/SUS AP1600R-E2 (BA2)

1U Rackmount Barebone Server

User Guide

E1732

First Edition V1
October 2004

Contents

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 A 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 A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This Class A 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 server, including sections on front panel and rear panel specifications.

2. **Chapter 2: Hardware setup**

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

3. **Chapter 3: Installation options**

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

4. **Chapter 4: Motherboard information**

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

5. **Chapter 5: BIOS information**

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

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.

References

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

1. **ASUS NCLV-D motherboard user guide**

   This manual contains detailed information about the NCLV-D motherboard.

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

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

3. **ASUS websites**

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

Chapter 1

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

Product introduction

ASUS AP1600R-E2 (BA2)

1.1 System package contents

Check your ASUS AP1600R-E2 (BA2) package for the following items.

> Contact your dealer immediately if any of the items is damaged or missing.

Package items
✓ ASUS AR14 1U rackmount chassis with: • ASUS NCLV-D motherboard • 500W power supply, 115V~230V • optical drive • system/device/rear fans • 2 x hot-swap HDD trays • riser card bracket • SATA backplane
✓ CPU heatsink (2 pcs.)
✓ AC power cable
✓ System screws and cables
✓ Rackmount rail kit
✓ Accessory box • AP1600R-E2 user guide • AP1600R-E2 support CD (includes ASWM) • TrendMicro® ServerProtect® CD • Bag of screws

1.2   System specifications

The ASUS AP1600R-E2 (BA2) is a 1U barebone server system featuring the ASUS NCLV-D motherboard. The server supports dual Intel® Xeon™ processors, and includes the latest technologies through the chipsets embedded on the motherboard.

Chassis	Rackmount 1U (AR14)
Motherboard	ASUS NCLV-D
Chipset	North Bridge: Intel® E7320 Memory Controller Hub (MCH) South Bridge: Intel® 6300ESB
Processor	Supports dual Intel® Xeon™ 3.2GHz processors with L2 512K and L3 1MB caches via two 604-pin sockets
Memory	4 x 184-pin DDR sockets for up to 16GB system memory Supports DDR 333 registered ECC DIMMs
LAN	Broadcom® BMC5721 64-bit Gigabit LAN controller Broadcom® BMC5705E 32-bit Gigabit LAN controller
VGA	ATI RAGE-XL PCI-based VGA controller Supports 8MB display memory
Expansion slots	1 x PCI-X 66 MHz/64-bit slot (PCI-X 1.0) 1 x Mini-PCI socket for the ASUS Server Management Board

Storage	Intel® 6300ESB South Bridge supports:
	    - 2 x Ultra DMA 100/66/33 HDDs
	    - 2 x SATA HDDs with RAID 0/1 configuration and
	        Intel® Matrix Storage Technology

Management	ASUS Server Web-based Management (ASWM)
Hardware monitors	Voltage, temperature, and fan speed monitoring Automatic System Restart (ASR) feature
Power supply	500W power supply, 115V~230V, 50Hz~60Hz
Dimensions	600 mm (l) x 445 mm (w) x 43.6 mm (h))

1.3 Front panel features

The chassis kit displays a simple yet stylish front panel with easily accessible features. The power and reset buttons, LED indicators, location switch, optical drive, and two USB ports are located on the front panel.
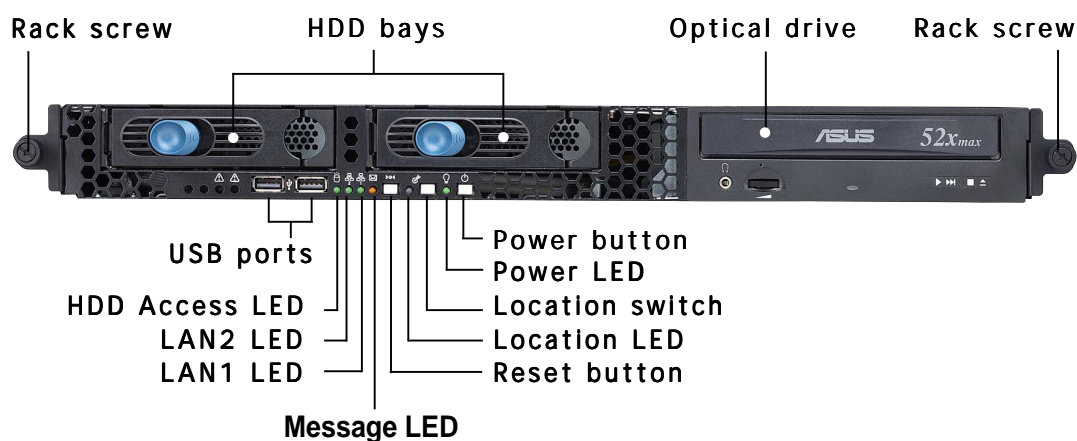
> Refer to section "1.6.1 Front panel LEDs" for the LED descriptions.

1.4 Rear panel features

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

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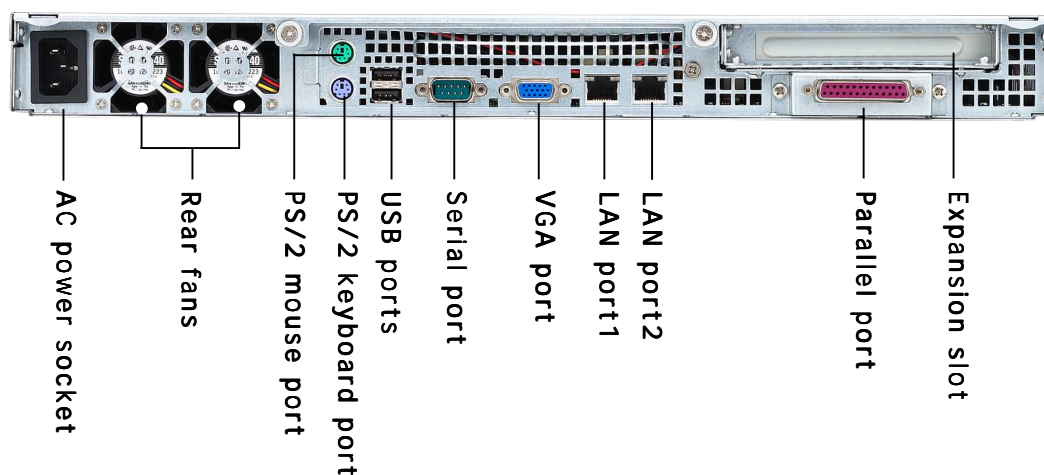
1.5   Internal features

The chaais includes the basic components as shown.
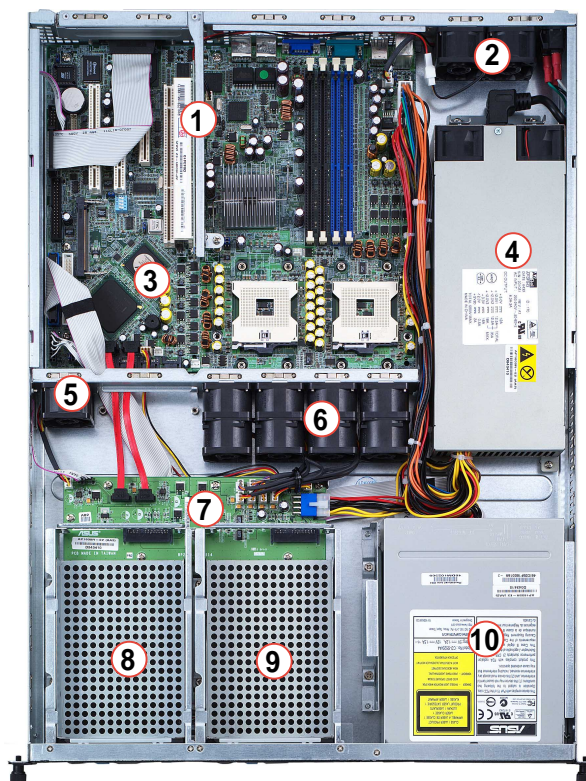
1. PCI-X riser card bracket
2. Rear fans
3. NCLV-D motherboard
4. Power supply
5. Device fan
6. System fans
7. SATA backplane
8. Hot-swap HDD tray 1
9. Hot-swap HDD tray 2
10. Optical drive

The barebone server does not include a floppy disk drive. Connect an external floppy disk drive (USB interface) to any of the USB ports on the front or rear panel if you need to use a floppy disk.

1.6   LED information

1.6.1   Front panel LEDs

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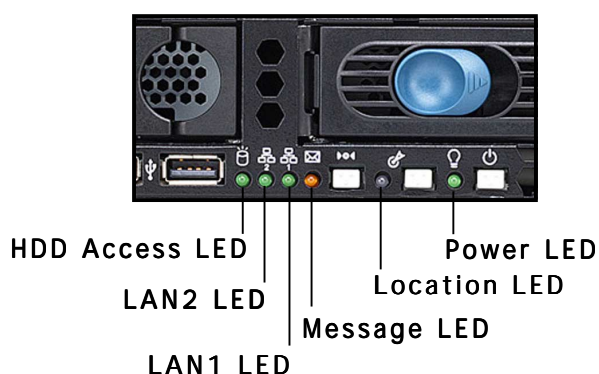
LED	Display status	Description
Power LED	ON	System power ON
HDD Access LED	OFF Blinking	No activity Read/write data into the HDD
Message LED	OFF Blinking	System is normal; no incoming event ASWM indicates a HW monitor event
Location LED	OFF ON	Normal status Location switch is pressed (Press the location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

1.6.2   Rear panel LEDs

RJ-45

ACT/LNK   SPEED
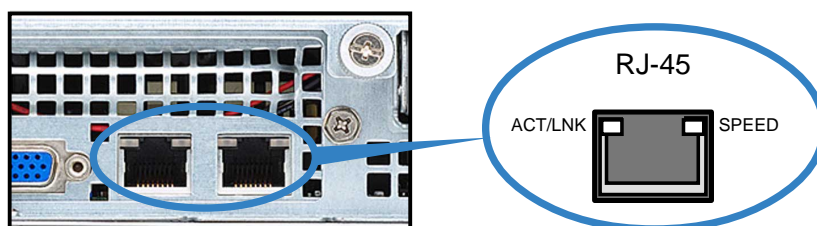
ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10Mbps connection
Green	Linked	Orange	100Mbps connection
Blinking	Linking	Green	1000Mbps connection

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

Hardware setup

2.1 Chassis cover

2.1.1 Removing the cover

1. Use a Phillips screwdriver to remove the screw on each front end of the top cover.

2. Loosen the two thumbscrews on the rear panel to release the top cover from the chassis.

Thumbscrews
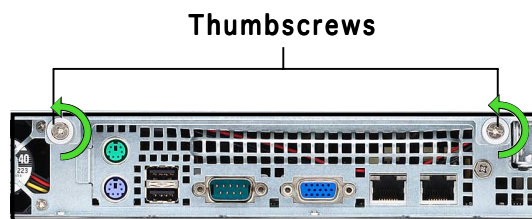
3. Firmly hold the cover and slide it toward the rear panel for about half an inch until it is disengaged from the chassis.
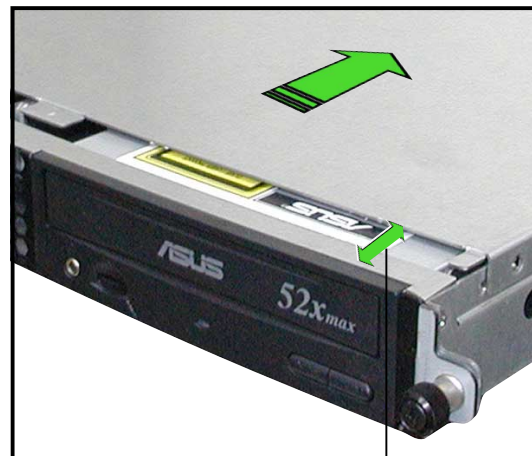
1/2 inch distance

4. Lift the cover from the chassis.

2.1.2 Installing the cover

1. Position the cover on top of the chassis with the thumbscrews on the rear, and leaving a gap of about half an inch from the front panel.

Side markings

2. Make sure that the side markings on the cover (two on each side) are aligned to the grooves on the chassis.

Grooves
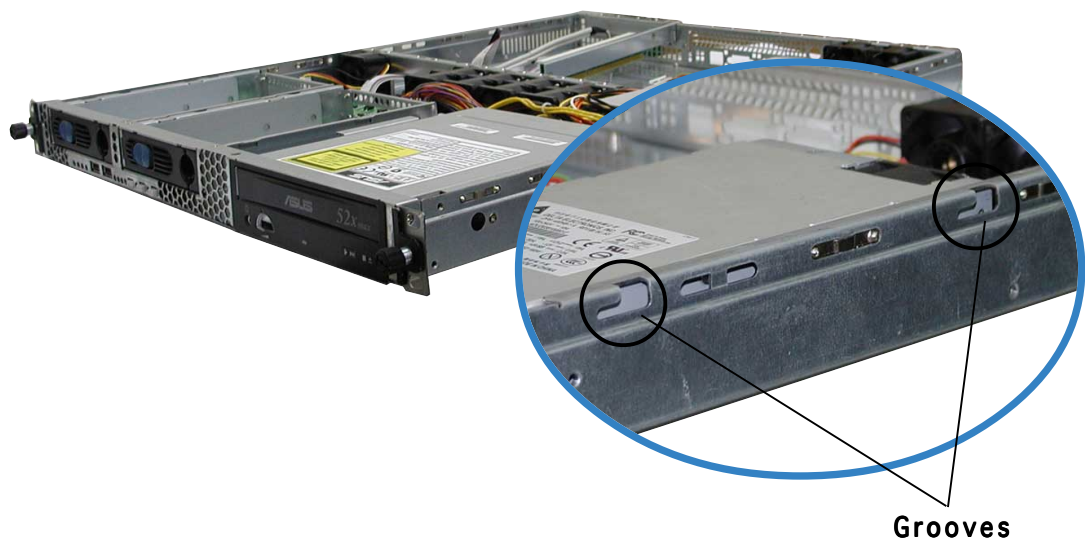
3. Slide the cover toward the front until it snaps in place.
4. Tighten the thumbscrews on the rear to secure the cover.

Thumbscrews
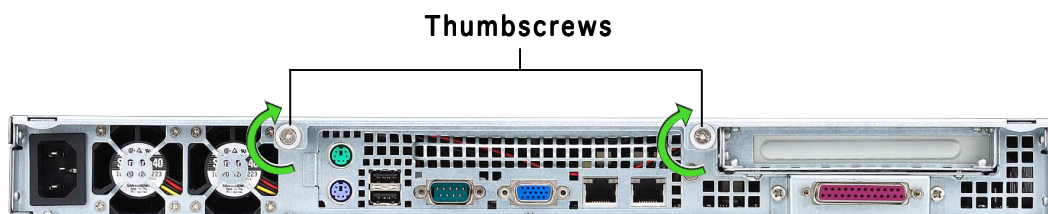
2.2 Central Processing Unit (CPU)

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

Intel Xeon

← Gold Arrow Pin A1

NCLV-D CPU Socket 604
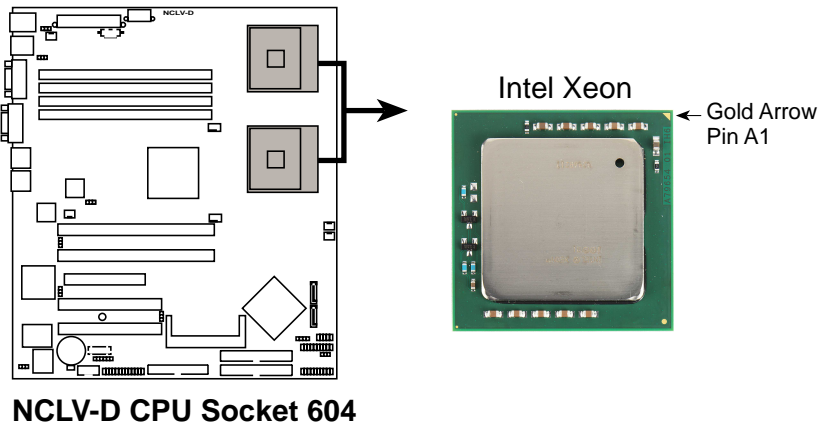
1. The motherboard supports either one or two CPUs. If you are installing only one CPU, you MUST install it in CPU socket 1.

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

2.2.1 Removing the CPU heatsink

If you have previously installed CPUs and heatsinks, follow these steps to remove the heatsinks before proceeding to the next section.

To remove the CPU heatsink:

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

2. Carefully lift the heatsink from the motherboard.
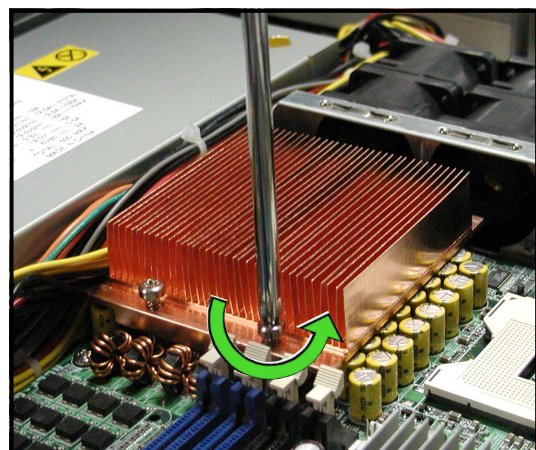
You don't need to detach the screws from the heatsink.

