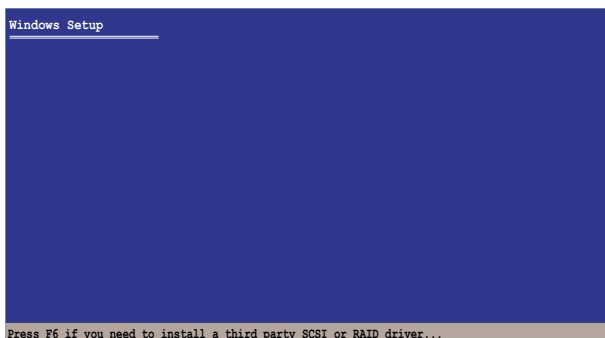
2. Press <F6> when the message "**Press F6 if you need to install a third party SCSI or RAID driver...**" appears at the bottom of the screen.

3. When prompted, press <**S**> to specify an additional device.

```
Windows Setup


Setup could not determine the type of one or more mass storage devices
installed in your system, or you have chosen to manually specify an adapter.
Currently, Setup will load support for the following mass storage devices(s):

   <none>

 * To specify additional SCSI adapters, CD-ROM drives, or special
   disk controllers for use with Windows, including those for
   which you have a device support disk from a mass storage device
   manufacturer, press S.

 * If you do not have any device support disks from a mass storage
   device manufacturer, or do not want to specify additional
   mass storage devices for use with Windows, press ENTER.

 S=Specify Additional Device     ENTER=Continue     F3=Exit
```

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

```
Windows Setup
_____


                         Please insert the disk labeled
                   Manufacturer-supplied hardware support disk
                                 into Drive A:
                         *   Press ENTER when ready.




ENTER=Continue     ESC=Cancel     F3=Exit
```

5.   Select the RAID controller driver from the list, then press <Enter>.

LSI Logic SATA RAID

Select "**LSI Logic Embedded SATA RAID**" for 32bit Windows Server OS from the list, then press <Enter>. For 64bit Windows Server OS, please select "**LSI Logic Embedded SATA RAID (Intel IA32E)**" item.

```
Windows Setup
_____
      You have chosen to configure a SCSI Adapter for use with Windows,
      using a device support disk provided by an adapter manufacturer.

      Select the SCSI Adapter you want from the following list, or press ESC
      to return to the previous screen.


                 LSI Logic Embedded SATA RAID
                 LSI Logic Embedded SATA RAID (Intel IA32E)






ENTER=Continue     F3=Exit
```
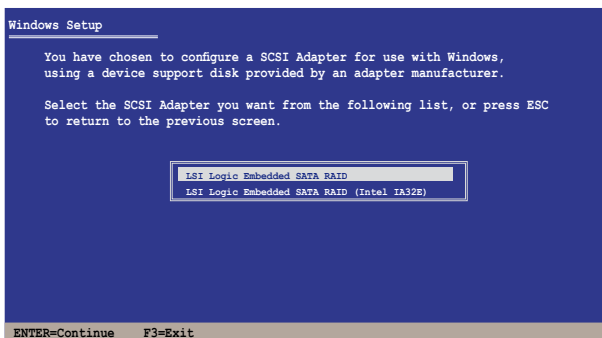
Intel Matrix Storage

Select "**Intel(R) 82801GR/GH SATA RAID Controller (Desktop ICH7RDH)**" for Intel Matrix Storage RAID mode from the list, then press <Enter>.

If you configured SATA as AHCI Mode in the BIOS setup utility of IDE Configuration, first install the **Intel SATA AHCI Driver** during windows setup. Then, select the "**Intel(R) 82801GR/GH SATA AHCI Controller (Desktop ICH7RDH)**" from the list. Refer to section **7.1.1 Creating a RAID driver disk** to create the Intel SATA Driver for windows system.

```
Windows Setup

    You have chosen to configure a SCSI Adapter for use with Windows,
    using a device support disk provided by an adapter manufacturer.

    Select the SCSI Adapter you want from the following list, or press ESC
    to return to the previous screen.


        Intel(R) 82801GR/GH SATA RAID Controller (Desktop ICH7R/DH)
        Intel(R) 82801GR/GH SATA AHCI Controller (Desktop ICH7R/DH)
        Intel(R) 82801FR SATA RAID Controller (Desktop ICH6R)
        Intel(R) 82801FR SATA AHCI Controller (Desktop ICH6R)
        Intel(R) 82801FBM SATA AHCI Controller (Mobile  ICH6M)
        Intel(R) 82801ER SATA RAID Controller (Desktop ICH5R)
        Intel(R) 6300ESB SATA RAIID Controller



ENTER=Continue     F3=Exit
```

