/SUS RS260-E3

Dual Intel® Xeon™ 2U Rackmount Server
800 MHz Front Side Bus

Service Guide

E2267

First edition V1
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Contents

Chapter 1: Product introduction

Chapter 2: Hardware setup

Contents

Contents

Chapter 7: Driver installation

Appendix: References

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.

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 barebone server, including sections on the 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 prepare the barebone server for rack mounting.

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 the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

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: References**

   This appendix includes additional information that you may refer to when configuring your barebone server.

Conventions

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

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 information to aid in completing a task.

Reference

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

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

Product introduction

1.1   System package contents

Check your system package for the following items.

Chassis	ASUS AR21 2U rackmount chassis
Motherboard	ASUS PVL-D/2U/SCSI motherboard
Components	700W redundant power supply, 115V~230V Slim optical drivel Slim floppy disk drive Chassis fan HDD fan Hot-swap SCSI HDD trays SCSI backplanes Front bezel CPU heatsink (2 pcs.)
Cables	RJ-45 extension connector AC power cable System cables
Accessories	Rackmount rail kit RS260-E3 user guide RS260-E3 support CD (includes ASWM*) CA eTrust Anti-virus CD AR21 chassis ears (left, right) Thermal grease strip Bag of screws

*ASUS System Web-based Management

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

1.2 System specifications

The ASUS RS260-E3 is a 2U barebone server system featuring the ASUS PVL-D/2U/SCSI motherboard. The server supports dual Intel® Xeon™ processors with EM64T technology, plus other latest technologies through the chipsets onboard.

Chassis	Rackmount 2U (AR21)
Motherboard	ASUS PVL-D/2U/SCSI
Chipset	North Bridge: Intel® E7520 Memory Controller Hub (MCH) South Bridge: Intel® ICH5R I/O Bridge: Intel® PXH

CPU	Dual 604-pin sockets Intel® Xeon™ processor (Dual core Xeon Paxville is support)
	   - Supports Extended Memory 64-bit Technology (EM64T)
	   - Supports Enhanced Intel SpeedStep Technology (EIST)
	   - Supports Intel Hyper-Threading Technology

Front side Bus	800MHz
Memory	Dual-Channel memory arctitecture 8 x 240-pin DDRII DIMM sockets support registered ECC DDRII-400 memory modules Supports 256MB up to 16GB system memory
LAN	2 x Broadcom® BCM5721 PCI Express Gigabit LAN controllers comply with PCI Express 1.0a specifications
VGA	ATI RAGE-XL PCI-based VGA controller Supports 8MB display memory

SCSI	Adaptec® AIC-7902W Ultra320 Dual-channel SCSI controller supports:
	   - 2 x SCSI channels with Host RAID 0, RAID 1, and RAID 0+1 configuration
	   - Zero-Channel RAID (optional)

Expansion slots	3 x full-length 64-bit/133MHz 3V PCI-X slots on a riser card 1 x low profile/half-length 64bit/133MHz 3V PCI-X slot 1 x Zero Channel RAID (ZCR) socket for Adaptec AIC-2015S board 1 x mini-PCI socket for ASUS Server Management Board
Storage	8 x 3.5-inch hot-swappable HDD bays 1 x slim optical drive 1 x slim 1.44MB floppy drive

(continued on the next page)

Front panel	2 x USB 2.0 ports Power switch Reset switch Location switch Power, HDD access, location, message, LAN 1/2 LED HDD LEDs: Status, activity
Rear panel	1 x PS/2 keyboard port 1 x PS/2 mouse port 1 x Serial port 1 x VGA port 2 x USB 2.0 ports 2 x RJ-45 ports (with LEDs) 1 x Location switch 1 x Location LED 2 x Rear fans status LED 1 x external SCSI port (alternative)
Management	ASUS Server Web-based Management (ASWM)
Hardware monitors	Voltage, temperature, and fan speed monitoring Automatic System Restart (ASR) feature
Power supply	700W redundant power supply, 115V~230V, 50Hz~60Hz
Dimensions	732.5mm (l) x 448mm (w) x 87.7mm (h)

Refer to "Chapter 4 Motherboard information" for details on the internal connectors.

1.3 Front panel features

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

Reset button

Location switch

Power button   **Slim floppy drive** **Slim optical drive**

Front panel LEDs

USB 2.0 ports   **Hot-swappable HDD bays**
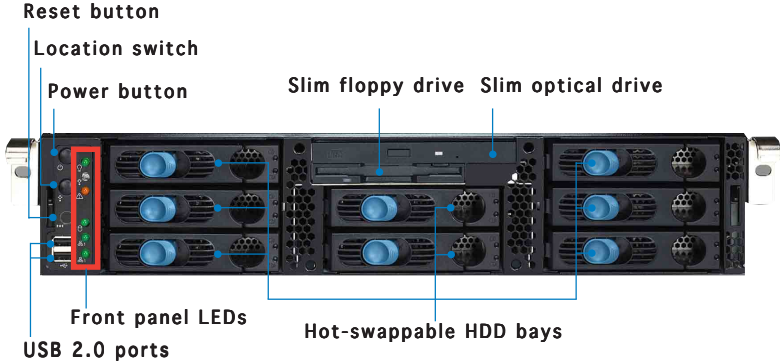
1.4 Rear panel features

The rear panel includes the expansion slots, LAN, VGA, and I/O ports, fans, and the system power sockets.

Redundant power supply modules **Rear fans status LEDs** **Rear fans** **Expansion slots**

AC power sockets

PS/2 mouse port

PS/2 keyboard port

USB 2.0 ports

Serial port

VGA port

Gigabit LAN1 port

Gigabit LAN2 port

External SCSI port (alternative)

Location switch

Location LED
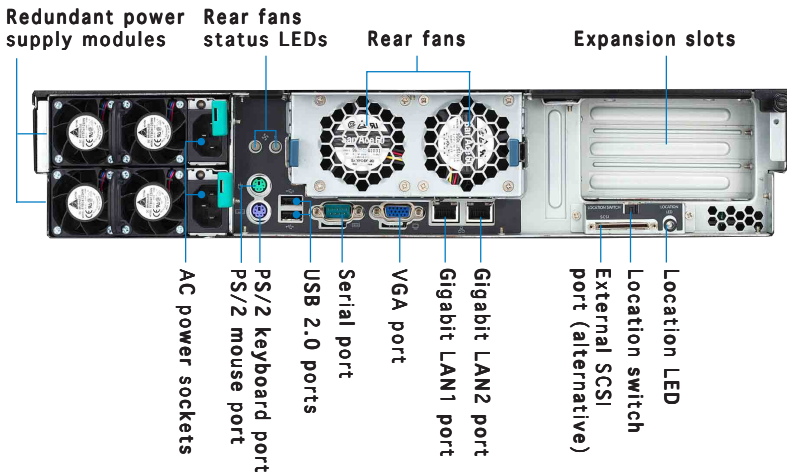
When disconnecting LAN cables, you need to remove the rear fan cage. Refer to section "2.7 Removable components" for instructions on removing the fan cage.

1.5 Internal features

The barebone system includes the basic components as shown.
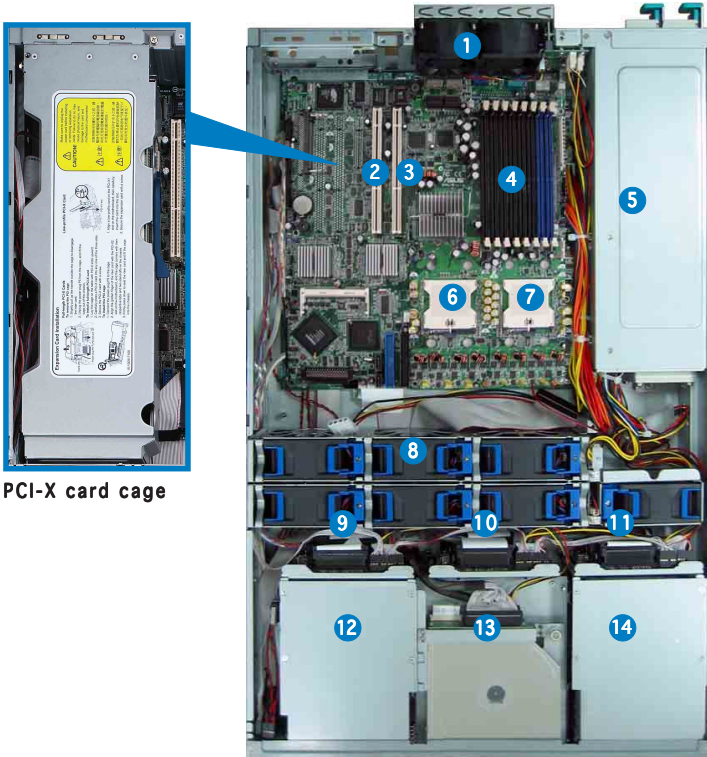
PCI-X card cage

1. 2 x rear fans	8. 7 x system fans
2. 64-bit PCI-X slots *(underneath the PCI-X card cage)*	9. SCSI backplane 1
	10. SCSI backplane 2
3. 64-bit PCI-X slots	11. SCSI backplane 3
4. 8 x DDR DIMM sockets	12. 3 x HDD bays
5. Power supply cage	13. Top: Slim optical drive
6. CPU2 socket with heatsink	Mid: Slim floppy drive
7. CPU1 socket with heatsink	Bottom: 2 x HDD bays
	14. 3 x HDD bays

The air duct lies on top of the motherboard components. Remove the air duct to access the components. Refer to section "2.1.4 Removing and installing the air duct" for instructions.

1.6　LED information

1.6.1　Front panel LEDs

LED	Icon	Display status	Description
Power LED		ON	System power ON
Storage Access LED		OFF Blinking	No activity Read/write data into the HDD
Message LED		OFF ON	System is normal; no incoming event ASWM indicates a HW monitor event
Location LED		OFF ON	Normal status Location switch is pressed (Press the location switch again to turn off)
LAN1 LED		OFF Blinking ON	No LAN connection LAN is transmitting or receiving data LAN connection is present
LAN2 LED		OFF Blinking ON	No Gbit LAN connection LAN is transmitting or receiving data LAN connection is present

The location switch and LED are for service purposes. When the system fails or is shut down, the server administrator can press either the front or the rear location switch to identify the location of the specific 2U system in a rack cabinet.

1.6.2 Rear fan LEDs

LED1 for Rear Fan 1

LED2 for Rear Fan 2

LED	Color	Description
LED1	Green	Rear Fan 1 is in normal operation
	Orange	Rear Fan 1 is faulty
LED2	Green	Rear Fan 2 is in normal operation
	Orange	Rear Fan 2 is faulty

This function only works under OS and the system has installed ASWM Software.

1.6.3 System fan LED

Each system fan has an LED to indicate the fan status.
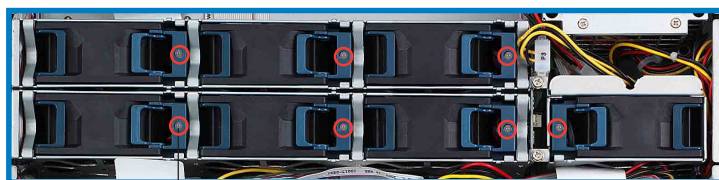
LED

LED	Color	Description
LED	Green	Fan is in normal operation
	Orange	Fan is faulty

This function only works under OS and the system has installed ASWM Software.

1.6.4 Power supply LED

Each system fan has an LED to indicate the fan status.

LED
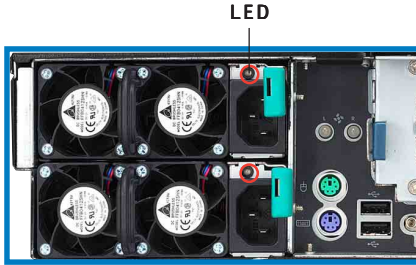
LED	Color	Display status	Description
LED	Green	Blinking	Power off and in standby mode
	Green	On	The power supply module is in normal operation
	Orange	On	One of the two power modules is disconnected from the power outlet or is defective
	Off	Off	Both power supply modules are disconnected from the power outlet or are defective

1.6.5 LAN port LEDs

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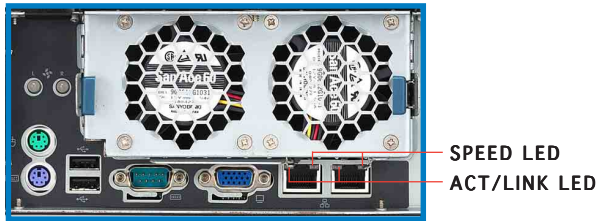
ACT/LINK LED		SPEED LED	
Status	**Description**	**Status**	**Description**
OFF	No link	OFF	10 Mbps connection
GREEN	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection

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

The chassis features a "screwless design" that allows convenient assembly and disassembly.

- Remove the front bezel to access the hot-swap HDDs, optical drive, and floppy drive.
- Remove the chassis cover to access the internal components or if you want to install system devices.

2.1.1 Removing the front bezel

To remove the front bezel:

1. Hold the sides of the front bezel, then slightly press the middle part to disengage it from the front panel.

Press here to release

2. Pull the bezel from the front panel.

2.1.2 Removing the top cover

Front half

To remove the front half of the top cover:

1. Push the two sliding locks on the top cover to release.
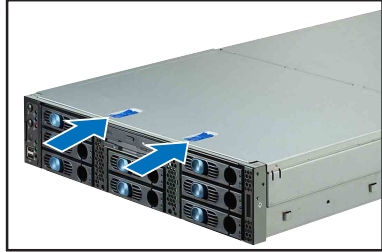
2. With both hands, flip up the front corners of the top cover, then lift.

   The front corners of the cover have dents that match those on the chassis. These dents provide a holding mechanism and keeps the cover in place even when the sliding locks are released.

Matching dents
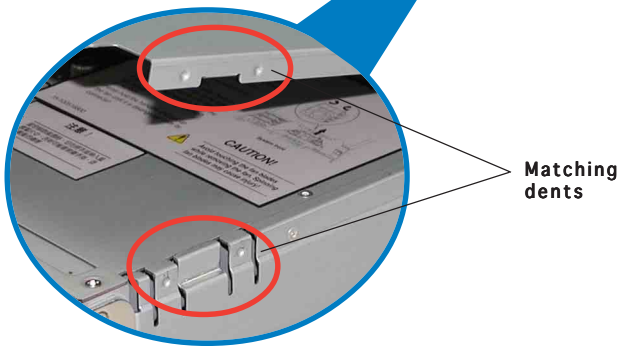
If you wish to access the hot-swappable system fans, backplanes, optical drive, and floppy drive, you only need to remove the front half of the top cover.

Rear half

> You need to remove the front half of the top cover before you can remove the rear half of the top cover. Refer to section "2.1.1 Removing the top cover (front half)" for instructions.

To remove the rear half of the top cover:

1. Loosen the thumbscrew that secures the top cover on the rear part of the chassis.

    Thumbscrew

2. Remove the screw on the rear half of the cover.
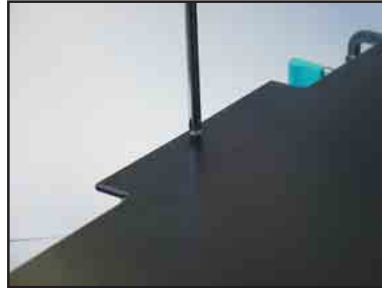
3. Firmly hold the rear half of the top cover, then remove it from the chassis.

    The barebone server without the top cover is shown on the right.

2.1.3 Installing the top cover

To install the top cover:

1. Place the rear half of the top cover over the chassis as shown, and align the mid-hooks with the notches on the sides.

2. Slide the cover toward the front panel until the mid-hooks are locked into the notches.

3. Flip down the front half part of the top cover.

4. Push the sliding locks toward the front edge to secure the front half of the top cover in place.
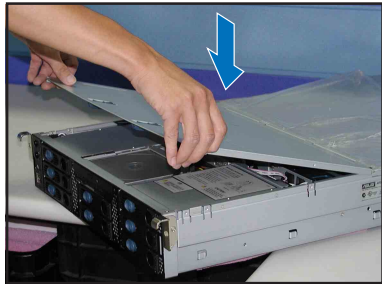
5. Tighten the thumbscrew on the rear corner of the cover to completely secure the top cover.
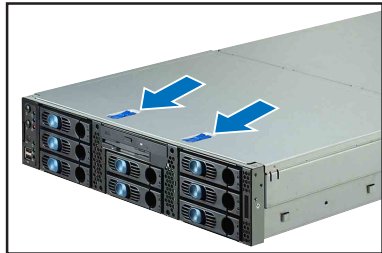
Thumbscrew

6. Replace the screw on the rear half of the cover.

2.1.4 Removing the air duct

To remove the air duct:

1. Carefully route the cables that may interfere when removing the air duct.

2. Hold the rear part of the air duct and press it for about a fraction of an inch, just enough to tilt the front end.

3. When tilted, carefully pull the air duct upward to release it from the chassis.
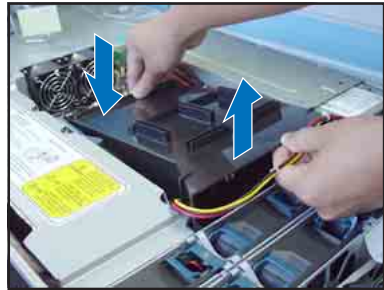
![warning icon] Be careful not to pull off or break any cables while removing the air duct.

2.1.5 Installing the air duct

To install the air duct:

1. Take note of the parts of the air duct that should match specific locations inside the chassis.

Metal strips to fit the plastic clips on the air duct
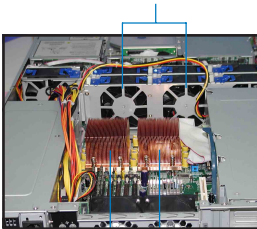
Plastic clips to grip the metal strips on the fan cage
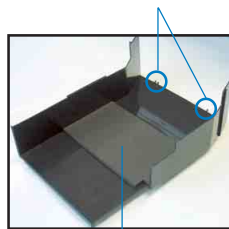
CPU heatsinks

Flat rubber pad should match the top of the two heatsinks

2. Position the air duct inside the chassis with the plastic clips matching the two vertical metal strips on the fan cage.

3. Check the rubber pads underneath the air duct and ensure that they are in place; otherwise, the air duct will not fit properly.

4. Fit the other end of the air duct making sure that no power cable is strayed under it.
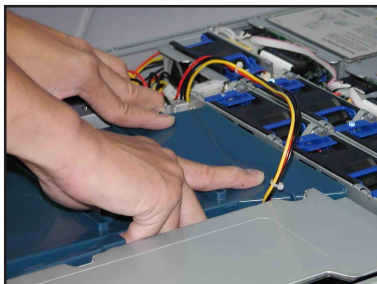
Be careful not to pull off or break any cables while installing the air duct.

5. When the air duct is in place, arrange the power cable cluster to fit the space beside the air duct.
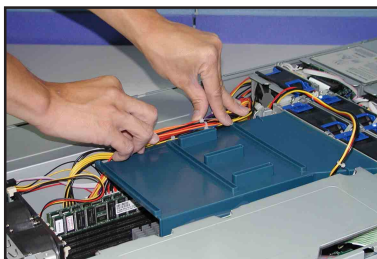
6. Flatten the power cable that runs across the air duct. When properly installed, the air duct should appear as shown.

2.2 Central Processing Unit (CPU)

The motherboard comes with two surface mount 604-pin Zero Insertion Force (ZIF) socket and designed for the Intel® Xeon™ processors.

Note in the illustration that the CPU has a gold triangular mark on one corner. This mark indicates the processor Pin 1 that should match a specific corner of the CPU socket.
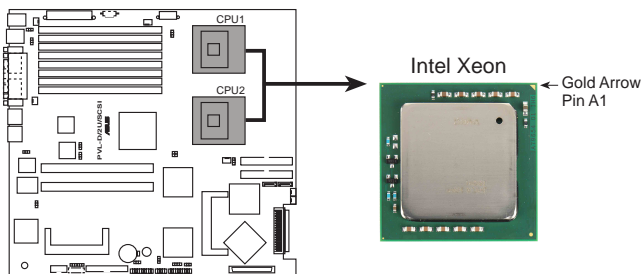
PVL-D/2U/SCSI CPU Socket 604

2.2.1 Removing the CPU heatsink

You must remove the CPU heatsink(s) before installing the CPU(s).

To remove the CPU heatsink:

1. Use a Phillips (cross) screwdriver to loosen the four screws that secure the heatsink until it is released.

> You don't need to detach the screws from the heatsink.
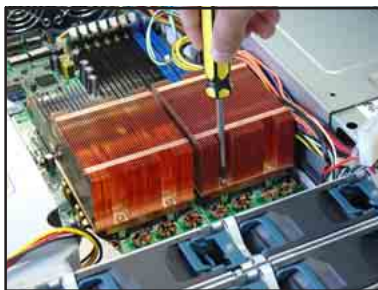
2. Carefully lift the heatsink from the motherboard.
3. Remove the rubber pad(s) on top of the CPU socket(s).

> Remove the rubber pad(s) only when you are ready to install the CPU(s).
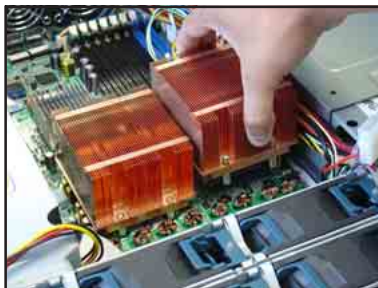
4. Remove the rubber pad(s) on top of the CPU socket(s).

![feather icon] Remove the rubber pad(s) only when you are ready to install the CPU(s).

2.2.2 Installing a CPU

![hand icon]
*   The motherboard supports either one or two CPUs. If you are installing only one CPU, you MUST install it in CPU socket 1.

*   If you are installing two CPUs, install in the CPU socket 2 first.

CPU Socket 1
(outer socket)

CPU Socket 2
(inner socket with rubber pad)

![warning icon] Incorrect installation of the CPU into the socket may bend the pins and severely damage the CPU!

To install the CPUs:

1. Locate the CPU1 socket on the motherboard. Flip up the socket lever and push it all the way to the other side.

![hand icon] Make sure that the socket lever is pushed back all the way. Otherwise the CPU does not fit in completely.

2.	Position the CPU above the socket as shown.

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

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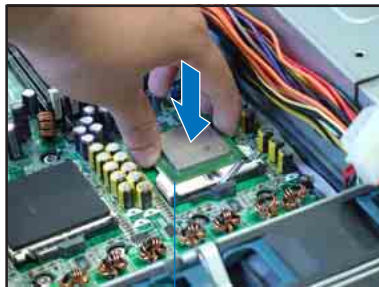
Marked corner

4.	Carefully push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

5.	Peel off the plastic film of the thermal grease strip.

Plastic film

Thermal grease

Thermal grease strip

6.	Place the thermal grease strip on top of the installed CPU. Make sure that the thermal grease covers the entire surface of the CPU.
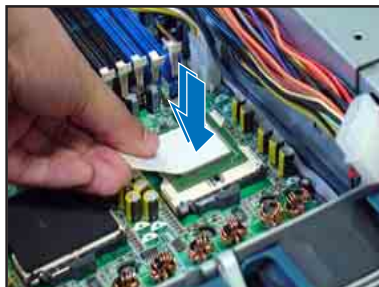
7. Press the thermal grease strip evenly against the surface of the CPU.
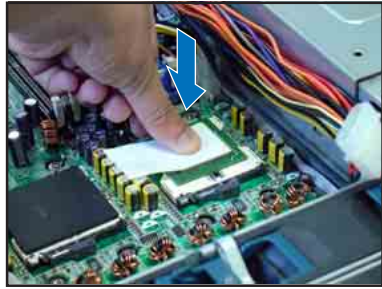
8. Peel off the thermal grease strip. Make sure that the grease remains on top of the CPU.

9. Repeat steps 2 to 8 if you wish to install a second CPU.
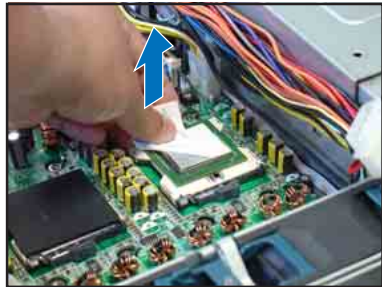
2.2.3 Installing the CPU heatsink

To install the CPU heatsink:

1. Carefully place the heatsink on top of the installed CPU (CPU1).

2. Hold down the heatsink lightly and twist each of the four screws with a Philips (cross) screwdriver just enough to attach the heatsink to the motherboard. When the four screws are attached, tighten them one by one to completely secure the heatsink.

3. If you installed a second CPU, follow steps 1 and 2 to install the second CPU heatsink.
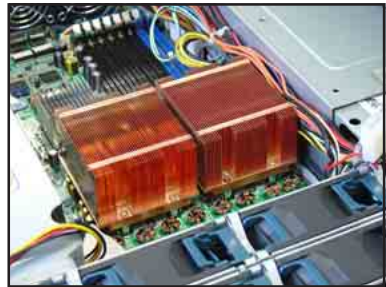
2.3 System memory

The motherboard comes with eight Double Data Rate 2 (DDR II) Dual Inline Memory Module (DIMM) sockets to support 240-pin DDR II modules.