2.2.2 Installling a CPU

To install the CPUs:

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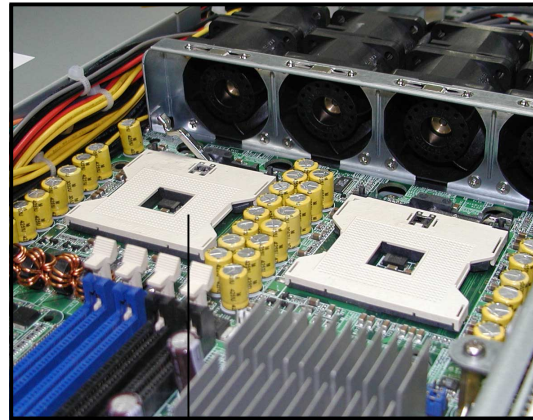
Socket for CPU1

2. Carefully insert the CPU into the socket as shown 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!
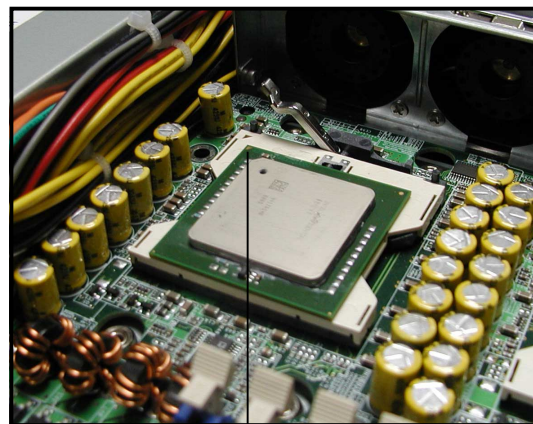
Marked corner
(gold arrow)

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

4. Apply the thermal interface material (thermal grease) to the top of the CPU. This thermal grease should come with the CPU package.

5. Repeat steps 1 to 4 if you wish to install a second CPU.
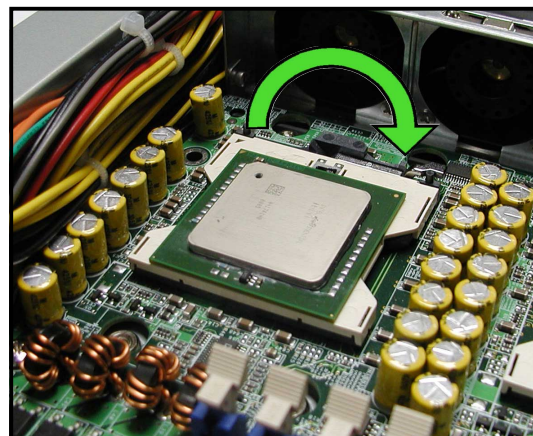
2.2.3 Installing the CPU heatsink

To install the CPU heatsink:

1. Carefully place the heatsink on top of the installed CPU (CPU1).
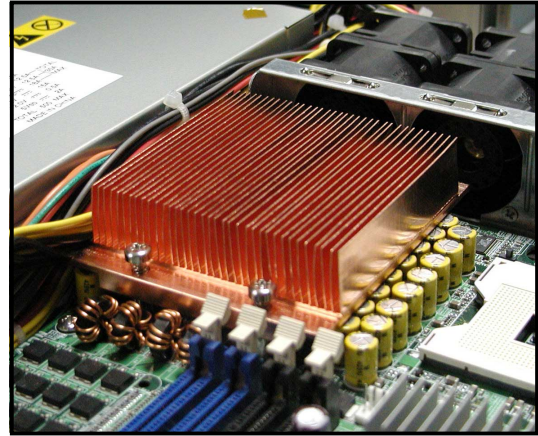
2. Twist each of the four screws with a Philips (cross) screwdriver just enough to attach the heatsink to the motherboard. When the four screws are attached, tighten them one by one to completely secure the heatsink.
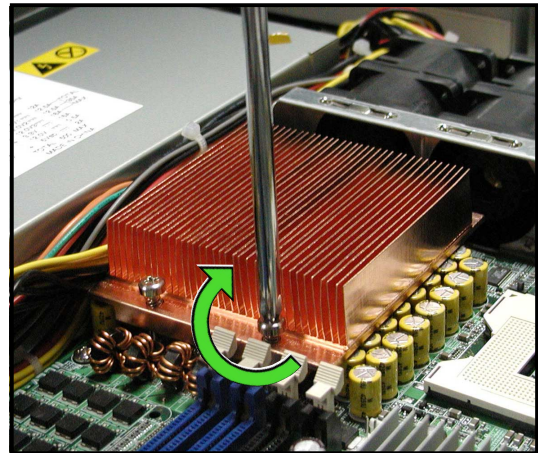
3. Follow steps 1 and 2 to install the second CPU heatsink.
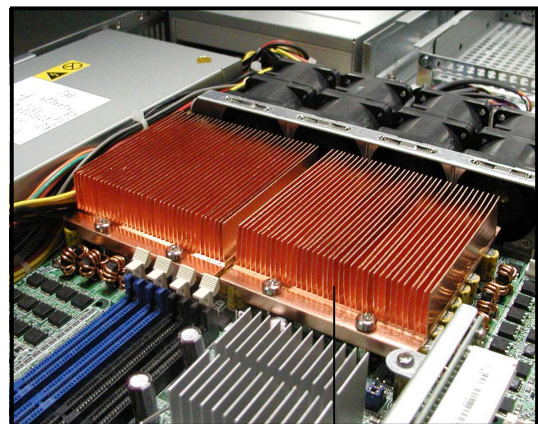
Heatsink for CPU2

2.4 System memory

2.4.1 Overview

The motherboard comes with four Double Data Rate (DDR) Dual Inline Memory Modules (DIMM) sockets. These sockets support up to 16 GB system memory using 184-pin registered ECC DDR 333 DIMMs.
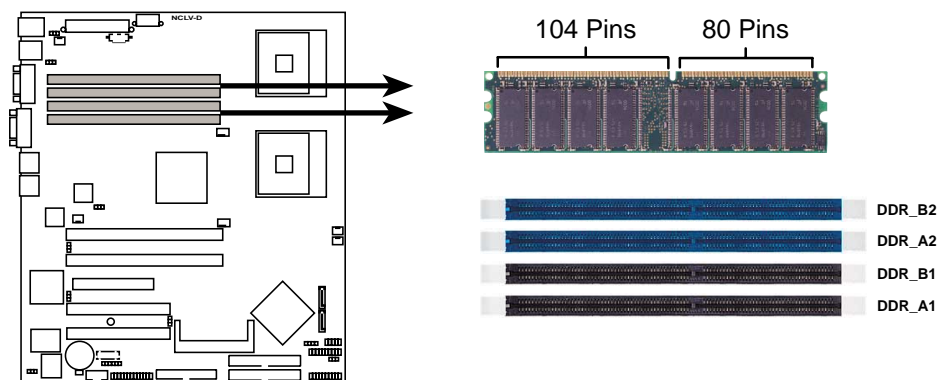
NCLV-D 184-Pin DDR DIMM sockets

2.4.2 Memory configurations

You may install 256 MB, 512 MB, 1 GB, 2GB, and 4GB registered ECC DDR 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 on the following URL for details.

- Due to chipset resource allocation, the system may detect less than 16 GB system memory when you installed four 4 GB DDR memory modules.

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

2.4.3 Installing a DIMM

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

1. Unlock a DIMM socket by pressing the retaining clips outward.

2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.

DDR DIMM notch

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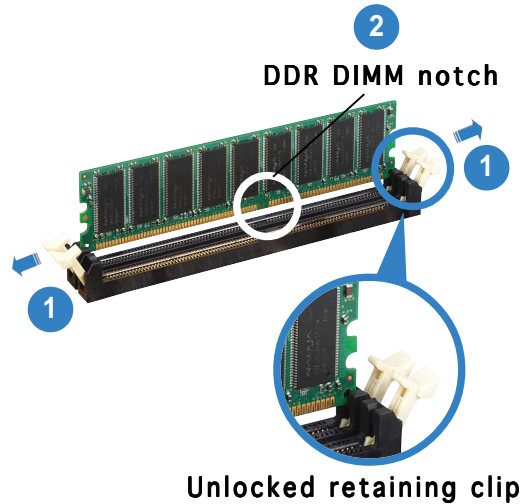
> A DDR DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

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

Locked Retaining Clip
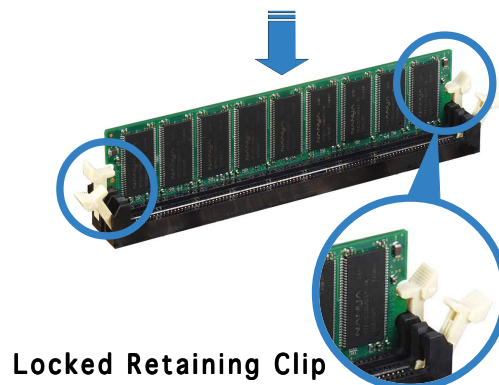
2.4.4 Removing a DIMM

Follow these steps to remove a DIMM.

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

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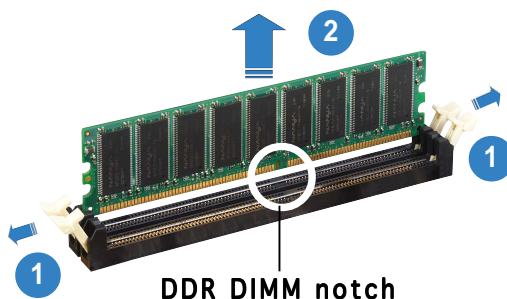
> Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

2.4   Hard disk drives

To install a SATA HDD:

1. 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.

2. Firmly hold the tray lever and
    pull the drive tray out of the
    bay.
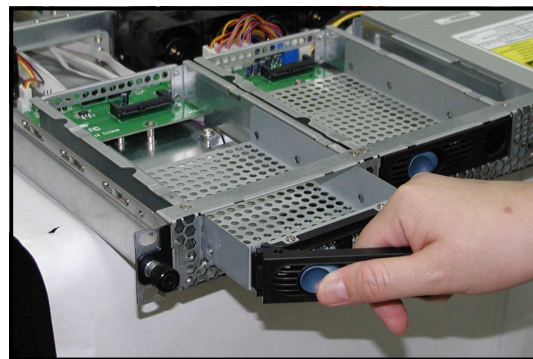
3. Take note of the drive tray
    holes. Each side has three holes
    to fit different types of hard disk
    drives. Use two screws on each
    side to secure the hard disk
    drive.

4. Place a SATA hard disk drive on
    the tray, then secure it with four
    screws.

5. Carefully insert the drive tray
   and push it all the way to the
   depth of the bay until just a
   small fraction of the tray edge
   protrudes.
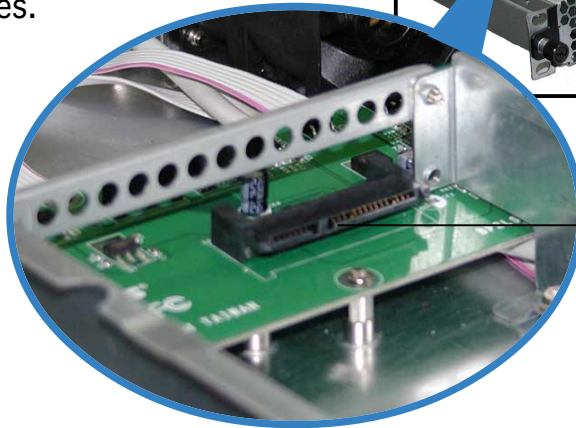
SATA interface
on the backplane

When installed, the SATA connector on the drive connects to the SATA
interface on the backplane.

6. 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.

7. Repeat steps 1 to 6 if you wish
   to install a second SATA drive.

8. Connect the bundled SATA cables to the connectors on the SATA
   backplane. Refer to section "2.7 SATA backplane cabling" for
   information on the SATA backplane cable connections.

2.5 Expansion slot

2.5.1 Installing an expansion card

The barebone server comes with a riser card bracket. You need to remove the bracket if you wish to install a PCI-X expansion card.

To install a PCI-X card:

1. Use a Phillips (cross) screwdriver to remove the screw that secures the riser card to the standoff.

Riser card screw

Riser card standoff
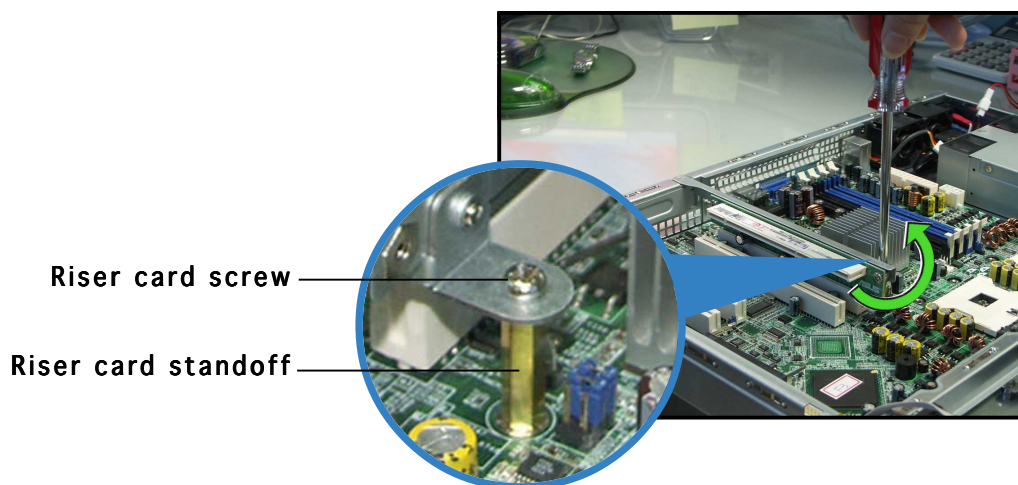
2. Firmly hold a riser card bracket, then pull it up to detach it from the PCI-X slot on the motherboard.
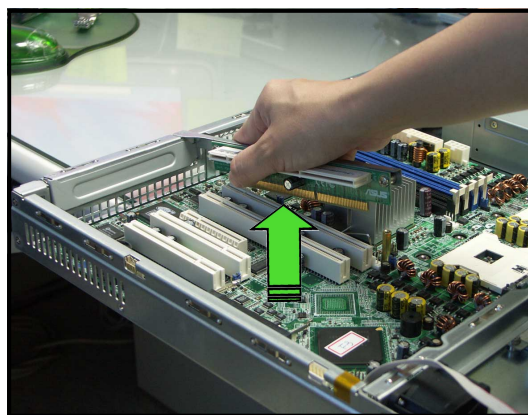
3. Remove the screw that secures the slot metal cover.
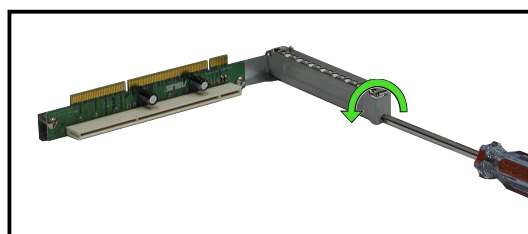
4. Install a PCI-X card to the bracket as shown, then secure the card with a screw.
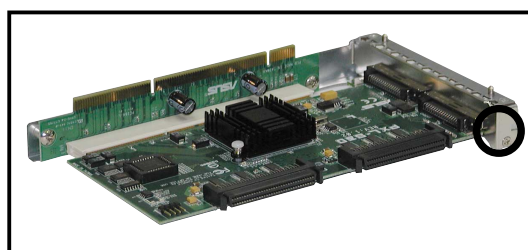
5. Take note of the holes on the riser card bay. The two pegs on the riser card bracket should match these holes to ensure that the bracket is properly in place.
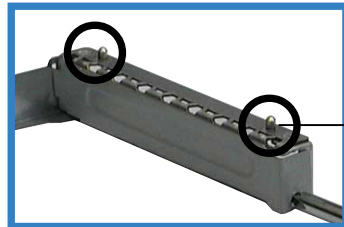
Peg on the riser card bracket
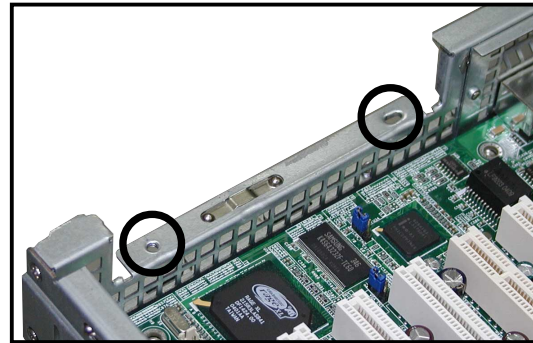
6. Install the riser card bracket with the card into the PCI-X slot on the motherboard.

7. Make sure that the golden connectors completely fit the slot and the bracket aligns with the rear panel.
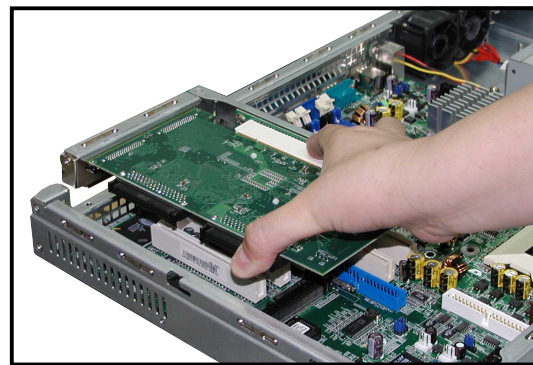
8. Secure the riser card to the standoff.

