/ISUS® TS500-E2

Dual Intel® Xeon™ Pedestal/5U Rackmount Server
800 MHz Front Side Bus

E2111

First Edition V1
August 2005

Contents

Contents

Chapter 3: Installation options

Chapter 4: Motherboard info

Chapter 5: BIOS information

Contents

Contents

Chapter 7: Driver installation

Appendix: Reference information

Notices

Federal Communications Commission Statement

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

• This device may not cause harmful interference, and

• This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and receiver.

• Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

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

Canadian Department of Communications Statement

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

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

Safety information

Electrical Safety

- Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.
- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing any additional devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your dealer.

Operation Safety

- Any mechanical operation on this server must be conducted by certified or experienced engineers.
- Before operating the server, carefully read all the manuals included with the server package.
- Before using the server, make sure all cables are correctly connected and the power cables are not damaged. If any damage is detected, contact your dealer as soon as possible.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Place the server on a stable surface.

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

Lithium-Ion Battery Warning

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

CD-ROM Drive Safety Warning

CLASS 1 LASER PRODUCT

Heavy System

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

About this guide

Audience

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

Contents

This guide contains the following parts:

1. **Chapter 1: Product Introduction**

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

2. **Chapter 2: Hardware setup**

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

3. **Chapter 3: Installation options**

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

4. **Chapter 4: Motherboard information**

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

5. **Chapter 5: BIOS information**

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

6. **Chapter 6: RAID Configuration**

   This chapter provides instructions for creating and configuring RAID for different system components.

7. **Chapter 7: Driver Installation**

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

8. **Appendix: Reference information**

   This appendix gives information on the standard or redundant power supply that came with the barebone server. This section also provides a troubleshooting guide for solving common problems when using the barebone server.

Conventions

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

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

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

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

NOTE: Tips and information to aid in completing a task.

Reference

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

Chapter 1

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

Product introduction

ASUS TS500-E2

1.1 System package contents

Check your ASUS TS500-E2 package with the items on the following table. The package contents vary for the following configurations:

- **RS8** (eight hot-swap SCSI hard disk drives)
- **RS4** (four hot-swap SCSI hard disk drives)

Item Description	Configurations	
	RS4	RS8
ASUS AK25 pedestal 5U rackmount chassis with:	●	●
• ASUS NCLV-DS2 motherboard	●	●
• 650 W (redundant) power supply	●	●
• SCSI backplane board	1	2
• U320 cable and terminator	●	●
• 52x CD-ROM or DVD-ROM drive	●	●
• Floppy disk drive	●	●
• Air duct	●	●
• Chassis fan	●	●
• HDD blower	1	2
• Hot-swap HDD trays (including HDD screws)	4	8
• Chassis roller wheels (4 sets)	●	●
• Front I/O board	●	●
• SMBus cable	●	●
• Dummy covers	4	
• Parallel port cable	●	●
AC power cable	●	●
System screws and cables	●	●
System keys (2 pcs.)	●	●
Bundled CDs • TS500-E2 support CD with ASWM* • Computer Associates® eTrust™ anti-virus CD	● ●	● ●
Documentation • ASUS TS500-E2 user guide • ASUS ASWM 2.0 user guide	● ●	● ●
Optional items • ASUS AK25 rackmount rail kit • ASUS AK25 650 W second power module for redundant power supply • ASUS AK25 HDD cage & blower upgarde kit	● ● ●	● ●

*ASUS System Web-based Management

1.2   System specifications

The ASUS TS500-E2 is a barebone server system featuring the ASUS NCLV-DS2 motherboard. The server supports dual Intel® Xeon™ processors in 604-pin sockets, and includes the latest technologies through the chipsets embedded on the motherboard.

Chassis	Pedestal or rackmount 5U with removable front door bezel and chassis foot stand or roller-wheels.
Motherboard	ASUS NCLV-DS2 (E-ATX form factor: 12 in x 10.5 in)
Chipset	Northbridge: Intel® E7320 Memory Controller Hub (MCH) Southbridge: Intel® 6300ESB I/O Controller Hub (ICH)
Processor	Dual 604-pin sockets for Intel® Xeon™ processors with Extended Memory 64-bit Technology (EM64T) Supports 1MB or 2MB L2 cache Supports Intel® Hyper-Threading Technology
Front Side Bus	800 MHz
Memory	Dual-channel memory architecture 6 x 240-pin DIMM sockets support registered ECC 400 MHz DDR2 memory modules Supports 256 MB up to 12 GB of system memory