The figure illustrates the location of the DDR II DIMM sockets :

128 Pins   112 Pins

DIMM_B4
DIMM_A4
DIMM_B3
DIMM_A3
DIMM_B2
DIMM_A2
DIMM_B1
DIMM_A1
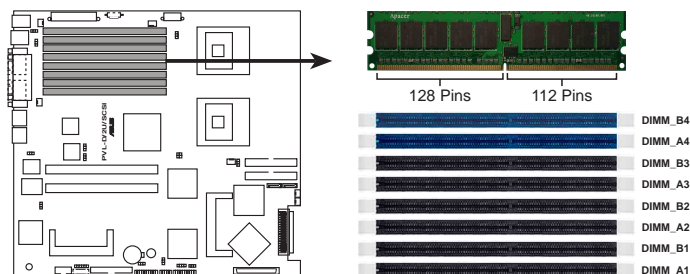
PVL-D/2U/SCSI 240-pin DDR2 DIMM sockets

2.3.1 Memory configurations

You may install 256 MB, 512 MB, and 1 GB registered ECC DDR II DIMMs into the DIMM sockets.

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

- Due to chipset resource allocation, the system may detect less than 16 GB system memory when you installed eight 2 GB DDR II memory modules.

- This motherboard does not support memory modules made up of 128 Mb chips or double-rank x16 memory modules.

- If you are installing only one memory module, install into the blue socket labeled DIMM_B4. Installing into any other socket would not work.

Mode	DIMM_B4	DIMM_A4	DIMM_B3	DIMM_A3	DIMM_B2	DIMM_A2	DIMM_B1	DIMM_A1
Single-channel*	✓							
Dual-channel	✓	✓						
Dual-channel	✓	✓	✓	✓				
Dual-channel	✓	✓	✓	✓	✓	✓		
Dual-channel	✓	✓	✓	✓	✓	✓	✓	✓

✓ Populated with DIMM
* Install only one memory module for single-channel memory configuration.

Single rank population

Single rank population diagram with MCH and DIMMs: Single Rank DIMM A1, Single Rank DIMM B1, Single Rank DIMM A2, Single Rank DIMM B2, Single Rank DIMM A3, Single Rank DIMM B3, Single Rank DIMM A4, Single Rank DIMM B4

Single and dual rank mixing

Single and dual rank mixing diagram with MCH and DIMMs: EMPTY, EMPTY, Single Rank DIMM A2, Single Rank DIMM B2, Single Rank DIMM A3, Single Rank DIMM B3, Dual Rank DIMM A4, Dual Rank DIMM B4

Dual rank population

Dual rank population diagram with MCH and DIMMs: EMPTY A1, EMPTY B1, EMPTY A2, EMPTY B2, Dual Rank DIMM A3, Dual Rank DIMM B3, Dual Rank DIMM A4, Dual Rank DIMM B4

2.3.2 Installing a DIMM

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

Follow these steps 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.
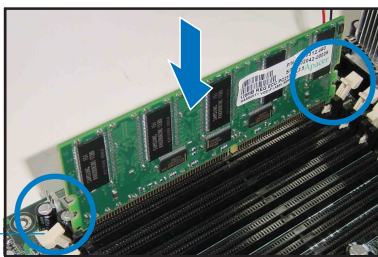
Unlocked retaining clip

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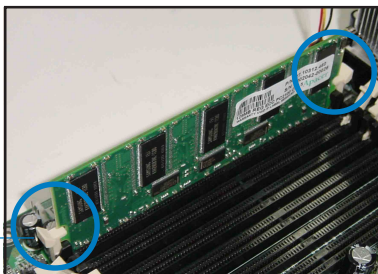
Locked retaining clip

2.3.3 Removing a DIMM

Follow these steps to remove a DIMM.

1. Simultaneously press the retaining clips outward to unlock the DIMM.
2. Remove the DIMM from the socket.
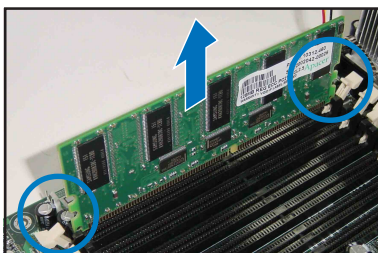
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2.4   Hard disk drives

To install a hard disk drive:

1.   Open the front bezel to access the hot-swap drive trays.

2.   Release a drive tray by pushing the spring lock to the right, then pulling the tray lever outward. The drive tray ejects slightly after you pull out the lever.

3.   Firmly hold the tray lever and pull the drive tray out of the bay.
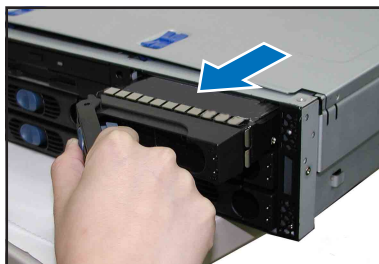
Metal bracket

4.   An empty drive tray includes a metal bracket for support. Use a Phillips (cross) screwdriver to remove the bracket if you wish to install a hard disk in the drive tray.
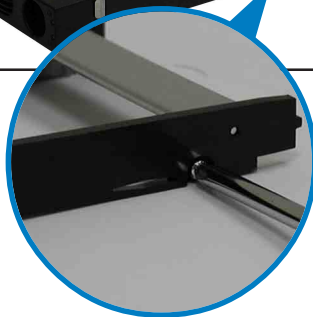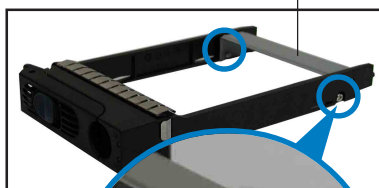
5. Place a hard disk drive into the drive tray, and secure it with four screws (two on each side).

6. Carefully insert drive tray and push it all the way to the depth of the bay until just a small fraction of the tray edge protrudes.
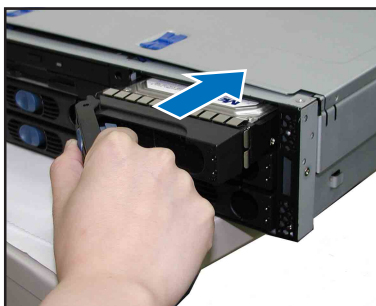
7. Push the tray lever until it clicks, and secures the drive tray in place. The drive tray is correctly placed when its front edge aligns with the bay edge.
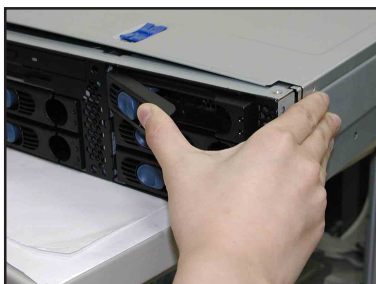
2.5 Expansion cards

The system motherboard comes with two PCI-X expansion slots, one slot is installed with the PCI cage to support three full-length expansion cards. A ZCR slot is also available for installation of a Zero Channel RAID card.
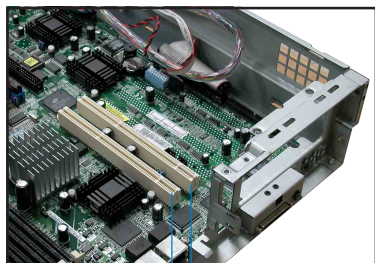
PCI-X1 PCI-X2
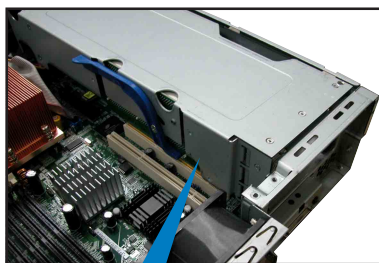
PCI-X slots inside the PCI cage
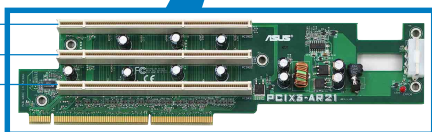
2.5.1 Installing a low-profile expansion card

To install a low-profile expansion card:

1. Firmly hold the card by the edges and align the card connector to the PCI-X slot.
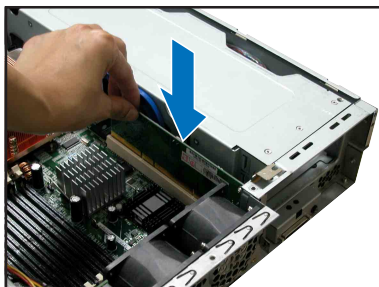
2. Push the card connector into the slot until it fits in place.
3. Secure the card bracket with a screw.
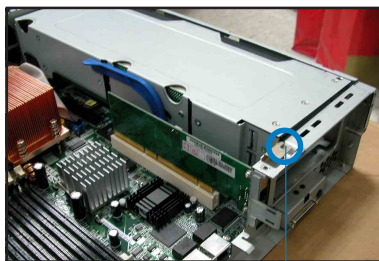
Card screw

2.5.2 Installing a full-length expansion card

The full-length expansion cards are inside the PCI cage. If you wish to install full-length expansion cards, you need to remove the PCI cage from the chassis.

To install a full-length expansion card:

1. Disengage the PCI cage from the chassis by lifting the cage handle to about 45° angle.
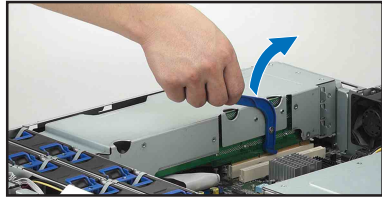
2. Firmly hold and lift the cage as shown to completely detach it from the chassis, then turn it over to access the power connector.
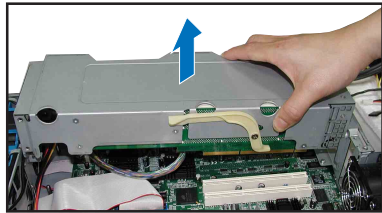
   DO NOT lift the PCI cage too high to avoid pulling and breaking the power cable!

3. Disconnect the 4-pin power plug from the connector inside the cage.
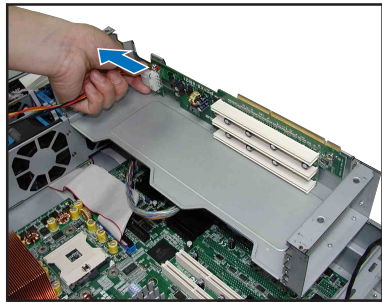
4. Place the cage on a flat stable surface with the slot facing up, and prepare the card that you want to install.
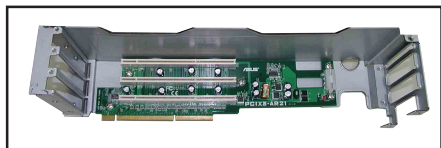
Internal view of PCI cage

Important notes on installing PCI cards in the PCI cage

- Install PCI-X cards in the following order:

  First PCI-X card   – top slot (furthest from motherboard)
  Second PCI-X card   – middle slot
  Third PCI-X card   – bottom slot (nearest the motherboard)

  Exceptions:

  1. Install a RAID card to the top slot to facilitate connection of SCSI cables.

  2. Install a LAN card to the bottom slot for easy connection of LAN (RJ-45) cables from the chassis rear panel.

- The PCI-X frequency depends on the number of cards installed on the PCI cage. Refer to the table below for details.

Installed PCI-X cards	PCI Frequency
One	133 MHz
Two	100 MHz
Dual-channel	66 MHz

5. Remove the metal cover opposite the PCI-X slot that you want to use, then install a PCI-X card as shown. The card golden connectors should match the notches on the slot.
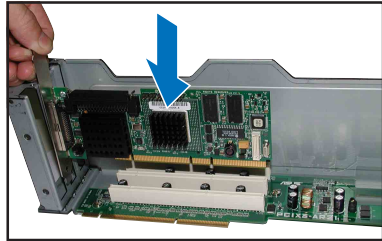
6. Firmly push down the card until it is completely seated on the slot.

7. Secure the card bracket with a screw.

8. Connect power or signal cable(s) to the card, if applicable.
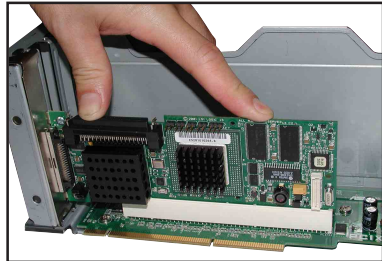
Repeat steps 5 to 8 if you wish to install other PCI-X cards.

9. Re-connect the 4-pin power plug
   to the connector inside the cage.

   ⚠ When re-connecting the power
   plug, place the PCI cage close
   enough to avoid pulling the
   power cable.
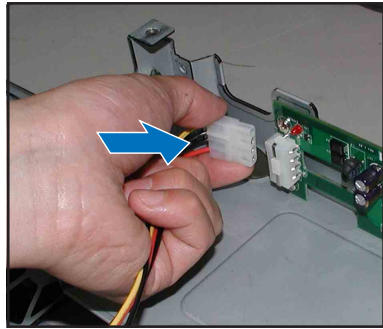
10. Before re-installing the PCI cage
    into the chassis, check that all
    cables on the PCI cage bay are
    properly connected and routed.

Cables on the PCI cage bay
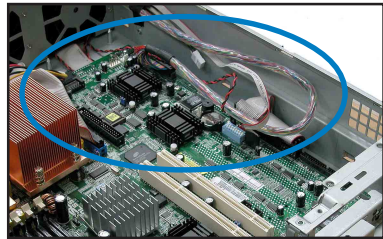
11. Take note of the two pegs on the
    PCI cage bay. These pegs should
    match the holes on the cage to
    make sure it fits in place.
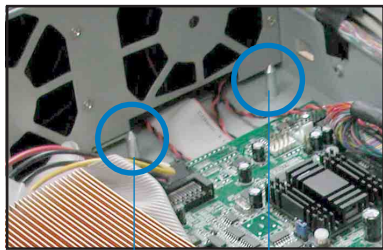
PCI cage pegs

12. Position the PCI cage into the bay making sure that the pegs go into the holes on the front of the cage, and the dents on the rear part match those on the chassis.
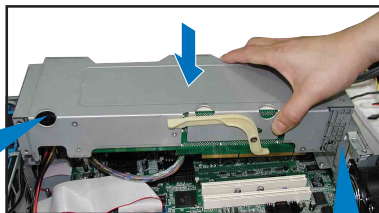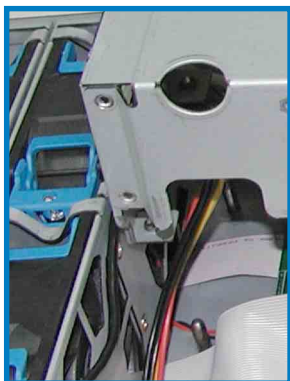
13. Match and push the cage card connector into the PCI-X slot (PCI-X2) until the PCI cage fits in place.
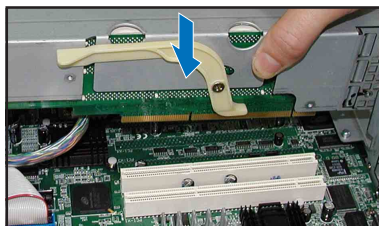
14. Ensure that the PCI cage card golden connectors completely fit the slot.

    If properly installed, the top of the PCI cage aligns with the top edge of the rear panel.

2.5.3 ZCR socket

The ZCR socket on the motherboard supports the Adaptec AIC-2015 Zero-Channel RAID card that allows RAID 0, RAID 1, RAID 10, RAID 5, RAID 50, and JBOD configurations.
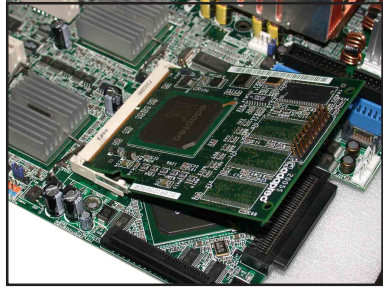
- • While you finish OS installation under 2015S (AIC-2015), and reboot the machine. Please reset 2015S as boot device under BIOS setting screen.
- • While you finish Linux OS (SUSE, RedHat) installation under 2015S,(RAID 1) you are not allowed to enter OS until the RAID building process is over. It may take 8 hours for 73GB HDD, 16 hours for 146GB HDD.

2.5.4 Mini-PCI socket

The Mini-PCI socket on the motherboard support an ASUS Server Management Board.
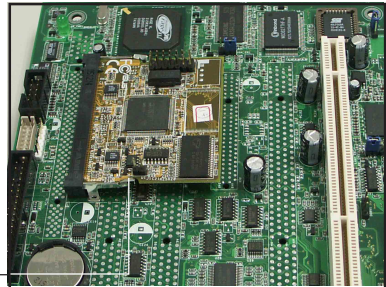
Mini-PCI socket

2.5.5 Configuring an expansion card

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

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 5 for information on BIOS setup.

2. Assign an IRQ to the card. Refer to the following tables.

3. Install the software drivers for the expansion card.

Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	N/A	Programmable Interrupt
3*	11	Communications Port (COM2)
4*	12	Communications Port (COM1)
5*	13	Sound Card (sometimes LPT2)
6	14	Floppy Disk Controller
7*	15	Printer Port (LPT1)
8	3	System CMOS/Real Time Clock
9*	4	ACPI Mode when used
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

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

IRQ assignments for this motherboard

	INTA#	INTB#	INTC#	INTD#	REQ#	GNT#
ICH5R IDE contrl.	PIRQC#	—	—	—	—	—
ICH5R SATA contrl.	PIRQC#	—	—	—	—	—
ICH5R SMBus contrl.	PIRQB#	—	—	—	—	—
ICH5R USB UHCI contrl. #1	PIRQA#	—	—	—	—	—
ICH5R USB UHCI contrl.#2	PIRQD#	—	—	—	—	—
ICH5R USB 2.0 EHCI contrl.	PIRQH#	—	—	—	—	—
AIC-7902W SCSI contrl.	PXH2_A_0	PXH2_A_1	—	—	PXH2_A_0	PXH2_A_0
Zero-Channel RAID sockets	PXH2_A_2	—	—	—	PXH2_A_1	PXH2_A_1
ATI RAGE XL video contrl.	PIRQB#	—	—	—	REQ1H#	GNT1#
PCIX slot 1 (64-bit)	PXH1_B_0	PXH1_B_1	PXH1_B_2	PXH1_B_3	PXH1_B_0	PXH1_B_0
PCIX slot 2 (64-bit)	PXH1_A_0	PXH1_A_1	PXH1_A_2	PXH1_A_3	PXH1_A_0	PXH1_A_0

2.6   Cable connections

✎
> • The bundled system cables are pre-connected before shipment. You do not need to disconnect these cables unless you will remove pre-installed components to install additional devices.
>
> • Refer to this section when reconnecting cables to ensure correct cable connections.

Rear panel

Front panel
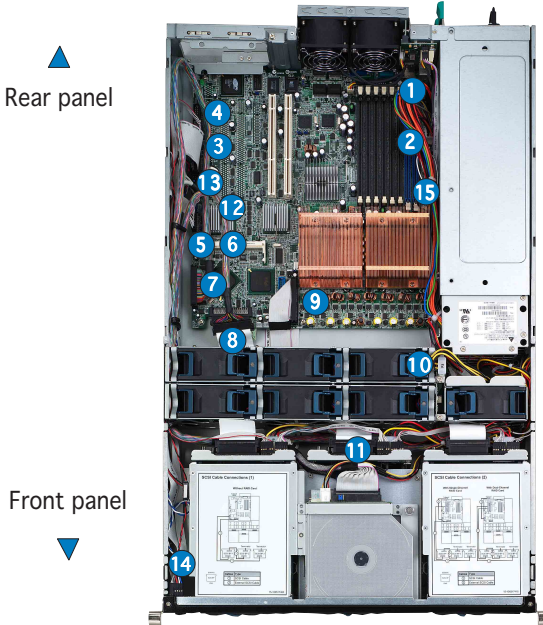
Pre-connected system cables

1. Rear fan connectors (from REAR_FAN2 of MB to FAN1 of rear fan board and from REAR_FAN1 of MB to FAN2 of rear fan board)
2. 24-pin/8-pin power connectors (from power supply to MB)
3. Floppy drive connector (from MB to floppy drive)
4. SMBus connector (from MB to SCSI backplane)
5. PANEL connectors (from MB to front panel)
6. Chassis intrusion connector (from MB to chassis)
7. SCSI-A1 connector (from MB to SCSI backplane or to external SCSI port)
8. SCSI-B1 connector (from MB to SCSI backplane)
9. Secondary IDE (from MB to optical drive)
10. Mid-fan power connector (from power supply to mid-fan board)
11. SCSI board connectors (from three SCSI backplane to MB and power supply)
12. Front USB connectors (from MB to front panel)
13. LAN LED connector and Locator LED connector/switch (from MB to front panel)
14. Locator LED connector/switch (from front panel to rear panel Locator LED/switch)
15. CPU_FAN1 connector (from MB to mid-fan board)

2.6.1 Motherboard

REAR_FAN1 cable

24-pin power cable

REAR_FAN2 cable

5-pin PSUSMB1 cable from power supply

4-pin fan cable (to mid-fan board)

8-pin power cable

33cm (13in)

PS/2 T: Mouse B: Keyboard	
USB1 USB2	
COM1	
VGA1	
RJ-45 (LAN-1)	
RJ-45 (LAN-2)	

ATXPWR

REAR_FAN2

PSUSMB1

ATX12V1

DDR DIMM_B4 (64/72 bit, 240-pin module)
DDR DIMM_A4 (64/72 bit, 240-pin module)
DDR DIMM_B3 (64/72 bit, 240-pin module)
DDR DIMM_A3 (64/72 bit, 240-pin module)
DDR DIMM_B2 (64/72 bit, 240-pin module)
DDR DIMM_A2 (64/72 bit, 240-pin module)
DDR DIMM_B1 (64/72 bit, 240-pin module)
DDR DIMM_A1 (64/72 bit, 240-pin module)

KBPWR1
USBPW12
PARALLEL PORT
REAR_FAN1

CPU_FAN1
FM_CPU1
CPU1

mPGA 604

Rear panel

Broadcom
BCM5721

Broadcom
BCM5721

AMI
8Mb
FWH

Super
I/O

PVL-D/2U/SCSI

ASUS

Intel® E7520
MCH

LAN1_EN1
LAN2_EN1

PCIX1 (64-bit, 133MHz 3V)

PCIX2 (64-bit, 133MHz 3V)

RECPVERY1

VGA_EN1

ATI
RAGE XL
VGA
Controller

BMC_RACK1

Intel®
PXH

Intel®
PXH

J2

CPU_FAN2   FM_CPU2

Intel®
ICH5R

ZCRSKT1

Adaptec®
AIC-7902

SEC_IDE

PRI_IDE

SATA2   SATA1

FRNT_FAN1
FRNT_FAN2

SCSIB1

30.5cm (12in)

CPU2

mPGA 604

CR2032 3V
Lithium Cell
CMOS Power

BUZZ1

CLRTC1

FLOPPY1

AUX_PANEL1

USB34

HDLED1

SCSI_EN1

SCSIA1

SB_PWR1

COM2

SMBCONN1

PANEL1

Floppy drive cable
Chassis intrusion cable

SMBus cable
to SCSI BP-1

20-pin PANEL cable to front panel

SCSI cable to
SCSI BP-1 or
external SCSI
port

12-pin LAN LED and
LOCATOR LED/switch to
front panel

USB cable to
front panel
board

SCSI cable
to SCSI BP-3

IDE cable to
optical drive

2.6.2 SCSI backplanes

View from front panel

Hot-swap SCSI
HDD connectors

View from rear panel

J5 SUMBus
connector

SCSI connector

J4 SUMBus
connector

Power connector

J6 jumper
J9 jumper

J3 jumper
J1 jumper
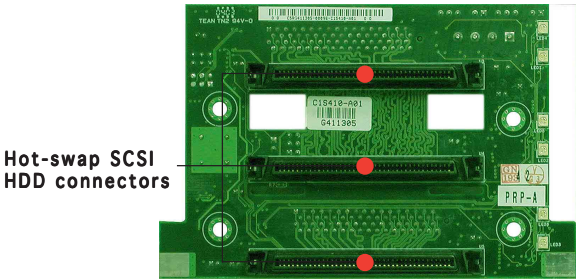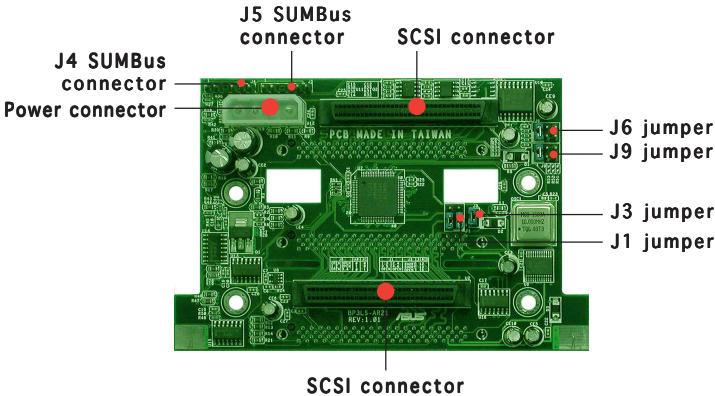
SCSI connector

2.6.3 SCSI HDD configurations

SCSI HDD Configuration 1

- SCSI-A and SCSI-B connectors on the motherboard used by SCSI backplane boards
- No RAID cards installed
- External SCSI port will not be used

SCSI BP-3
SCSI BP-2
SCSI BP-1

SCSI-B connector
(Connects to SCSI BP-1)

SCSI-A connector
(Connects to SCSI BP-2)

📝 Install another SCSI card if you want to add an external SCSI device.