9. Connect the cable(s) to the card, if applicable.
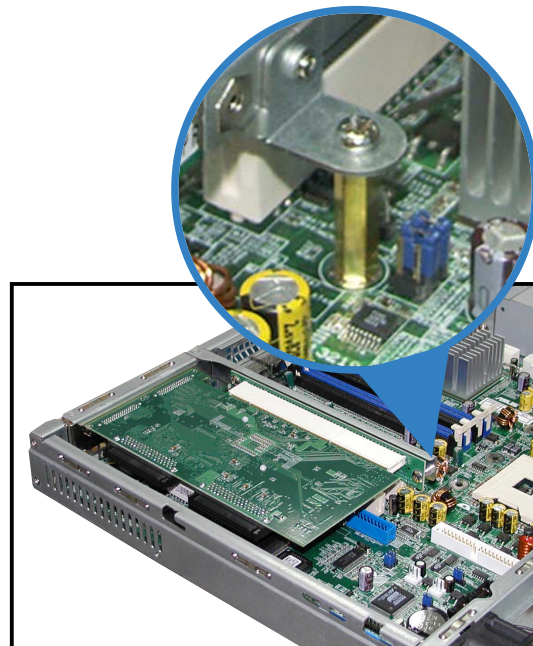
2.5.2 Configuring an expansion card

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#
AIC-8130	PXIRQ2	—	—	—	X_REQ3	X_GNT3
ATI Rage XL	PIRQB#	—	—	—	REQ2#	GNT2#
BCM5705E	PIRQF#	—	—	—	REQ3#	GNT3#
PCIX slot 1 (64-bit)	PXIRQ0	PXIRQ1	PXIRQ2	PXIRQ3	X_REQ0	X_GNT0

When using PCI cards on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

2.6 Cable connections
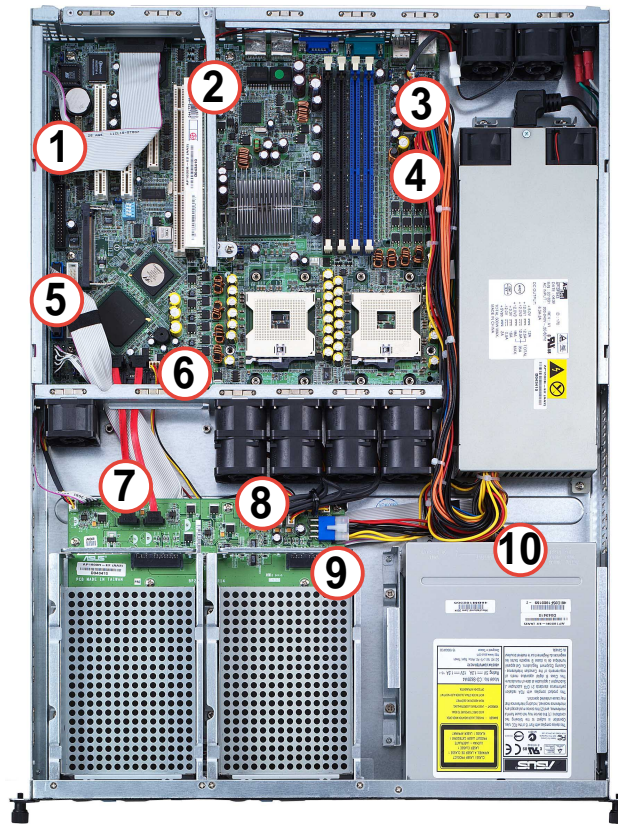
Pre-connected system cables

1. Parallel port cable (from motherboard to rear panel)
2. Rear fan connector (from power supply to motherboard)
3. 24-pin SSI power connector (from power supply to motherboard)
4. 8-pin SSI power connector (power supply to motherboard)
5. Secondary IDE connector (from motherboard to optical drive)
6. Device fan connector (from motherboard to SATA backplane board)
7. SATA connectors (from motherboard to SATA backplane board)
8. System fan connectors (from mid-fans to SATA backplane)
9. SATA backplane power connector (from power supply)
10. 4-pin power connector (from power supply to optical drive)

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. System fans
2. Device fan
3. Power supply module
4. Optical drive
5. Motherboard

2.7.1 System fans

To uninstall the system fans:

1. Disconnect all the system fan cables from the connectors on the backplane board.
2. Remove the four screws that secure a fan.
3. Repeat step 2 to uninstall the other fans.
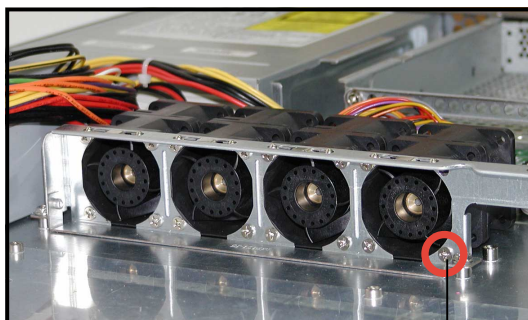
Fan screw

2.7.2 Device fan

To uninstall the device fan:

1. Disconnect the system fan cable from the connector on the motherboard.
2. Remove the four screws that secure the device fan.
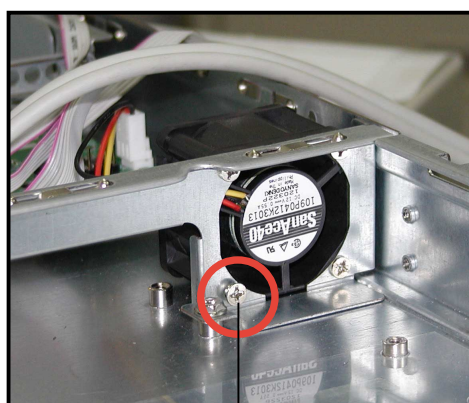
Fan screw

2.7.3 Power supply module

To uninstall the power supply module:

1. Disconnect all the power cables
    connected to the motherboard and
    other system devices.
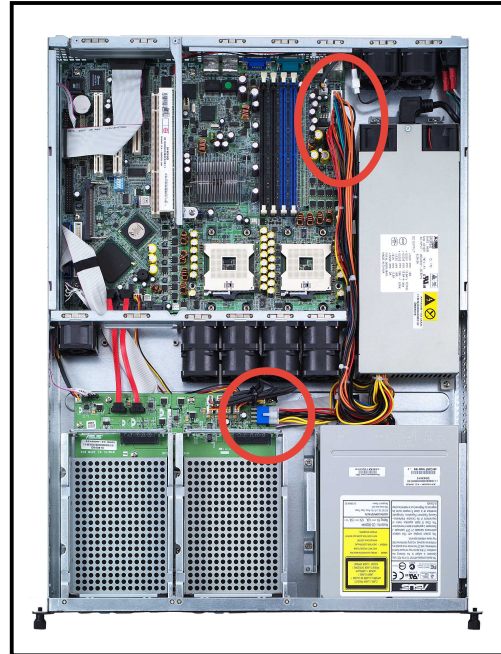
2. Use a Phillips (cross) screwdriver
    to remove the screw the secures
    the front end of the power
    supply.
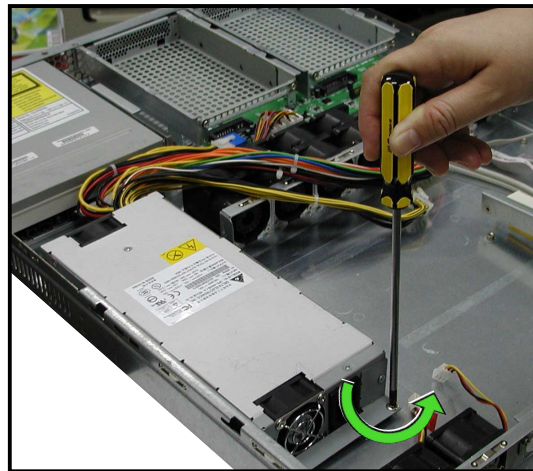
3. Slide the power supply backward for about half an inch, then carefully
    lift it out from the chassis.

2.7.4 Optical drive

To uninstall the optical drive:

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

2. Use a Phillips (cross) screwdriver
    to remove the two screws that
    secure the meal bracket on the
    side of the optical drive. Remove
    the bracket to release the drive.

3. Slide the optical drive toward the
    front panel, then carefully pull it
    out of the drive bay.

To install an optical drive:

1. From the front panel, insert the rear end of the optical drive into the 5.25-inch drive bay.

2. Place the metal bracket parallel to the side of the optical drive, matching its two pegs with the lower holes, and the bracket holes with the standoffs on the base of the chassis.

 The metal bracket should fit completely to ensure that the optical drive is securely in place.

Drive holes to match the pegs on the metal bracket

Drive metal bracket

Bracket pegs

Standoffs to match the holes on the metal bracket

Holes to match the standoffs
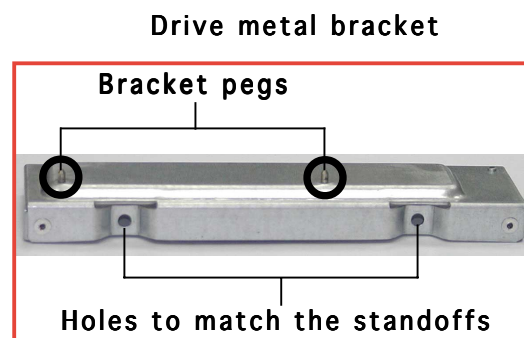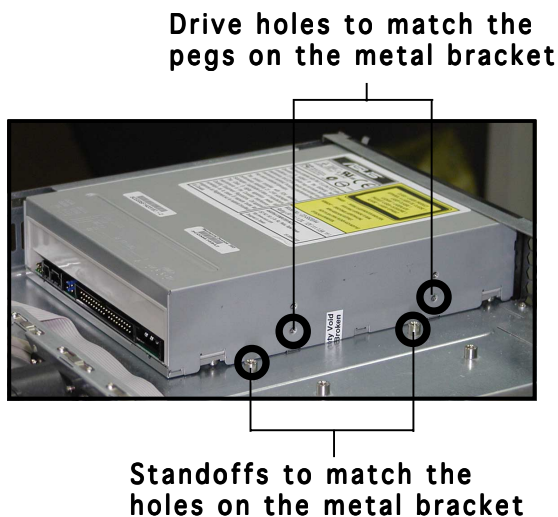
3. Secure the bracket with two screws.
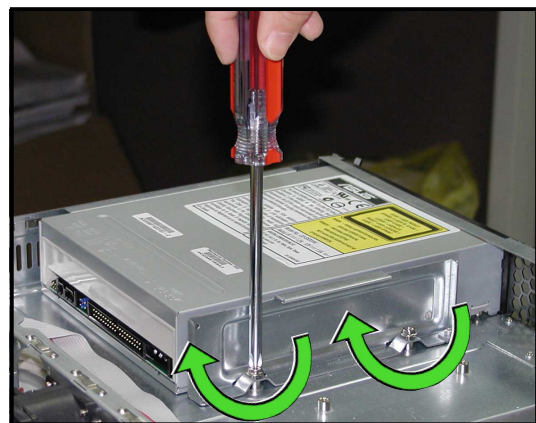
2.7.5 Motherboard

To uninstall the motherboard:

1. Disconnect all the pre-connected cables from the motherboard. See section "2.6 Cable connections" for illustration.

2. Uninstall all the devices from the motherboard including the CPU and heatsink, riser card bracket, and DDR DIMMs. Refer to the corresponding sections for instructions on removing these components.

3. Remove the riser card standoff by twisting it counterclockwise.

Riser card standoff
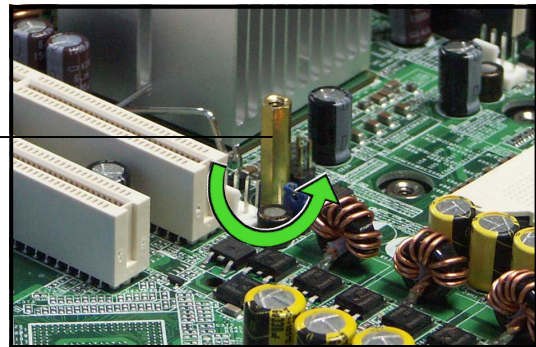
3. Use a Phillips (cross) screwdriver to remove the screws that secure the motherboard to the base of the chassis.
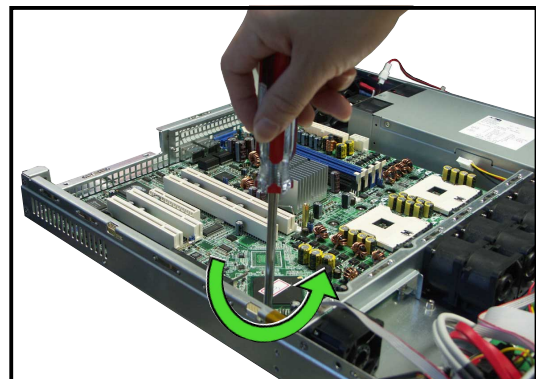
4. Carefully lift the motherboard out of the chassis as shown.
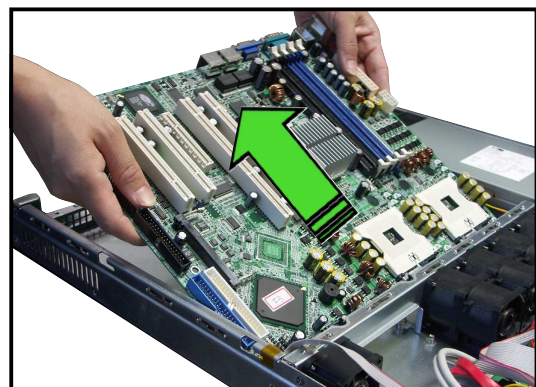
To reinstall the motherboard:

1. Firmly hold the motherboard by the sides and insert it into the chassis as shown.
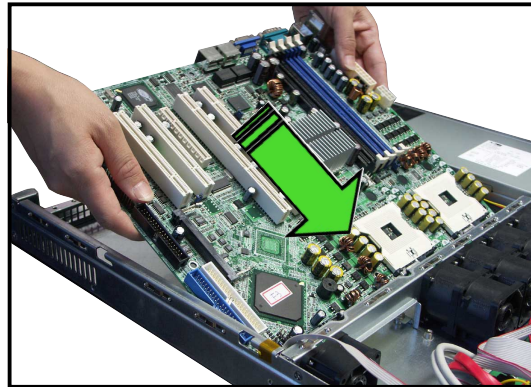
2. Carefully adjust the motherboard until the rear panel ports fit in place.
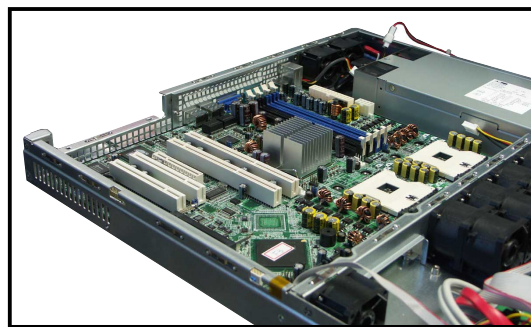
3. Use a Phillips (cross) screwdriver to secure the motherboard with seven (7) screws in the holes as shown.
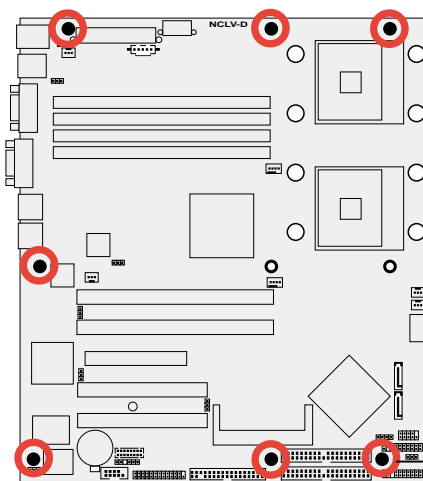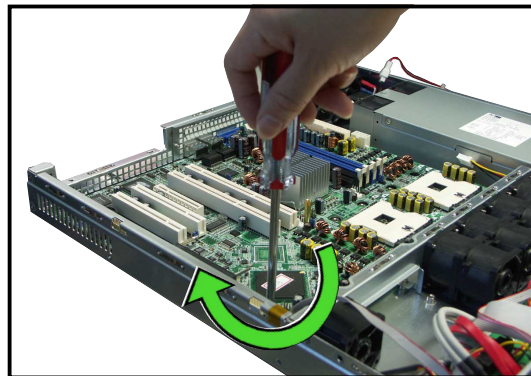
Screw hole

4. Insert the riser card standoff into the motherboard hole beside the PCI-X slot, and twist it clockwise until secure.
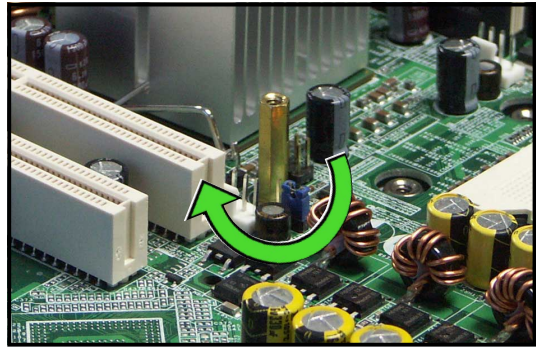
5. Reconnect all the required cables to the motherboard. See section "2.6 Cable connections" for illustration.