LAN	Dual Gigabit LAN controller
	  • LAN1 : Broadcom BCM5721 Gigabit LAN controller
	   - PCI Express 1.0a specifications compliant
	  • LAN2 : Broadcom BCM5705E Gigabit LAN controller
	   - PCI 2.3 specifications compliant

Storage	Adaptec AIC-7901 SCSI controller supports :
	  - Ultra 320 SCSI channel with RAID 0, RAID 1, and RAID 0+1 configuration
	  - Zero-Channel RAID (optional) upgrade to RAID 5

HDD Bay	4 x Hot swap SCSI HDD tray (Ultra320, 80 pin) Optional HDD upgrade kit to support 8 x hot swap SCSI HDD tray (Ultra320, 80 pin)
Expansion slots	1 x PCI Express x8 slot (PCI Express 1.0a, x4 Link) 1 x PCI-X 66 MHz/64-bit slot (PCI-X 1.0) 1 x PCI-X 66 MHz/64-bit slot (supports ZCR, PCI-X 1.0) in green-color slot 2 x PCI 33 MHz/32-bit/5V slot (PCI 2.3) 1 x Mini-PCI socket for the ASUS Server Management Board
Graphics	ATI Rage-XL PCI-based VGA controller

Drive bays	1 x 3.25-inch FDD bay 3 x 5.25-inch drive bays
Front panel	2 x USB ports
Rear panel	1 x Serial port 1 x Parallel port 1 x PS/2 keyboard port 1 x PS/2 mouse port 2 x LAN (RJ-45) ports 2 x USB ports 1 x VGA port
Management	ASUS Server Web-based Management (ASWM) 2.0
Hardware monitors	Voltage, temperature, CPU and memory utilization, and fan speed monitoring Automatic Server Restart (ASR) feature
Power supply	650 W power supply *with redundant capability (with 24-pin and 8-pin power plugs)*

1.3   Front panel features

The TS500-E2 chassis displays a stylish front bezel with lock. The bezel covers the system components on the front panel and serves as security. Open the bezel to access the front panel components.

The drive bays, power and reset buttons, LED indicators, CD-ROM drive, floppy drive, and USB 2.0 ports are located on the front panel. For future installation of 5.25-inch devices, two drive bays are available.

(RS8)

CD-ROM drive

Empty 5.25-inch bays

Power button

Reset button

Message LED

HDD access LED

Power LED

Floppy disk drive

USB 2.0 ports

Drive bays

Security lock
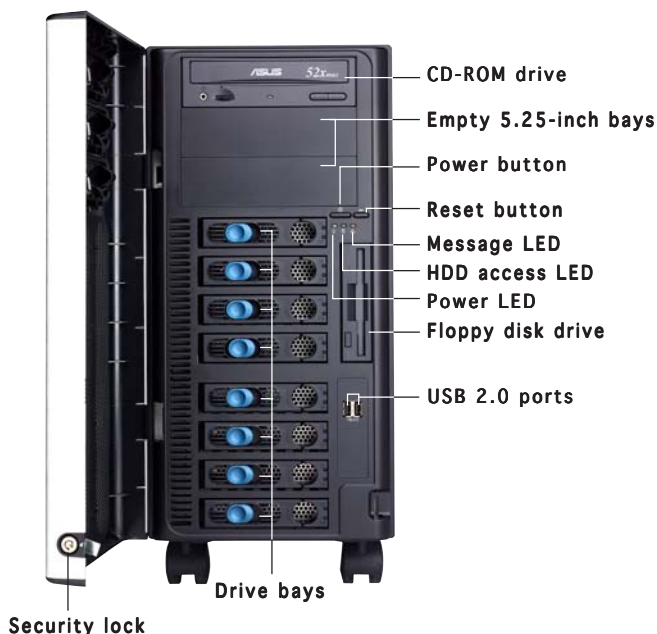
1.4   Rear panel features

The rear panel includes a slot for the motherboard rear I/O ports, expansion slots, a chassis lock and intrusion switch, a vent for the system fan, and power supply module.