SCSI BP-3	SCSI BP-2	SCSI BP-1
	SCSI-A connector on the motherboard	SCSI-B connector on the motherboard
Terminator	Terminator	

SCSI cable

Rear panel
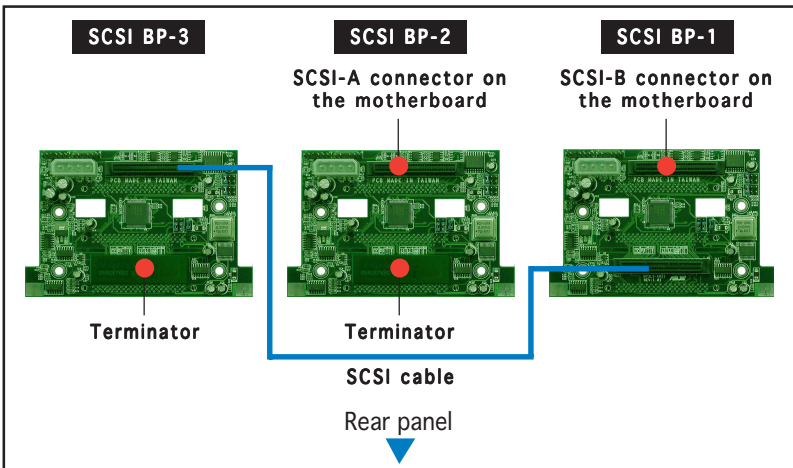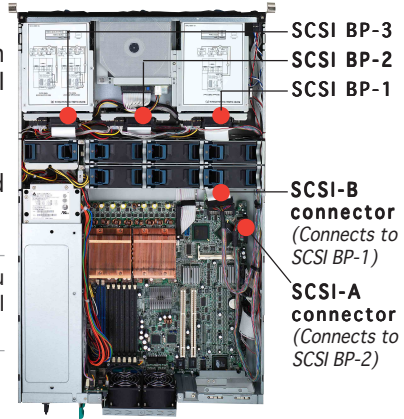
SCSI HDD Configuration 2

- SCSI-A and SCSI-B connectors on the motherboard used by SCSI backplane boards
- A Zero Channel RAID card is installed in the ZCR slot

📝
- For SCSI HDD Configuration 2, follow the SCSI cabling and setting of Configuration 1.
- Install another SCSI card if you want to add an external SCSI device.

SCSI HDD Configuration 3

• Single-channel RAID card installed, connects to SCSI BP-1
• SCSI-A connector used by SCSI BP-2
• SCSI-B connector free for use by external SCSI device
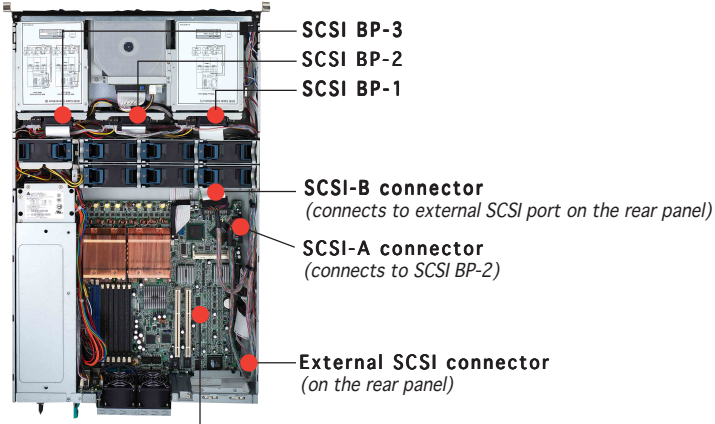
SCSI BP-3
SCSI BP-2
SCSI BP-1

SCSI-B connector
(connects to external SCSI port on the rear panel)

SCSI-A connector
(connects to SCSI BP-2)

External SCSI connector
(on the rear panel)

Single-channel RAID card installed on the PCI-X riser card *(inside PCI cage)*

SCSI BP-3   SCSI BP-2   SCSI BP-1

SCSI-A connector on the motherboard

External SCSI connector on the rear panel

Terminator   **Terminator**

SCSI cable
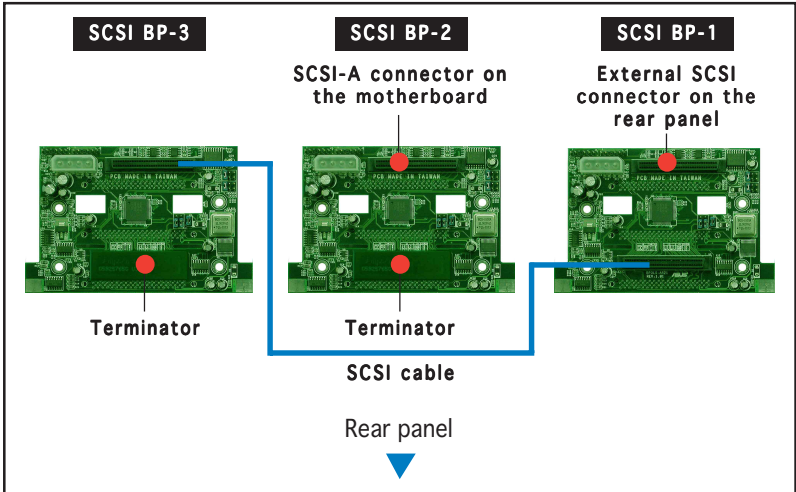
Rear panel

SCSI HDD Configuration 4

- Dual-channel RAID card installed
- SCSI-A connector has no connected device
- SCSI-B connector used by external SCSI connector (from rear panel)

SCSI BP-3
SCSI BP-2
SCSI BP-1

SCSI-B connector
(connects to the external SCSI connector)

SCSI-A connector

External SCSI connector
(on the rear panel)

Dual-channel RAID card installed on the PCI-X riser card *(inside PCI cage)*

SCSI BP-3   **SCSI BP-2**   **SCSI BP-1**

RAID card   **RAID card**
Channel 2 connector   **Channel 1 connector**

Terminator   **Terminator**

SCSI cable

Rear panel
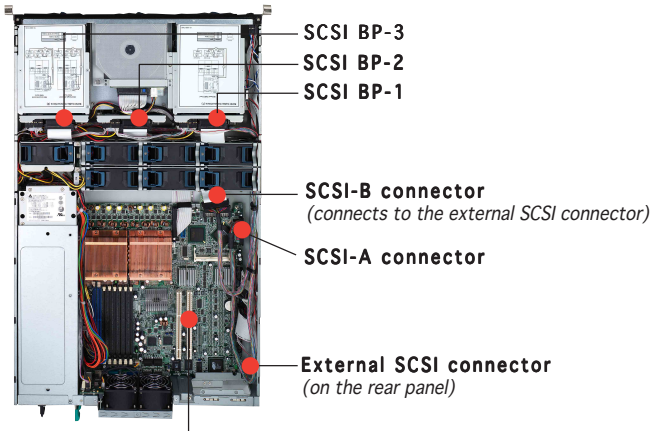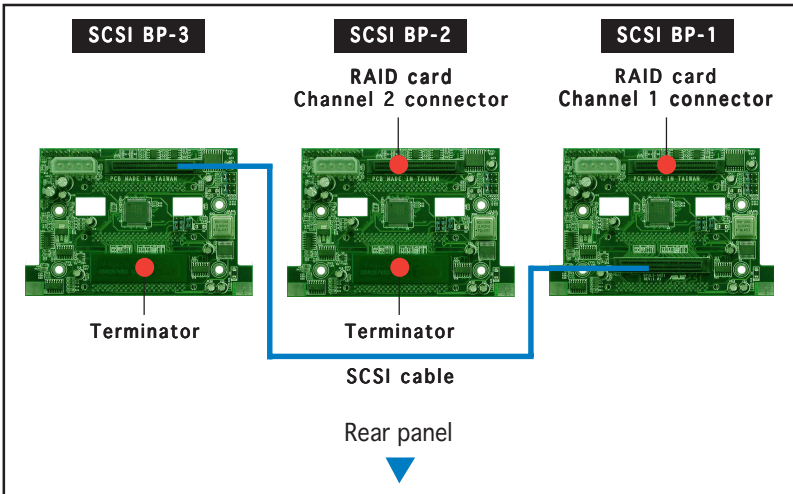
2.6.4   SCSI ID assignments
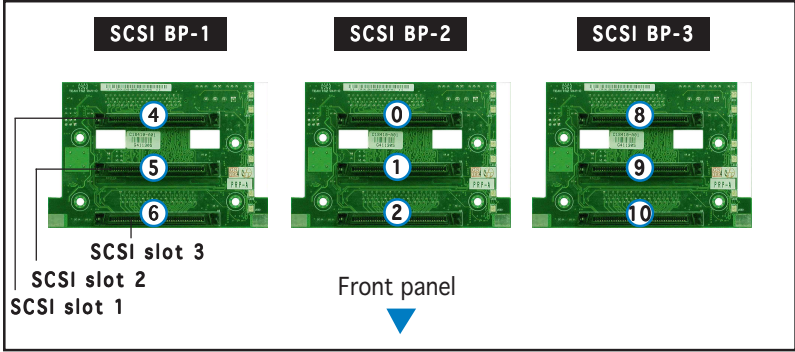
	SCSI BP-1	SCSI BP-2	SCSI BP-3
SCSI slot 1	4	0	8
SCSI slot 2	5	1	9
SCSI slot 3	6	2	10
SAF-TE	12	15	13
SCSI card (if present)			7

2.6.5   SCSI jumper settings
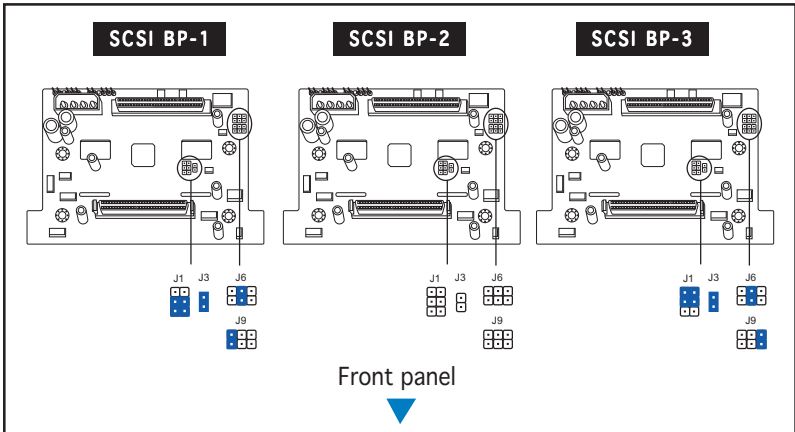
Do not change the jumper settings, unless you are replacing the SCSI board for Return Merchandise Authorization (RMA).

2.6.6 SMBus and backplane power cabling

SCSI BP-3
SCSI BP-2
SCSI BP-1

Mid-fan board
(FANBPC-E2-AR21)

SMBus
(Connect to
SCSI BP-3)

SCSI BP-3

SCSI BP-2

SCSI BP-1

SMBus connector on
mid-fan board

BPSMBUS1 connector
on the motherboard

PSU Plug 6

PSU Plug 7

PSU Plug 8

SMBus cable

SMBus cable

Rear panel
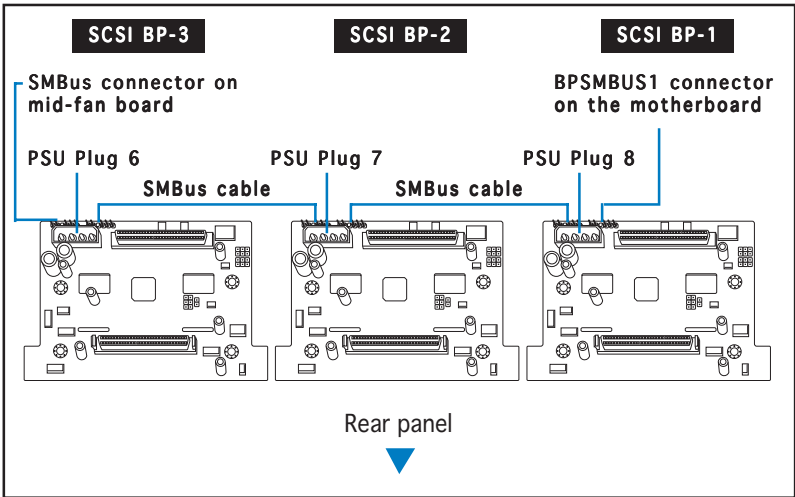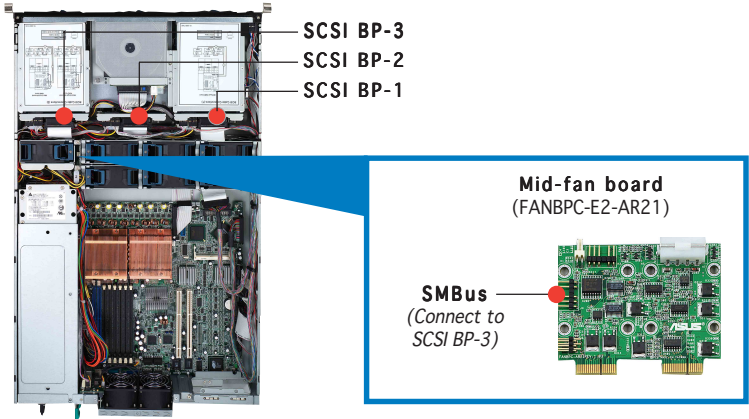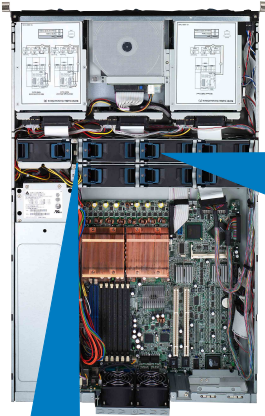
2.6.7 Fan boards

Main mid-fan boards (FANBP-AR21)
(located underneath the 7 hot-swap fans)

7 6   5   4

3   2   1
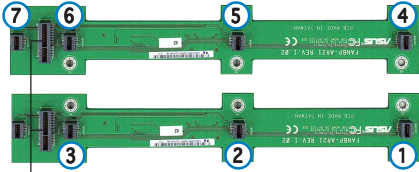
Connect the mid-fan board
(FANBPC-E2-AR21)

Mid-fan board
(FANBPC-AR21)

P3 plug from power supply

3-pin connects to CPU_FAN1

SMBus cable from SCSI BP-3

**6-1 pin cable from
FAN60BPC-AR21
J2 connector**

To main fan board
(FANBP-AR21)

Fan interface board
(FAN60BPC-AR21)

Side facing rear panel

Connects the
FAN60M-AR21
board

Rear fan LEDs

Side facing front panel

Connects to J5 on
FANBPC-AR21

Connects to
REAR_FAN2 on MB

Connects to
REAR_FAN1 on MB

Rear fan board
(FAN60M-AR21)

Rear fan cables

Connects to
FAN60BPC-AR21
board
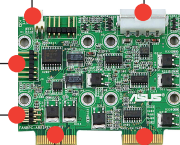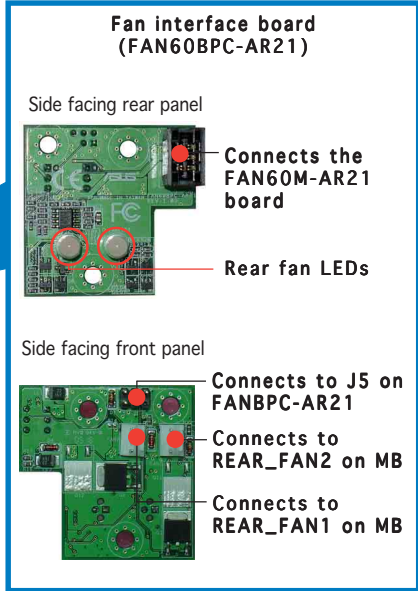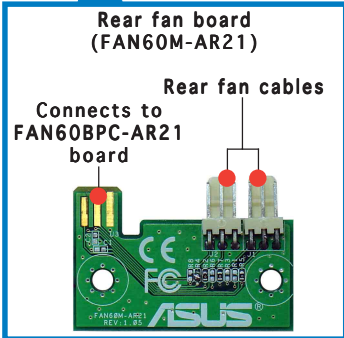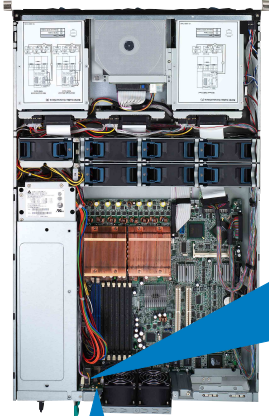
2.7   Removable components

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

1. Hot-swap mid-fans   4. Optical drive/floppy drive
2. Rear fans   5. Front panel LED/switch board
3. Power supply modules   6. SCSI backplanes

2.7.1   Hot-swap mid-fans (80mm)

The fan LED lights up green in normal operation. If the LED color turns orange, the fan is faulty and should be replaced.

To remove an 80mm hot-swap fan:

1.   Stand in front of the system and open the top cover.

2.   Use the thumb and index finger of your right hand to flip up the right handle, and the thumb and index finger of your left hand to flip up the left handle of the fan that you want to remove.

3.   Firmly hold the handles and pull up the fan until it is disengaged from its connector.

> ⚠ Avoid touching the fan blades while removing the fan. Spinning fan blades may cause injury!
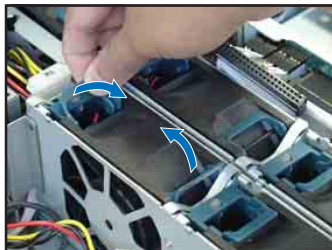
Note on the power supply mid-fan

When you re-install the mid-fan for the power supply module(s) make sure that the arrow points to the direction of the rear panel. Installing the fan otherwise will cause CPU overheating.

2.7.2 Rear fans (60mm)

To uninstall the rear fans:

1. Remove the top cover screw.
2. Press the rear fan cage levers inward.
3. Pull the fan cage from the chassis.
4. Set the rear fan cage aside.
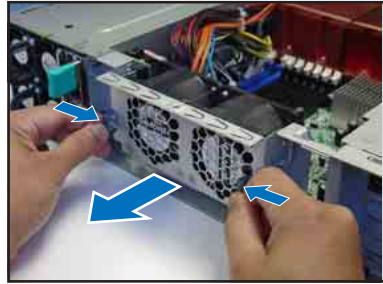
2.7.3 Power supply modules

The barebone system ships with one power supply module. You may purchase a second power supply module for redundancy.

To uninstall a power supply module:

1. Locate the power supply modules on the rear panel, and select the module that you want to remove.

2. Hold the module lever and press the latch on the inner side to release the module.

Please remove AC power code, first. Unless, you can not press the latch.

PSU1

PSU2
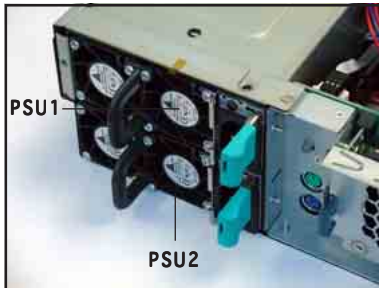
3. Firmly pull the lever to slide the power supply module out of the chassis.
4. Repeat steps 2 to 3 to remove the other module.

2.7.4 Slim optical and floppy drives

To uninstall the optical and floppy disk drives:

1. Disconnect the power and signal cables connected to the rear of the drives.

    Signal cable

    Power cable
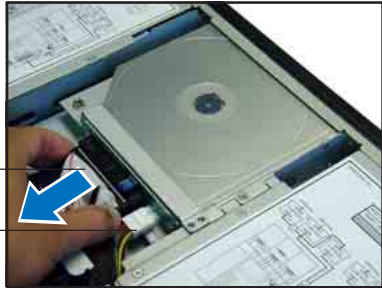
2. Loosen the screws that secure the drive bracket to the chassis. The optical drive is attached to the top of the bracket, and the floppy drive to bottom.
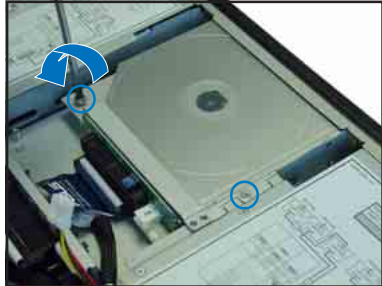
3. Slide the drive bracket toward the SCSI backplanes to release it from the chassis, then carefully pull it out of the drive bay.
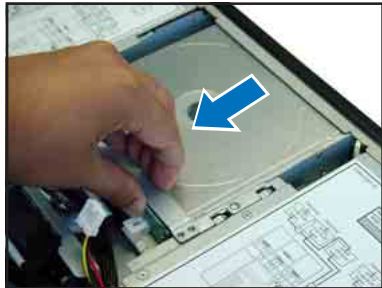
2.7.5 Front panel LED and switch board

To uninstall the front panel and swtich board:

1. Disconnect all cables connected to the rear of the board.
2. Remove the three screws the secure the board to the chassis.
3. Carefully remove the board out of the chassis.

When removed, the LED and switch board appears as shown. The LEDs and switches on the board correspond to the LEDs and buttons on the system front panel.

Locator switch connector

Locator LED connector

Panel connector

Front USB connector

Front side   Rear side
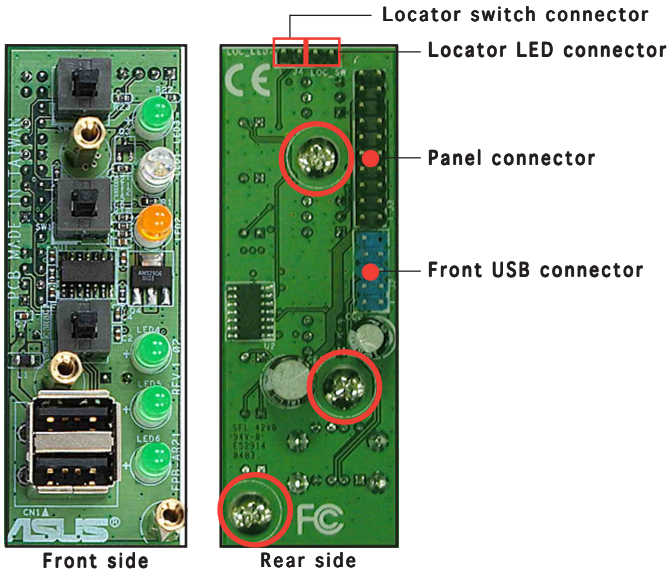
2.7.6 SCSI backplanes

To uninstall a SCSI backplane:

1. Disconnect all cables connected to the rear of the SCSI backplane.
2. Carefully push the backplane upward to remove it from the chassis.
3. Repeat steps 1 to 2 to remove the other backplanes.
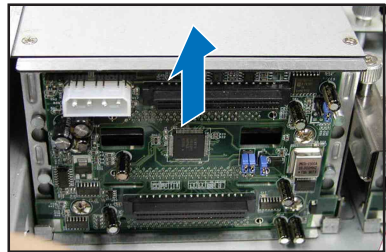
Chapter 3

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

3.1 Rackmount rail kit items

Your rackmount rail kit package contains:

- one pair of server rails (for the server)
- two pairs of rack rails (for the rack)
  to accommodate different sizes of rack
- Nut-and-bolt type screws

Rear end   Server rails   Rack rails   Nuts-and-screws

Front end
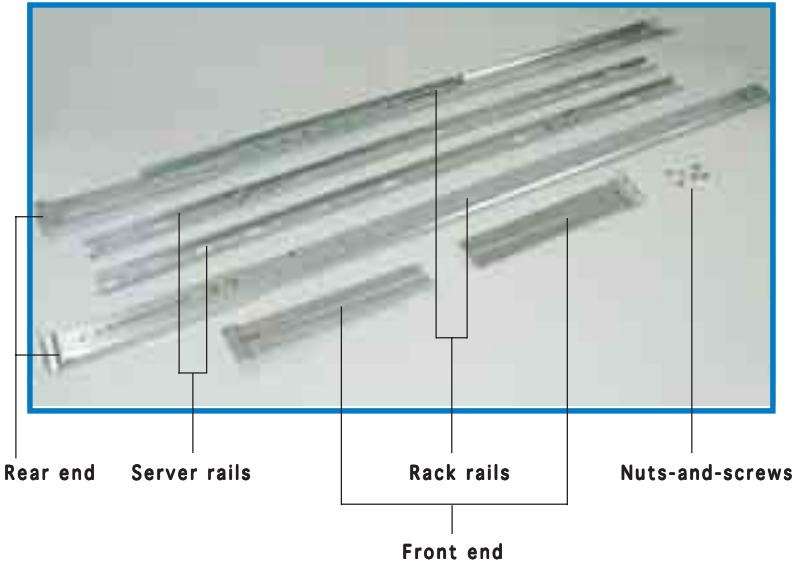
- The rear ends come pre-installed in the rack rails. The rear end nuts and screws are loosen to allow flexible installation on the industrial rack.

- Install the server in an industrial rack with at least 100 cm depth.

3.2   Attaching the rails to the server

To attach the server rails:

1.   Locate the hooks on the side of the chassis.

2.   Position a server rail parallel to the side of the chassis, and match each of the five hooks to the holes on the rail.

Side hook locked to rail hole

3.   Secure the server rail to the side of the chassis with two screws.

4.   Repeat steps 1 to 3 to attach the second server rail to the other side of the chassis.

3.3　Attaching the rack rails

To attach the rack rails:

1.	Select two units of space (2U) on the rack where you want to install the barebone server.

2.	Install the nuts on the holes of the 2U space on the rack front.

3.	Install the nuts on the holes of the 2U space on the corresponding rack rear.

4.	Measure the depth of the rack to determine the length of the rack rails.
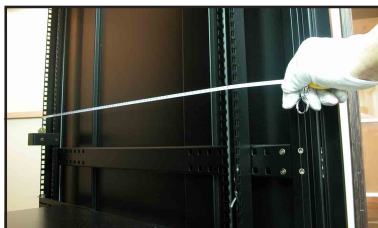
5.	Take two pieces of rack rail, consisting of the middle piece with the pre-installed rear end, and one front end (left or right).