6. Reinstall all the devices that you have previously removed.

2.8   SATA backplane cabling

Connects the SMBus
cable from the MB

Connect the SATA
cables from the MB

(FAN1) Connects the fan cable
from CPU_FAN1 on the MB

Connect the
system fan cables

Connects the
device fan cable

Connect the SATA HDDs

Connects a 4-pin plug
from power supply
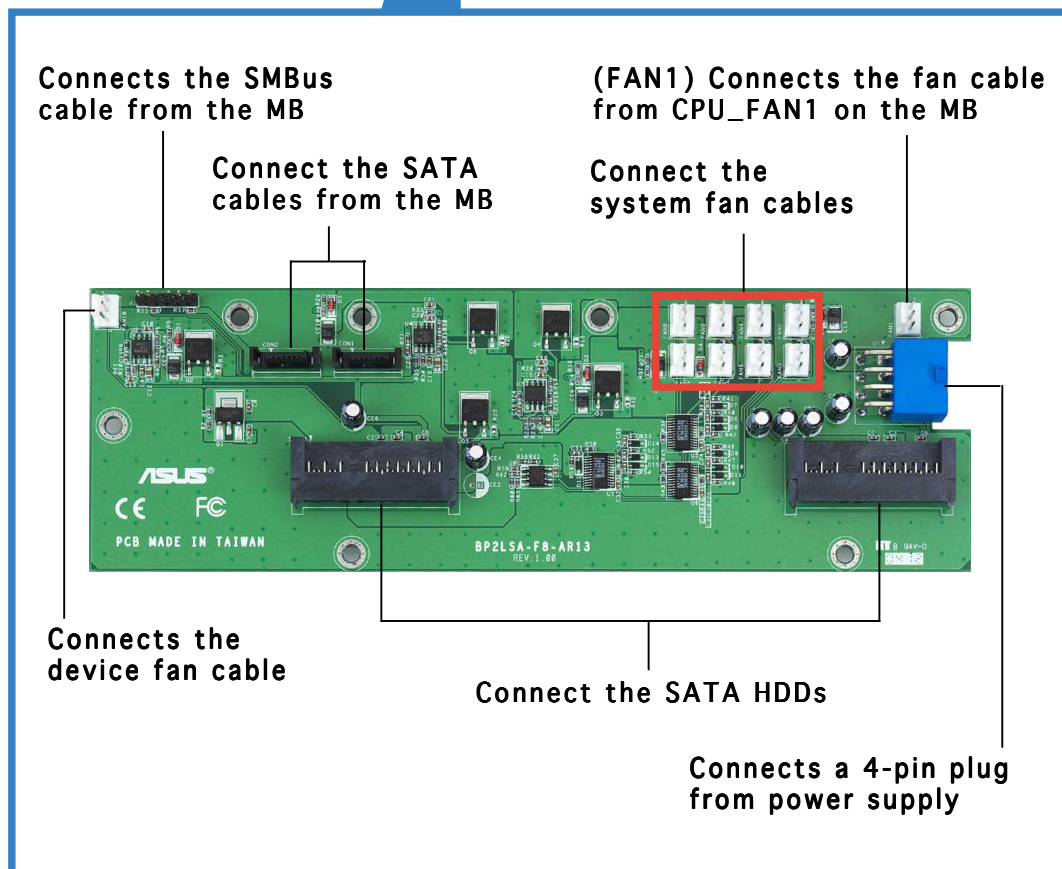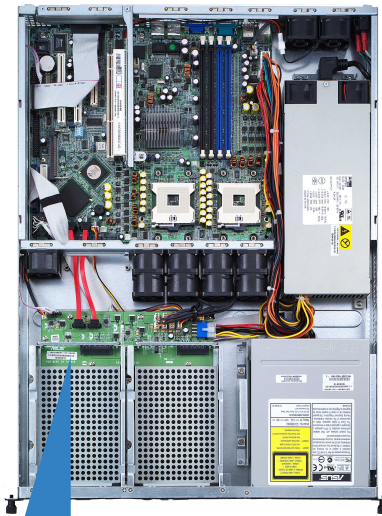
This chapter describes how to install the optional components and devices into the barebone server.

Installation options

ASUS AP1600R-E2 (BA2)

3.1 Rackmount rail kit items

If you have the rackmount rail kit, it contains two pairs of rails (one pair for each side of the barebone system), and eight (8) pairs of nut-and-bolt type screws.
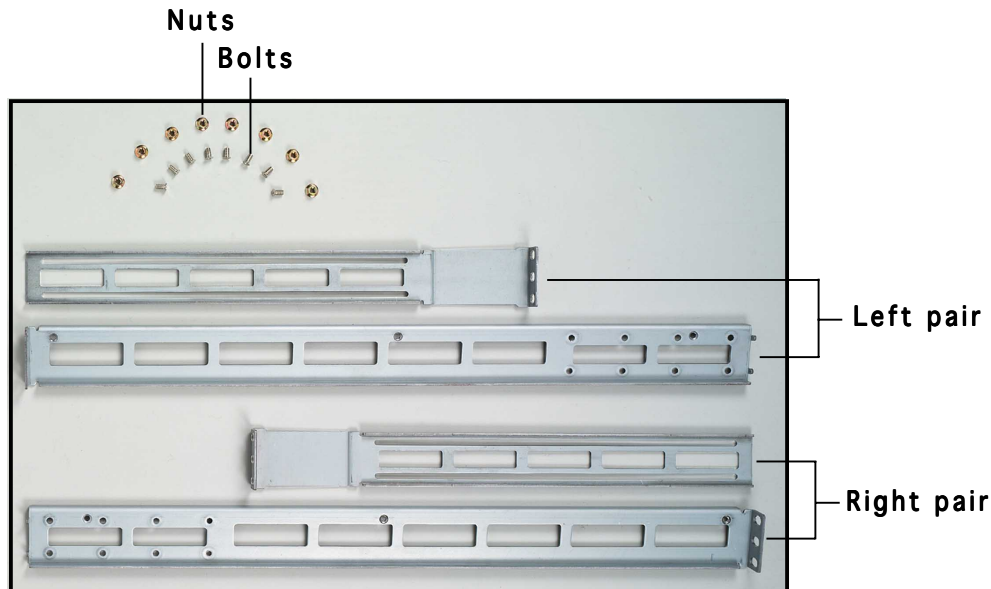
3.2 Rack rails assembly

To assemble the rack rails:

1. Determine the depth of the rack where you wish to install the system.
2. Match one long and one short rail to your desired length, and fix them together using four (4) pairs of nuts and bolts.
3. Repeat step 2 to assemble the other rail pair.
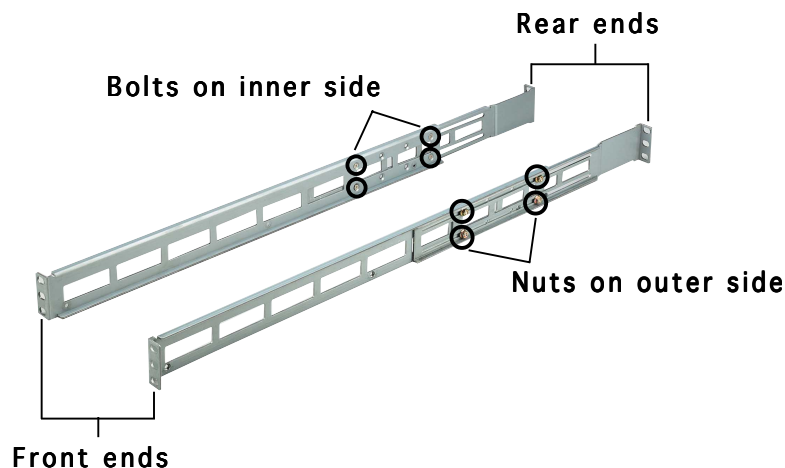
3.3 Attaching the rails to the rack

To attach the rails to the rack:

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

2. Remove the screws from the 1U space on the rack front.
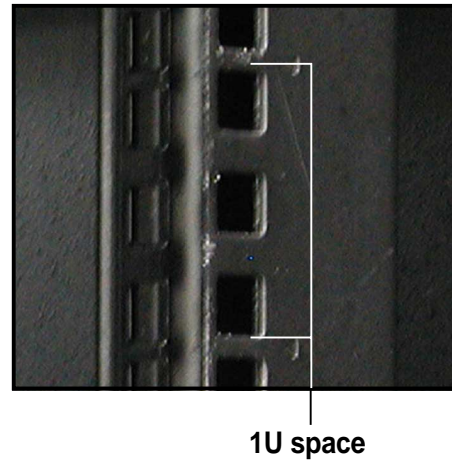
1U space

3. Align the front end holes of a rack rail pair to the 1U space.

4. Drive in two screws on the outer holes to secure the front end.
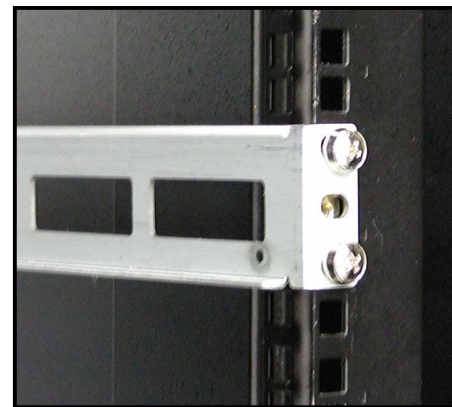
5. Find the **rear 1U space** that corresponds to the **front 1U space** where you attached the rail.

6. Remove the screws from the rear 1U space, and align the rear end holes.

7. Drive in two screws on the outer holes to secure the rear end.

8. From the rack front, find the corresponding 1U space for the second rail pair.

9. Repeat steps 2 to 7 to attach the second rail pair. When properly installed, the rack rails appear as shown.
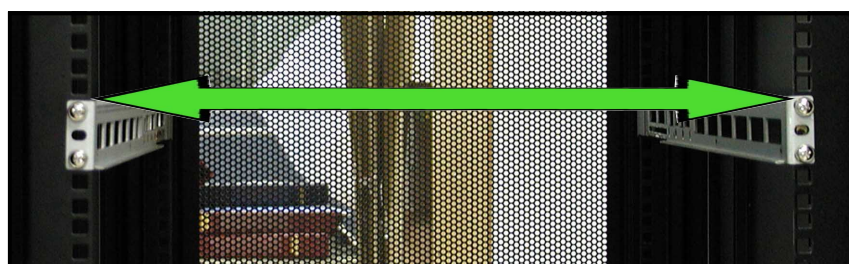
3.4   Rackmounting the server

To mount the server to the rack:

1.   Firmly hold the server on both sides and insert the rear panel side to the front end of the rack rail, then carefully push the server all the way to the back until the front panel fits the front end of the rack, and the rack screws on the server match the middle hole on the rack..
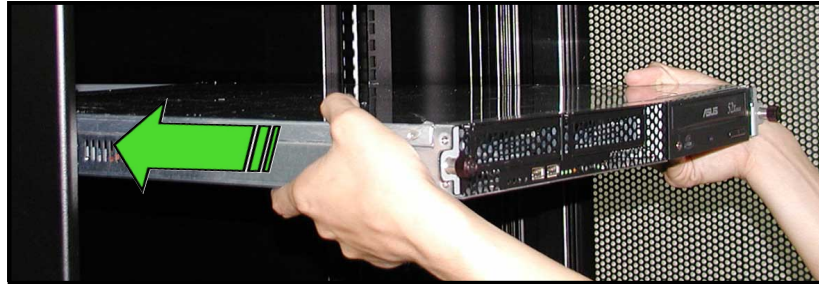
2.   Tighten the two rack screws to secure the server to the rack.

Rack screw

Chapter 4

This chapter includes the motherboard layout, and brief descriptions of the jumpers and internal connectors.

Motherboard info

4.1 Motherboard layout
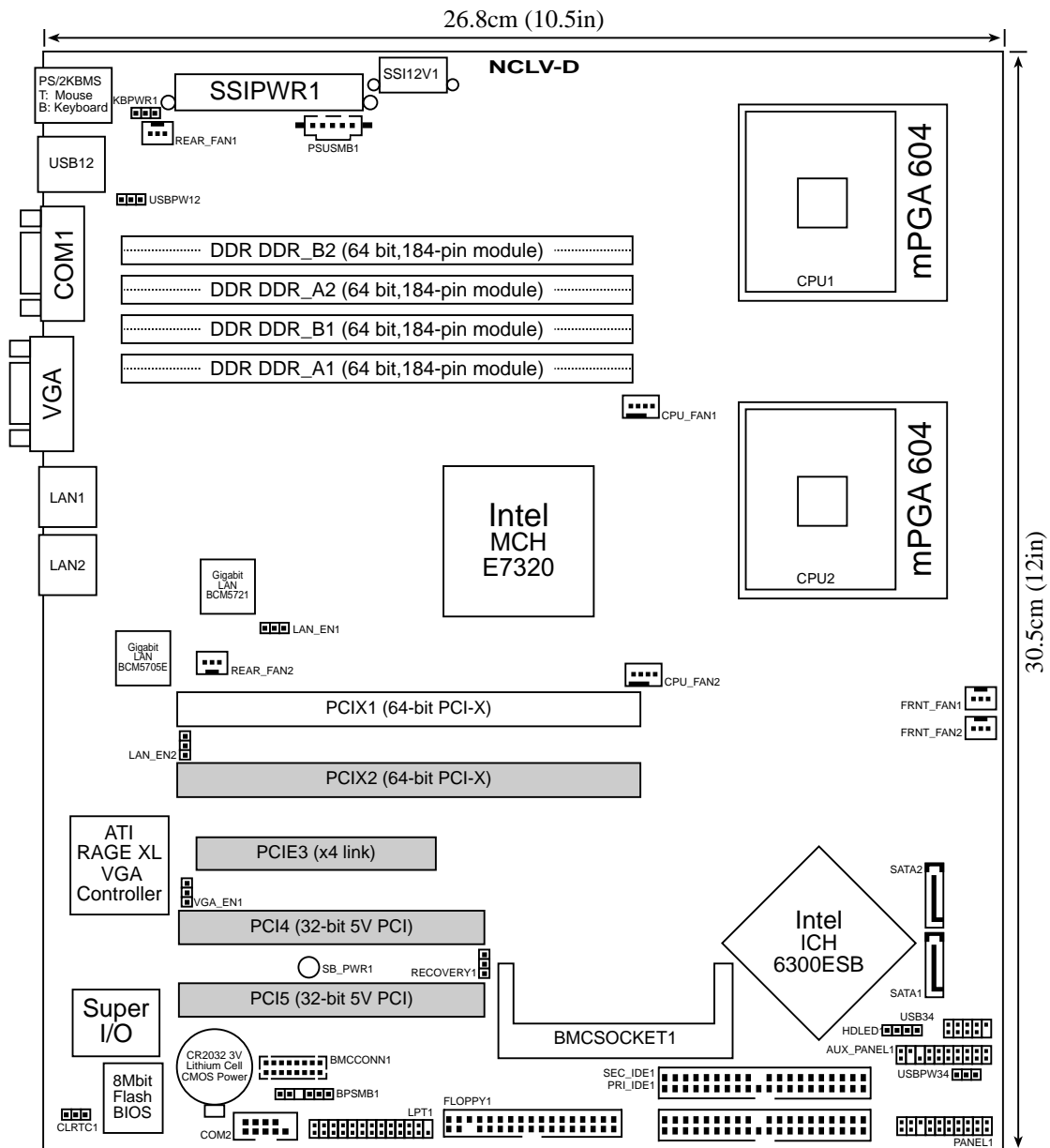
The four grayed out card slots are present on the motherboard but are not used in this system. You may install one PCI-X card via the riser card bracket.

Layout contents

4.2 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!

NCLV-D Clear RTC RAM

CLRTC1

2 1 — Normal (Default)

3 2 — Clear CMOS
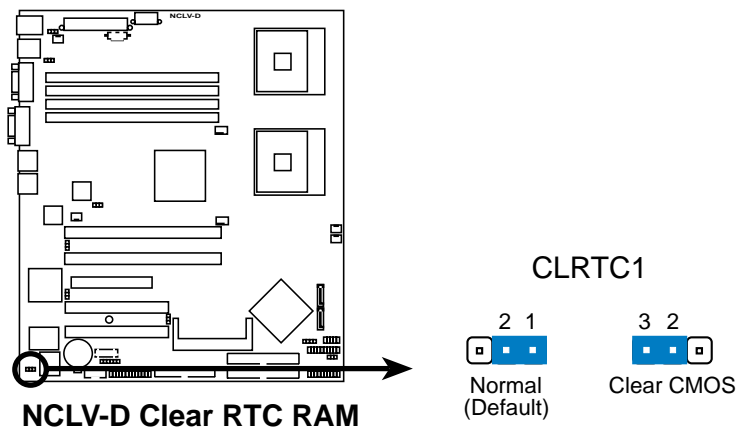
✎ You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

---

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

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

VGA_EN1

Enable (Default)

Disable

NCLV-D VGA Setting
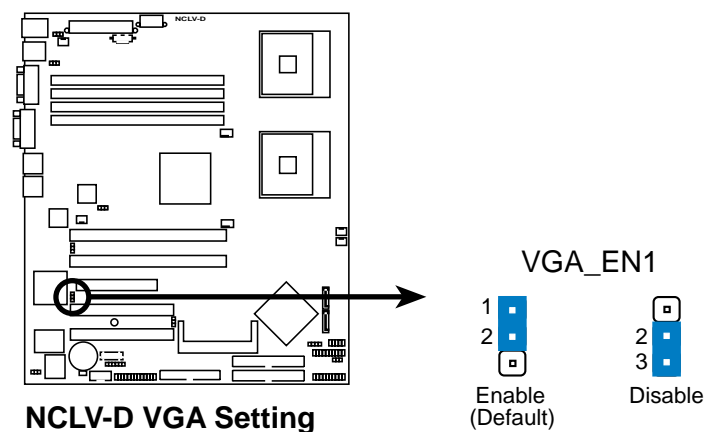
3. USB device wake-up (3-pin USBPW12, USBPW34)

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 S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).