Power supply module
PS/2 mouse port
PS/2 keyboard port
USB ports
Serial port
VGA port
Gigabit LAN 1 ports
Gigabit LAN 2 ports

Power connector
12 cm system fan

Chassis cover lock

Expansion slots

*** The Second power
supply module for
redundant power
supply is optional.*
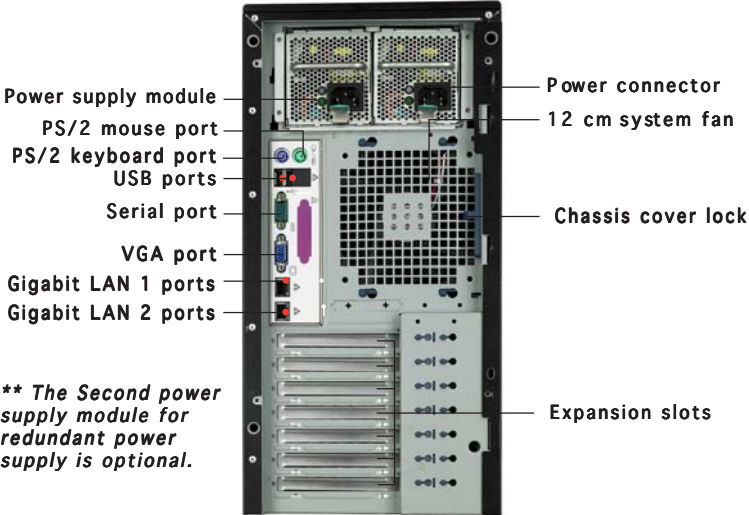
1.5   Internal features

The barebone server system includes the basic components as shown. The photo below shows the TS500-E2 with its air duct and hard disk drive blowers installed. The air duct provides cool air from the outside through the chassis side cover vent for the system to maintain optimum thermal performance. The HDD blowers circulate cool air within the system.

1
2

1. Air duct
2.HDD blowers
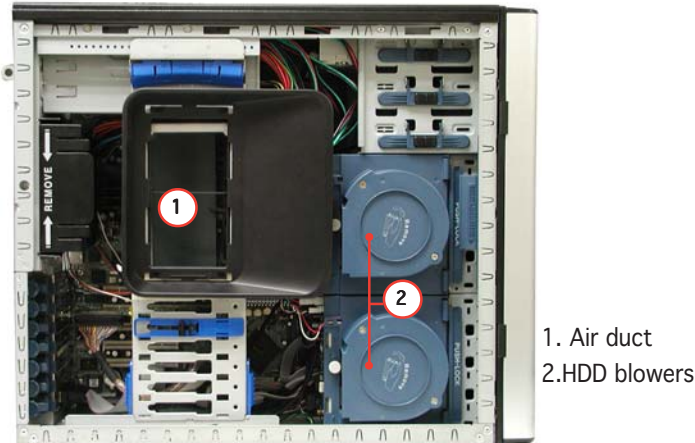
The succeeding photos show the system without its air duct installed to reveal the internal components.

RS8 (eight hot-swap SCSI configuration)
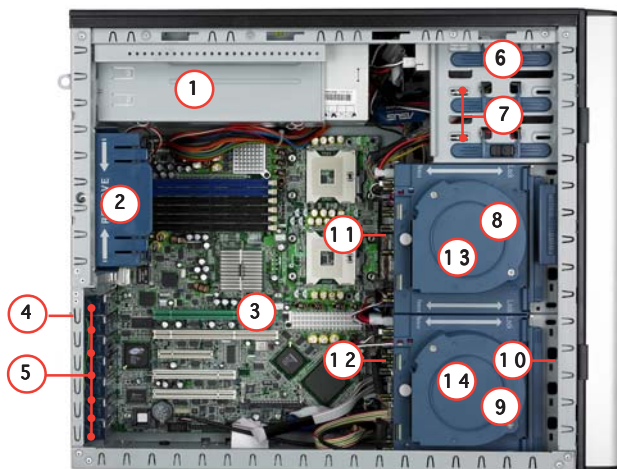
1. Power supply cage
2. Chassis fan
3. NCLV-DS2 motherboard
4. Chassis intrusion switch
5. Expansion card locks
6. CD-ROM/DVD-ROM drive
7. 2 x 5.25-inch drive bays

8. Hard disk drive cage 1(hidden)
9. Hard disk drive cage 2(hidden)
10. Front I/O board
11. SCSI backplane (hidden) 1
12. SCSI backplane (hidden) 2
13. HDD blower* 1
14. HDD blower* 2

* The hard disk drive cage is behind the blower.

1.6 LED information

The barebone system comes with five LED indicators. Refer to the following table for the LED status description.