	Attach the front end to the middle piece using the supplied nuts and screws. Make sure that the front end dent supports the middle piece.
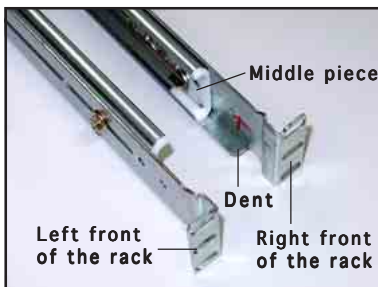
7.	Measure the rack rail when assembled to make sure that it fits the rack.
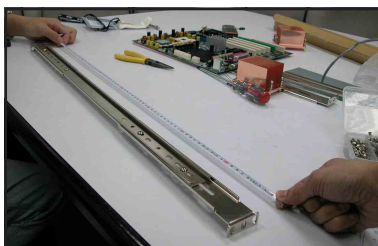
8. Position the rack rail to the 2U space on the rack. Make sure that the front end of the rack rail goes to the front of the rack space.
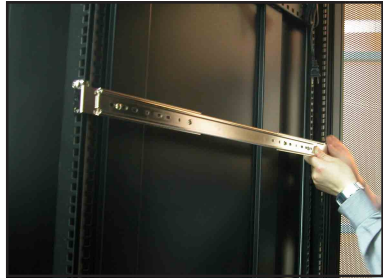
9. Secure the front end of the rail with two rack screws.
10. Secure the rear end of the rail with two rack screws.
11. Repeat steps 5 to 9 to assemble and attach the second rack rail.
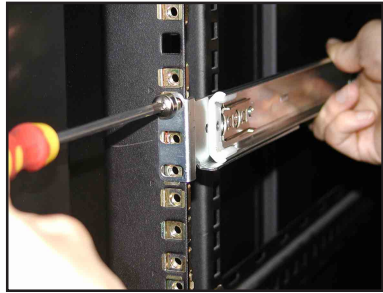
3.4   Rackmounting the server

To mount the server to the rack:

1.   Align the server rails with the rack rails and push the server halfway to the rack.

2.   Align a mounting ear with the holes on a front corner of the chassis, then secure it with two screws.

3.   Attach the other mounting ear to the other corner of the chassis.
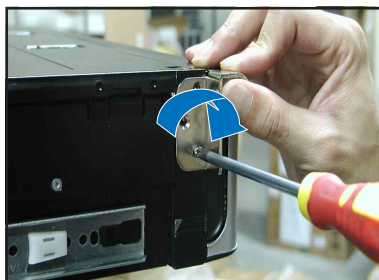
4.   Pull the server rail lock, then push the server all the way to the depth of the rack.

      Make sure that the mounting ear and the rack screw holes align.
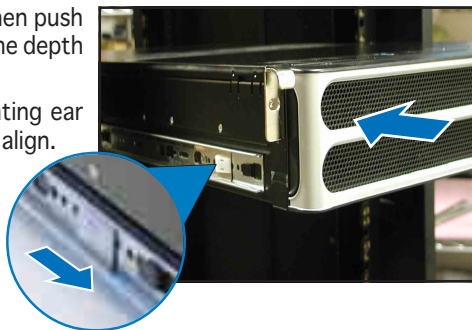
5.   Drive a screw on the mounting ear to secure the server in place.
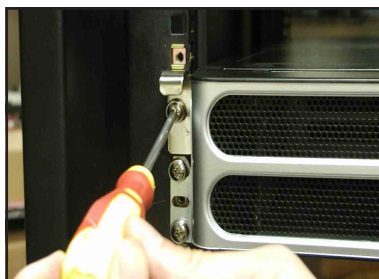
This chapter includes the
motherboard layout, and brief
descriptions of the jumpers and
internal connectors.

Motherboard info

4.1   Motherboard layout
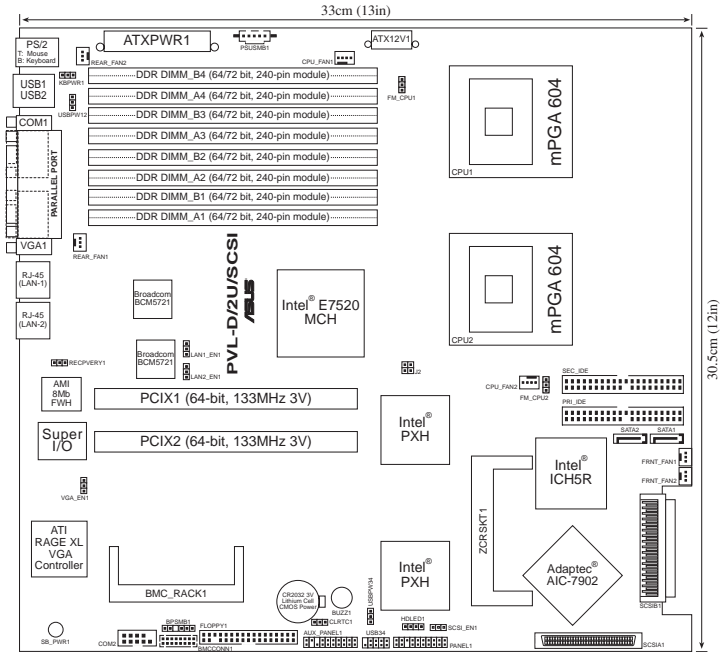
4.2   Screw holes

Place 9 screws into the holes indicated by circles to secure the motherboard to the chassis.

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

Place this side towards the rear of the chassis

Layout contents

4.3   Support kits for the motherboard

For additional protection from motherboard breakage due to the weight of the CPU heatsinks, your motherboard package comes with CEK springs that you can use as weight support. Remove the CEK spring when replacing the orginial MB. Then Install the CEK springs before installing the motherboard.

Each CEK spring has four hooks to match the designated holes around the CPU area.
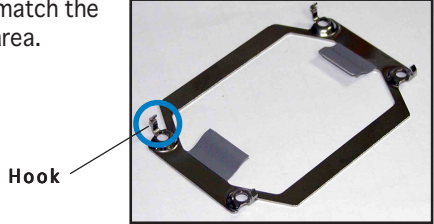
Hook

To remove the CEK spring:

1.   Locate the CEK spring hooks on the motherboard, then press the hook as arrow show.
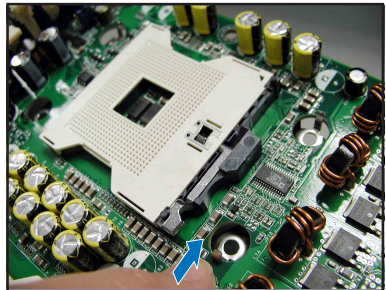
2.   Then until hook leave the holes .
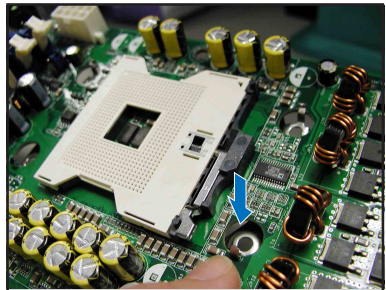
3. Follow the step 1 and 2 to press another hook as arrow show.

   Then leave the CEK spring away.
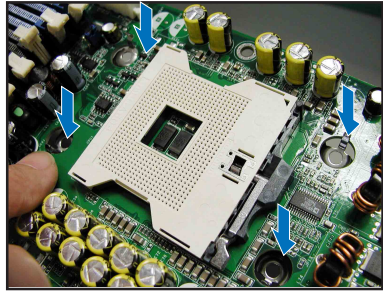
To install the CEK spring:

1. Locate the CPU heatsink holes on the motherboard.

Socket for CPU2

Socket for CPU1

Heatsink hole
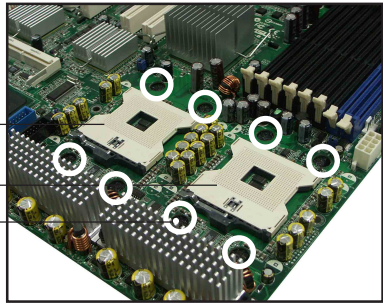
2. Position the CEK spring underneath the motherboard, then match the CEK spring hooks to the CPU1 heatsink holes.
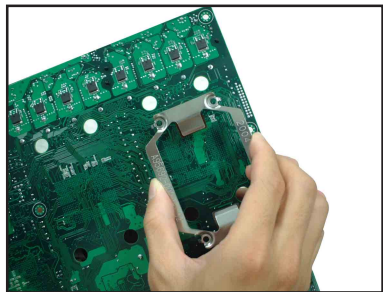
4.4 Jumpers

1. Clear RTC RAM (CLRTC1)

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

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.

2. Remove the onboard battery.

3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.

4. Re-install the battery.

5. Plug the power cord and turn ON the computer.

6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

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

PVL-D/2U/SCSI Clear RTC RAM

CLRTC1

2 1   3 2

Normal   Clear CMOS
(Default)
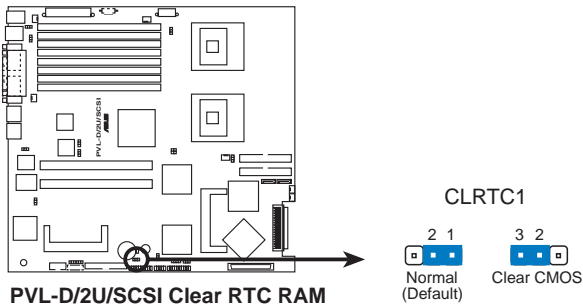
2. CPU fan pin selection (3-pin FM_CPU1, FM_CPU2)

These jumpers allow you to connect either a 3-pin or a 4-pin fan cable plug to the CPU fan connectors (FM_CPU1, FM_CPU2). Set these jumpers to pins 1-2 if you are using a 3-pin fan cable plug, or to pins 2-3 if you are using a 4-pin plug.

FM_CPU1

3
2

DC mode
(Default)

2
1

PWM

FM_CPU2

2
1

DC mode
(Default)

3
2

PWM

PVL-D/2U/SCSI FM_CPU setting
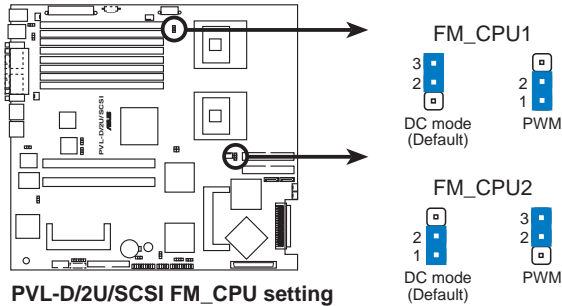
3. USB device wake-up (3-pin USBPW12, USBPW34)

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

USBPW12

2
1

+5V
(Default)

3
2

+5VSB

USBPW34

2
3

+5VSB

1
2

+5V
(Default)

PVL-D/2U/SCSI USB device wake up
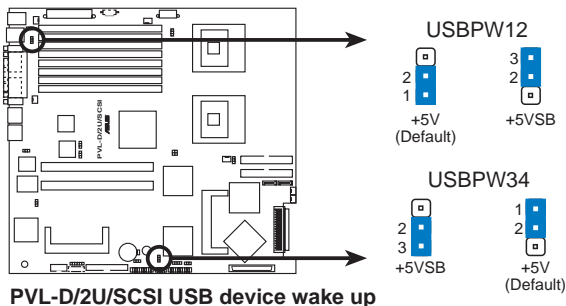
- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.

- If you are using Windows 2000, you need to install Service Pack 4 to wake up the system from S4 sleep mode.

- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

4. Keyboard power (3-pin KBPWR1)

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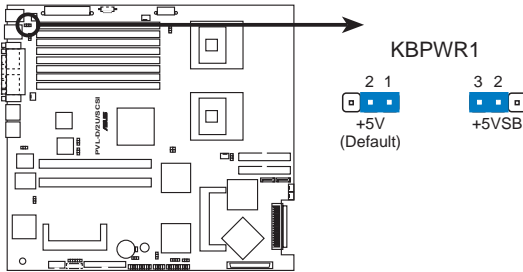
PVL-D/2U/SCSI Keyboard power setting

5. VGA controller setting (3-pin VGA_EN1)

These jumpers allow you to enable or disable the onboard ATI® RAGE-XL PCI VGA controller. Set to pins 1-2 to activate the VGA feature.
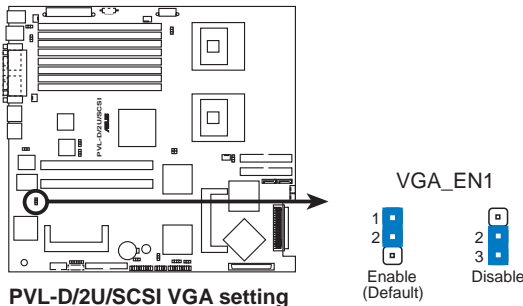
PVL-D/2U/SCSI VGA setting

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

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

LAN1_EN1

2
1
Enable
(Default)

3
2
Disable
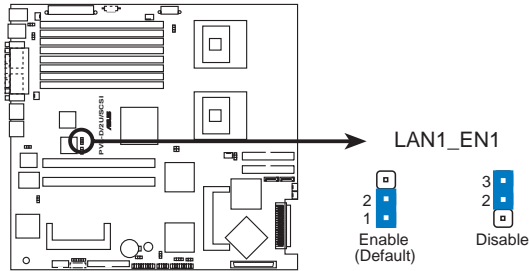
PVL-D/2U/SCSI LAN1_EN setting

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

These jumpers allow you to enable or disable the onboard Broadcom®
BCM5721 Gigabit LAN2 controller. Set to pins 1-2 to activate the Gigabit
LAN feature.

LAN2_EN1

2
1
Enable
(Default)

3
2
Disable
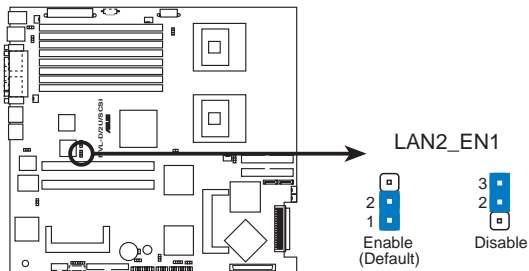
PVL-D/2U/SCSI LAN2_EN setting

8. SCSI controller setting (3-pin SCSI_EN1)

This jumper allows you to enable or disable the onboard Adaptec® AIC-7902W SCSI U320 controller. Set to pins 1-2 to activate the SCSI feature, and support RAID configurations.

PVL-D/2U/SCSI SCSI setting

SCSI_EN1

1 2 — Enable (Default)
2 3 — Disable
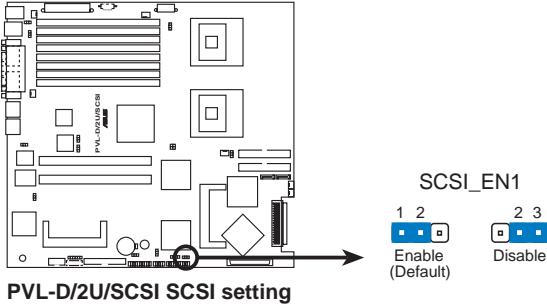
9. Force BIOS recovery setting (3-pin RECOVERY1)

This jumper allows you to quickly update or recover the BIOS settings when it becomes 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.

PVL-D/2U/SCSI BIOS recovery setting

RECOVERY1

1 2 — Normal (Default)
2 3 — BIOS Recovery
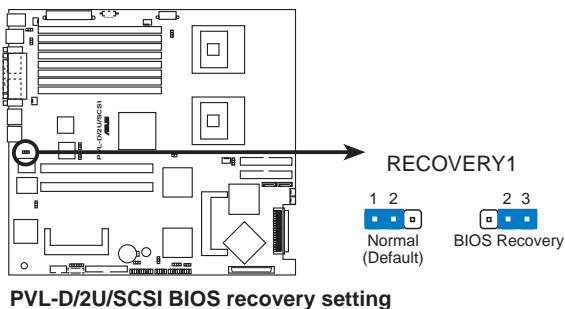
4.5   Connectors

This section describes the internal connectors on the motherboard. Refer to section "1.4 Rear panel features" for information on the external (rear panel) connectors.

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

This connector supports the provided floppy drive ribbon cable. After connecting one end to the motherboard, connect the other end to the floppy drive. (Pin 5 is removed to prevent incorrect insertion when using ribbon cables with pin 5 plug).
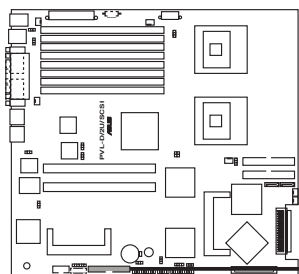
FLOPPY1

PIN 1

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

PVL-D/2U/SCSI Floppy disk drive connector

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

This connector supplies power to the hard disk drive activity LED. The read or write activities of any device connected to an add-on SCSI card or RAID card cause this LED to light up.

HDLED1

SCSI_ACTLED+
SCSI_ACTLED-
SCSI_ACTLED-
SCSI_ACTLED+
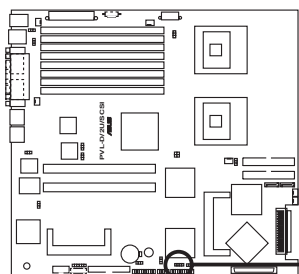
PVL-D/2U/SCSI SCSI/SATA card activity LED connector

3. Primary IDE connectors (40-1 pin PRI_IDE, SEC_IDE)

These connectors are 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.

> • 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.

SEC_IDE

PRI_IDE

PIN 1

PIN 1

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

PVL-D/2U/SCSI IDE connectors
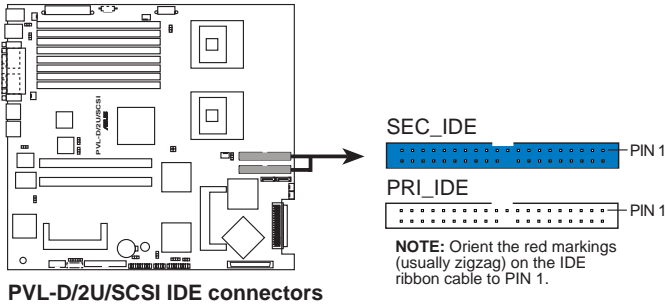
4. Power supply SMBus connector (5-pin PSUSMB1)

This connector is for the power supply SMB cable, if your power supply supports the SMBus function.

I2C_7_CLK#
I2C_7_DATA#
NC
GND
+3.3V Remote Sense

PSUSMB1

PVL-D/2U/SCSI Power supply SMBus connector
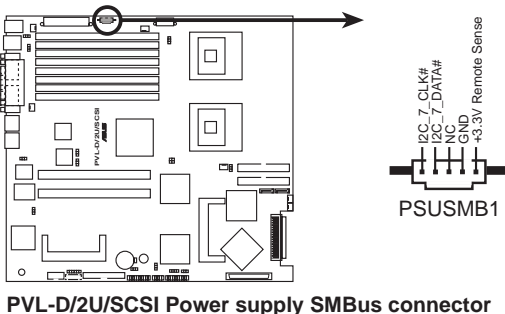
5. Serial ATA connectors (7-pin SATA1, SATA2)

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 or RAID 1 configuration with the Intel® Matrix Storage Technology through the onboard Intel® ICH5R integrated RAID controller.

> These connectors are set to **Standard IDE** mode by default. In **Standard 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].
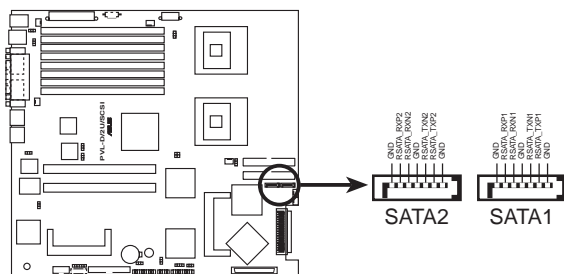
PVL-D/2U/SCSI SATA connectors

> **Important notes on Serial ATA**
>
> • You must install Windows® 2000 Service Pack 4 or the Windows® XP Service Pack 1 before using Serial ATA hard disk drives. The Serial ATA RAID feature (RAID 0/RAID 1) is available only if you are using Windows® 2000/XP.
>
> • Use only two Serial ATA RAID connectors for each RAID 0 or RAID 1 set.
>
> • When using the connectors in **Standard 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
SATA1	Master	Boot disk
SATA2	Slave	Data disk

6. Ultra320 SCSI connectors (two 68-pin SCSIA1, SCSIB1)

This motherboard comes with the Adaptec® AIC-7902W SCSI U320 controller that support two 68-Pin Ultra320 SCSI connectors, one for each of the two channels. Each channel can support a maximum of 15 devices as specified by Ultra320 standards.

SCSIB1
68-Pin Ultra320/
Ultra2-Wide SCSI Connector

SCSIA1
68-Pin Ultra320/
Ultra2-Wide SCSI Connector

PVL-D/2U/SCSI Onboard SCSI connectors
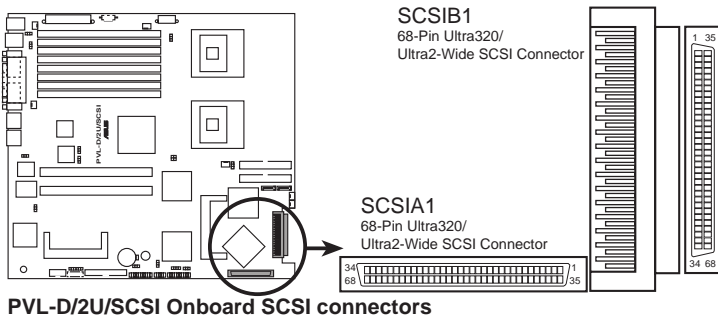
SCSI Connection Notes

This motherboard has two 68-Pin Ultra320 SCSI connectors; one for each of the two channels.

The onboard SCSI chipset incorporates an advanced multimode I/O cell that supports both single-ended (SE), Ultra2, Ultra160, and Ultra320 devices. With Ultra320 devices, the SCSI bus platform performs at full Ultra320 speeds (up to 320MB/s) and extended cabling 12m (or 25m in a point-to-point configuration). When an SE device is attached, the bus defaults to an SE speed and 1.5m cable length.

Connect SCSI devices as shown. Each channel should have only one type of SCSI standard (e.g. Ultra320, Ultra160, Ultra2, Ultra-Wide). Mixing SCSI devices on the same channel decreases performance of the slower device.

68-pin Internal SCSI Cable (Twisted-Pair Ribbon)

Channel A

Internal SCSI Devices (up to 15 devices)

68-pin Female Terminator

68-pin Internal SCSI Cable (Twisted-Pair Ribbon)

Channel B

Internal SCSI Devices (up to 15 devices)

68-pin Female Terminator

PVL-D/2U/SCSI SCSI connection example
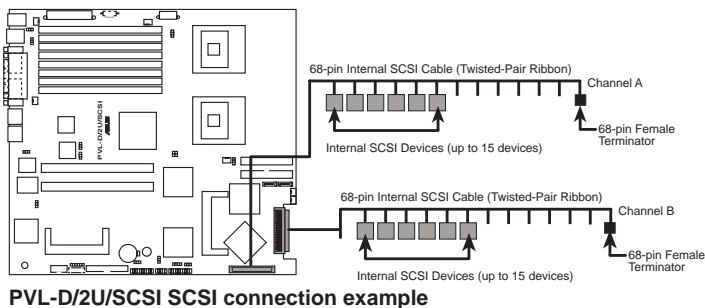
7. USB connector (10-1 pin USB34)

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

USB34

GND
GND
USB PortA(+)
USB PortA(-)
Power

NC
GND
USB PortB(+)
USB PortB(-)
Power

PVL-D/2U/SCSI USB connector
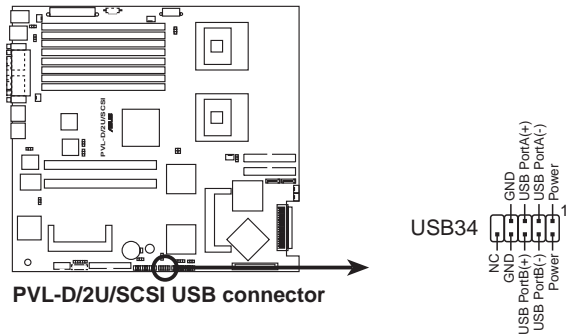
8. CPU and system fan connectors (4-pin CPU_FAN1/2, 3-pin REAR_FAN1/2, FRNT_FAN1/2)

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.

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!

CPU_FAN1

REAR_FAN2

REAR_FAN1

CPU_FAN2

FRNT_FAN1
FRNT_FAN2

PVL-D/2U/SCSI Fan connectors

CPU_FAN1

GND
FAN Power
FAN Speed
PWM Control

CPU_FAN2

PWM Control
FAN Speed
FAN Power
GND

REAR_FAN1

GND
+12V
Rotation

REAR_FAN2

Rotation
+12V
GND

FRNT_FAN1

GND
+12V
Rotation

FRNT_FAN2

GND
+12V
Rotation
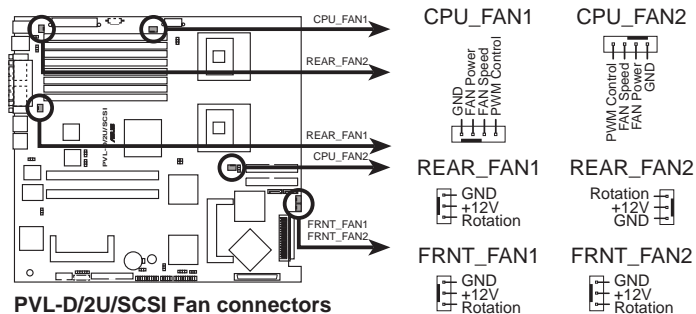
The CPU_FAN1 connector is attached to the mid-fan board. All system fans will rotate in full speed when you disconnect the CPU_FAN1 cable.

9. BMC connector (16-pin BMCCONN1)

This connector is for the ASUS server management card, if available.