USBPW12

+5V (Default)

+5VSB

USBPW34

+5V (Default)

+5VSB

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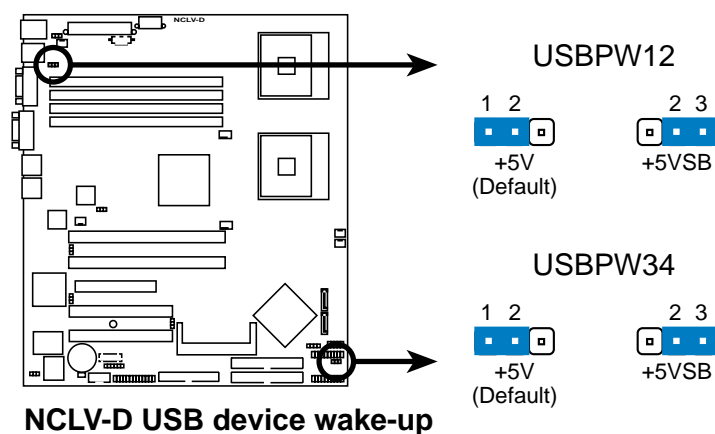
- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.

- 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.
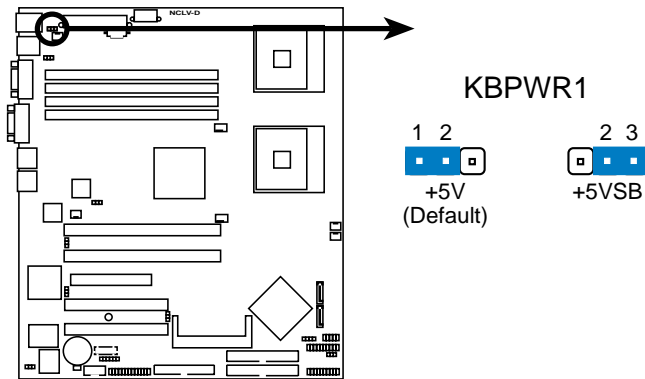
NCLV-D Keyboard power setting

5. Gigabit LAN controller setting (3-pin LAN_EN1)

These jumpers allow you to enable or disable the onboard Broadcom BCM5721 Gigabit LAN controller. Set to pins 1-2 to activate the Gigabit LAN feature.
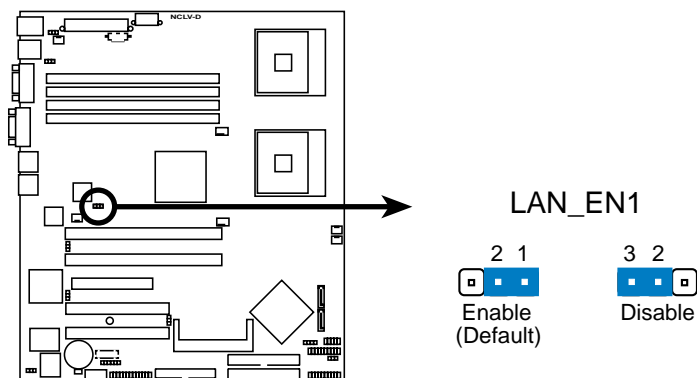
NCLV-D LAN_EN1 setting

6. Gigabit LAN controller setting (3-pin LAN_EN2)

These jumpers allow you to enable or disable the onboard Broadcom BCM5705E Gigabit LAN controller. Set to pins 1-2 to activate the Gigabit LAN feature.

NCLV-D LAN_EN2 setting

LAN_EN2

Enable
(Default)

Disable
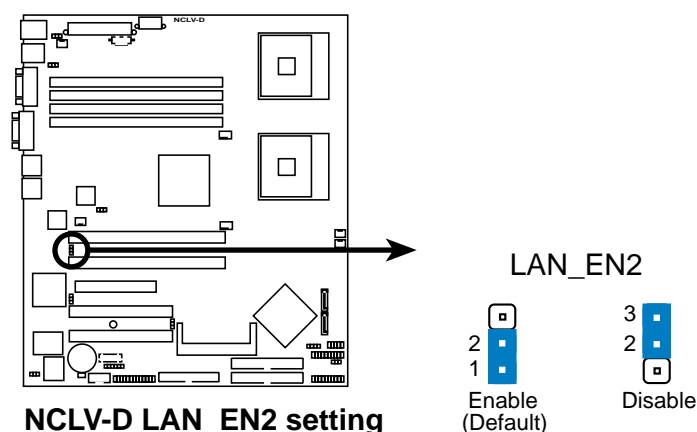
7. BIOS Recovery (3-pin RECOVERY1)

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

To recover the BIOS:

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

2. Move the jumper cap from pins 1-2 (default) to pins 2-3.

3. Insert a floppy disk with the original or updated BIOS file.

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

5. The system searches for the BIOS file in the floppy then reflashes the BIOS.

6. When finished, shut down your computer.

7. Replace the jumper cap from pins 2-3 to pins 1-2.

8. Reboot your computer.

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

NCLV-D BIOS recovery setting

RECOVERY1

Normal
(Default)

BIOS Recovery
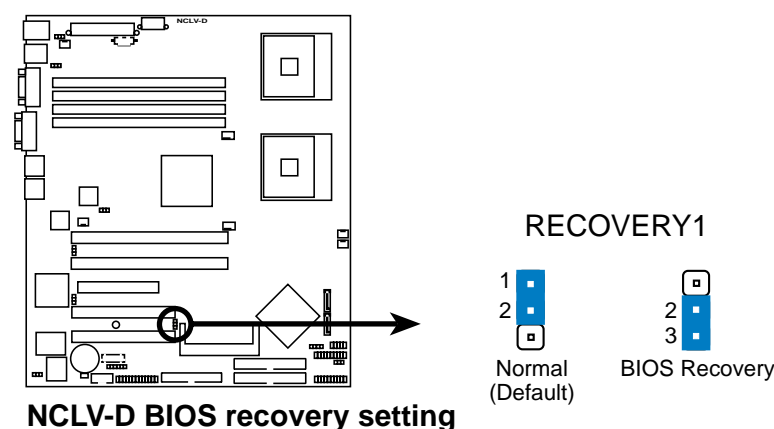
4.3   Connectors

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

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

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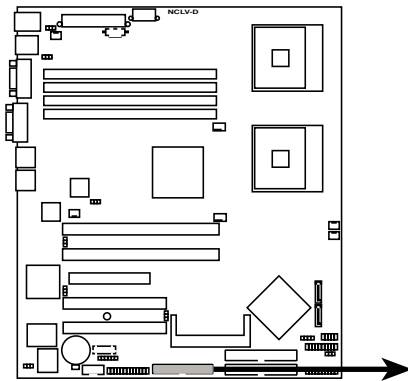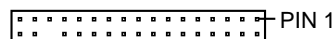
FLOPPY

PIN 1

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

NCLV-D Floppy disk drive connector

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

These connectors are for Ultra DMA 100/66 signal cables. The Ultra DMA 100/66 signal cable has two connectors: a blue connector for the primary IDE connector on the motherboard and a black connector for an Ultra DMA 100/66 IDE slave device (optical drive/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.
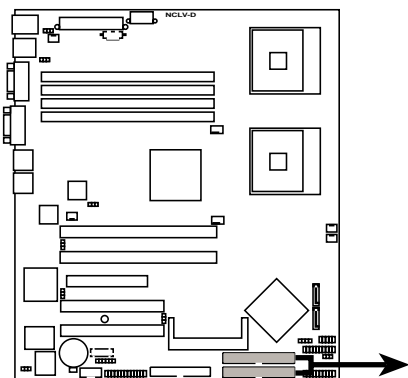
SEC_IDE1

PIN 1

PRI_IDE1

PIN 1

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

NCLV-D IDE connectors

3. 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 Adaptec® HostRAID Technology through the onboard Intel® 6300ESB 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]. See section "4.3.6 IDE Configuration" on page 4-15 for details.

NCLV-D SATA connectors

SATA2

GND
RSATA_TXP2
RSATA_TXN2
GND
RSATA_RXP2
RSATA_RXN2
GND

SATA1

GND
RSATA_TXP1
RSATA_TXN1
GND
RSATA_RXP1
RSATA_RXN1
GND
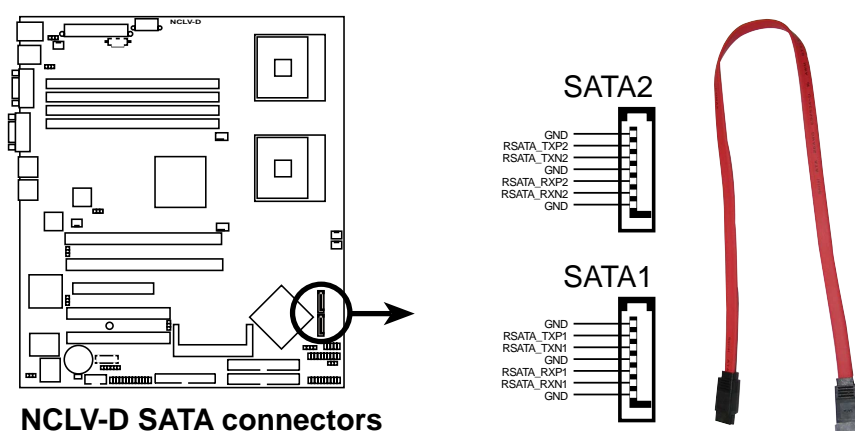
Important notes on Serial ATA

- 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

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

This connector supplies power to the hard disk activity LED. The read or write activities of any device connected to the primary/secondary IDE connectors or the SATA connectors cause this LED to light up.
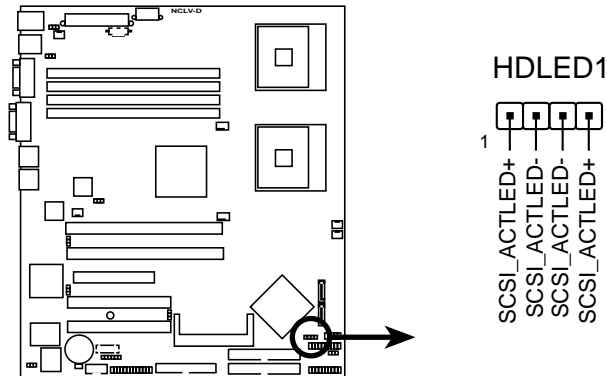
NCLV-D
SCSI/SATA card activity LED connector

5. System fan connectors (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!
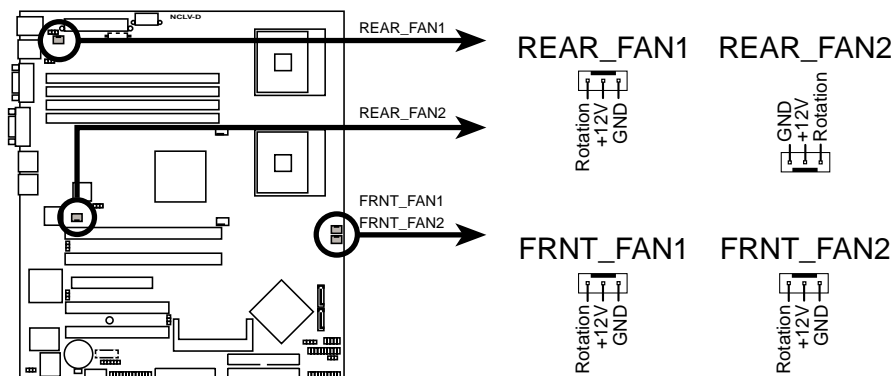
NCLV-D Fan connectors

6. 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. The USB connector complies with USB 2.0 specification that supports up to 480 Mbps connection speed.

NCLV-D USB 2.0 connector
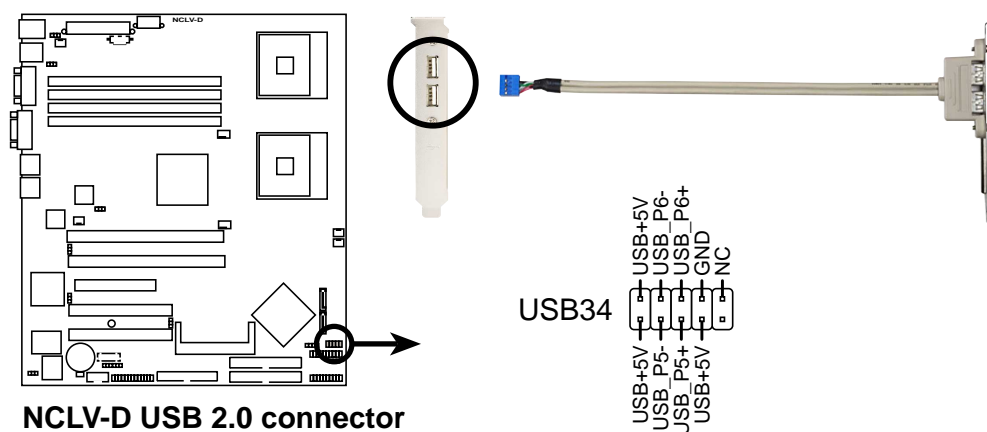
7. Serial port connector (10-1 pin COM2)

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

NCLV-D
Serial port2 (COM2) connector
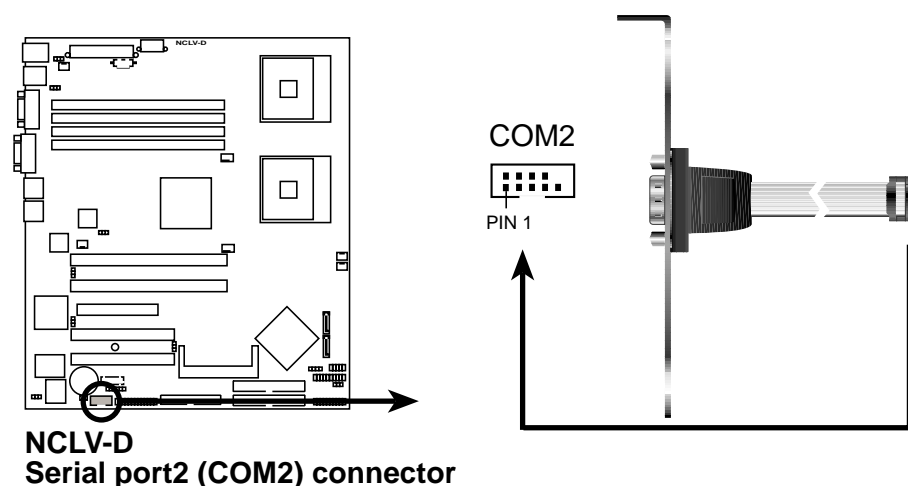
8. SSI power connectors (24-pin EATXPWR1, 8-pin SSI+12V1/+12V2)

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 450 W 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.

NCLV-D Power connectors

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

1
+3 Volts
-12 Volts
Ground
PSON#
Ground
Ground
Ground
-5 Volts
+5 Volts
+5 Volts
+5 Volts
Ground

8-pin

GND
GND
GND
GND

+12V1 CPU
+12V1 CPU
+12V2 CPU
+12V2 CPU

For Power Supply with 20-pin Power Connector
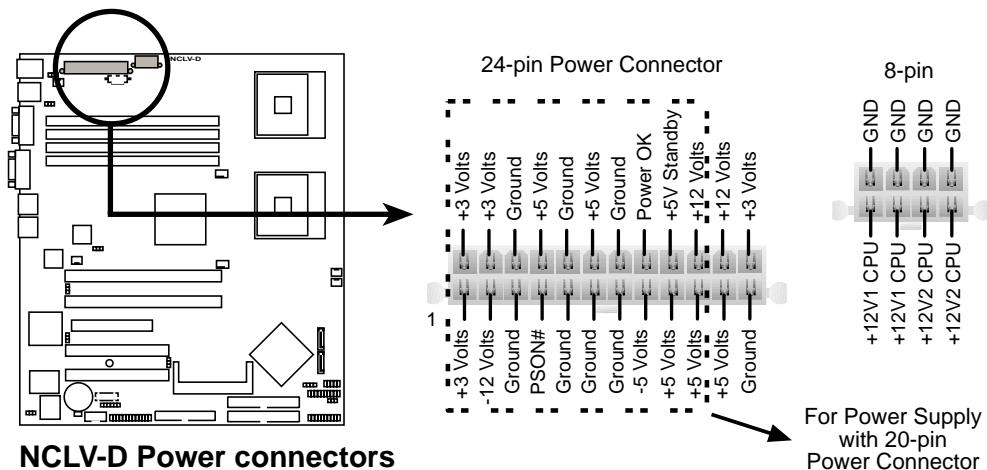
9. Backplane SMBus connector (6-1 pin BPSMB1)

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.