6.   The Windows® 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® Server OS

To install the RAID controller driver on an existing Windows® 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**. The **LSI Logic Embedded SATA RAID** or **Intel® 8201 GR/GH SATA RAID** items should appear.
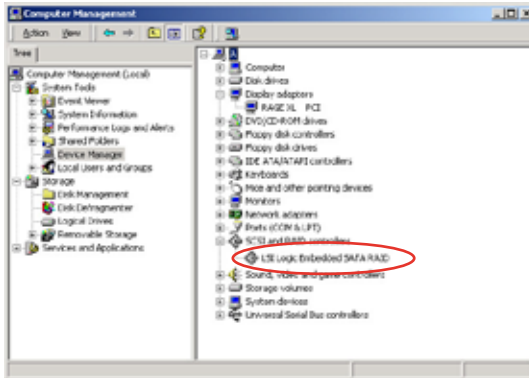
4. Right-click the **RAID controller driver** item, then select **Properties** from the menu.

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

To install the Intel® ICH7R LSI Logic Embedded SATA RAID controller driver when installing Red Hat® Enterprise operating system:

1. Boot the system from the Red Hat® Installation CD.
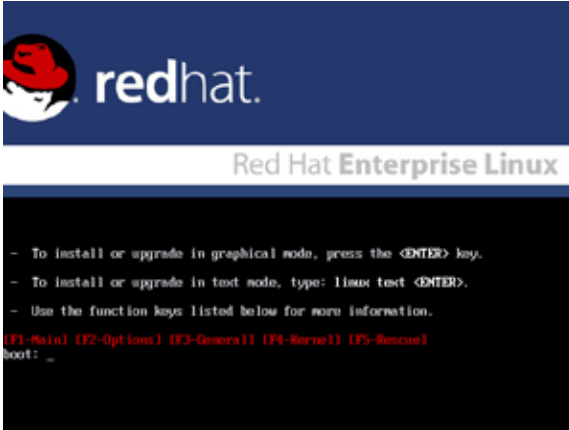
2. At the **boot:**, type **linux dd**, then press <Enter>.
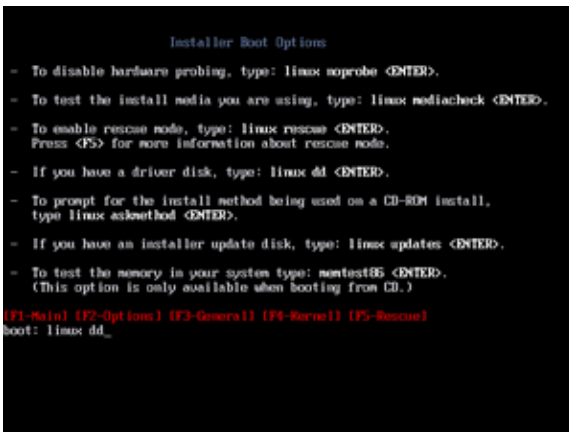
3. Select **Yes** using the <Tab> key when asked if you have the driver disk. Press <Enter>
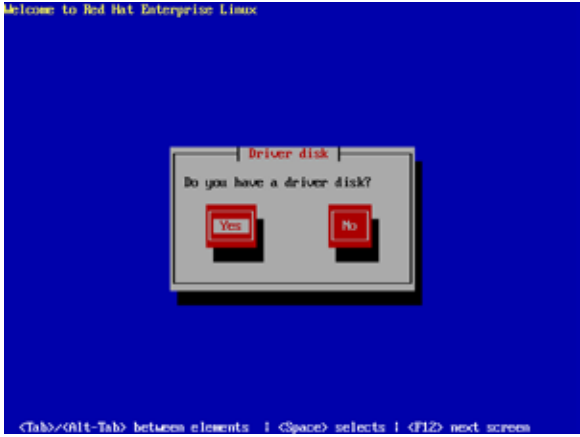
4. Select **fd0** using the <Tab> key when asked to select the driver disk source. Press <Tab> to move the cursor to **OK**, then press <Enter>.
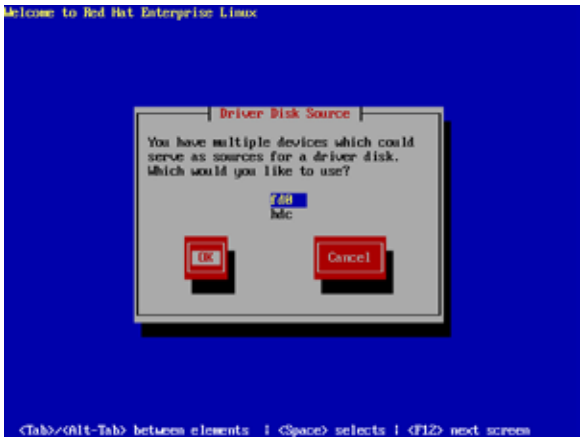
5.   When prompted, insert the Red Hat® Enterprise RAID driver disk to the floppy
      disk drive, select **OK**, then press <Enter>.
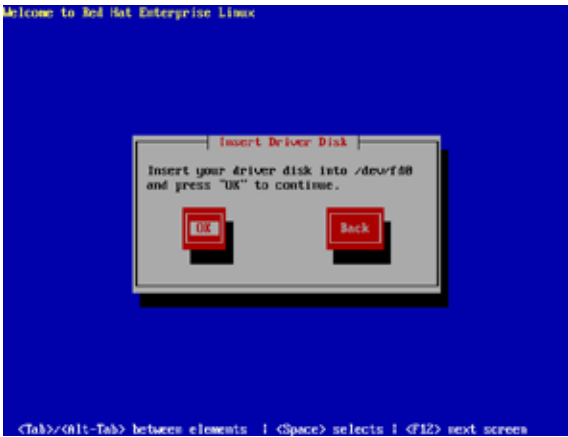
      The drivers for the RAID controller are installed to the system.