1.6.1 System and HDD LED

Power LED (blue)

HDD Access LED (green)

Message LED (red)

Drive Status LED (green/red)

Drive Activity LED (green)
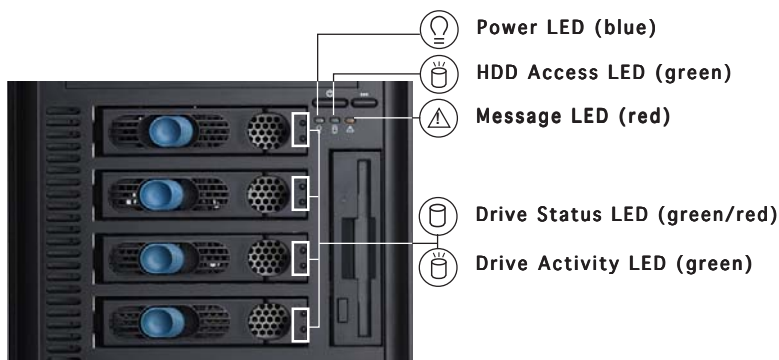
LED	Icon	Display status	Description
System			
Power LED		ON	System power ON
		Blinking	System is in suspend mode
HDD Access LED		OFF	No activity
		Blinking	Read/write data into the HDD
Message LED		OFF	System is normal; no incoming event
		Blinking	ASMS indicates a HW monitor event
Hard disk drives			
Drive Status LED		Green	Bridge board connected to backplane
			Installed HDD is in good condition
		Red	HDD failure
		Green/Red - Blinking	HDD rebuilding using the RAID card
			SAF-TE* function
Drive Activity LED		Blinking	Read/write data into the HDD

*SCSI Access Fault-Tolerant Enclosure

The Power, HDD Access, and Message LEDs are visible even if the system front bezel is closed.

1.6.2 Power supply LED

Display status	Description
(Upper)Green	Standby (Power cords plugged)
(Lower)Green	Power on
Power off	Power cords unplugged

Chapter 1: Product introduction

Chapter 2

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

Hardware setup

2.1 Chassis cover

The chassis features a "screwless design" that allows convenient assembly and disassembly. You can simply push or slide mechanical bolts and locks to remove the cover.

2.1.1 Removing the side cover

1. Push up the chassis lock on the rear panel to release the side cover.
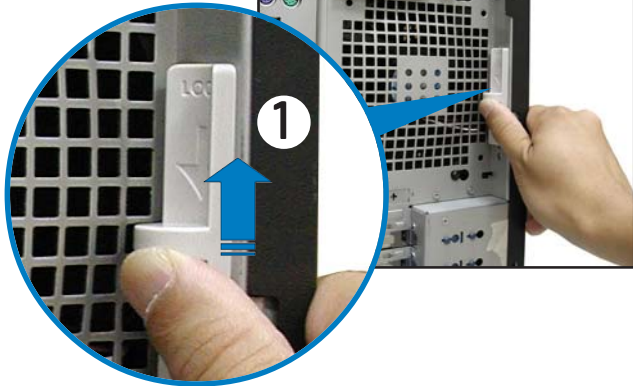
2. Slide the side cover for about half an inch toward the rear until it is disengaged from the chassis.
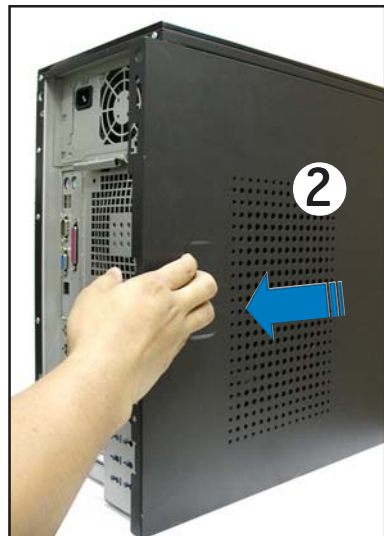
Viewing the internal structure

Without the side cover, the internal structure and installed components of the barebone server vary depending on the model you purchased. Refer to section "1.5 Internal features" for the different model configurations.

Perform the procedures in the succeeding sections to install the CPU, system memory, disk drives, and expansion cards; replace fans and power supply; and connect the system cables.

> You may need to remove some of the installed components to access the DIMM sockets and internal connectors. Refer to section "2.10 Removable components" for instructions.

2.1.2   Reinstalling the side cover

To reinstall the side cover:

1. Match and insert the hooks of the cover to the elongated holes on the side of the chassis. All the six hooks (three each on the top and bottom) of the cover must properly fit the designated holes.