NCLV-D SMBus connector

BPSMB1

1

NC
I2C_6_CLK#
GND
I2C_6_DATA#
+5V
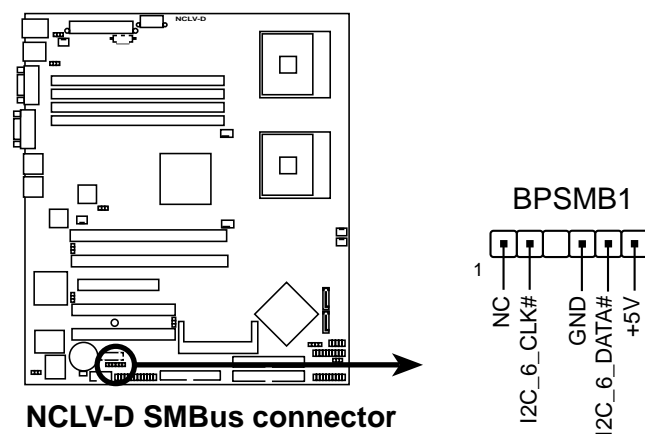
10. Power Supply SMBus connector (6-1 pin PSUSMB1)

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.

NCLV-D Power supply SMBus connector

PSU_I2CCLK
PSU_I2CDATA
NC
GND
+3.3V Remote Sense

PSUSMB1
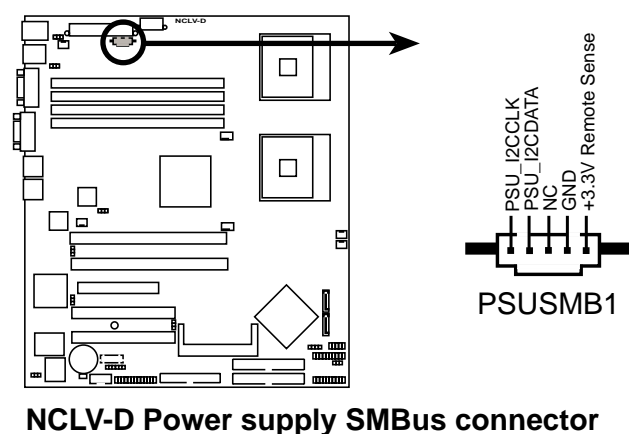
11. Parallel port connector (26-1 pin LPT1)

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

LPT1

Pin 1

AFD#
ERROR#
PINIT#
SLIN#
GND
GND
GND
GND
GND
GND
GND
GND
GND

STB#
SPD0
SPD1
SPD2
SPD3
SPD4
SPD5
SPD6
SPD7
ACK#
BUSY
PE
SLCT

NCLV-D Parallel port connector
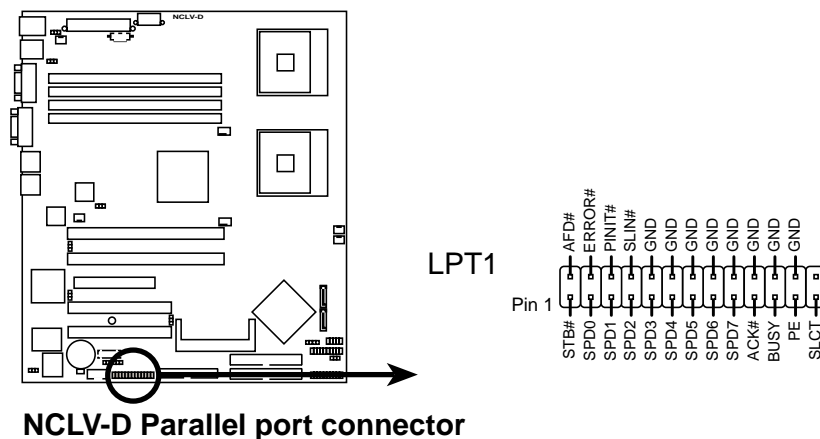
12. BMC connector (16-pin BMCCONN1)

This connector is for an ASUS server management card.

BMCCONN1

+5VSB
+5VSB
BMC SMBCLK
I2CCLK1
PSON#
BMC_RST#
PWROK
PSONEN#

+5VSB
+5VSB
BMC SMBDATA
I2CDATA1
FP_PWRBTN#
BMC_PRESENT#
BMC_SMI#
GND

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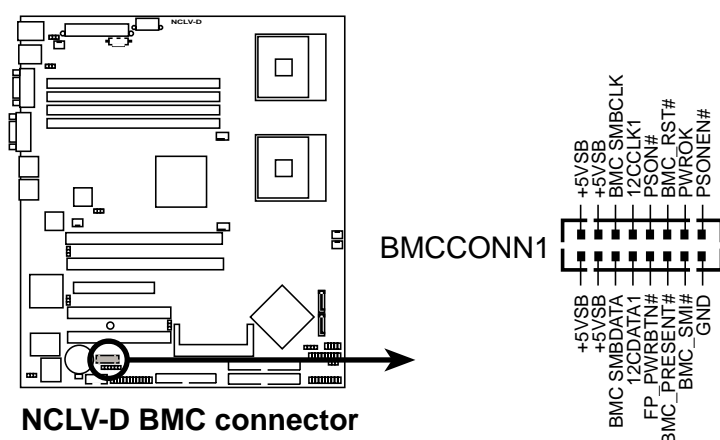
13. System panel auxiliary connector (20-pin AUX_PANEL1)

This connector supports several server system functions.

NCLV-D Auxiliary panel connector
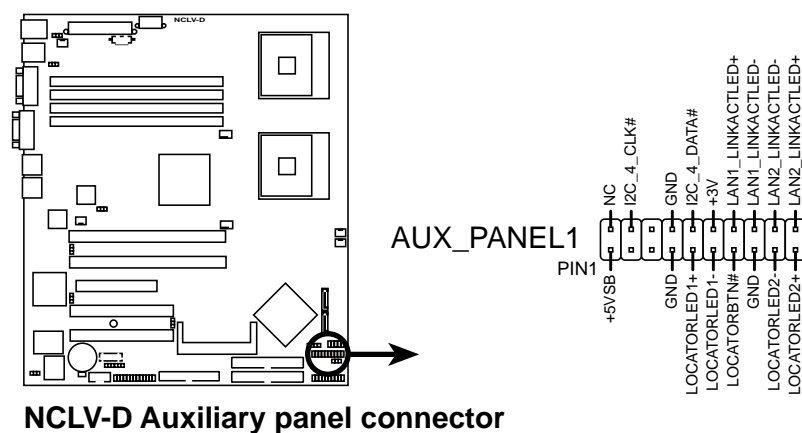
- **LAN1 link activity LED (2-pin LAN1_LINKACTLED)**
  This 2-pin connector is for the LAN1 Activity LED. Connect the LAN1 Activity LED cable to this connector. This LED blinks during a network activity and is always lit when linked.

- **LAN2 link activity LED (2-pin LAN2_LINKACTLED)**
  This 2-pin connector is for the LAN2 Activity LED. Connect the LAN2 Activity LED cable to this connector. This LED blinks during a network activity and lights up when linked.

- **Locator LED 1 (2-pin LOCATORLED1)**
  This 2-pin connector is for the Locator LED 1. Connect the Locator LED 1 cable to this connector. This LED lights up when the Locator button is pressed.

- **Locator LED 2 (2-pin LOCATORLED2)**
  This 2-pin connector is for the Locator LED 2. Connect the Locator LED 2 cable to this connector. This LED lights up when the Locator button is pressed.

- **Locator Button/Switch (2-pin LOCATORBTN)**
  This connector is for the locator button. This button queries the state of the system locator.

- **Front Panel SMBus (6-1 pin)**
  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.

14. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.

PANEL1

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

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

NCLV-D System panel connector
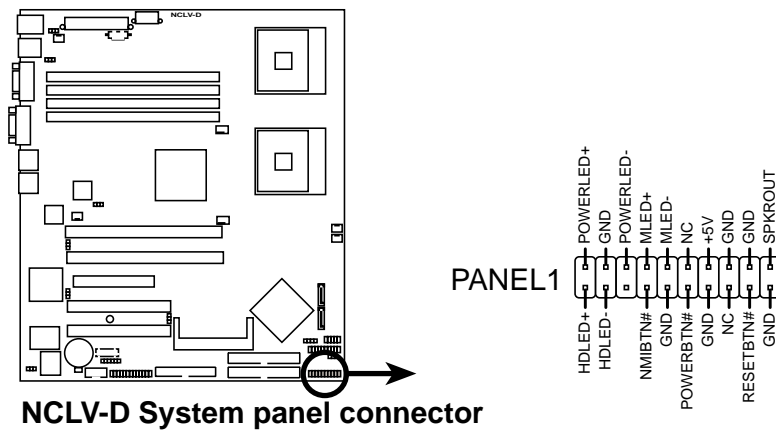
> The system panel connector is color-coded for easy connection. Refer to the connector descriptions on the next page for details.

- **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.

Chapter 5

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

BIOS setup

5.1 Managing and updating your BIOS

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

1. **ASUS AFUDOS** (Updates the BIOS in DOS mode using a bootable floppy disk.)
2. **ASUS CrashFree BIOS 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

> This barebone system does not include a floppy disk drive. Connect an external floppy disk drive (USB interface) to any of the USB 2.0 ports on the front or rear panel if you need to use a floppy disk.

To create 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**.

Windows® 2000 environment

To create a set of boot disks for Windows® 2000:

a. Insert a formatted, high density 1.44 MB floppy disk into the drive.

b. Insert the Windows® 2000 CD to the optical drive.

c. Click **Start**, then select **Run**.

d. In the **Open** field, type `D:\bootdisk\makeboot a:`
    assuming that D is your optical drive letter.

e. Press <Enter>, then follow screen instructions to continue.

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

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 /iNCLVD.ROM
```

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

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

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

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

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

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

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

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

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

    Please restart your computer

A:\>
```

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 to **NCLVD.ROM**.

Recovering the BIOS from a floppy disk

This barebone system does not include a floppy disk drive. Connect an external floppy disk drive (USB interface) to any of the USB 2.0 ports on the front or rear panel if you need to use 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 "NCLVD.ROM". Completed.
Start flashing...
```

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

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

Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

1. Remove any floppy disk from the floppy disk drive, then turn on the system.

2. Insert the support CD to the optical drive.

3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

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

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

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

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

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

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

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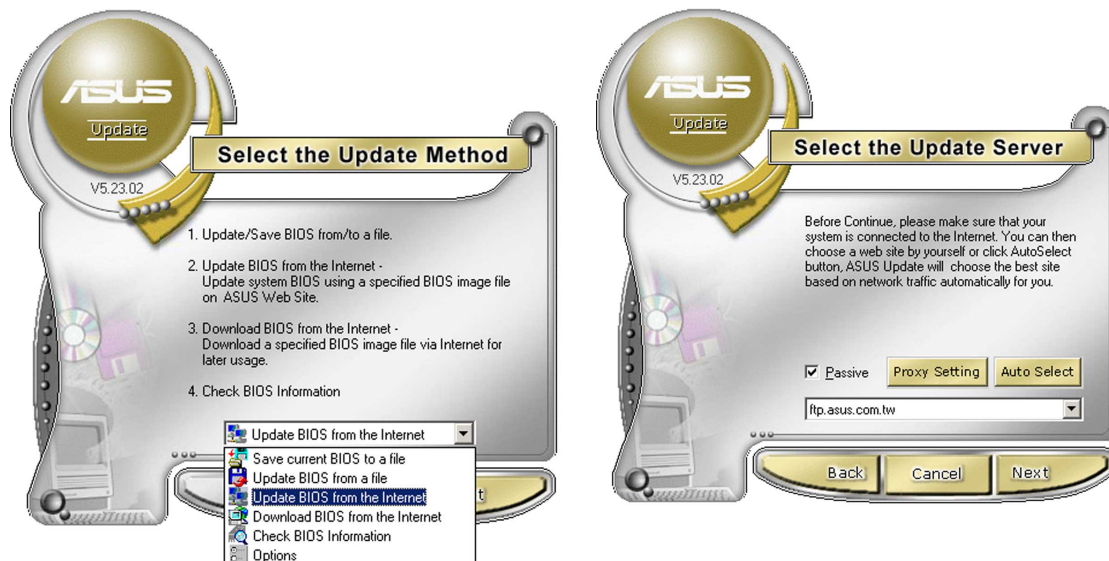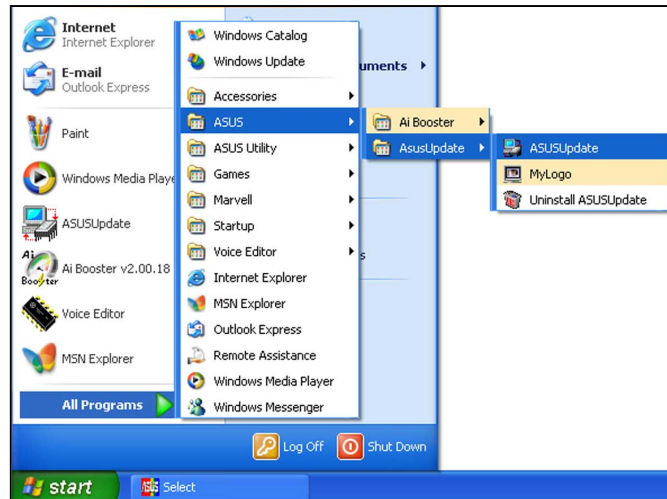
2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.

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.
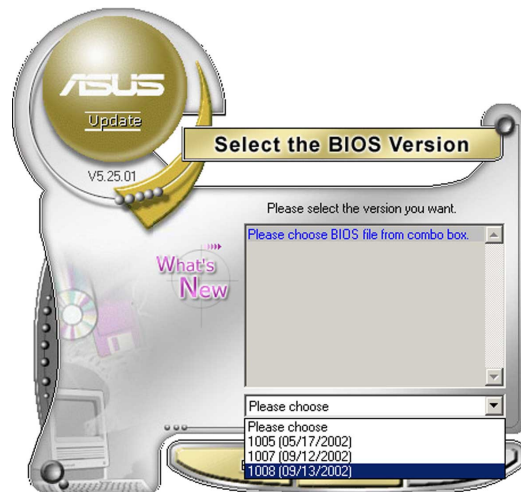
Updating the BIOS through a BIOS file

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**.
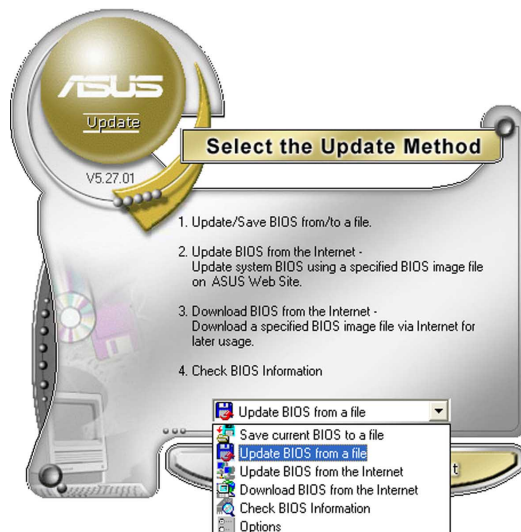
3. Locate the BIOS file from the **Open** window, then click **Save**.

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    Power    Boot    Exit

    System Time              [11:51:19]           Use [ENTER], [TAB]
    System Date             [Thu 05/07/2004]      or [SHIFT-TAB] to
    Legacy Diskette A       [1.44M, 3.5 in]       select a field.

 ▶  Primary IDE Master   :  [ST320413A]           Use [+] or [-] to
 ▶  Primary IDE Slave    :  [ASUS CD-S520/A]      configure system time.
 ▶  Third IDE Master     :  [Not Detected]
 ▶  Third IDE Slave      :  [Not Detected]
 ▶  Fourth IDE Master    :  [Not Detected]
 ▶  Fourth IDE Slave     :  [Not Detected]
 ▶  IDE Configuration                             ←      Select Screen
                                                  ↑↓     Select Item
 ▶  System Information                            +-     Change Field
                                                  Tab    Select Field
                                                  F1     General Help
                                                  F10    Save and Exit
                                                  ESC    Exit

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```

Sub-menu items   Navigation keys

5.2.2 Menu bar

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

Main   For changing the basic system configuration

Advanced   For changing the advanced system settings

Power   For changing the advanced power management (APM)
                configuration

Boot   For changing the system boot configuration

Exit   For selecting the exit options and loading default
                settings

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

5.2.3 Navigation keys

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

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

5.2.4 Menu items

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

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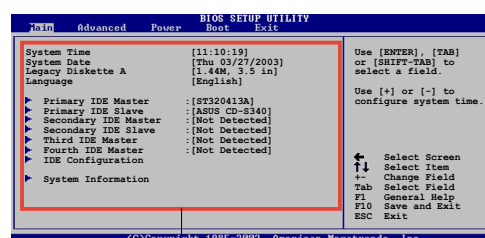
Main menu items

5.2.5 Sub-menu items

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

5.2.6 Configuration fields

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

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to "5.2.7 Pop-up window."

5.2.7 Pop-up window

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

5.2.8 Scroll bar

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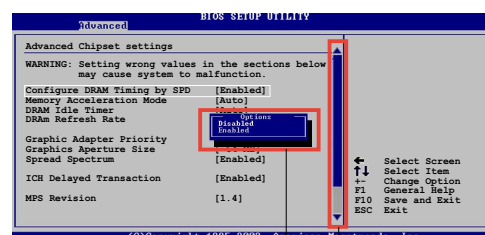
Pop-up window

Scroll bar

5.2.9 General help

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

5.3   Main menu

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

🖋 This is a NOTE.Refer to section "5.2.1 BIOS menu screen" for information on the menu screen items and how to navigate through them.