+5VSB
+5VSB
BMC_SMBCLK
I2CCLK1
PSON#
BMC_RST#
PWROK
PSONEN#

BMCCONN1

+5VSB
+5VSB
BMC_SMBDATA
I2CDATA1
FP_PWRBTN#
BMC_PRESENT#
BMC_SMI#
BMC_GND

PVL-D/2U/SCSI BMC connector
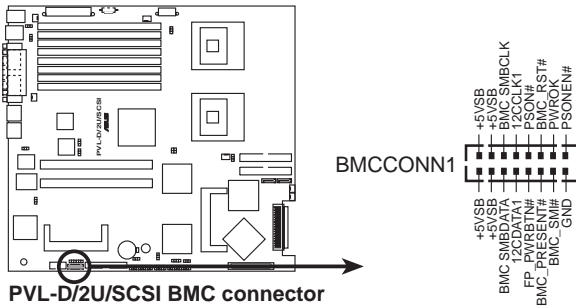
10. ATX power connectors (24-pin ATXPWR1, 8-pin ATX12V1)

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.

- Use of an SSI 12 V Specification 2.0-compliant power supply unit (PSU) that provides a minimum power of 450W is recommended for a fully-configured system.

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

- Use of a PSU with a higher power output is recommended when configuring a system with more power consuming devices. The system may become unstable or may not boot up if the power is inadequate.

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

ATXPWR1
24-pin Power Connector

+3 Volts
+3 Volts
Ground
+5 Volts
Ground
+5 Volts
Ground
Power OK
+5V Standby
+12 Volts
+12 Volts
+3 Volts

+3 Volts
-12 Volts
Ground
PSON#
Ground
Ground
Ground
-5 Volts
+5 Volts
+5 Volts
+5 Volts
Ground

ATX12V1
8-pin

GND
GND
GND
GND

12V
12V
12V
12V
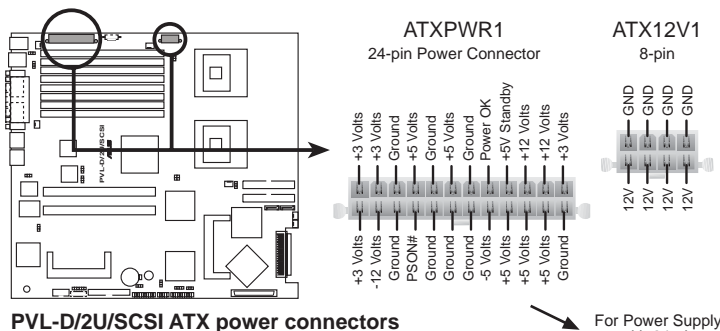
PVL-D/2U/SCSI ATX power connectors

For Power Supply
with 24-pin
Power Connector

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

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

BPSMB1

FAN_DC
I2C_6_CLK#
GND
I2C_6_DATA#
+5V

PVL-D/2U/SCSI SMBus connector
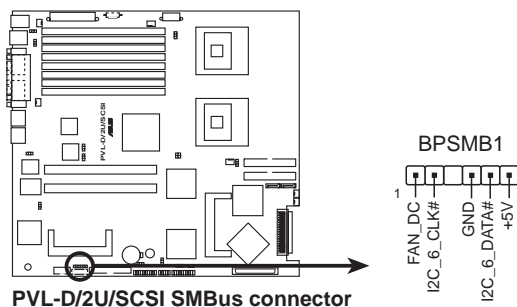
12. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.

PANEL1

POWERLED+
NC
POWERLED-
MLED+
MLED-
NC
+5V
GND
GND
SPKROUT

HDLED+
HDLED-
NMIBTN#
GND
POWERBTN#
GND
NC
RESETBTN#
GND

PVL-D/2U/SCSI System panel connector
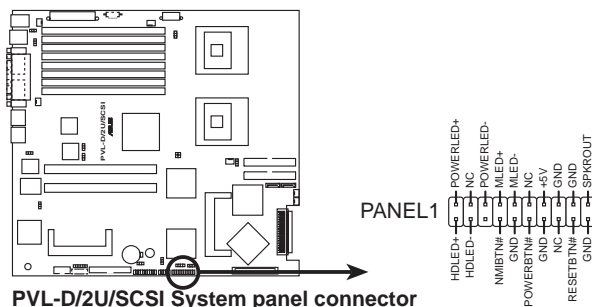
- **System power LED (Green 3-pin PLED)**
  This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **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.

- **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.

- **ATX power button/soft-off button (Yellow 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.

The system panel connector is color-coded for easy connection.

13. Auxiliary panel connector (20-pin AUX_PANEL1)

This connector is for additional front panel features including front panel SMB, locator LED and switch, chassis intrusion, and LAN LEDs.

- **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 (2-1 pin CHASSIS)**
  These leads are for the intrusion detection feature for chassis with intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to these leads to record a chassis intrusion event. To disable this feature, place a jumper cap over the CASEOPEN and GND leads.

- **Locator LED (6-pin LOCATOR)**
  These leads are for the locator switch and LED on the front panel.
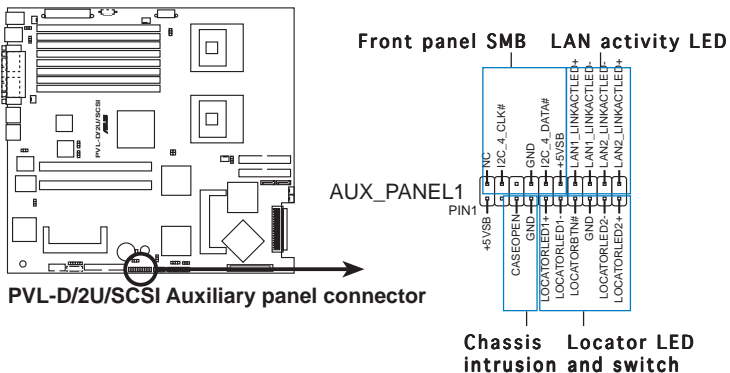
PVL-D/2U/SCSI Auxiliary panel connector

Front panel SMB   **LAN activity LED**

AUX_PANEL1

NC
I2C_4_CLK#
GND
I2C_4_DATA#
+5VSB
LAN1_LINKACTLED+
LAN1_LINKACTLED-
LAN2_LINKACTLED-
LAN2_LINKACTLED+

PIN1

+5VSB
CASEOPEN
GND
LOCATORLED1+
LOCATORLED1-
LOCATORBTN#
GND
LOCATORLED2-
LOCATORLED2+

Chassis intrusion   **Locator LED and switch**

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

BIOS information

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

Refer to the corresponding sections for details on these utilities.

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

5.1.1   Creating a bootable floppy disk

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

DOS environment

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

Windows® XP environment

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

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 600 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 /iI8021A00.100
```

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

```
A:\>afudos /iI8021A00.100
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 /iI8021A00.100
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:\>
```

5.1.3   ASUS CrashFree BIOS 2 utility

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

> • Prepare the motherboard support CD or the floppy disk containing the updated motherboard BIOS before using this utility.
>
> • Make sure that you rename the original or updated BIOS file in the floppy disk according the exact name of your motherboard, e.g. **I8022A0.rom**.

Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

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

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

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

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "I8021A00.100". Completed.
Start flashing...
```

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

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

Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

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

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

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

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy not found!
Checking for CD-ROM...
CD-ROM found!
Reading file "I8021A00.100". Completed.
Start flashing...
```

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

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

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

5.1.4   ASUS Update utility

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

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

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

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

Installing ASUS Update

To install ASUS Update:

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

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

Updating the BIOS through the Internet

To update the BIOS through the Internet:

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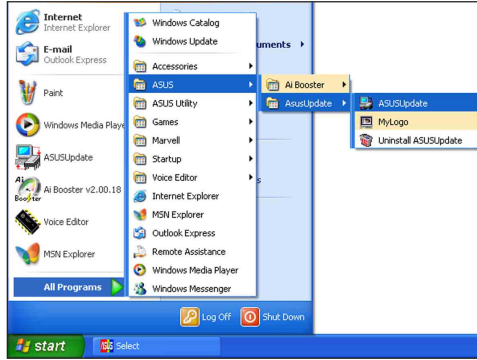
2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.

3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.
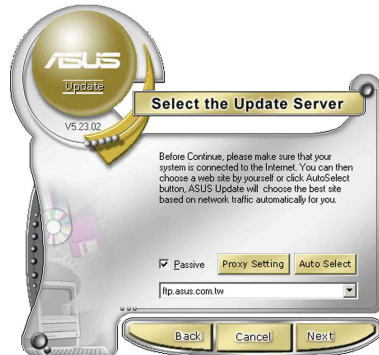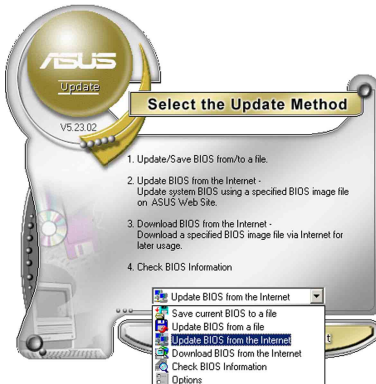
4. From the FTP site, select the BIOS
    version that you wish to download.
    Click Next.

5. Follow the screen instructions to
    complete the update process.

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

Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

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

2. Select **Update BIOS from a file**
    option from the drop-down menu,
    then click **Next**.
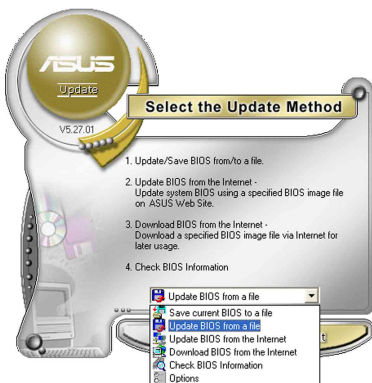
3. Locate the BIOS file from the **Open** window, then click **Save**.

4. Follow the screen instructions to complete the update 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 <Del> during the Power-On-Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

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

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

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

  System Date                  [Thu 09/22/2005]       Use [ENTER]. [TAB],
  System Time                  [11:10:19]             or [SHIFT-TAB] to
                                                      select a field.
  Legacy Diskette A            [1.44M, 3.5 in]
                                                      Use [+] or [-] to
  ▶    IDE Configuration                              configure system time.
  ▶    Primary IDE Master      [ST32122A]
  ▶    Primary IDE Slave       [ASUS CD-S520A]
  ▶    Secondary IDE Master    [Not Detected]
  ▶    Secondary IDE Slave     [Not Detected]
  ▶    Third IDE Master        [Not Detected]         ◀▶  Select Screen
  ▶    Fourth IDE Master       [Not Detected]         ↑↓  Select Item
                                                      +-  Change Option
  ▶    System Information                             F1  General Help
                                                      F10 Save and Exit
                                                      ESC Exit

       v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```

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

Server   For changing the advanced server settings

Security   For changing the security settings

Boot   For changing the system boot configuration

Exit   For selecting the exit options and loading default
                settings

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

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.

```
                    BIOS SETUP UTILITY
  Main   Advanced   Server   Security   Boot   Exit
┌──────────────────────────────────────────┬───────────────────┐
│ System Date           [Thu 09/22/2005]    │ Use [ENTER], [TAB],│
│ System Time           [11:10:19]          │ or [SHIFT-TAB] to  │
│                                           │ select a field.    │
│ Legacy Diskette A     [1.44M, 3.5 in]     │                    │
│                                           │ Use [+] or [-] to  │
│ ► IDE Configuration                       │ configure system   │
│ ► Primary IDE Master    : [ST32122A]      │ time.              │
│ ► Primary IDE Slave     : [Not Detected]  │                    │
│ ► Secondary IDE Master  : [Not Detected]  │                    │
│ ► Secondary IDE Slave   : [Not Detected]  │ ↔    Select Screen │
│ ► Third IDE Master      : [Not Detected]  │ ↑↓   Select Item   │
│ ► Fourth IDE Master     : [Not Detected]  │ +-   Change Option │
│                                           │ F1   General Help  │
│ ► System Information                      │ F10  Save and Exit │
│                                           │ ESC  Exit          │
├──────────────────────────────────────────┴───────────────────┤
│    v02.58 (C) Copyright 1985-2004, American Megatrends, Inc.   │
└───────────────────────────────────────────────────────────────┘
```

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.

```
                    BIOS SETUP UTILITY
  Advanced
┌──────────────────────────────────────────┬───────────────────┐
│ APM Configuration                       ▲ │ Use [ENTER], [TAB],│
│                                           │ or [SHIFT-TAB] to  │
│ Power Management/APM    [Enabled]         │ select a field.    │
│ Video Power Down Mode   [Suspend]         │                    │
│ Hard Disk Power Down Mode [Suspend]       │ Use [+] or [-] to  │
│ Suspend Time Out(Minute)[Disabled]        │ configure system   │
│ Throttle Slow Clock Ratio /50%            │ time.              │
│                         ┌─Options──────┐  │                    │
│ Power Button Function   │ Disabled     │  │                    │
│ Restore on AC Power Loss│ Enabled      │  │ ↔    Select Screen │
│ Power On by PS/2 Keyboard [Disabled]   │  │ ↑↓   Select Item   │
│ Power On by PS/2 Mouse  [Disabled]        │ +-   Change Option │
│ Power On Ring           [Disabled]        │ F1   General Help  │
│ Power On PME#           [Disabled]        │ F10  Save and Exit │
│ Power On RTC Alarm      [Disabled]      ▼ │ ESC  Exit          │
└──────────────────────────────────────────┴───────────────────┘
```

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    Server    Security    Boot    Exit

  System Time                [11:10:19]            Use [ENTER]. [TAB],
  System Date                [Mon 09/22/2005]      or [SHIFT-TAB] to
                                                   select a field.
  Legacy Diskette A          [1.44M, 3.5 in]
                                                   Use [+] or [-] to
  ▶ IDE Configuration                              configure system time.
  ▶ Primary IDE Master       [ST32122A]
  ▶ Primary IDE Slave        [ASUS CD-S520A]
  ▶ Secondary IDE Master     [Not Detected]
  ▶ Secondary IDE Slave      [Not Detected]
  ▶ Third IDE Master         [Not Detected]        ←→  Select Screen
  ▶ Fourth IDE Master        [Not Detected]        ↑↓  Select Item
                                                   +-  Change Option
  ▶ System Information                             F1  General Help
                                                   F10 Save and Exit
                                                   ESC Exit

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```

5.3.1   System Date [Day xx/xx/xxxx]

Allows you to set the system date.

5.3.2   System Time [xx:xx:xx]

Allows you to set the system time.

5.3.3   Legacy Diskette A [1.44M, 3.5 in.]

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

5.3.4 IDE Configuration

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

```
                          BIOS SETUP UTILITY
  Main

  IDE Configuration                                  Set [Compatible Mode]
                                                     when Legacy OS (i.e.
                                                     WIN ME, 98, NT4.0, MS
  Onboard IDE Operate Mode      [Enhanced Mode]      DOS) is used.
     Enhanced Mode Support On   [S-ATA]
       Configure S-ATA as RAID  [No]                 Set [enhanced Mode]
  IDE Detect Time Out (Sec)     [35]                 when native OS (i.e.
                                                     WIN2000, WIN XP) is
                                                     used.


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

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```

Onboard IDE Operate Mode [Enhanced Mode]

Allows selection of the IDE operation mode depending on the installed operating system (OS). Set to [Enhanced Mode] if you are using native OS, e.g. Windows® 2000/XP. Set to [Compatible Mode] if you are using legacy OS, e.g. Windows® ME/98/NT, MS-DOS. Configuration options: [Compatible Mode] [Enhanced Mode]

> The items **Enhanced Mode Support On** and **Configure S-ATA as RAID** appear only when you set the Onboard IDE Operate Mode to [Enhanced Mode].

Enhanced Mode Support On [S-ATA]

Allows you to set Serial ATA, Parallel ATA, or both, as native mode. Configuration options: [P-ATA+S-ATA] [S-ATA] [P-ATA]

Configure S-ATA as RAID [No]

Allows you to configure the Serial ATA devices as RAID sets. Configuration options: [No] [Yes]

> The above item appears only if you set the **Enhanced Mode Support On** item to [S-ATA] or [P-ATA+S-ATA]

IDE Detect Time Out (Sec) [35]

Selects the time our value (in seconds) for detecting ATA/ATAPI devices. Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

5.3.5 Primary/Secondary IDE Master/Slave, Third, and Fourth IDE Master

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        : Hard Disk                       the system.
  Vendor        : ST32122A
  Size          : 2.1GB
  LBA Mode      : Supported
  Block Mode    : 16 Sectors
  PIO Mode      : Supported
  Async DMA     : MultiWord DMA-2
  Ultra DMA     : Ultra DMA-5
  SMART Monitoring: Supported

  Type                      [Auto]             ←→  Select Screen
  LBA/Large Mode            [Auto]             ↑↓  Select Item
  Block(Multi-sector Transfer)  [Auto]        +-   Change Option
  PIO Mode                  [Auto]             F1   General Help
  DMA Mode                  [Auto]             F10  Save and Exit
  SMART Monitoring          [Auto]             ESC  Exit
  32Bit Data Transfer       [Disabled]

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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) [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]

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

32Bit Data Transfer [Disabled]

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

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

  System Information

  Model Name    ASUS PVL-D/2U/SCSI
  Model ID      8021A0

  ASUS-BIOS
  Version       1001
  Date          09/20/2005

  ▶  Processor
  ▶  System Memory

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

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```
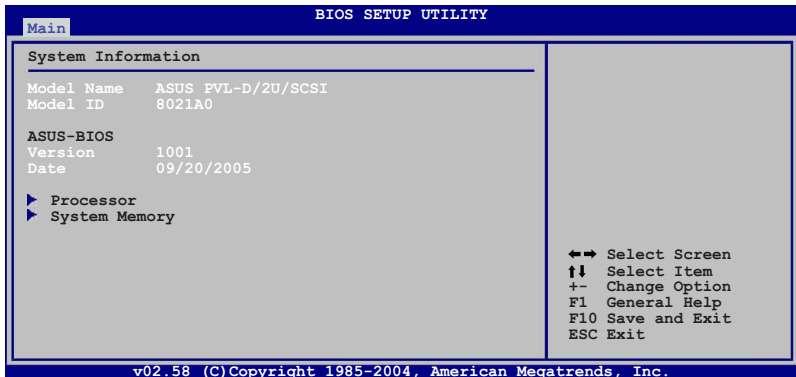
Model Name

Displays the auto-detected ASUS motherboard model (either PVL-D/SCSI, or PVL-D/1U).

Model ID

Displays the auto-detected identification number of the motherboard.

ASUS BIOS

Displays the auto-detected BIOS version in the motherboard.

Processor Information

Displays the auto-detected information about the installed CPU or CPUs.

```
                              BIOS SETUP UTILITY
 Main

    Processor Information

    *** CPU1 :
    Brand          Genuine Intel(R) CPU 2.80GHz
    ID/uCode       0F34h/07h
    Ratio Value    Actual 14 Max 14
    Cache Value    L1/16KB  L2/2048KB  L3/0KB

    *** CPU2 :
    Brand          Genuine Intel(R) CPU 2.80GHz
    ID/uCode       0F34h/07h
    Ratio Value    Actual 14 Max 14
    Cache Value    L1/16KB  L2/2048KB  L3/0KB
                                               ←→  Select Screen
                                               ↑↓  Select Item
                                               +-  Change Option
                                               F1  General Help
                                               F10 Save and Exit
                                               ESC Exit

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```

System Memory Information

Displays the auto-detected information about the installed DDR2 DIMMs.

```
                              BIOS SETUP UTILITY
 Main

    System Memory Information

    Type           DDR2 400
    Total Memory   512MB
      DIMM01       512MB
      DIMM02       None
      DIMM03       None
      DIMM04       None
      DIMM05       None
      DIMM06       None
      DIMM07       None
      DIMM08       None
                                               ←→  Select Screen
                                               ↑↓  Select Item
                                               +-  Change Option
                                               F1  General Help
                                               F10 Save and Exit
                                               ESC Exit

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```
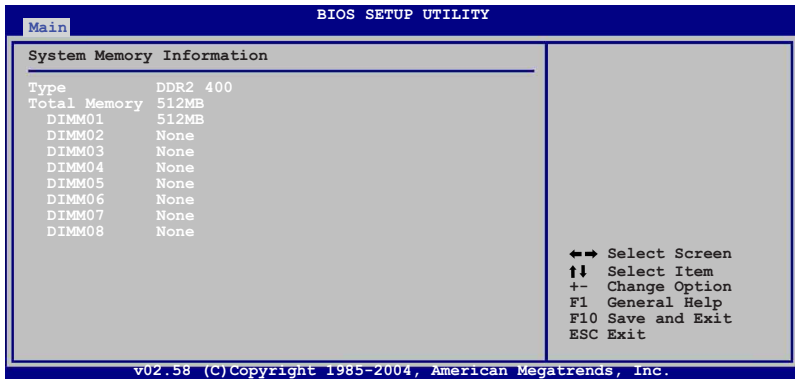
5.4   Advanced menu

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
        Advanced

Advanced Settings                              Configure CPU.
──────────────────────────────────────
▶ CPU Configuration
▶ Chipset Configuration
▶ Onboard Devices Configuration
▶ PCI/PnP Configuration
▶ Power Configuration
▶ Hardware Monitor


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

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```
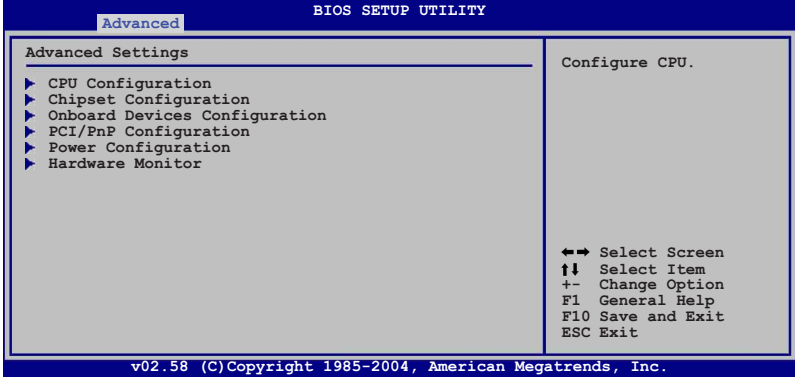
5.4.1   CPU Configuration

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

```
                         BIOS SETUP UTILITY
             Advanced

Configure Advanced CPU settings                Select MPS Revision.
──────────────────────────────────────
MPS Table Version          [1.4]
Hyper Threading Technology [Enabled]
Max CPUID Value Limit      [Disabled]
Enhanced C1 Control        [Auto]
CPU Internal Thermal Control [Auto]

Intel(R) SpeedStep(tm) Tech.   [Automatic]


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

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```

MPS Table Version [1.4]

Allows you to select the multi-processor system version.
Configuration options: [1.1] [1.4]

Hyper-Threading Technology [Enabled]

Allows you to enable or disable the processor Hyper-Threading Technology.
Configuration options: [Disabled] [Enabled]

Max CPUID Value Limit [Disabled]

Setting this item to [Enabled] allows legacy operating systems to boot
even without support for CPUs with extended CPUID functions.
Configuration options: [Disabled] [Enabled]

Enhanced C1 Control [Auto]

When this item is set to [Auto], BIOS automatically checks the CPU capability
to enable C1E support. In C1E mode, the CPU has lower power consumption.
Configuration options: [Auto] [Disabled]

CPU Internal Thermal Control [Auto]

When this item is set to [Auto], BIOS automatically checks the CPU capability
to enable TM or TM2 support. In TM mode, the CPU has lower power
consumption. In TM2 mode, the CPU core ratio and VID is reduced. Configuration
options: [Auto] [Disabled]

> The following item appears only when you installed an Intel® Pentium® 4
> CPU that supports the Enhanced Intel SpeedStep® Technology (EIST).

Intel(R) SpeedStep Technology [Automatic]

Allows you to use the Enhanced Intel SpeedStep® Technology. When set to
[Automatic], you can adjust the system power settings in the operating system
to use the EIST feature.

Set this item to [Disabled] if you do not want to use the EIST.

Configuration options: [Automatic] [Disabled]

> The motherboard comes with a BIOS file that supports EIST.

5.4.2   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                 │                          │
   │ ─────────────────────────────────────     │  Options for NB.         │
   │ WARNING: Setting wrong values in below sections                      │
   │          may cause system to malfunction.                           │
   │ ▶ Northbridge Configuration                                          │
   │ Onboard LAN Boot ROM         [Enabled]                               │
   │ Onboard SCSI Boot ROM        [Enabled]                               │
   │                                            │                          │
   │                                            │ ◄► Select Screen         │
   │                                            │ ↑↓ Select Item           │
   │                                            │ +-  Change Option        │
   │                                            │ F1  General Help         │
   │                                            │ F10 Save and Exit        │
   │                                            │ ESC Exit                 │
   └────────────────────────────────────────────────────────────────────┘
         v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```
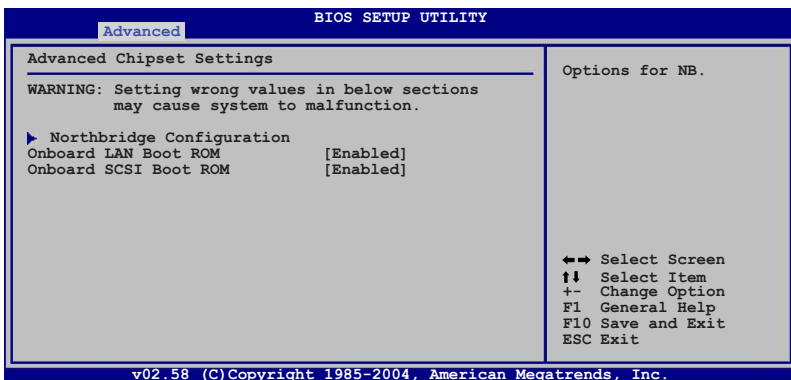
Onboard LAN Boot ROM [Enabled]

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

Onboard SCSI Boot ROM [Enabled]

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

The above item appears only on PVL-D/SCSI model.

NorthBridge Configuration

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

```
                              BIOS SETUP UTILITY
      Advanced

 NorthBridge Chipset Configuration                     ENABLE: Allow
 ─────────────────────────────────────────────        remapping of
 DIMM SPEED: DDR2 400                                  overlapped PCI memory
 Memory Remap Feature           [Enabled]              above the total
 Memory Mirroring/Sparing       [Disabled]             physical memory.