2. Slide the cover toward the front until it snaps in place.

3. Push down the chassis lock to secure the side cover.
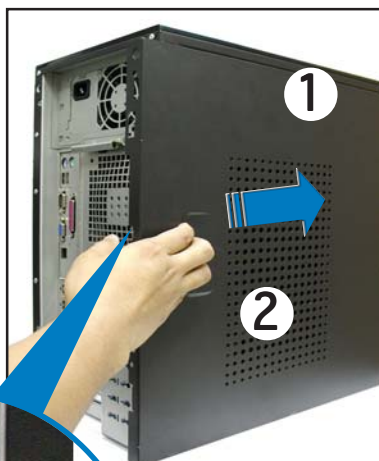
2.2   Motherboard information

The barebone server comes with the NCLV-DS2 motherboard already installed. The motherboard is secured to the chassis by nine (9) screws as indicated by the circles in the illustration below.

> Refer to "Chapter 4 Motherboard information" for detailed information on the motherboard.

Place this side towards the rear of the chassis
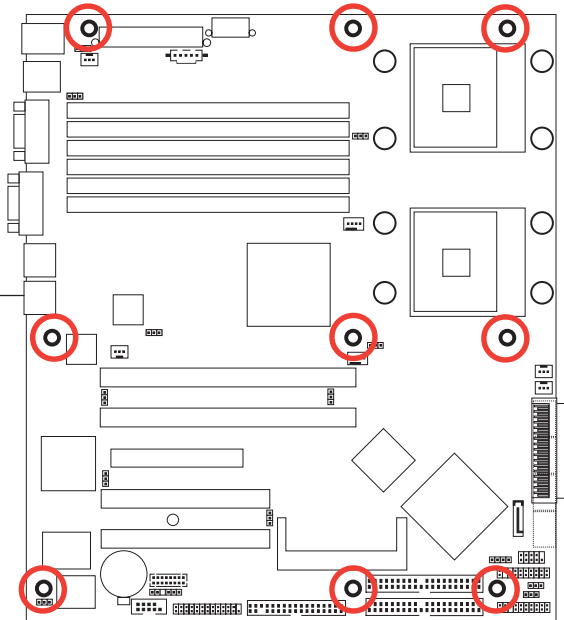
> Make sure to unplug the power cord before installing or removing any motherboard component or connection. Failure to do so may cause you physical injury and may damage motherboard components.

2.3 Central Processing Unit (CPU)

2.3.1 Overview

The motherboard comes with surface mount 604-pin Zero Insertion Force (ZIF) sockets. The sockets are designed for the Intel® Xeon™ processor in the 604-pin package with 1 MB or 2MB L2 cache. The new generation Xeon™ processor supports 800 MHz system bus and Extended Memory 64-bit Technology (EM64T).

2.3.2 Installling the CPU

To install a CPU:

1. Locate the CPU sockets on the motherboard.

Intel Xeon

← Gold Arrow
Pin A1

NCLV-DS2 CPU Socket 604
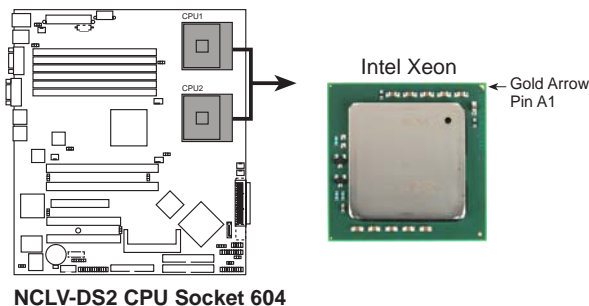
> If installing only one CPU, use the socket CPU1.

2. Flip up the socket lever and push it all the way to the other side.

> Make sure that the socket lever is pushed back all the way, otherwise the CPU does not fit in completely.

Socket for CPU1

3. Position the CPU above the socket as shown.

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

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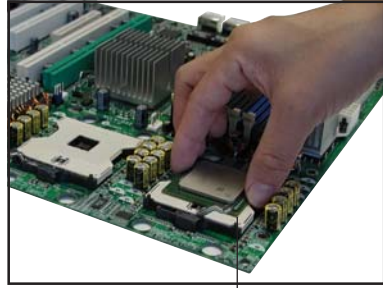
Marked corner (gold arrow)

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

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

7. Repeat steps 1 to 6 if you wish to install a second CPU.
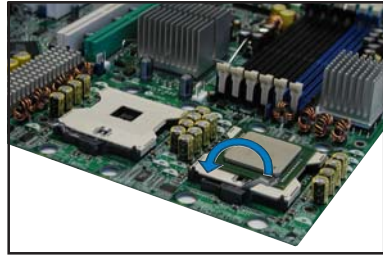
2.3.3 Installing the CPU heatsink and fan

The Intel® Xeon™ processors require an Intel certified or ASUS qualified heatsink and fan assembly to ensure optimum thermal condition and performance.