```
                         BIOS SETUP UTILITY
   Main    Advanced    Power    Boot    Exit

   System Time              [11:51:19]              Use [ENTER], [TAB]
   System Date              [Thu 05/07/2004]        or [SHIFT-TAB] to
   Legacy Diskette A        [1.44M, 3.5 in]         select a field.

 ▶ Primary IDE Master    :  [ST320413A]             Use [+] or [-] to
 ▶ Primary IDE Slave     :  [ASUS CD-S520/A]        configure system time.
 ▶ Third IDE Master      :  [Not Detected]
 ▶ Third IDE Slave       :  [Not Detected]
 ▶ Fourth IDE Master     :  [Not Detected]
 ▶ Fourth IDE Slave      :  [Not Detected]
 ▶ IDE Configuration                                ←     Select Screen
                                                    ↑↓    Select Item
 ▶ System Information                               +-    Change Field
                                                    Tab   Select Field
                                                    F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit

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```

5.3.1   System Time [xx:xx:xxxx]

Allows you to set the system time.

5.3.2   System Date [Day xx/xx/xxxx]

Allows you to set the system date.

5.3.3   Legacy Diskette A [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 Primary, Third and Fourth IDE Master/Slave

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

```
                            BIOS SETUP UTILITY
  Main

  Primary IDE Master                                  Select the type
                                                      of device connected
  Device         : Hard Disk                          to the system.
  Vendor         : ST320413A
  Size           : 20.0GB
  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]

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]

5.3.5   IDE Configuration

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

```
                          BIOS SETUP UTILITY
 Main

 IDE Configuration                                When in AHCI/RAID
 Onboard IDE Operate Mode      [Enhanced Mode]    mode SATA
   Enhanced Mode Support On    [S-ATA]            controller is
     Configure S-ATA as RAID   [No]               forced to Native
 IDE Detect Time Out (Sec)     [35]               mode.
```
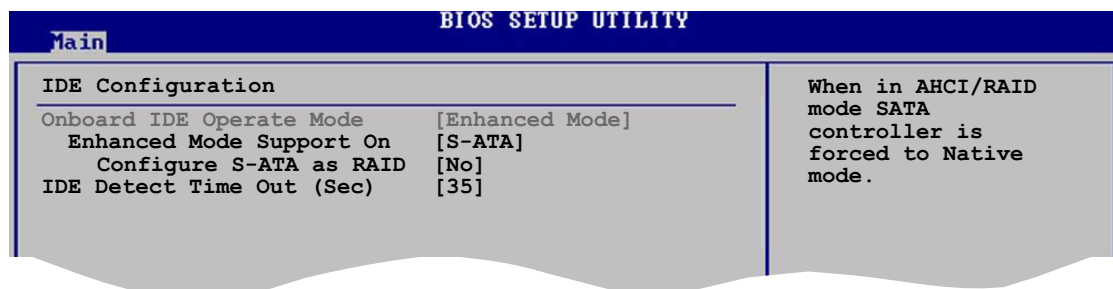
Onboard IDE Operate Mode [Enhanced Mode]

Allows selection of the IDE operation mode depending on the installed
operating system (OS). Set to [Enhanced Mode] if you are using native OS
including Windows® 2000/XP. Configuration options: [Compatible Mode]
[Enhanced Mode]

Enhanced Mode Support On [S-ATA]
Allows you to use native OS on Serial ATA and Parallel ATA ports. It is
recommend that you do not change the default setting for better OS
compatibility. In this setting, you may use legacy OS on the Parallel
ATA ports only if you do not install any Serial ATA device.

Configure S-ATA as RAID [No]
Allows you to set the Serial ATA devices connected to the Serial ATA
connectors as RAID sets. Configuration options: [No] [Yes]

The following item appears only when you set the **Onboard IDE Operate Mode** to [Compatible Mode]

Compatible Mode Option [Primary P-ATA+S-ATA]
Allows you to select the combined mode for the installed IDE and SATA devices.

The Secondary **P-ATA+S-ATA** and **P-ATA Ports Only** options are for advanced users only. If you set to any of these options and encountered problems, revert to the default setting **Primary P-ATA+S-ATA**. Configuration options: [Primary P-ATA+S-ATA] [Secondary P-ATA+S-ATA] [P-ATA Ports Only]

IDE Detect Time Out [35]

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

5.3.6   System Information

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

```
                        BIOS SETUP UTILITY
  Main

    AMIBIOS
    Version     : 08.00.10
    Build Date  : 07/07/04

    Processor
    Type        : Intel(R) Xeon (TM) CPU 2.80GHz
    Speed       : 2800 MHz
    Count       : 2

    System Memory
    Size        : 512MB

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

            (C)Copyright 1985-2002, American Megatrends, Inc.
```
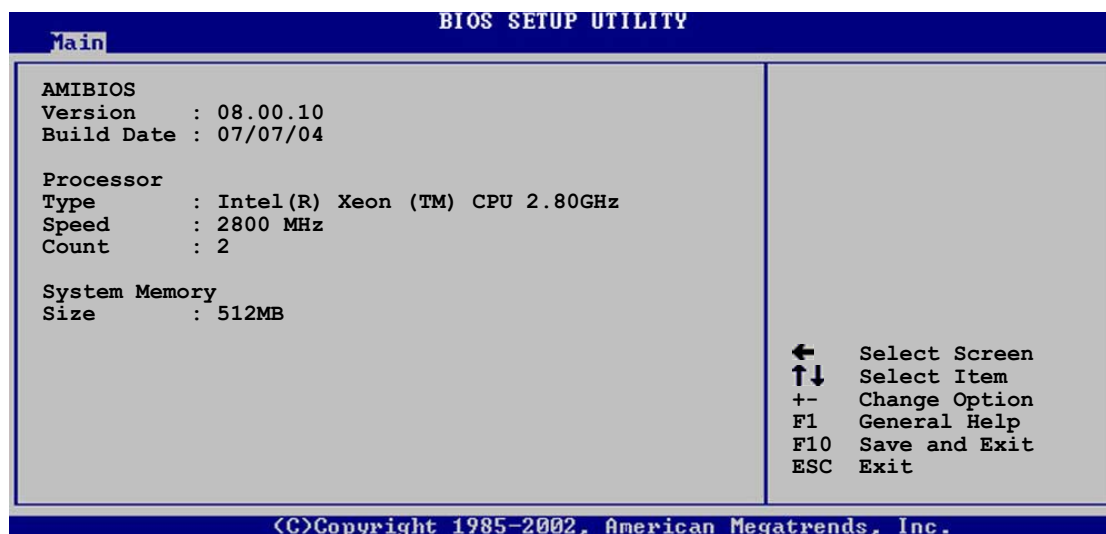
AMI BIOS

Displays the auto-detected BIOS information

Processor

Displays the auto-detected CPU specification

System Memory

Displays the auto-detected system memory

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

▶  USB Configuration                        Configure the USB
▶  MPS Configuration                        support.
▶  Remote Access Application

▶  CPU Configuration
▶  Chipset
▶  Onboard Devices Configuration
▶  PCI PnP




              (C)Copyright 1985-2002, American Megatrends, Inc.
```
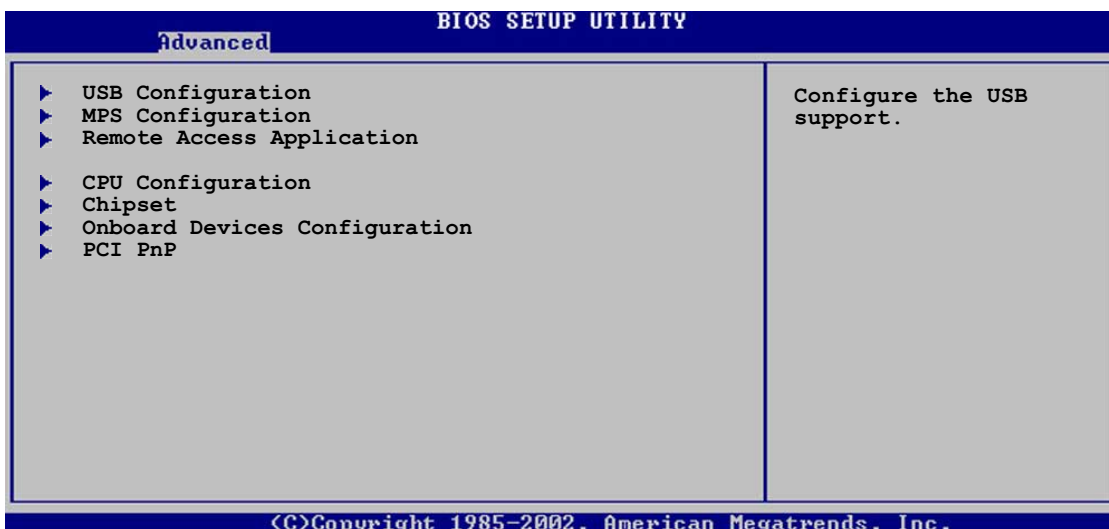
5.4.1 USB Configuration

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
Module Version - 2.23.2-9.4                 controllers.

USB Devices Enabled: None

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

✏️ 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 [Enabled]

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

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 USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.
Configuration options: [Disabled] [Enabled] [Auto]

USB 2.0 Controller [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: [HiSpeed] [FullSpeed]

5.4.2   MPS Configuration

The items in this menu allows you to configure the Multi-Processor Table. Select an item then press <Enter> to display the configuration options.

```
                          BIOS SETUP UTILITY
        Advanced

     MPS Configuration                              Select MPS Revision.

     MPS Revision              [1.4]
```
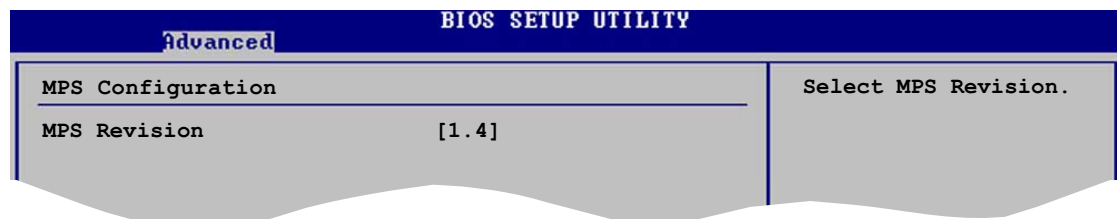
MPS Revision [1.4]

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

5.4.3 Remote Access Configuration

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

```
                        BIOS SETUP UTILITY
      Advanced

 Configure Remote Access type and parameters          Select Remote Access
                                                      type.
 Remote Access               [Enabled]

 Serial port number          [COM1]
 Serial Port Mode            [115200 8,n,1]
 Flow Control                [None]
 Redirection After BIOS POST [Always]

 Terminal Type               [ANSI]
 VT-UTFB Combo Key Support    [Disabled]
```
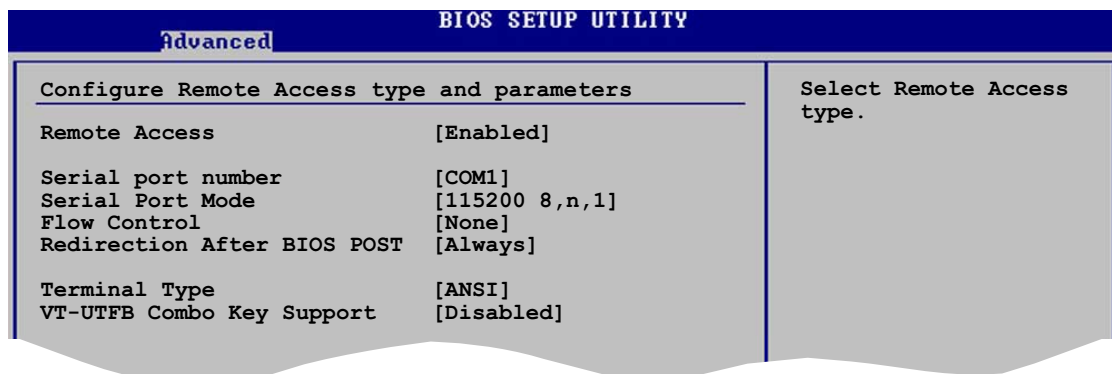
Remote Access [Enabled]

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

Serial port number [COM1]

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

Serial Port Mode [115200 8,n,1]

Sets the Serial port mode.
Configuration options: [115200 8,n,1] [57600 8,n,1] [38400 8,n,1] [19200 8,n,1] [09600 8,n,1]

Flow Control [None]

Allows you to 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]

5.4.4 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                    Sets the ratio
                                                       between CPU Core
    Manufacturer: Intel                                Clock and the FSB
    Brand String: Intel(R) Xeon (TM) CPU 2.80GHz       Frequency.
    Frequency   : 2800 MHz                             NOTE: If an invalid
    FSB Speed   : 800 MHz                              ratio is set in CMOS
                                                       then actual and
    Ratio Status: Unlocked                             setpoint values may
                                                       differ.
    Ratio Actual Value : 14
      Ratio CMOS Setting:         [  8]
    Hyper Threading Technology    [Enabled]
    Max CPUID Value Limit:        [Disabled]
                                                    ←    Select Screen
                                                    ↑↓   Select Item
                                                    +-   Change Option
                                                    F1   General Help
                                                    F10  Save and Exit
                                                    ESC  Exit

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```

Ratio CMOS Setting [8]

Sets the ratio between the CPU core clock and the Front Side Bus frequency. The BIOS auto-detects the default value of this item. Use the

> 🖉 You can only adjust the **Ratio CMOS** settings if you installed an unlocked CPU. Refer to the CPU documentation for details.

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]

5.4.5 Chipset

The Chipset 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 PCI LAN Boot ROM      [Enabled]
```
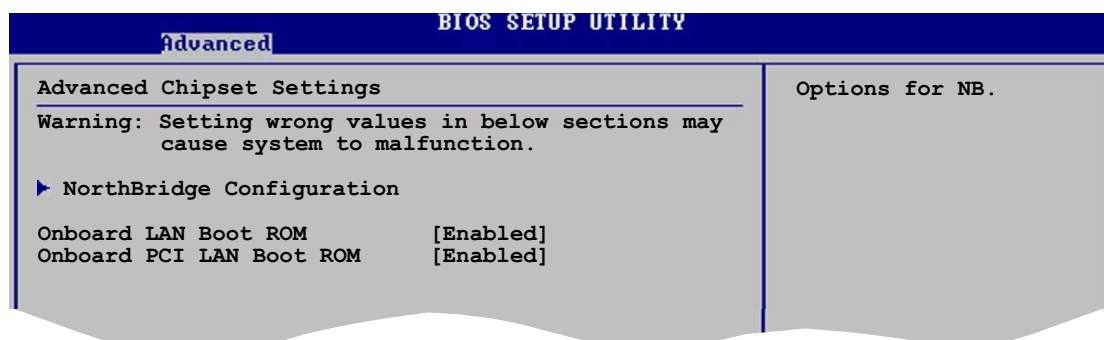
Onboard LAN Boot ROM [Enabled]

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

Onboard PCI LAN Boot ROM [Enabled]

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

NorthBridge Configuration

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

```
                        BIOS SETUP UTILITY
          Advanced

    NorthBridge Chipset Configuration            ENABLE: Allow
                                                 remapping of
    DIMM Speed                DDR 333            overlapped PCI memory
    Memory Remap Feature      [Enabled]          above the total
                                                 physical memory.