                                                       DISABLE: Do not allow
                                                       remapping of memory.



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

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```

DIMM Speed

Displays the installed DIMM type and speed. This item is auto-detected and is not configurable.

Memory Remap Feature [Enabled]

Allows you to remap the overlap PCI memory over the total physical memory. Configuration options: [Disabled] [Enabled]

Memory Mirroring/Sparing [Disabled]

Allows you to select the memory RAS feature: mirroring or sparing. Configuration options: [Disabled] [Mirroring] [Sparing]

5.4.3 Onboard Devices Configuration

```
                          BIOS SETUP UTILITY
      Advanced
  Advanced Onboard Devices Settings          Configure the USB
                                             support.
  ▶ USB Configuration
  ▶ Super IO Configuration




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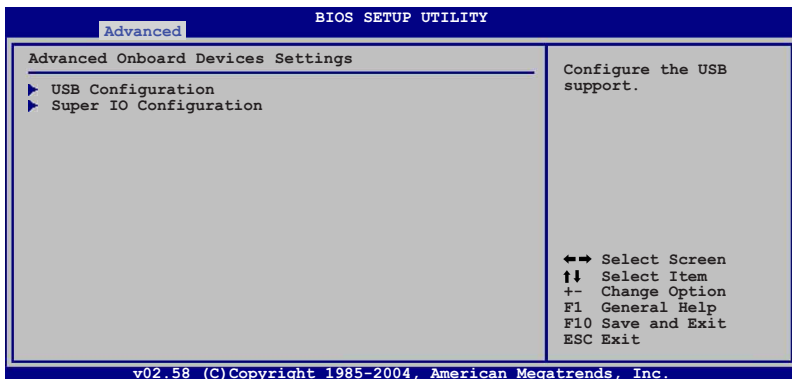
USB Configuration

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

```
                          BIOS SETUP UTILITY
      Advanced
  USB Configuration                           Enables USB host
                                              controllers.
  Module Version - 2.23.2-5.3

  USB Devices Enabled:
            None

  USB Function                [4 USB Ports]
  Legacy USB Support          [Auto]
  USB 2.0 Controller          [Enabled]
  USB 2.0 Controller Mode     [HiSpeed]

  ▶ USB Mass Storage Device Configuration
                                             ←→  Select Screen
                                             ↑↓  Select Item
                                             +-  Change Option
                                             F1  General Help
                                             F10 Save and Exit
                                             ESC Exit
      v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```
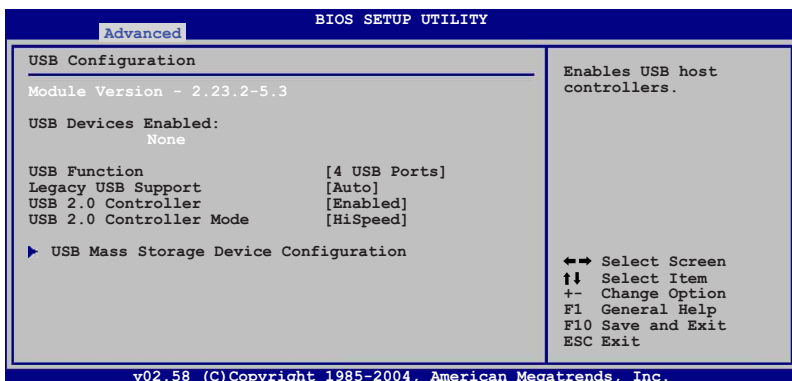
> The **Module Version** and **USB Devices Enabled** items show the auto-detected values. If no USB device is detected, the **USB Devices Enabled** item shows **None**.

USB Function [4 USB Ports]

Allows you to enable a specific number of USB ports, or disable the USB function. Configuration options: [Disabled] [2 USB Ports] [4 USB Ports]

Legacy USB Support [Auto]

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

USB 2.0 Controller [Enabled]

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

USB 2.0 Controller Mode [HiSpeed]

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

USB Mass Storage Device Configuration

The items in this menu allows you to confgure the USB Mass Storage Class devices. Select an item then press <Enter> to display the configuration options.

```
                          BIOS SETUP UTILITY
    Advanced

  USB Mass Storage Device Configuration                Number of seconds POST
                                                       waits for the USB mass
  USB Mass Storage Reset Delay         [20 Sec]        device after start
                                                       unit command.
  No USB Mass Storage device detected




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

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```
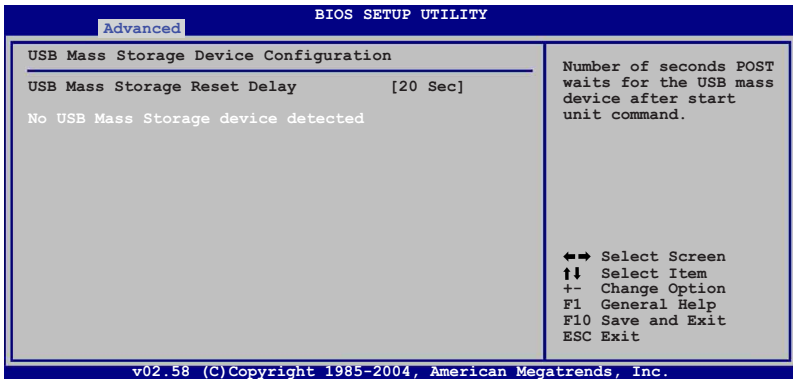
USB Mass Storage Reset Delay[20 Sec]

Allows you to set the number of seconds POST waits for the USB mass device after start unit command. Configuration options: [10 Sec] [20 Sec] [30 Sec] [40 Sec]

Super IO Configuration

```
                        BIOS SETUP UTILITY
   Advanced

 Configure Win83627THF 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]
 Parallel Port Address       [Disabled]




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

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```
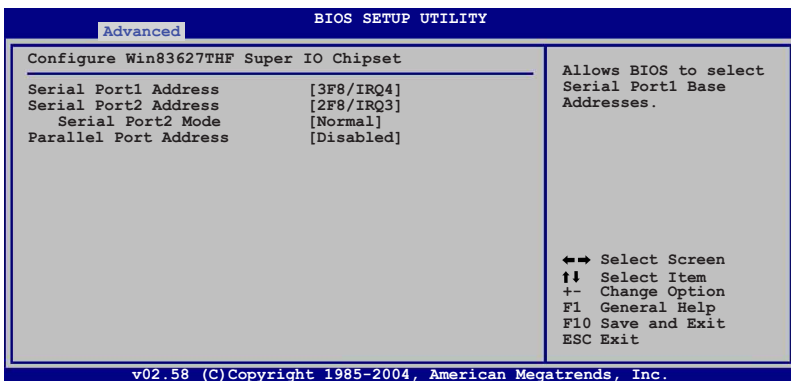
Serial Port1 Address [3F8/IRQ4]

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 the BIOS to select the Serial Port 2 mode.
Configuration options: [Normal] [IrDA] [Ask IR]

The following items appear only when the **Serial Port2 Mode** item is
set to [IrDA] or [Ask IR].

IR I/O Pin Select [SINB/SOUTHB]
Allows the BIOS to select the receiver or transmit pin for Serial Port2 (IR Mode).
Configuration options: [SINB/SOUTHB] [IRRY/IRTX]

IR Duplex Mode [Half Duplex]
Allows the BIOS to select full or half duplex for Serial Port2 (IR Mode).
Configuration options: [Full Duplex] [Half Duplex]

Parallel Port Address [Disabled]

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

The following items appear only when the **Parallel Port Address** item is set to [378], [278], or [3BC].

Parallel Port Mode [Normal]

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

EPP Version [1.9]

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

ECP Mode DMA Channel [DMA3]

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

Parallel Port IRQ [IRQ7]

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

5.4.4 PCI/PnP Configuration

The PCI/PnP Configuration menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting the 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
  Plug and Play OS          [No]              configure all the
  Palette Snooping          [Disabled]        devices int he system.
                                              YES: Lets the
  IRQ-3 assigned to         [PCI Device]      operating system
  IRQ-4 assigned to         [PCI Device]      configure Plug and
  IRQ-5 assigned to         [PCI Device]      Play (PnP) devices not
  IRQ-7 assigned to         [PCI Device]      required for boot if
  IRQ-9 assigned to         [PCI Device]      your system has a Plug
  IRQ-10 assigned to        [PCI Device]      ans Play operating
  IRQ-11 assigned to        [PCI Device]      system.
  IRQ-14 assigned to        [PCI Device]
  IRQ-15 assigned to        [PCI Device]      ←→  Select Screen
                                              ↑↓  Select Item
                                              +-  Change Option
                                              F1  General Help
                                              F10 Save and Exit
                                              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]

Palette Snooping [Disabled]

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

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 devices. Configuration options: [PCI Device] [Reserved]

5.4.5 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
    Advanced
 ┌──────────────────────────────────────────┬──────────────────────────┐
 │ Power Configuration                       │ Include ACPI APIC        │
 │                                           │ table pointer to RSDT    │
 │ ACPI APIC Support          [Enabled]      │ pointer list.            │
 │ ▶ APM Configuration                       │ IMPORTANT!!!             │
 │                                           │ Do not change the APIC   │
 │                                           │ support settings after   │
 │                                           │ OS installation;         │
 │                                           │ otherwise, a system      │
 │                                           │ boot failure may         │
 │                                           │ occur.                   │
 │                                           │                          │
 │                                           │ ←→  Select Screen        │
 │                                           │ ↑↓  Select Item          │
 │                                           │ +-  Change Option        │
 │                                           │ F1  General Help         │
 │                                           │ F10 Save and Exit        │
 │                                           │ ESC Exit                 │
 ├──────────────────────────────────────────┴──────────────────────────┤
 │    v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.          │
 └─────────────────────────────────────────────────────────────────────┘
```
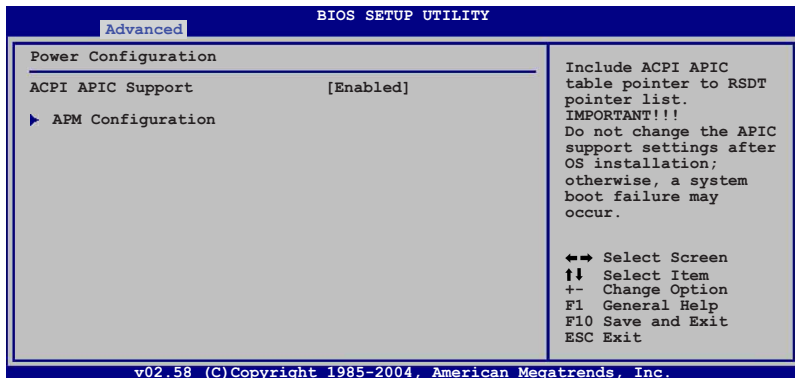
ACPI APIC Support [Enabled]

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]

APM Configuration

```
                        BIOS SETUP UTILITY
   Advanced

APM Configuration                                      Enable or disable APM.

Power Management/APM            [Enabled]
Video Power Down Mode          [Suspend]
Hard Disk Power Down Mode      [Suspend]
Suspend Time Out (Minute)      [Disabled]
Throttle Slow Clock Ratio      [50%]

Power Button Function          [On/Off]
Restore on AC Power Loss       [Last State]

Power On By PS/2 Keyboard      [Disabled]
Power On By PS/2 Mouse         [Disabled]        ←→  Select Screen
Power On By Ring               [Disabled]        ↑↓  Select Item
Power On By PME#               [Disabled]        +-  Change Option
Power On By RTC Alarm          [Disabled]        F1  General Help
                                                 F10 Save and Exit
                                                 ESC Exit

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```

Power Management [Enabled]

Allows you to enable or disable the motherboard Advance Power Management (APM) feature. Configuration options: [Enabled] [Disabled]

Video Power Down Mode [Suspend]

Allows you to select the video power down mode.
Configuration options: [Disabled] [Standby] [Suspend]

Hard Disk Power Down Mode [Suspend]

Allows you to select the hard disk power down mode.
Configuration options: [Disabled] [Standby] [Suspend]

Suspend Time Out (Minute) [Disabled]

Allows you to select the specified time at which the system goes on suspend mode. Configuration options: [Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

Throttle Slow Clock Ratio [50%]

Allows you to select duty cycle in throttle mode.
Configuration options: [87.5%] [75.0%] [62.5%] [50.0%] [37.5%] [25.0%] [12.5%]

Power Button Function [On/Off]

Allows the system to go into On/Off mode or suspend mode when the power button is pressed. Configuration options: [On/Off] [Suspend]

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]

Power On By PS/2 Keyboard [Disabled]

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

Power On By PS/2 Mouse [Disabled]

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

Power 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]

Power On By PME# [Disabled]

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

Power On By 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]

5.4.6   Hardware Monitor

```
                          BIOS SETUP UTILITY
     Advanced
 Hardware Monitor                                      CPU1 Temperature.
 CPU1 Temperature              [49°C/120°F]
 CPU2 Temperature              [47°C/114°F]
 MB Temperature                [39°C/102°F]
 CPU1 Fan Speed                [5038RPM]
 CPU2 Fan Speed                [5045RPM]
 Front1 Fan Speed              [N/A]
 Front2 Fan Speed              [N/A]
 Rear1 Fan Speed               [N/A]
 Rear2 Fan Speed               [N/A]
 Smart Fan Control             [Smart Fan]             ←→  Select Screen
 CPU1 Temperature              [060]                   ↑↓  Select Item
 CPU2 Temperature              [060]                   +-  Change Option
 MB Temperature                [50]                    F1  General Help
                                                       F10 Save and Exit
 VCORE1 Voltage                [ 1.236V]               ESC Exit

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```

Use the down arrow key to display additional items.

```
 VCORE2 Voltage               [ 1.258V]               ←→  Select Screen
 3.3V Voltage                 [ 3.280V]               ↑↓  Select Item
 5V Voltage                   [ 5.010V]               +-  Change Option
 5VSB Voltage                 [ 4.980V]               F1  General Help
 VBAT Voltage                 [ 3.088V]               F10 Save and Exit
 12V Voltage                  [11.749V]               ESC Exit

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```
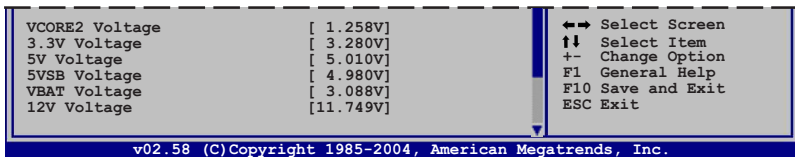
CPU1/CPU2 Temperature [xxxºC/xxxºF]
MB Temperature [xxxºC/xxxºF]

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

> If you installed only one CPU, the **CPU2 Temperature** item shows [N/A].

CPU1/CPU2 Fan Speed [xxxxRPM] or [N/A]
Front1/Front2 Fan Speed [xxxxRPM] or [N/A]
Rear1/Rear2 Fan Speed [xxxxRPM] or [N/A]

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

Smart Fan Control [Smart Fan]

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

The **CPU1 Temperature**, **CPU2 Temperature**, and **MB Temperature** items do not appear when you disable the **Smart Fan Control** feature.

CPU1/CPU2 Temperature [XXX]
MB Temperature [XXX]

Displays the detected CPU and system threshold temperatures when the Smart Fan Control feature is enabled.

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

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

5.5   Server menu

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

```
                       BIOS SETUP UTILITY
  Main    Advanced    Server    Security    Boot    Exit
 ┌─────────────────────────────────────┬───────────────────────┐
 │ Server Features                      │ Configure Remote      │
 │                                      │ Access.               │
 │ ▶ Remote Access Configuration        │                       │
 │                                      │                       │
 │                                      │                       │
 │                                      │                       │
 │                                      │                       │
 │                                      │                       │
 │                                      │                       │
 │                                      │ ←→  Select Screen     │
 │                                      │ ↑↓  Select Item       │
 │                                      │ +-   Change Option    │
 │                                      │ F1   General Help     │
 │                                      │ F10  Save and Exit    │
 │                                      │ ESC  Exit             │
 └─────────────────────────────────────┴───────────────────────┘
     v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```
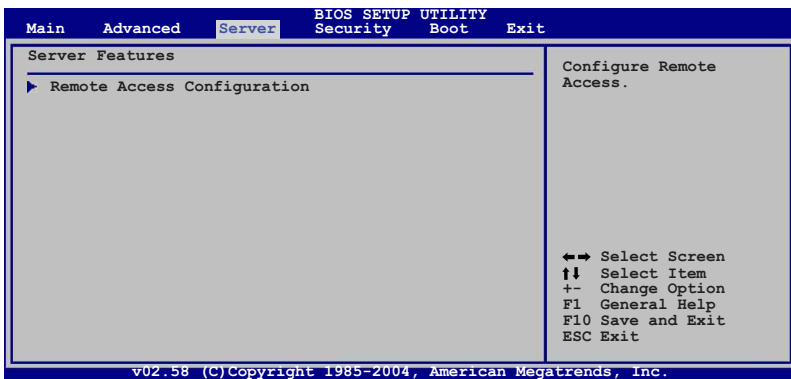
Remote Access Configuration

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
  Main    Advanced    Server    Security    Boot    Exit
 ┌─────────────────────────────────────┬───────────────────────┐
 │ Configure Remote Access type and parameters │ Select Remote Access │
 │                                      │ type.                 │
 │ Remote Access          [Disabled]    │                       │
 │                                      │                       │
 │                                      │                       │
 │                                      │                       │
 │                                      │                       │
 │                                      │                       │
 │                                      │                       │
 │                                      │ ←→  Select Screen     │
 │                                      │ ↑↓  Select Item       │
 │                                      │ +-   Change Option    │
 │                                      │ F1   General Help     │
 │                                      │ F10  Save and Exit    │
 │                                      │ ESC  Exit             │
 └─────────────────────────────────────┴───────────────────────┘
     v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```
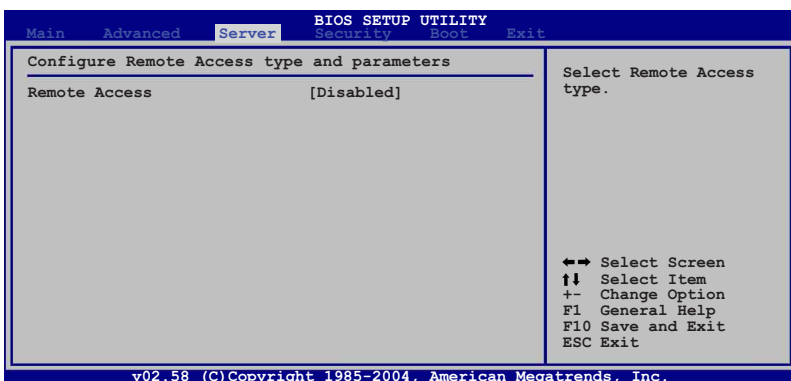
Remote Access [Disabled]

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

When the **Remote Access** item is set to [Enabled], the following items
appear.

Serial port number [COM1]

Allows you to select the Serial Port for console redirection.
Configuration options: [COM1] [COM2]

Baudrate [19200]

Allows you to select Serial Port settings.
Configuration options: [115200] [57600] [38400] [19200] [9600]

Flow Control [None]

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

Redirection After BIOS POST [Always]

Sets the redirection mode after the BIOS Power-On Self-Test (POST). Some
operating 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 [Disabled]

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

5.6   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
    Main    Advanced    Server    Security    Boot    Exit
   ┌──────────────────────────────────────────┬──────────────────────┐
   │  Security Settings                        │  <Enter> to change   │
   │                                           │  password.           │
   │  Supervisor Password   : Not Installed    │  <Enter> again to    │
   │  User Password         : Not Installed    │  disable password.   │
   │                                           │                      │
   │  Change Supervisor Password               │                      │
   │                                           │                      │
   │                                           │                      │
   │                                           │                      │
   │                                           │  ←→  Select Screen   │
   │                                           │  ↑↓  Select Item     │
   │                                           │  +-   Change Option  │
   │                                           │  F1   General Help   │
   │                                           │  F10  Save and Exit  │
   │                                           │  ESC  Exit           │
   └──────────────────────────────────────────┴──────────────────────┘
          v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```
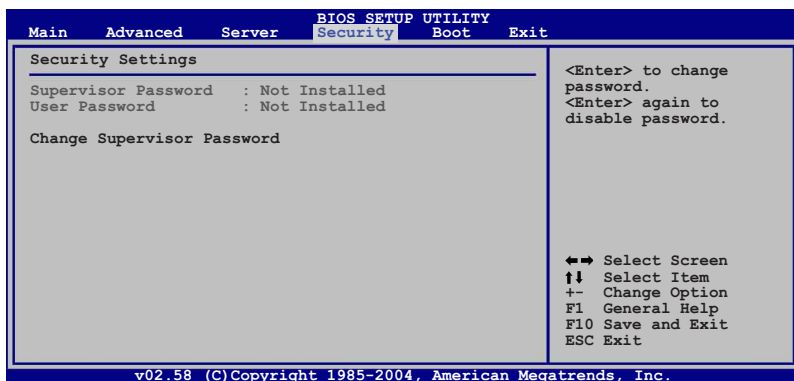
Change Supervisor Password

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 or change a supervisor password:

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

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

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

To clear the supervisor password:

Select the **Change Supervisor Password** then press <Enter>. The message "Password Uninstalled" appears.

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

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

```
                        BIOS SETUP UTILITY
   Main    Advanced    Server    Security    Boot    Exit
  ┌──────────────────────────────────────────┬────────────────────────┐
  │ 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]    │                        │
  │                                           │ ←→  Select Screen      │
  │                                           │ ↑↓  Select Item        │
  │                                           │ +-  Change Option      │
  │                                           │ F1  General Help       │
  │                                           │ F10 Save and Exit      │
  │                                           │ ESC Exit               │
  └──────────────────────────────────────────┴────────────────────────┘
      v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```

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   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    Server    Security    Boot    Exit
 ┌────────────────────────────────────────────┬─────────────────────────┐
 │ Boot Settings                              │  Specifies the Boot     │
 │ ▶  Boot Device Priority                    │  Device Priority        │
 │                                            │  sequence.              │
 │ ▶  Boot Settings Configuration             │                         │
 │                                            │                         │
 │                                            │                         │
 │                                            │                         │
 │                                            │                         │
 │                                            │  ←→  Select Screen      │
 │                                            │  ↑↓  Select Item        │
 │                                            │  +-   Change Option     │
 │                                            │  F1   General Help      │
 │                                            │  F10  Save and Exit     │
 │                                            │  ESC  Exit              │
 └────────────────────────────────────────────┴─────────────────────────┘
        v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```

5.7.1   Boot Device Priority

```
                         BIOS SETUP UTILITY
   Main    Advanced    Server    Security    Boot    Exit
 ┌────────────────────────────────────────────┬─────────────────────────┐
 │ Boot Device Priority                       │  Specifies the boot     │
 │                                            │  sequence from the      │
 │ 1st Boot Device        [1st FLOPPY DRIVE]  │  available devices.     │
 │ 2nd Boot Device        [PS-ASUS CD-S520/A] │                         │
 │ 3rd Boot Device        [PM-ST32122A]       │  A device enclosed in   │
 │                                            │  parenthesis has been   │
 │                                            │  disabled in the        │
 │                                            │  corresponding menu.    │
 │                                            │                         │
 │                                            │  ←→  Select Screen      │
 │                                            │  ↑↓  Select Item        │
 │                                            │  +-   Change Option     │
 │                                            │  F1   General Help      │
 │                                            │  F10  Save and Exit     │
 │                                            │  ESC  Exit              │
 └────────────────────────────────────────────┴─────────────────────────┘
        v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```

1st ~ xxth Boot Device [xxx Drive]

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

5.7.2 Boot Settings Configuration
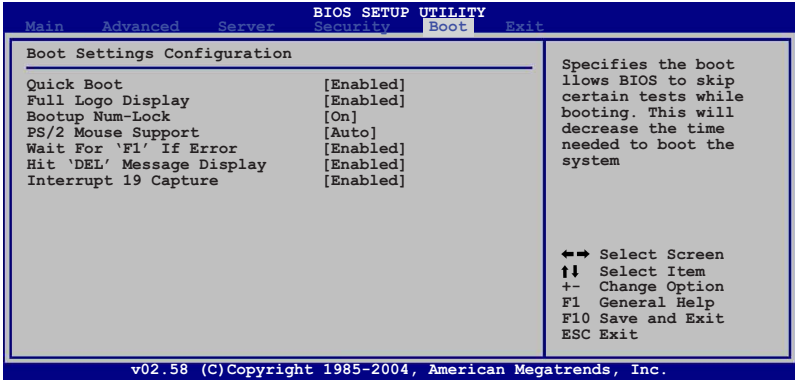
Quick Boot [Enabled]

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

Full Logo display [Enabled]

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

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

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]

5.8   Exit menu

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

```
                         BIOS SETUP UTILITY
  Main    Advanced    Server    Security    Boot    Exit

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




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

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```

> If you made changes to any of the settings in the menus, pressing <Esc>
> does not immediately exit this menu. A confirmation window appears and
> prompts you to either save your changes or cancel the command. Select
> one of the options from this menu to exit.