When you buy a boxed Intel CPU, the package includes the heatsink, fan, retention brackets, screws, thermal grease, installation manual, and other items that are necessary for CPU installation.

• Make sure that you have applied the thermal grease to the top of the CPU before installing the heatsink and fan.

• Refer to the installation manual that came with the CPU package for details on heatsink/fan assembly and installation.

• CoolerMaster E3W-N7WSS-04 is ASUS qualified for TS500-E2 system.

CPU heatsink (top view)   **CPU heatsink (bottom view)**
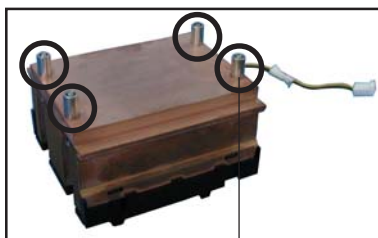
Heatsink screw

Before installing the CPU heatsinks, ensure that the jumpers FM_CPU1 and FM_CPU2 are set correctly depending on the pin definition of your CPU fan cables. Refer to section "4.2 Jumpers" for information on these jumpers.

To install the CPU heatsink and fan:

1. Place the heatsink on top of the installed CPU, making sure that the four screws on the heatsink align with the nuts on the support plate.
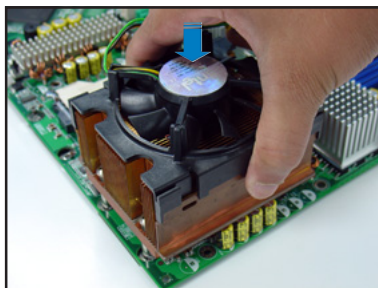
2. Use a Phillips screwdriver to tighten the four heatsink screws in a diagonal sequence.
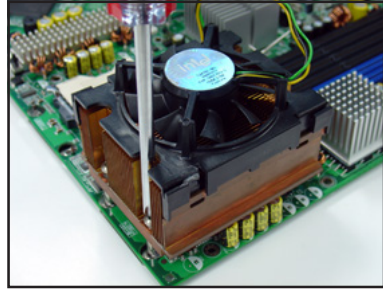
3. Connect the fan cable to the 4-pin connector labeled CPU_FAN1.

Do not forget to connect the CPU fan connector! Hardware monitoring errors may occur if you fail to plug this connector.
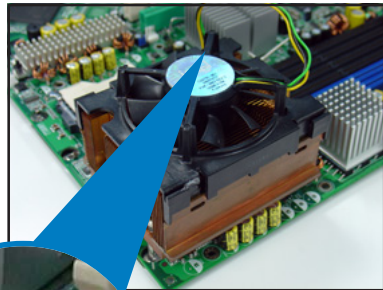
CPU_FAN1 connector

4. Repeat steps 1 to 3 to install the other heatsink if you have installed a second CPU, then connect the fan cable to the 4-pin connector labeled CPU_FAN2.

The heatsinks appear as shown when installed.
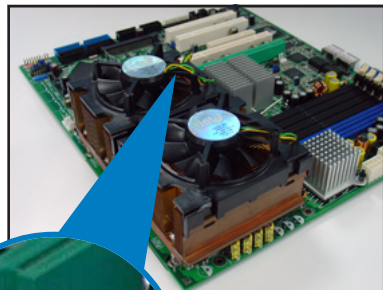
CPU_FAN2 connector

2.4 System memory

2.4.1 Overview

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

A DDR2 has a 240-pin footprint. DDR2 DIMMs are notched to match the break on the socket and ensure correct installation.

The figure illustrates the location of the DDR2 DIMM sockets:

128 Pins   112 Pins

DDR_B3
DDR_A3
DDR_B2
DDR_A2
DDR_B1
DDR_A1
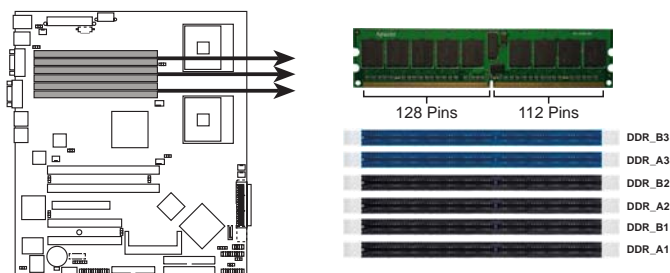
NCLV-DS2 240-pin DDR2 DIMM sockets

2.4.2 Memory configurations

You may install 256 MB, 512 MB, 1 GB, and 2 GB 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 DDR2 Qualified Vendors List at the ASUS web site.