                                                 DISABLE: Do not allow
                                                 remapping of memory.
```
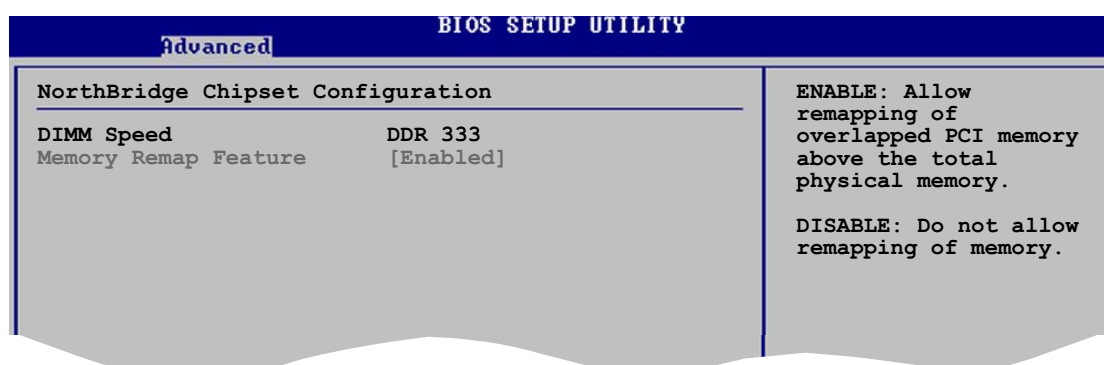
DIMM Speed

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]

5.4.6 Onboard Devices Configuration

```
                    BIOS SETUP UTILITY
      Advanced

 Configure Win627EHF Super IO Chipset          Allows BIOS to Select
                                               Serial Port1 Base
 Serial Port1 Address       [3F8/IRQ4]         Addresses.
 Serial Port2 Address       [2F8/IRQ3]
 Parallel Port Address      [378]
 Parallel Port Mode         [Normal]
   Parallel Port IRQ        [IRQ7]
```
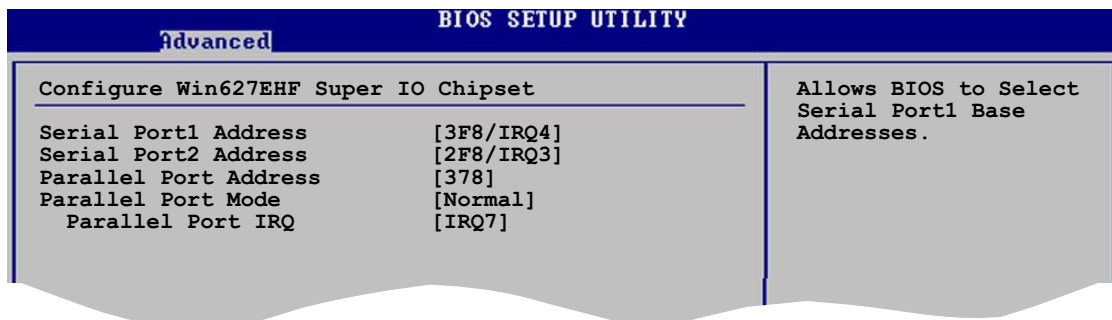
Serial Port1 Address [3F8/IRQ4]

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

Serial Port1 Address [2F8/IRQ3]

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

Parallel Port Address [378]

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

Parallel Port Mode [ECP]

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

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]

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]

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

5.4.7 PCI PnP

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

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

```
                        BIOS SETUP UTILITY
    Advanced

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

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```

Plug And Play O/S [No]

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

PCI Latency Timer [64]

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

Allocate IRQ to PCI VGA [Yes]

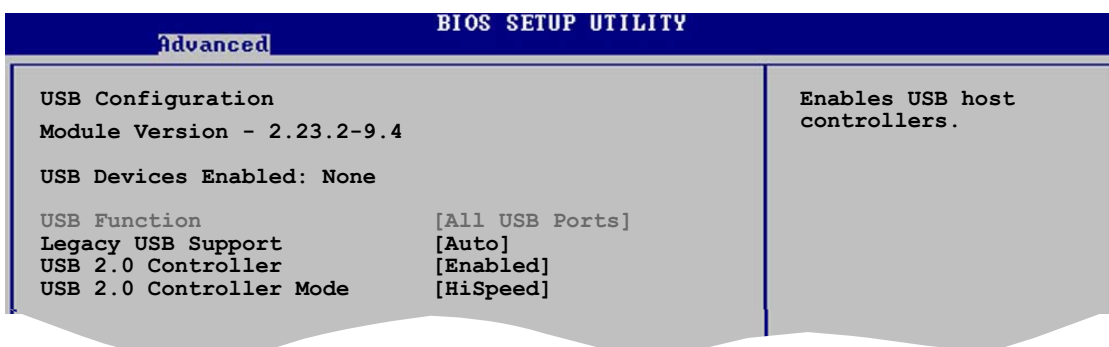When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested. Configuration options: [No] [Yes]

Palette Snooping [Disabled]

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

PCI IDE BusMaster [Enabled]

Allows BIOS to use PCI bus mastering when reading/writing to IDE devices.
Configuration options: [Disabled] [Enabled]

Offboard PCI/ISA IDE Card [Auto]

Allows you to assign a PCI slot to a PCI IDE card, when required.
Configuration options: [Auto] [PCI Slot1] [PCI Slot2] [PCI Slot3] [PCI Slot4]
[PCI Slot5] [PCI Slot6]

IRQ-xx assigned to [PCI Device]

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

Use the arrow down key to scroll down the menu.

```
┌─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─┐
   IRQ-15 assigned to        [PCI Device]
   DMA Channel 0             [PCI Device]
   DMA Channel 1             [PCI Device]       ←    Select Screen
   DMA Channel 3             [PCI Device]      ↑↓    Select Item
   DMA Channel 5             [PCI Device]      +-    Change Option
   DMA Channel 6             [PCI Device]      F1    General Help
   DMA Channel 7             [PCI Device]      F10   Save and Exit
                                               ESC   Exit
   Reserved Memory Size      [Disabled]     ▼
            (C)Copyright 1985-2002, American Megatrends, Inc.
```
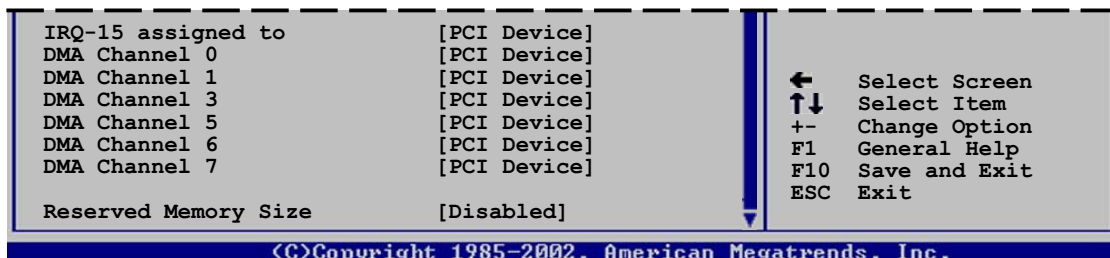
DMA Channel X assigned to [PCI Device]

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

Reserved Memory Size [Disabled]

Allows you to set the reserved memory size.
Configuration options: [Disabled] [16k] [32k] [64k]

5.5   Power menu

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

```
                    BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit

  ACPI APIC Support           [Enabled]         Select the ACPI state
                                                used for System
  ▶ APM Configuration                           Suspend.
  ▶ Hardware Monitor



                                                ←→     Select Screen
                                                ↑↓     Select Item
                                                Enter  Go to Sub Screen
                                                F1     General Help
                                                F10    Save and Exit
                                                ESC    Exit


       vMM.mm (C)Copyright 1985-2002, American Megatrends, Inc.
```
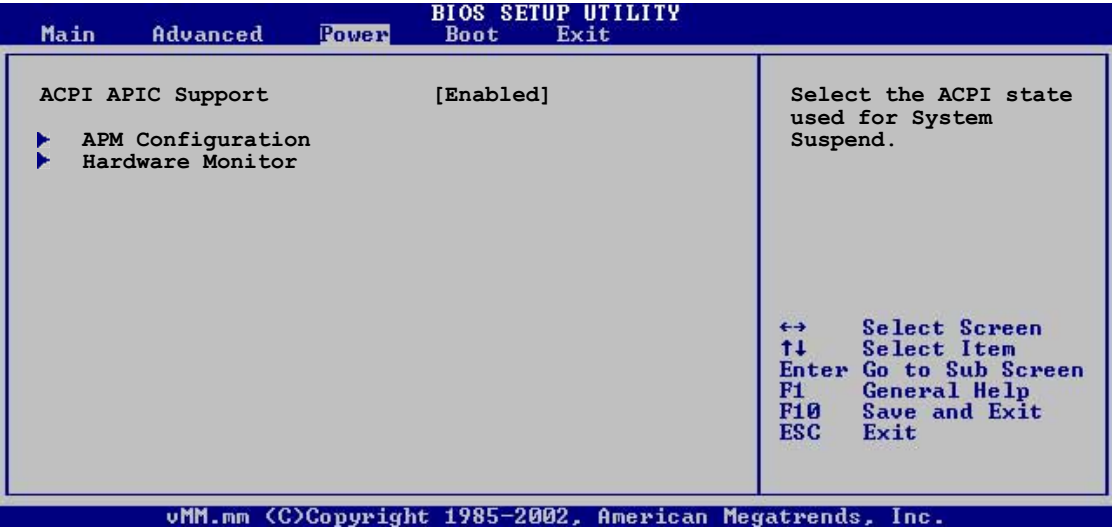
5.5.1   ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

⚠️   Do not change the ACPI APIC support after you have installed the operating system (OS), otherwise, a boot failure may occur.

5.5.2 APM Configuration

```
                    BIOS SETUP UTILITY
              Power

 APM Configuration                                   Enable or disable
 Power Management/APM          [Enabled]              APM.
 Video Power Down Mode         [suspend]
 Hard Disk Power Down Mode     [Suspend]
 Suspend Time Out              [Disabled]
 Throttle Slow Clock Ratio     [50%]

 Power Button Mode             [On/Off]
 Restore on AC Power Loss      [Power Off]

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


        vMM.mm (C)Copyright 1985-2002, American Megatrends, Inc.
```

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 [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 Mode [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 [Power Off]

When set to Power Off, the system goes into off state after an AC power loss. When set to Power On, the system 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]

5.5.3 Hardware Monitor

```
                        BIOS SETUP UTILITY
                 Power

  Hardware Monitor

  CPU1 Temperature            [49°C/120°F]
  CPU2 Temperature            [47°C/114°F]
  MB  Temperature             [47°C/114°F]

  CPU1 Fan Speed              0
  CPU2 Fan Speed              0
  Front1 Fan Speed            0
  Front2 Fan Speed            0
  Rear1 Fan Speed             [8500RPM]
  Rear2 Fan Speed             [8500RPM]                ←→      Select Screen
                                                      ↑↓      Select Item
  Smart Fan Control           [Disabled]              +-      Change Option
                                                      F1      General Help
  VCORE1 Voltage              [ 1.320V]               F10     Save and Exit
  VCORE2 Voltage              [ 1.380V]               ESC     Exit
  3.3V Voltage                [ 3.345V]
  5V Voltage                  [ 5.094V]
  5VSB Voltage                [ 5.046V]

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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.

CPU1/CPU2 Fan Speed [0]
Front1/Front2 Fan Speed [0]
Rear1/Rear2 Fan Speed [xxxxRPM] or [N/A]

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

> The CPU and Front fan speeds items normally show the value 0. To check the actual fan rotations per minute, use the ASUS Server Web-based Management (ASWM) software. Refer to the ASWM user guide for more information.

Smart Fan Control [Disabled]

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

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

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

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

Use the arrow down key to display additional items.

```
  VBAT Voltage                [ 3.120V]            ESC    Exit
  12V Voltage                 [12.053V]
                                                    ▼
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```

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

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

5.6   Boot menu

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

```
                        BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit

 APM Configuration

 ▶  Boot Device Priority

 ▶  Boot Settings Configuration
 ▶  Security

                                             ←    Select Screen
                                             ↑↓   Select Item
                                             Enter Go to Sub-screen
                                             F1    General Help
                                             F10   Save and Exit
                                             ESC   Exit

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```

5.6.1   Boot Device Priority

```
                        BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit

 Boot Device Priority                        Specifies the boot
                                             sequence from the
 1st Boot Device      [1st FLOPPY DRIVE]     available devices.
 2nd Boot Device      [PM-ST330620A]
 3rd Boot Device      [PS-ASUS CD-S360]      A device enclosed in
 4th Boot Device      [MBA v7.5.12 Slot 0]   parenthesis has been
                                             disabled in the
                                             corresponding type
                                             menu.


                                             ←    Select Screen
                                             ↑↓   Select Item
                                             Enter Go to Sub-screen
                                             F1    General Help
                                             F10   Save and Exit
                                             ESC   Exit

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```

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

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

5.6.2 Boot Settings Configuration

```
                      BIOS SETUP UTILITY
                        Boot

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

Quick Boot [Enabled]

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

Full Screen Logo [Enabled]

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

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

Add On ROM Display Mode [Force BIOS]

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

Bootup Num-Lock [On]

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

PS/2 Mouse Support [Auto]

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

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]

Quiet Boot Progress Bar [Disabled]

Enables or disables the quiet boot progress bar during POST. Configuration options: [Disabled] [Enabled]

5.6.3   Security

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

```
                       BIOS SETUP UTILITY
                           Boot

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

   Boot Sector Virus Protection      [Disabled]



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

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```
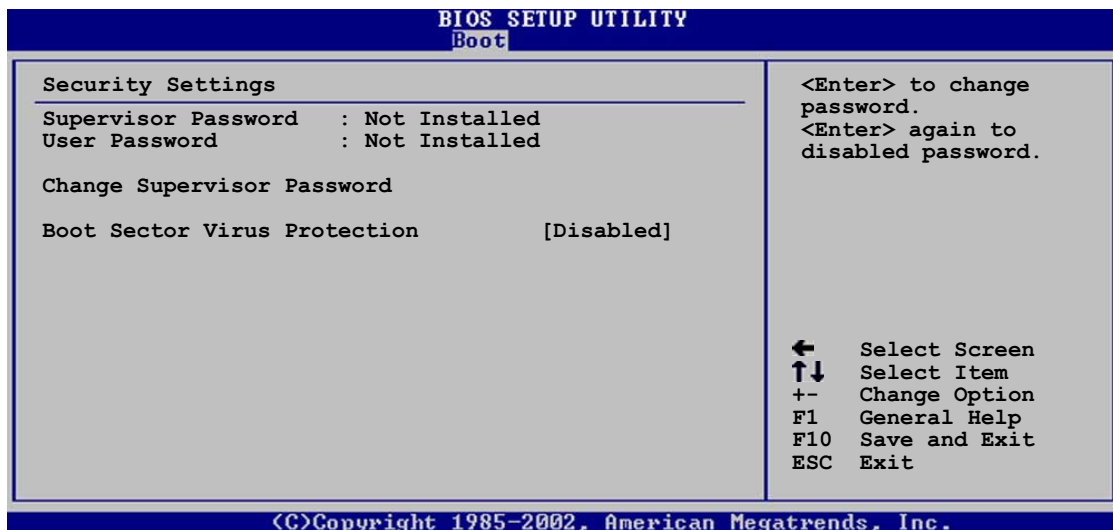
Change Supervisor Password

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

To set a Supervisor Password:

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

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

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

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

> If you forget your BIOS password, you can clear 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
                              Boot

   Security Settings
   Supervisor Password    : Not Installed
   User Password          : Not Installed

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

   Boot Sector Virus Protection  [Disabled]

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

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```

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.
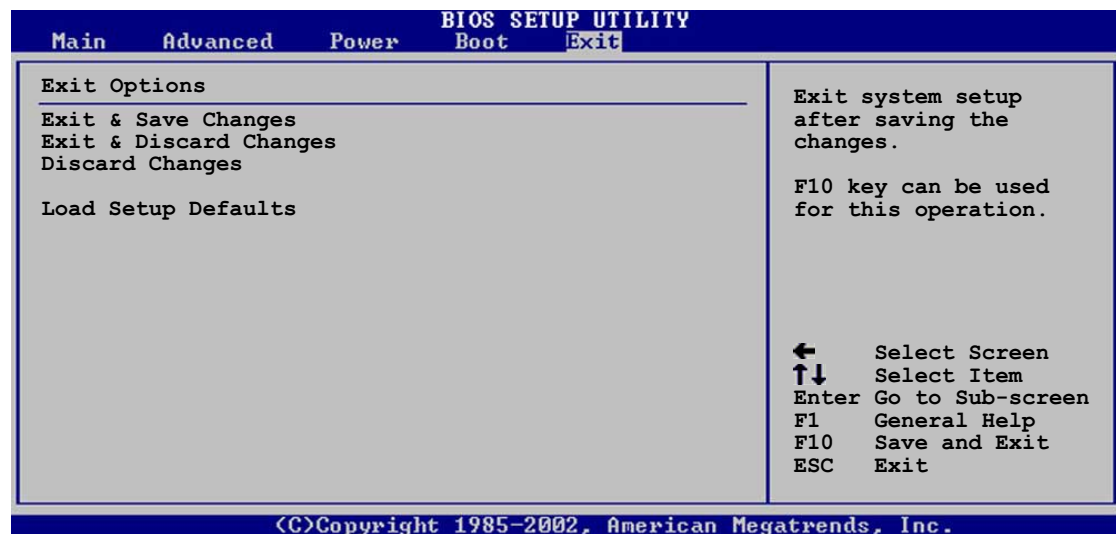Configuration options: [Setup] [Always]

Boot Sector Virus Protection [Disabled]

Allows you to enable or disable the boot sector virus protection.
Configuration options: [Disabled] [Enabled]

5.7   Exit menu

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

```
                         BIOS SETUP UTILITY
  Main    Advanced    Power    Boot    Exit

 ┌──────────────────────────────────────────┐┌───────────────────────────┐
 │ Exit Options                             ││ Exit system setup         │
 │                                          ││ after saving the          │
 │ Exit & Save Changes                      ││ changes.                  │
 │ Exit & Discard Changes                   ││                           │
 │ Discard Changes                          ││ F10 key can be used       │
 │                                          ││ for this operation.       │
 │ Load Setup Defaults                      ││                           │
 │                                          ││                           │
 │                                          ││                           │
 │                                          ││                           │
 │                                          ││                           │
 │                                          ││  ←     Select Screen      │
 │                                          ││  ↑↓    Select Item        │
 │                                          ││  Enter Go to Sub-screen   │
 │                                          ││  F1    General Help       │
 │                                          ││  F10   Save and Exit      │
 │                                          ││  ESC   Exit               │
 │                                          ││                           │
 └──────────────────────────────────────────┘└───────────────────────────┘
              (C)Copyright 1985-2002, American Megatrends, Inc.
```

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

Exit & Save Changes

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

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

Exit & Discard Changes

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

Discard Changes

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

Load Setup Defaults

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