Exit & Save Changes

Select this option then press <Enter>, or simply press <F10>, to save your
changes to CMOS before exiting the Setup utility.

When a confirmation window appears, select [OK] then press <Enter> to
save your changes and exit Setup. If you wish to cancel the command, select
[Cancel] then press <Enter> to return to the Exit menu.

Exit & Discard Changes

Select this option then press <Enter> to exit the Setup utility without saving
your changes.

When a confirmation window appears, select [OK] then press <Enter> to
discard your changes and exit Setup. If you wish to cancel the command,
select [Cancel] then press <Enter> to return to the Exit menu.

Discard Changes

Select this option then press <Enter> to discard the changes that you made,
and restore the previously saved settings.

When a confirmation window appears, select [OK] then press <Enter> to
discard the changes, and load the previously saved settings. If you wish to
cancel the command, select [Cancel] then press <Enter> to return to the Exit
menu.

Load Setup Defaults

Select this option then press <Enter> to load the optimized settings for each of the Setup menu items.

When a confirmation window appears, select **[OK]** then press <Enter> to load the default settings. If you wish to cancel the command, select [Cancel] then press <Enter> to return to the Exit menu.

Chapter 6

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

RAID configuration

6.1   Setting up RAID

The motherboard comes with the following RAID solutions:

PVL-D/2U/SCSI model

*   **Adaptec® AIC-7902W SCSI RAID** controller supports SCSI hard disk drives and RAID 0, RAID 1, and RAID 0+1 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.

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

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

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

> 7902 HostRAID doesn't support PAE Mode under Windows 2000 Server SP4, due to Adaptec driver limitation.

6.1.2 Installing hard disk drives

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

To install the SCSI hard disks for RAID configuration:

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

Refer to Chapter 4 for details on entering and navigating through the BIOS Setup.

6.1.3 RAID configuration utilities

Depending on the RAID connectors that you use, you can create a RAID set using the utilities embedded in each RAID controller. For example, use the **Adaptec SCSISelect (TM) Utility!** if you installed SCSI hard disk drives to the SCSI connector(s) supported by the Adaptec® AIC-7902W RAID controller. Refer to the succeeding sections for details on how to use each RAID configuration utility.

6.2   Adaptec SCSISelect(TM) Utility!

The Adaptec SCSISelect(TM) Utility allows you to create RAID 0, 1, and 0+1 set(s) from SCSI hard disk drives connected to the SCSI connector supported by the Adaptec embedded SCSI controller.

To enter the Adaptec SCSISelect(TM) Utility!:

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

2.   During POST, the Adaptec SCSI BIOS automatically detects the installed SCSI hard disk drives and displays any existing RAID set(s). Press <Ctrl> <A> to enter the utility.

```
Adaptec SCSI BIOS v4.30
Copyright 2003 Adaptec, Inc. All Rights Reserved.

*** Press <Ctrl><A> for SCSISelect(TM) Utility! ***

Slot Ch ID LUN  Vendor    Product             Size  Bus Status
**************************************************************
00   A  0  0    SEAGATE   ST318432LC          18GB  16
00   A  1  0    SEAGATE   ST318432LC          18GB  16
00   A  2  0    SEAGATE   ST318432LC          18GB  16
00   A  11 0    SDR       GEM318                    8
00   B  15 0
```

3.   The utility auto-detects the available SCSI channels. Select the SCSI channel, then press <Enter>.

```
********************************************************************
********************************************************************
********************************************************************
********************************************************************
********************************************************************
********************************************************************
********************************************************************
********************************************************************
***************         AIC-7902 A at slot 00 09:02:00     ********
***************         AIC-7902 B at slot 00 09:02:01     ********
********************************************************************
********************************************************************
********************************************************************
********************************************************************
********************************************************************
********************************************************************
********************************************************************
********************************************************************
 <Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)
```

6.2.1 Configuring the SCSI controller

You need to configure the SCSI controller before creating a RAID set. After selecting the SCSI channel to use, the utility prompts you to select from the available options. Use the arrow keys to select **Configure/View SCSI Controller Settings**, then press <Enter>.

6.2.2 Enabling the HostRAID controller

To enable the Adaptec HostRAID controller:

1. Use the arrow keys to select the **HostRAID** item in the Configuration section.
2. Press <Enter> to set the item to **Enabled**.

3. Press <Esc> to exit.
4. When the utility prompts you to save the changes, select **Yes**, then press <Enter>.

The screen returns to the options menu.

6.2.3   Creating a RAID 0 set (Stripe)

To create a RAID 0 set for Performance:

1.   After enabling the HostRAID, the utility returns to the initial menu. Use the arrow keys to select **Configure/View HostRAID Settings**, then press <Enter>.

2. The utility displays the installed SCSI hard disk drives status and menu options. When available, the HDD status shows **Free**. Press **<C>**.

The utility does not display an installed SCSI HDD(s) with an existing RAID condiguration or is part of an existing RAID set. Use the **SCSI Disk Utilities** to reformat the HDD(s), or use the previous RAID card to clear the RAID configuration on the HDD(s).

3. Select **RAID-0 (High Performance, No Fault Tolerance)** from the **Select RAID Type** menu, then press <Enter>.

Refer to the **Striping Requirements** note at the bottom of the screen to determine the number of hard disk drives required for the selected RAID type.

4. Use the arrow keys to select a RAID set member, then press <SpaceBar> to mark. An **X** mark appears after the selected HDD.

5. Follow the step 4 to select the other members of the RAID set, then press <Enter> when finished.

```
*********************** AIC-7902 A at slot 00, 09:02:00 ***********************
*** RAID-0: Select RAID members **********************************************
**                                                                          **
**           ID   Vendor    Product              Size                       **
**           ******************************************************         **
**           0    SEAGATE   ST318432LC           18GB    X                  **
**           1    SEAGATE   ST318432LC           18GB    X                  **
**           2    SEAGATE   ST318432LC           18GB    X                  **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
******************************************************************************
                          <Space> select drives
              <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

6. Select the stripe size from the menu, then press <Enter>.

```
** Select stripe size ***
*         16-KB          *
*         32-KB          *
*         64-KB          *
*************************
```

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

7. When prompted, use the keyboard to assign a name for the RAID 0 set, then press <Enter>.

```
*********** Assign RAID Name ************
* Enter 1 to 15 alphabetic or numeric  *
* characters. Press <Enter> when finished. *
*      ******************               *
*         *ICH5R        *               *
*      ******************               *
****************************************
```

8. If you want to make the array bootable, select **Yes** from the menu, then press <Enter>.

9. When prompted to create the RAID 0 set, select <Yes>, then press <Enter>.

⚠️ The utility erases all data from the selected hard disk drives. Make sure to backup all important data before creating a RAID set.

A **Build Complete** message appears to indicate that you have successfully created the RAID 0 set.

10. The screen displays the information on the created RAID set. Press <Esc> to exit the utility.

6.2.4   Creating a RAID 1 set (Mirror)

To create a RAID 1 set for Fault Tolerance:

1.   Follow steps 1 to 2 of the **Creating a RAID 0 set** section.
2.   Select **RAID-1 (Fault Tolerance)** from the **Select RAID Type** menu, then press <Enter>.

Refer to the **Mirroring Requirements** note at the bottom of the screen to determine the number of hard disk drives required for the selected RAID type.

3.   Use the arrow keys to select a RAID set member, then press <SpaceBar> to mark. An **X** mark appears after the selected HDD.
4.   Follow step 3 to select the other members of the RAID set, then press <Enter> when finished.

6. Select **Create new RAID-1** from the RAID-1 Build Option menu, then press <Enter>. Refer to the options description below.

```
*************** RAID-1 Build Option ****************
*                 Create new RAID-1                *
*              Copy from ( 0) to ( 1)              *
*              Copy from ( 1) to ( 0)              *
****************************************************
```

- **Create a New RAID-1** - The default option. Select this option when creating a new RAID 1 set.
- **Copy from (0) to (1)** - Select this option when you want to copy the source drive contents to a target drive, provided that the source is equal to or smaller than the target drive.
- **Copy from (1) to (0)** - Select this option when you want to copy the source drive contents to a target drive, provided that the source is larger than the target drive.

7. When prompted, use the keyboard to assign a name for the RAID 1 set, then press <Enter>.

```
************* Assign RAID Name ************
* Enter 1 to 15 alphabetic or numeric    *
* characters. Press <Enter> when finished. *
*           *****************              *
*           *ICH5R            *            *
*           *****************              *
******************************************
```

8. If you want to make the array bootable, select **Yes** from the menu, then press <Enter>.

```
*******************************
* Do you want to make         *
*  this array as bootable?    *
*                             *
*   *****************         *
*   *    Yes         *        *
*   *    No          *        *
*   *****************         *
*******************************
```

9. When prompted to create the RAID 1 set, select <Yes>, then press <Enter>.

```
** Create Array? ***
*       Yes          *
*       No           *
********************
```

⚠ The utility erases all data from the selected hard disk drives. Make sure to backup all important data before creating a RAID set.

10. When a confirmation dialogue box appears, select <Yes>, then press <Enter>.

```
** Are you sure? ***
*       Yes          *
*       No           *
********************
```

11. The utility builds the RAID 1 set and displays a progress bar at the center of the screen. Press <Esc> if you want to stop the building process.

A **Build Complete** message appears to indicate that you have successfully created the RAID 1 set.

12. The screen displays the information on the created RAID set. Press <Esc> to exit the utility.

6.2.5 Creating a RAID 10 set (Stripe+Mirror)

To create a RAID 10 set for Fault Tolerance and Performance:

1. After enabling the HostRAID, the utility returns to the initial menu. Use
    the arrow keys to select **Configure/View HostRAID Settings**, then
    press <Enter>.

2. The utility displays the SCSI hard disk drives installed in your computer
    and the menu options. Press <**C**>.

3. Select **RAID-10 (Fault Tolerance, High Performance)** from the **Select RAID Type** menu, then press <Enter>.

```
******************** AIC-7902 A at slot 00, 09:02:00 ********************
*** Create RAID ********************************************************
**                                                                    **
**        ID  Vendor   Product          Size                          **
**      **************************************************             **
**        4   FUJITSU  MAT3073NC        74GB                           **
**        5   FUJITSU  MAT3073NC        74GB                           **
**        6   FUJITSU  MAT3073NC        74GB                           **
**        8   FUJITSU  MAT3073NC        74GB                           **
**        9   FUJITSU  MAT3073NC        74GB                           **
**     **************** Select RAID Type ****************               **
**     * RAID-0  (High Performance, No Fault Tolerance) *              **
**     * RAID-1  (Fault Tolerance)                      *              **
**     * RAID-10 (Fault Tolerance, High Performance)    *              **
**     ***********************************************               **
**                                                                    **
**        *********** Striping/Mirroring Requirements ***********      **
**        *           Min 4 drives, Max 4 drives.             *        **
**        ****************************************************        **
**                                                                    **
***********************************************************************
          <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

Refer to the **Striping/Mirroring Requirements** note at the bottom of the screen to determine the number of hard disk drives required for the selected RAID type.

4. Use the arrow keys to select a RAID set member, then press <SpaceBar> to mark. An **X** mark appears after the selected HDD.

5. Follow the step 4 to select the other members of the RAID set, then press <Enter> when finished.

```
******************** AIC-7902 A at slot 00, 09:02:00 ********************
*** RAID-10: Select RAID members ***************************************
**                                                                    **
**        ID  Vendor   Product          Size                          **
**      **************************************************             **
**        4   FUJITSU  MAT3073NC        74GB   X                       **
**        5   FUJITSU  MAT3073NC        74GB   X                       **
**        6   FUJITSU  MAT3073NC        74GB   X                       **
**        8   FUJITSU  MAT3073NC        74GB   X                       **
**        9   FUJITSU  MAT3073NC        74GB                           **
**        10  FUJITSU  MAT3073NC        74GB                           **
**                                                                    **
**                                                                    **
**                                                                    **
**                                                                    **
**                                                                    **
**                                                                    **
**                                                                    **
**                                                                    **
***********************************************************************
                      <Space> select drives
          <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

6. Select the stripe size from the menu, then press <Enter>.

    ** Select stripe size ***
    16-KB
    32-KB
    64-KB

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

7. When prompted, use the keyboard to assign a name for the RAID 10 set, then press <Enter>.

    ************ Assign RAID Name ************
    Enter 1 to 15 alphabetic or numeric
    characters. Press <Enter> when finished.
    7902

8. If you want to make the array bootable, select **Yes** from the menu, then press <Enter>.

    Do you want to make
    this array as bootable?

    Yes
    No

9. When prompted to create the RAID 10 set, select <Yes>, then press <Enter>.

    ** Create Array? ***
    Yes
    No

The utility erases all data from the selected hard disk drives. Make sure to backup all important data before creating a RAID set.

A **Build Complete** message appears to indicate that you have successfully created the RAID 10 set.

Build Completed.

10. The screen displays the information on the created RAID set. Press <Esc> to exit the utility.

6.2.6 Adding a spare drive to a RAID 10 set

To add a spare drive to a RAID 10 set:

1. Press <**S**> from the **Configure/View Host RAID Settings** menu.

2. Select **Add Spare** from the Options menu, then press <Enter>.

3. Use the arrow keys to select the spare drive from the list, then press <Enter>.

4. When a confirmation dialogue box appears, select <Yes>, then press <Enter>.

5.   The screen displays the information on the added spare drive.
      Press <Esc> to exit the utility.

6.2.7   Deleting a RAID 10 set spare drive

To delete a RAID 10 set spare drive:

1.   From the utility main menu, press <**S**>, select **Delete Spare** from the
      Options menu, then press <Enter>.

2. The screen displays the available spare drive(s). Use the arrow keys to select the spare drive you want to delete, then press <Enter>.

```
*********************** AIC-7902 A at slot 00, 09:02:00 ***********************
*** Delete spare        ********************************************************
**                                                                          **
**              ID  Vendor   Product        Size                            **
**       ***************************************************                 **
**        2  SEAGATE  ST318432LC         18GB                               **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
******************************************************************************
*********************************************************************************
          <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

3. When a confirmation dialogue box appears, select <Yes>, then press <Enter> to delete the spare drive.

4. Press <ESC> to exit the utility.

```
** Are you sure? ***
*        Yes        *
*        No         *
********************
```

6.2.8 Deleting a RAID set

To delete a RAID set:

1. Press <**D**> from the **Configure/View Host RAID Settings** menu.

```
********************** AIC-7902 A at slot 00, 09:02:00 **********************
*** Create, Spare, Delete, Rebuild, Verify, Bootable ***********************
**                                                                         **
**   ARRAY Name: ICH5R - Striped - 64K stripe size (Bootable)              **
**                                                                         **
**   ID  Type              Vendor  Product             Size   Status       **
**   ***********************************************************            **
**    0  Striped (R0)      SEAGATE  ST318432LC         18GB   Optimal      **
**    1  Striped (R0)      SEAGATE  ST318432LC         18GB   Optimal      **
**    2  Striped (R0)      SEAGATE  ST318432LC         18GB   Optimal      **
**                                                                         **
**                                                                         **
**                                                                         **
**                                                                         **
**                                                                         **
**                                                                         **
**                                                                         **
**                                                                         **
**                                                                         **
**                                                                         **
**************************************************************************
                            <Esc> exit
```

2. For RAID 0 and RAID 10 set, go to step 3. For a RAID 1 set, select a delete option from the menu (see below), then go to step 3.

    - **Drive ID 1** - Deletes all data on drive 1
    - **Drive ID 2** - Deletes all data on drive 2
    - **Drive ID 1 & 2** - Deletes all data on both drives
    - **None** - Breaks the array but keeps all existing data on both drives

3. When prompted, select **Yes** from the **Delete Array?** menu, then press <Enter>.

```
** Delete Array? ***
*                  *
*      Yes         *
*                  *
*      No          *
********************
```

> ⚠ You lose all data on the hard disk drives when you delete a RAID set. Make sure to backup all important data before deleting a RAID set.

4. Press <ESC> to exit the utility.

6.2.9 Rebuilding a RAID set

> The rebuild option is available only for RAID 1 and RAID 10 sets.

To rebuild a RAID set:

1. From the main menu, select the RAID set you want to rebuild, then press <Enter>.

```
*********************** AIC-7902 A at slot 00, 09:02:00 ***********************
*** Create, Spare, Delete, Rebuild, Verify, Bootable ***********************
**                                                                          **
**   ID  Type               Vendor   Product           Size   Status        **
**   *********************************************************************   **
**    4  Stripe/Mirror (R10) ADAPTEC  7902             147GB   Optimal       **
**    9  Hard Drive          FUJITSU  MAT3073NC         74GB   Free          **
**   10  Hard Drive          FUJITSU  MAT3073NC         74GB   Free          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
**                                                                          **
*********************************************************************
         <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

2. Press **<R>**.

> While rebuilding the array, you can press <Esc> to stop. A pop-up menu appears for confirmation. Select **Yes** to stop rebuilding and return to the main menu.

A Build/Rebuild Completed message appears on screen to indicate that you have successfully rebuilt the array.

3. Press any key to return to the main menu.

6.2.10 Verifying a RAID set hard disk drive

To verify a RAID set hard disk drive:

1. Select **SCSI Disk Utilities** from the main menu options, then press <Enter>.

```
***********************************************************************
***********************************************************************
***********************************************************************
***********************************************************************
******************** AIC-7902 A at slot 00, 09:02:00 *****************
*                                                                     *
*      Would you like to configure the SCSI controller, configure     *
*      the HostRAID settings, or run the SCSI Disk Utilities?         *
*      Select the option and press <Enter>.                           *
*                                                                     *
******************************* Options *******************************
**          Configure/View SCSI Controller Settings                 **
**          Configure/View HostRAID Settings                        **
**                  SCSI Disk Utilities                              **
***********************************************************************
*                                                                     *
***********************************************************************
***********************************************************************
***********************************************************************
***********************************************************************
    <Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)
```

2. The screen displays the RAID set drives. Use the arrow keys to select the hard disk drive you want to verify, then press <Enter>.

```
********************* AIC-7902 A at slot 00, 09:02:00 *****************
*****                                                           *****
******* Select SCSI Disk and press <Enter> ********************
*****                                                           *****
*****   SCSI ID #0:              SEAGATE   ST318432LC           *****
*****   SCSI ID #1:              SEAGATE   ST318432LC           *****
*****   SCSI ID #2:              SEAGATE   ST318432LC           *****
*****   SCSI ID #3:              No device                      *****
*****   SCSI ID #4:              No device                      *****
*****   SCSI ID #5:              No device                      *****
*****   SCSI ID #6:              No device                      *****
*****   SCSI ID #7:              Adaptec AIC-7902               *****
*****   SCSI ID #8:              No device                      *****
*****   SCSI ID #9:              No device                      *****
*****   SCSI ID #10:             No device                      *****
*****   SCSI ID #11:             SDR       GEM318               *****
*****   SCSI ID #12:             No device                      *****
*****   SCSI ID #13:             No device                      *****
*****   SCSI ID #14:             No device                      *****
*****   SCSI ID #15:             No device                      *****
*****                                                           *****
*****                                                           *****
    <Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)
```

3.   Select **Verify Disk Media** from the menu, then press <Enter>.

You can also use the SCSI Disk Utilities to format the hard disk drive.

4.   After verifying the hard disk drive, press <Esc> to exit the utility.

6.2.11 Making a RAID set bootable

To make a RAID set bootable:

1.   Select **SCSI Disk Utilities** from the main menu options, then press <Enter>.

2. Select the RAID set you want to make bootable, then press <Enter>.

3. Press **<B>** when the RAID set information displays on screen.

4. When prompted, select **Mark bootable**, then press <Enter>.

The letter "**B**" appears before a bootable RAID set for easy identification.

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

Creating a driver disk :

A floppy disk with the RAID and SCSI driver is required when installing Windows 2000/2003 Server or Linux operating system on a hard disk drive. You can create a RAID or SCSI driver disk in DOS (using the Makedisk application in the support CD).

To create a RAID driver disk in DOS environment:

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

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

The Makedisk menu appears.

```
A)    FreeDOS command prompt
B)    Create 7902 HostRAID for RHEL3 UP3 32 bit Driver Disk
C)    Create 7902 HostRAID for RHEL3 UP3 64 bit Driver Disk
D)    Create 7902 HostRAID for RHEL3 UP5 32 bit Driver Disk
E)    Create 7902 HostRAID for RHEL4 UP1 32 bit Driver Disk
F)    Create 7902 HostRAID for RHEL4 UP1 64 bit Driver Disk
G)    Create 7902 HostRAID for SLES9 SP1 32 bit Driver Disk
H)    Create 7902 HostRAID for SLES9 SP1 64 bit Driver Disk
I)    Create 7902 HostRAID for Windows 32 bit Driver Disk
J)    Create 7902 HostRAID for Windows 64 bit Driver Disk
K)    Create 7902 SCSI for RHEL4 32 bit Driver Disk
L)    Create 7902 SCSI for RHEL4 64 bit Driver Disk
M)    Create 7902 SCSI for Windows 32/64 bit Driver Disk
N)    Broadcom ASF Firmware Update
O)    Write RS260-E3(RS8) FRU
Please choose A ~ O:
```

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.

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

Windows® 2000/2003 Server

A floppy disk with the RAID driver is required when installing Windows® 2000/2003 Server operating system on a hard disk drive that is assigned to an array.

To create a RAID driver disk from Windows® environment:

1. Place the system or motherboard support CD in the optical drive.
2. When the **Drivers** menu appears, select the RAID driver disk you want to create.

    OR

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

Red Hat® Enterprise ver. 3.0 UP5

To create a RAID driver disk for Red Hat® Enterprise ver. 3.0 UP5 system:

1. Insert a blank formatted high-density floppy disk to the floppy disk drive.
2. Decompress the file into the floppy disk from the following path in the support CD:

    For Adaptec AIC-7902W HostRAID driver disk :

    > **\Drivers\adaptec\aic7902\HostRAID\Linux\a320raid-3.00.057-rhel3qu5.tar.gz**
    >
    > (Please decompress the *.gz file into the local hard disk, and then decompress the a320raid-3.00.057-rhel3qu5.i686.img into the

floppy   disk)
3. Eject the floppy disk.

7.1.2   Installing the RAID controller driver

Windows® 2000/2003 Server OS

During Windows® 2000/2003 Server OS installation

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

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

```
Windows 2000 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 2000 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 2000, 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 2000, 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 2000 Setup




               Please insert the disk labeled

         Manufacturer-supplied hardware support disk

                     into Drive A:

               *  Press ENTER when ready.






  ENTER=Continue   ESC=Cancel   F3=Exit
```
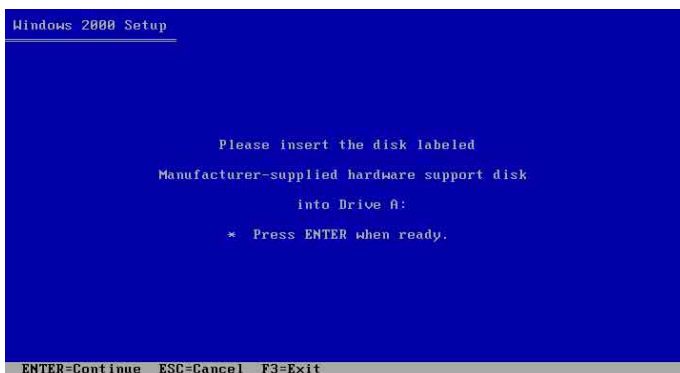
5. Select the RAID controller driver from the list, then press <Enter>.