- Due to chipset resource allocation, and depending on the number of expansion cards installed, the following conditions may occur:

  - the system may detect less than 8 GB system memory when you installed four 2 GB DDR2 memory modules
  - may show an available memory space of less than 4 GB when you installed four 1 GB DDR2 memory modules

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

- If you are installing only one memory module, install into the blue socket labeled DDR_A3 or DDR_B3. Installing into any other socket would not work.

Mode	DDR_B3 (blue)	DDR_A3 (blue)	DDR_B2 (black)	DDR_A2 (black)	DDR-B1 (black)	DDR_A1 (black)
Single-channel	✓					
		✓				
Dual-channel	✓	✓				
	✓	✓	✓	✓		
	✓	✓	✓	✓	✓	✓

✓   Populated with DIMM

Single and dual rank mixing
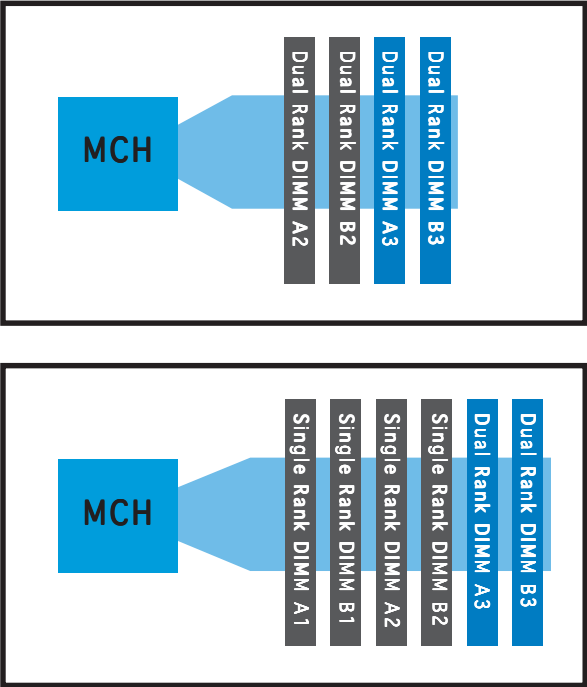
2.4.3 Installing a DIMM

> 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.

To install a DIMM:

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

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

3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.
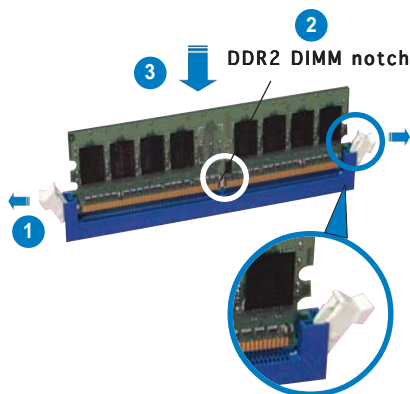
DDR2 DIMM notch

Unlocked retaining clip

> • A DDR2 DIMM is keyed with a notch so that it fits in only one direction. Do not force a DIMM into a socket to avoid damaging the DIMM.
>
> • The DDR2 DIMM sockets do not support DDR DIMMs. DO NOT install DDR DIMMs to the DDR2 DIMM sockets.

2.4.4 Removing a DIMM

Follow these steps to remove a DIMM.

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

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

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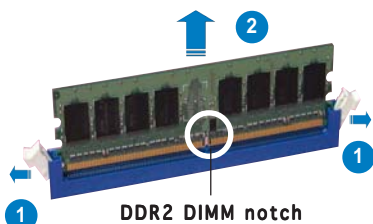
2. Remove the DIMM from the socket.

2.5   Front panel assembly

2.5.1   Removing the front panel assembly

> Before you can install a 5.25-inch drive, you should first remove the front panel assembly (front bezel and front panel cover). The front panel assembly is attached to the chassis through four **hooked tabs** on the left side and four **hinge-like tabs** on the right side.

To remove the front panel assembly:

1. Pull the lock lever (blue bar) on the front edge of the chassis outward to release the front panel assembly.

Lock lever

2. Pull and swing the left edge of the front panel outward.

3.   Unhook the hinge-like tabs from the holes on the right side of the front panel to completely detach the front panel assembly from the chassis.