6.   When asked if you will load additional RAID controller drivers, select **Yes**,
      then install the additional RAID controller drivers.
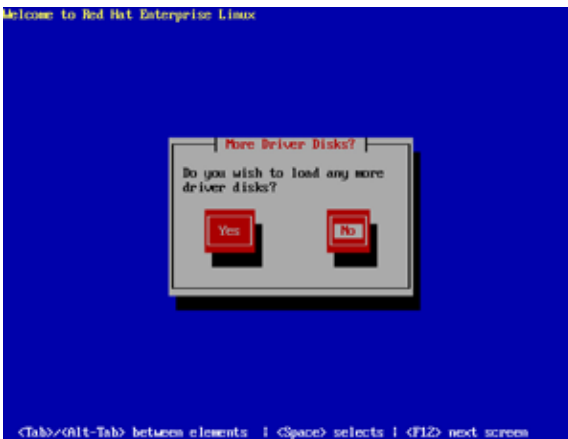
7.   Follow screen instructions to continue the OS installation.

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>.
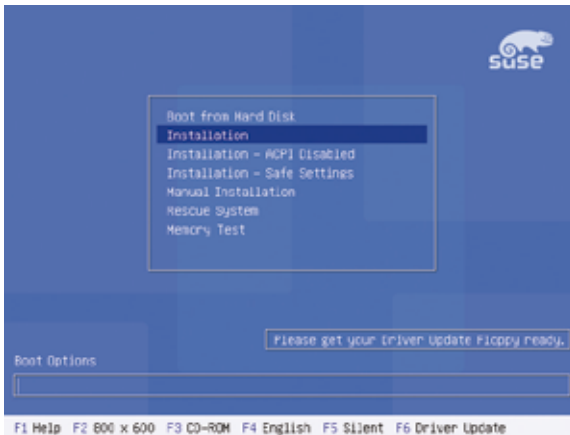
4. When prompted, insert the RAID driver disk to the floppy disk drive, then press <Enter>.
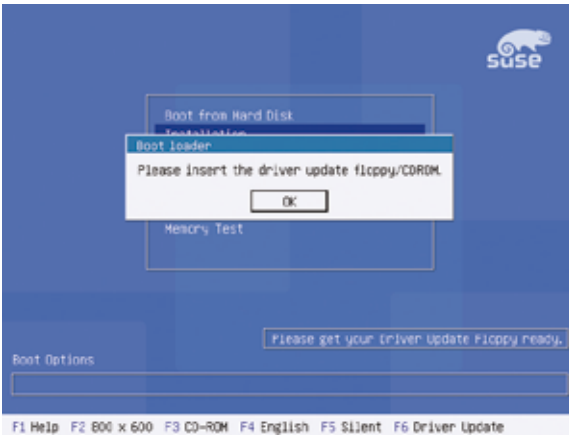
5. When prompted, select the floppy disk drive (fd0) as the driver update medium, select **OK**, then press <Enter>.
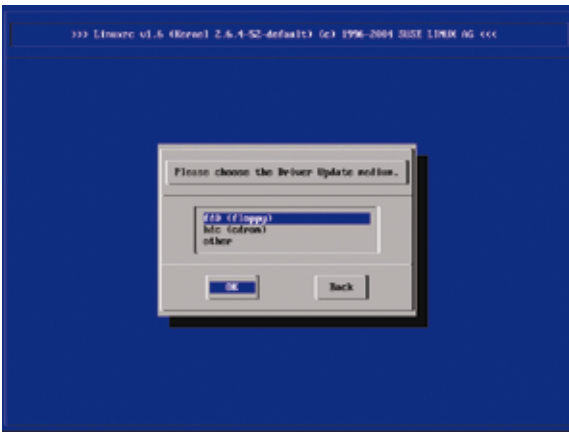
The drivers for the RAID controller are installed to the system.

7.2 LAN driver installation

This section provides instructions on how to install the Broadcom BCM5721 LAN controller driver.

7.2.1 Windows® Server

To install the Broadcom BCM5721 LAN controller driver on a Windows® 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 BCM5721 Driver** option to begin installation.

4.   Click **Next** when the InstallShield Wizard window appears. Follow screen instructions to continue installation.
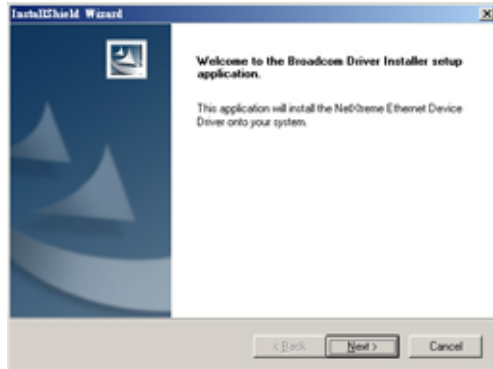
7.2.2   Red Hat® Enterprise

Follow these instructions when installing the Broadcom 5721 LAN controller base driver for the Red Hat Enterprise operating system.

Building the driver

Install first the Kernel Development tools before building the driver from the TAR file.

To build the driver from the TAR file:

1.   Create a directory and extract the TAR files:
     `tar xvzf bcm5700-<version>.tar.gz`

2.   Build the driver bcm5700.o as a loadable module for the running kernel:
     `cd bcm5700-<version>/src`
     `make`

3.   Test the driver by loading it:
     `insmod bcm5700.o`

4.   Install the driver and man page:
     `make install`

5.   Refer to Red Hat distribution documentation to configure the network protocol and address

7.3 VGA driver installation

This section provides instructions on how to install the XGI Graphics driver.

7.3.1 Windows® Server

You need to manually install the XGI Graphics driver on a Windows® Server operating system.

To install the XGI Graphicsdriver:

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.

> Windows® automatically detects the VGA controller and displays a New Hardware Found window. Click Cancel to close this window.