```
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=Select   F3=Exit
```

- For **Adaptec® 7902W HostRAID** driver, select **Adaptec HostRAID U320 Diver ver. 1.02 for Windows 2000/XP/ 2003**. (PVL-D/SCSI model only)

6. The Windows® 2000/2003 Setup loads the RAID controller drivers from the RAID driver disk. When prompted, press <Enter> to continue installation.

7. Setup then proceeds with the OS installation. Follow screen instructions to continue.

To an existing Windows® 2000/2003 Server OS

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

1. Restart the computer, then log in with **Administrator** privileges.
2. Windows® automatically detects the RAID controller and displays a **New Hardware Found** window. Click **Cancel**.
3. Right-click the **My Computer** icon on the Windows® desktop , then select **Properties** from the menu.
4. Click the **Hardware** tab, then click the **Device Manager** button to display the list of devices installed in the system.
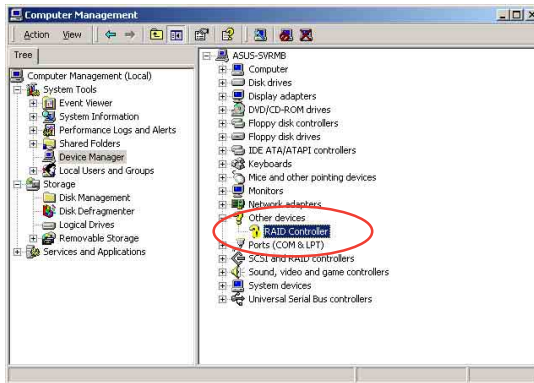
5. Right-click the **RAID controller** item, then select **Properties**.
6. Click the **Driver** tab, then click the **Update Driver** button.
7. The **Upgrade Device Driver Wizard** window appears. Click **Next**.
8. Insert the RAID driver disk you created earlier to the floppy disk drive.
9. Select the option "**Search for a suitable driver for my device (recommended)**, then click **Next**.
10. The wizard searches the RAID controller drivers. When found, click **Next** to install the drivers.
11. Click **Finish** after the driver installation is done.

To verify the RAID controller driver installation:

1. Right-click the **My Computer** icon on the Windows® desktop , then select **Properties** from the menu.
2. Click the **Hardware** tab, then click the **Device Manager** button.
3. Click the "+" sign before the item **SCSI and RAID controllers**.
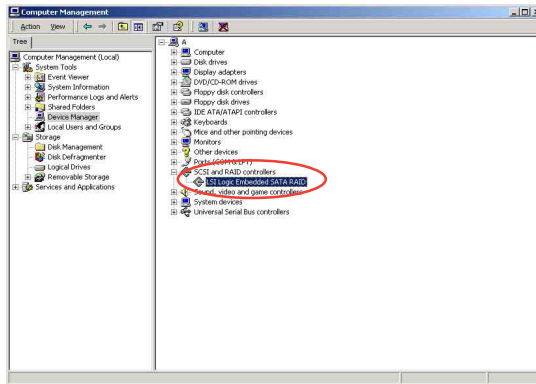
- For PVL-D/2U/SCSI model, the **Adaptec AIC-7902W HostRAID Drive** items should appear.

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 ver. 3.0

To install the RAID controller driver when installing Red Hat® Enterprise ver. 3.0 OS:

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

2. At the **boot:**, type **linux dd** , then press <Enter>.
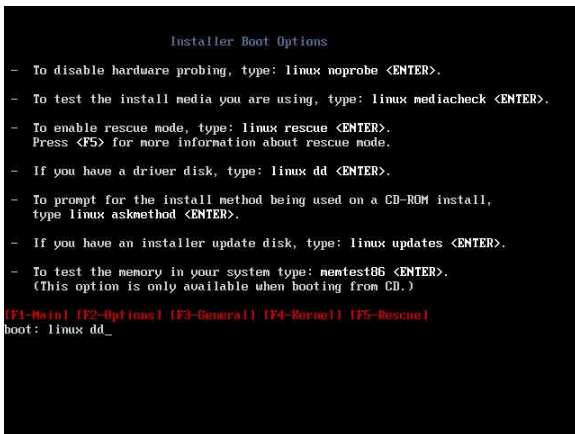
3. Select **Yes** using the <Tab> key when asked if you have the driver disk. Press <Enter>
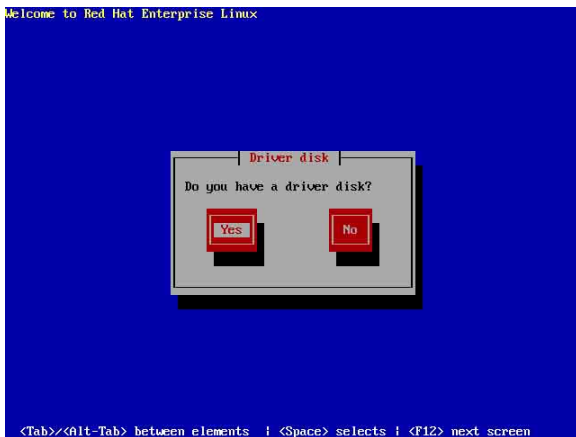
4. Select **fd0** using the <Tab> key when asked to select the driver disk source. Press <Tab> to move the cursor to **OK**, then press <Enter>.
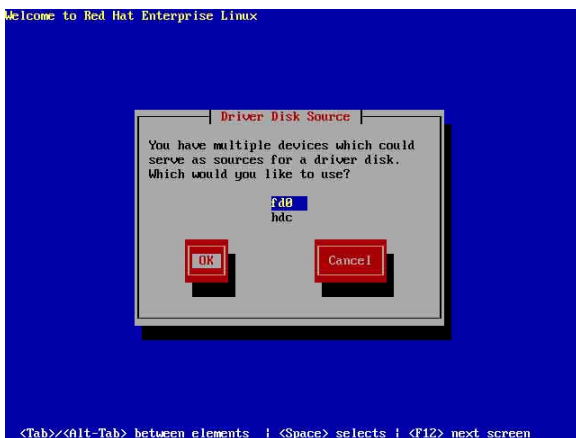
5. When prompted, insert the Red Hat® Enterprise ver. 3.0 RAID driver disk
    to the floppy disk drive, select **OK,** then press <Enter>.
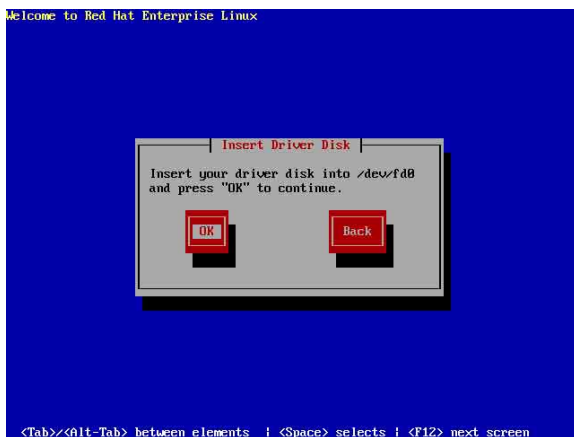
    The drivers for the RAID controller are installed to the system.

6. When asked if you will load additional RAID controller drivers:
    •   For PVL-D/2U/SCSI model, select **Yes**, then install the additional
        RAID controller drivers (for Adaptec® AIC-7902W).
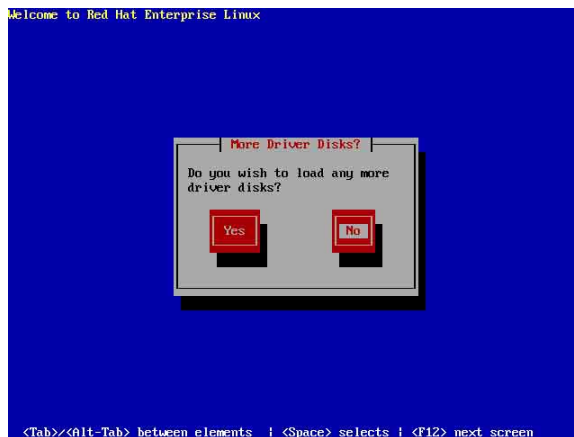
7. Follow screen instructions to continue the OS installation.

7.2   LAN driver installation

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

7.2.1   Windows® 2000/2003 Server

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

1.   Restart the computer, then log on with **Administrator** privileges.

2.   Insert the motherboard/system support CD to the optical drive. The CD automatically displays the **Drivers** menu if Autorun is enabled in your computer.

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

3.   Click the **Broadcom 5721 Driver** option to begin installation.
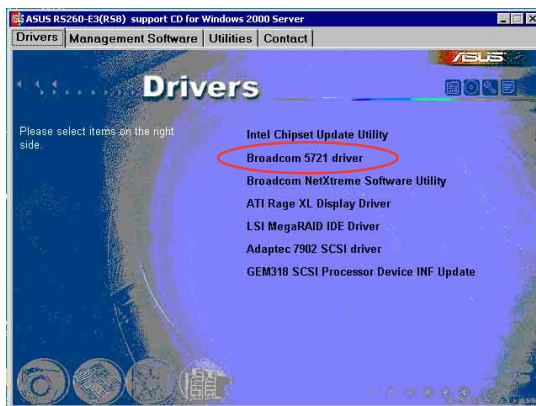
4. Click **Next** when the InstallShield Wizard window appears. Follow screen instructions to continue installation.
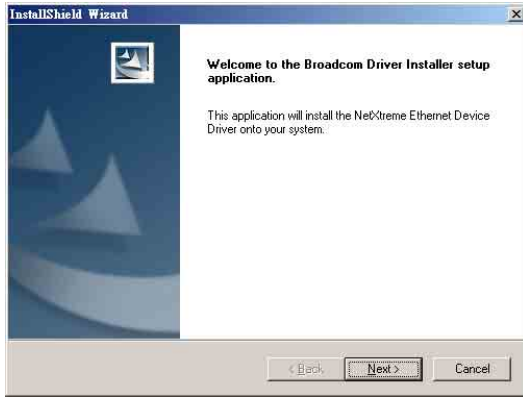
7.2.2 Red Hat® Enterprise ver. 3.0

Follow these instructions when installing the Broadcom® Gigabit LAN controller base driver for the Red Hat® Enterprise ver. 3.0 operating system.

Installing the source RPM package

To install the source RPM package:

1. Install the source RPM package:

    `rpm -ivh bcm5700-<version>.src.rpm`

2. Change the directory to the RPM path and build the binary driver for your kernel:

    `cd /usr/src/{redhat,OpenLinux,turbo,packages,rpm ..}`
    `rpm -bb SPECS/bcm5700.spec or rpmbuild -bb SPECS/`
    `bcm5700.spec`

    > The RPM path is different for different Linux distributions.

3. Install the newly built package (driver and man page):

    `rpm -ivh RPMS/i386/bcm5700-<version>.i386.rpm`

    > You need the force option when installing the driver on some distributions that has an older version of the driver.

    For **2.2.x kernels**, the driver is installed in:

    `/lib/modules/<kernel_version>/net/bcm5700.o`

    For **2.4.x kernels**, the driver is installed in:

    `/lib/modules/<kernel_version>/kernel/drivers/net/`
    `bcm5700.o`

    For **2.4.x kernels with bcm5700 driver patched in**, the driver is installed in:

    `/lib/modules/<kernel_version>/kernel/drivers/net/bcm/`
    `bcm5700.o`

    or

    `/lib/modules/<kernel_version>/kernel/drivers/addon/`
    `bcm5700/bcm5700.o`

4. Load the driver:

    `insmod bcm5700`

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

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
    ```

    See the RPM instructions on the previous page for the location of the installed driver.

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 ATI® RAGE XL Video Graphics Adapter (VGA) driver.

7.3.1 Windows® 2000 Server

You need to manually install the ATI® RAGE XL VGA driver on a Windows® 2000 Server operating system.

To install the ATI® RAGE XL VGA driver:

1. Restart the computer, then log on with **Administrator** privileges.

2. Insert the motherboard/system support CD to the optical drive. The support CD automatically displays the **Drivers** menu if Autorun is enabled in your computer.

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

3. Click the item **ATI Rage XL Display Driver** from the **Drivers** menu.
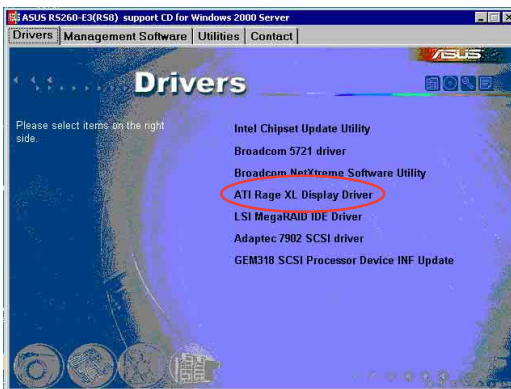
4. The **ATI Windows 2000 Driver** window appears. Click **Next**. Follow screen instructions to complete installation.
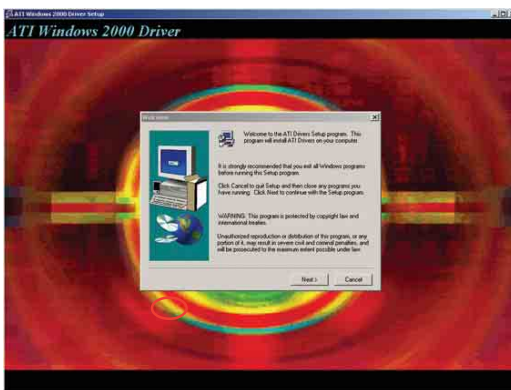
7.3.2 Windows® 2003 Server

The Windows® 2003 Server operating system automatically recognizes the ATI® RAGE XL VGA driver during system installation. There is no need to install an additional driver(s) to support the onboard VGA.

7.3.3 Red Hat® Enterprise ver. 3.0

The Red Hat® Enterprise ver. 3.0 operating system automatically recognizes the ATI® RAGE XL VGA 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.
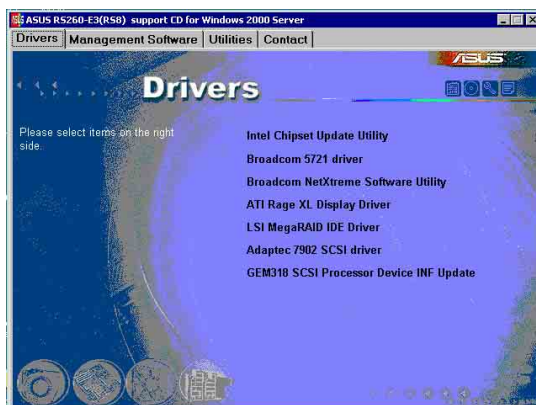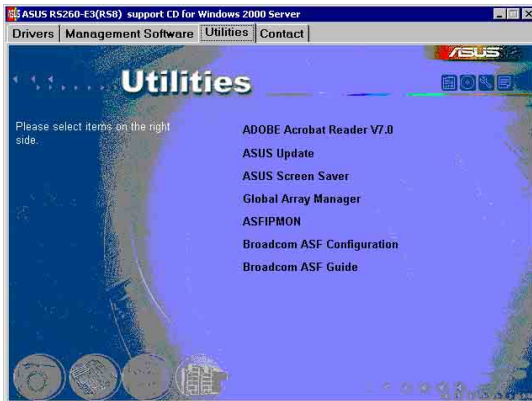
7.4.3 Management Software menu

The **Management Software** menu displays the available network and server monitoring applications. 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.

Appendix

This appendix includes additional information that you may refer to when configuring your barebone server.

References

A.1   Power supply

A.1.1   General description

The barebone server comes with one SSI-type 700W redundant power supply with 115V/230V AC voltage, 50Hz/60Hz frequency.

---

*   You may purchase and install a second power supply with the same specifications.

*   When you installed two power supply modules, make sure to plug both modules to a power outlet to achieve redundancy.

There are nine (9) power plugs from the power supply unit. Take note of the devices to which you should connect the plugs.

P1 P4 P2 P5 P3 P8 P9 P6 P7
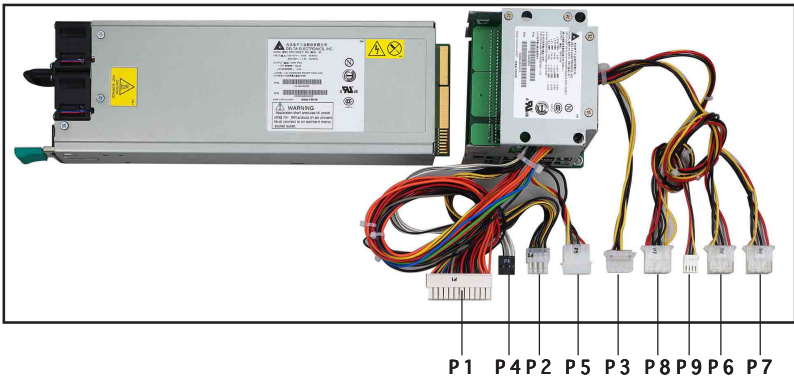
P1   Motherboard 24-pin ATX power connector
P2   Motherboard 8-pin +12V AUX power connector
P3   Mid-fan board
P4   SMBus connector
P5   PCI cage riser board
P6   SCSI 1 backplane board
P7   SCSI 2 backplane board
P8   SCSI 3 backplane board
P9   Optical drive/floppy drive board

A.1.2 Specifications

Output voltage regulation

Output Voltage	Min (V)	Nom (V)	Max (V)	Ripple/Noise
+3.3V	3.25	3.30	3.35	50mV$_{p-p}$
+5V	4.90	5.00	5.10	50mV$_{p-p}$
+12V	11.40	12.00	12.60	120mV$_{p-p}$
-12V	-11.40	-12.00	-13.80	120mV$_{p-p}$
+5VSB	4.85	5.00	5.20	50mV$_{p-p}$

Output current capacity

Output Voltage	Min (A)	Max (A)	Max. Output(W)
+3.3V	0.5	20.0	66.0
+5V	0.5	20.0	100.0
+12V1	0.5	12.5	216.0
+12V2	0.5	12.5	216.0
+12V3	1.5	14.0	300.0
+12V4	1.5	14.0	300.0
-12V	0.0	0.5	6.0
+5VSB	0.0	2.0	10.0

Over-voltage protection

Voltage	Min (V)	Max (V)
+3.3V	3.8	4.3
+5V	5.7	6.5
+12V	13.5	15.0

Redundant power LED

Refer to section 1.6.4 for details.

A.2   OS Support List

1. Windows 2000 Advanced Server w/SP4
2. Windows Server 2003 Enterprise/SP1
3. Windows Server 2003 x64 Enterprise/SP1
4. RedHat Enterprise Linux AS3.0/UP5 32bit (Don't support Paxville)
5. RedHat Enterprise Linux AS4.0 32bit
6. RedHat Enterprise Linux AS4.0 64bit
7. SuSE Linux Enterprise 9.0 W/SP2 32bit

A.3   Qualified Vendors List (QVL)

DDR2 400 Registered DIMM AVL Candidate			
Vender	Size	Module Spec	Memory Chip
Samsung	512MB	DDR2-400 512MB ECC/REG (Single Rank)	Samsung / K4T51083QB-GCCC
Samsung	512MB	DDR2-400 512MB ECC/REG (Dual Rank)	Samsung / K4T56083QF-GCCC
Samsung	1GB	DDR2-400 1GB ECC/REG (Dual Rank)	Samsung / K4T51083QB-GCCC
Hynix	512MB	DDR2-400 512MB ECC/REG (Single Rank)	Hynix / HY5PS12821F-E3
Elpida	1GB	DDR2-400 1GB ECC/REG (Single Rank)	
Elpida	512MB	DDR2-400 512MB ECC/REG (Single Rank)	
Kingston	512MB	DDR2-400 512MB ECC/REG (Single Rank)	
Samsung	1GB	DDR2-400 1GB ECC/REG (Single Rank)	Samsung / K4T51043QB-GCCC
Samsung	256MB	DDR2-400 256MB ECC/REG (Single Rank)	Samsung / K4T56083QF-GCCC
Samsung	512MB	DDR2-400 512MB ECC/REG (Single Rank)	Samsung / K4T56043QF-GCCC
Apacer	1GB	DDR2-400 1GB ECC/REG (Dual Rank)	Samsung / K4T51083QB-GCCC
Apacer	512MB	DDR2-400 512MB ECC/REG (Single Rank)	Infineon / HYB18T512800AC-5
Corsair	1GB	DDR2-400 1GB ECC/REG (Single Rank)	
Kingston	1GB	DDR2-400 1GB ECC/REG (Single Rank)	
Apacer	512MB	DDR2-400 512MB ECC/REG (Single Rank)	Samsung / K4T51083QB-GCCC
Samsung	1GB	DDR2-400 1GB ECC/REG (Dual Rank)	Samsung / K4T51083QB-GCCC
Trascend	1GB	DDR2-400 1GB ECC/REG (Single Rank)	Samaung / K4T51043QB-GCCC
Wintec	1GB	DDR2-400 1GB ECC/REG (Single Rank)	Infineon / HYB18T512 400AF-5
Wintec	512MB	DDR2-400 512MB ECC/REG (Single Rank)	Samsung / K4T51083QB-GCD5
Apacer	512MB	DDR2-400 512MB ECC/REG (Single Rank)	Infineon / HYB18T512800AF-5
Apacer	1GB	DDR2-400 1GB ECC/REG (Single Rank)	Infineon / HYB1875T512400AF-5
ATP	1GB	DDR2-400 1GB ECC/REG (Single Rank)	Samsung / K4T51043QB-GCCC

(continued on the next page)

Qualified Vendors List (QVL) *continued*

ATP	512MB	DDR2-400 512MB ECC/REG (Single Rank)	Samsung / K4T56043QF-GCCC
Apacer	2GB	DDR2-400 2GB ECC/REG (Single Rank)	Elpida / EDE1104AASE-4A-E
Apacer	2GB	DDR2-400 2GB ECC/REG (Dual Rank)	Infineon / HYB18T512400AF-5
Nanya	1GB	DDR2-400 2GB ECC/REG (Single Rank)	Nanya / NT5TU128M4AE-5A
Nanya	2GB	DDR2-400 2GB ECC/REG (Dual Rank)	Nanya / NT5TU128M4AE-5A
Nanya	512MB	DDR2-400 512MB ECC/REG (Single Rank)	Nanya / NT5TU64M8AE-5A
Trascend	2GB	DDR2-400 2GB ECC/REG (Single Rank)	Elpida / EDE1104AASE-4A-E
Trascend	2GB	DDR2-400 2GB ECC/REG (Single Rank)	Infineon / HYB18T1G400AF-5
Trascend	1GB	DDR2-400 1GB ECC/REG (Single Rank)	Samaung / K4T51043QC-ZCCC
Apacer	512MB	DDR2-400 512MB ECC/REG (Single Rank)	Elpida / E5108AG-5C-E
Apacer	1GB	DDR2-400 1GB ECC/REG (Single Rank)	Elpida / E5104AE-5C-E
Trascend	512MB	DDR2-533 512MB ECC/REG (Single Rank)	Samsung / K4T51083QB-GCD5
Trascend	1GB	DDR2-533 1GB ECC/REG (Double Rank)	Samaung / K4T51083QB-ZCD5
Apacer	2GB	DDR2-533 2GB ECC/REG (Dual Rank)	Infineon / HYB18T512400AC37
Unigen	512MB	DDR2-533 ECC/REG (Single Rank)	Elpida / E5108AB-5C-E
ATP	512MB	DDR2-533 512MB ECC/REG (Single Rank)	Micron / 4XB42 D9CHK
ATP	1GB	DDR2-533 1GB ECC/REG (Single Rank)	Samsung / K4T51043QB-GCD5
Trascend	512MB	DDR2-533 512MB ECC/REG (Single Rank)	Samsung / K4T51083QC-ZCD5
Trascend	1GB	DDR2-533 1GB ECC/REG (Double Rank)	Samaung / K4T51083QC-ZCD5
Viking	1GB	DDR2-533 1GB ECC/REG (Double Rank)	Infineon / HYB18T512800AF37

SCSI HDD (15K)			
Vendor	**Type**	**Size**	**Product No.**
Seagate/8M/15K	U320/80-pin	36GB	ST336753LC
Seagate/8M/10K	U320/80pin	36 GB	ST336753LC
FSC/15K	U320/80pin	36 GB	MAS3367NC
Seagate/8M/15K	U320/80pin	73 GB	ST373453LC
FSC/15K	U320/80pin	73 GB	MAS3735NC
Hitachi 8M/15K		73 GB	

Qualified Vendors List (QVL) *continued*

LAN card		
Vendor	**Part Description**	**Product No.**
ASUS	PXI-G45 PCI-X Gb LAN Card	80-C1S510-0B01
Intel	PRO/1000 MT Server	PWLA8490MT
Intel	PRO/1000 MT Dual port	PWLA8492MT
Intel	PRO/1000 MT Quad port	PWLA8494MT

SCSI card		
Vendor	**Description**	**Product No.**
ASUS	PXL-S30 64 bit U320 SCSI Card	PXL-S30 R1.04
LSI	LSI21320 , 2ch U320	22-T00420204
Adaptec	SCSI 39320-R, 2ch PCI-X U320	1978300; ASC-39320-PK
Adaptec	SCSI 29320-R, 1ch PCI-X U320	1978100; ASC-29320-PK
Adaptec	SCSI 39160, 2ch 64bit PCI U160	1822300; ASC-39160-PK

SCSI RAID card		
Vendor	**Description**	**Product No.**
LSI	MegaRAID 320-1 1ch 64bit PCI U320	
Adaptec	ASR2120S 1ch 64bit PCI U320	1961800; ASR-2120S
Adaptec	Adaptec SCSI ZCR RAID 2025ZCR	2025ZCR
Intel	SRCU42L 1+1ch 64bit PCI U320	SRCU42L

A.4   Troubleshooting

Some problems that you may encounter are not due to defects on the system or the components. These problems only requires simple troubleshooting actions that you can perform by yourself.

Problem	Action
The power LED on the server or on the monitor do not light up	1. Check if the power cable is properly connected to the power connector in the system rear panel. 2. Make sure that the power cables are connected to a grounded power outlet. 3. Press the power button to make sure that the system is turned on.
The keyboard does not work	Check if the keyboard cable is properly connected to the PS/2 keyboard port.
The mouse does not work	Check if the mouse cable is properly connected to the mouse port.
The system does not perform power-on self tests (POST) after it was turned on	1. Check the memory modules and make sure you installed the DIMMs the system supports. 2. Make sure that the DIMMs are properly installed on the sockets.
The system continuously beeps after it was turned on	1. Check the memory modules and make sure you installed supported DIMMs. 2. Make sure that the DIMMs are properly installed on the sockets.

Problem	Action
The message "Non-system disk or disk error" appears	1. Check if a bootable HDD is active. 2. Check if the HDDs are properly installed.
Network connection not available	1. Make sure that the network cable is connected to the LAN port on the rear panel. 2. Make sure that you have installed the LAN drivers from the support CD.
Why do the fans run in full speed after the system is switched on? (system fan: 5700RPM; rear fan: 11800RPM)	Please go to Hardware Monitor in BIOS setup and check the CPU temperature and setting of Smart-Fan Control. If Smart-Fan is disabled, please set Smart-FAN control to "Enabled". If Smart -Fan is already enabled, please check the followings: 1. If CPU temperature is over 60°C in BIOS setup, please shut down and re-install CPU's heatsink to make sure that CPU's heatsink is tightly secured to the CPU. 2. If CPU temperature is over 60°C in BIOS setup, please check whether the arrow on the system fans points to the direction on the rear panel. Re-install the fan in case it causes CPU to overheat. 3. If CPU temperature is under 60°C in BIOS setup, please check the CPU_FAN1 connector on the MB connected with 3-pin connectors on the mid-fan board (FANBPC-AR21).

A.5   PVL-D/2U/SCSI block diagram