3. Click the item XGI VOLARI Z9s from the Drivers menu.

4. The **XGI VOLARI Z9s** window appears. Click **Next**. Follow screen instructions to complete installation.
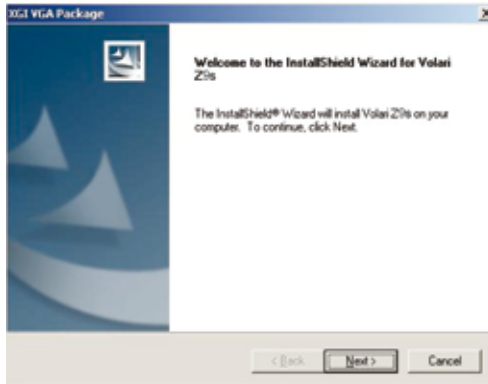
7.3.2 Red Hat enterprise

The Red Hat Enterprise operating system automatically recognizes the XGI Graphics driver during system installation. There is no need to install an additional driver(s) to support the onboard VGA.

7.4 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.

7.4.1 Running the support CD

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

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

7.4.2 Drivers menu

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

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

7.4.3   Management Software menu

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

7.4.4   Utilities menu

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

7.4.5   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.

The Appendix describes the CPU features
that the motherboard supports.

Reference
information

A.1   Intel® EM64T

- The motherboard is fully compatible with Intel® Pentium® 4 LGA775 processors running on 32-bit operating systems.

- The motherboard comes with a BIOS file that supports EM64T. You can download the latest BIOS file from the ASUS website (www.asus.com/support/download/) if you need to update the BIOS file. See Chapter 5 for details.

- Visit www.intel.com for more information on the EM64T feature.

- Visit www.microsoft.com for more information on Windows® 64-bit OS.

Using the Intel® EM64T feature

To use the Intel® EM64T feature:

1. Install an Intel® Pentium® 4 CPU that supports the Intel® EM64T.

2. Install a 64-bit operating system (Windows® XP Professional x64 Edition).

3. Install the 64-bit drivers for the motherboard components and devices from the support CD.

4. Install the 64-bit drivers for expansion cards or add-on devices, if any.

Refer to the expansion card or add-on device(s) documentation, or visit the related website, to verify if the card/device supports a 64-bit system.

A.2   Enhanced Intel SpeedStep® Technology (EIST)

- The motherboard comes with a BIOS file that supports EIST. You can download the latest BIOS file from the ASUS website (www.asus.com/support/download/) if you need to update the BIOS. See Chapter 5 for details.

- Visit www.intel.com for more information on the EIST feature.

## A.2.1   System requirements

Before using EIST, check your system if it meets the following requirements:

- Intel® Pentium® 4 processor with EIST support

- BIOS file with EIST support

- Operating system with EIST support (Windows® XP SP2/Linux 2.6 kernel or later versions)

A.2.2   Using the EIST

To use the EIST feature:

1.   Turn on the computer, then enter the BIOS Setup.

2.   Go to the Advanced Menu, highlight CPU Configuration, then press <Enter>.

3.   Set the Intel(R) SpeedStep Technology item to [Automatic], then press <Enter>. See page 5-24 for details.

4.   Press <F10> to save your changes and exit the BIOS setup.

5.   After the computer restarts, right click on a blank space on the desktop, then select Properties from the pop-up menu.

6.   When the Display Properties window appears, click the Screen Saver tab.

7.   Click the Power button on the Monitor power section to open the Power Options Properties window.
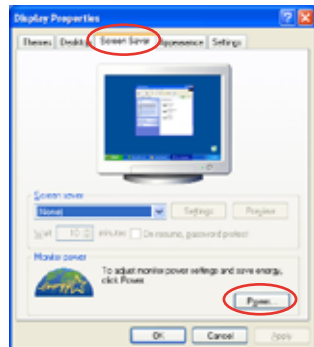
8.   On the Power schemes section, click ⌄, then select any option except Home/Office Desktop or Always On.

9.   Click Apply, then click OK.

10. Close the Display Properties window.

   After you adjust the power scheme, the CPU internal frequency slightly decreases when the CPU loading is low.
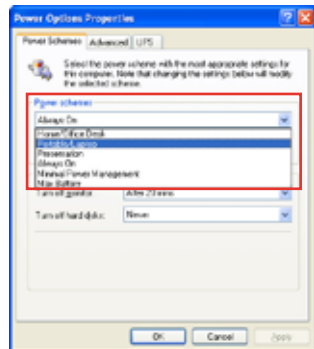
> The screen displays and procedures may vary depending on the operating system.

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