Do not use too much force when removing the front panel assembly.
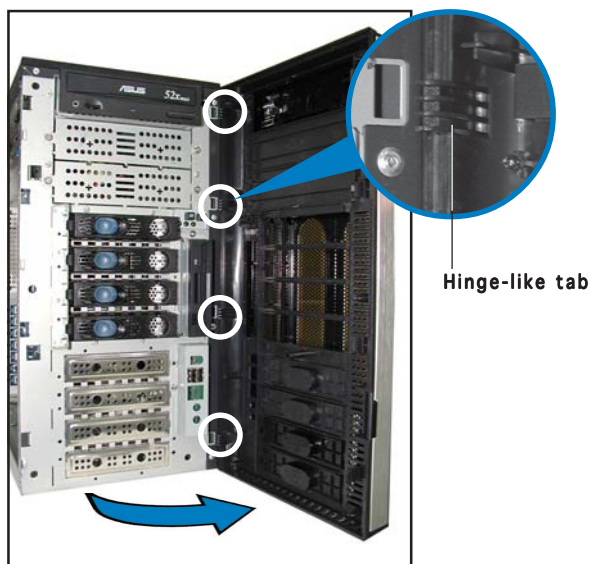
Hinge-like tab

2.5.2 Reinstalling the front panel assembly

To reinstall the front panel assembly (front bezel and front panel cover):

1. Insert the four hinge-like tabs to the holes on the right edge of the chassis.
2. Swing the front panel to the left and fit the four (4) hooked tabs to the left side of the chassis until the tabs snap back in place.

Hinge-like tab

Hooked tab
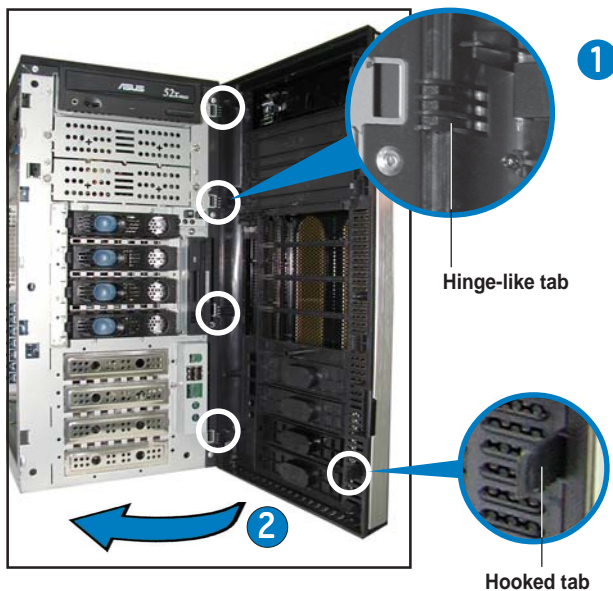
2.6   5.25-inch drives

> If you have previously used and powered up the system, and that it may be connected to an AC power source, make sure to unplug the power cable before installing or removing any system components. Failure to do so may cause damage to the motherboard and other system components!

Three 5.25-inch drive bays are located on the upper front part of the chassis. A CD-ROM or DVD-ROM drive that comes standard with the system package occupies the uppermost bay *(labeled 1)*. The two lower bays *(labeled 2 and 3)* are available for additional 5.25-inch devices.
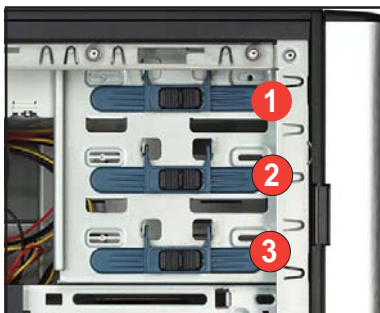
To install a 5.25-inch drive:

1.   Use a Phillips (cross) screwdriver to remove the screws that secure the metal cover of the bay where you want to install the drive.

2.   From the side of the drive bay, slide the drive bay lock by pushing it to the left to release the drive lock bar.
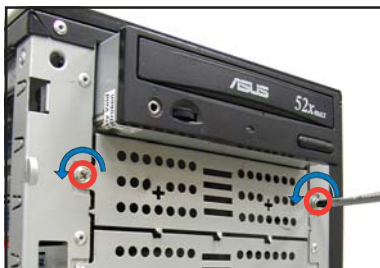
Drive lock bar

Drive bay lock
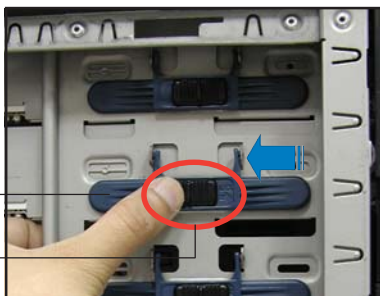
3.   When released, pull up the drive bay lock bar. Underneath the lock bar are two pegs that match the holes on the drive bay. This mechanism secures the drive to the bay in place of screws.

Lock pegs

Drive bay holes
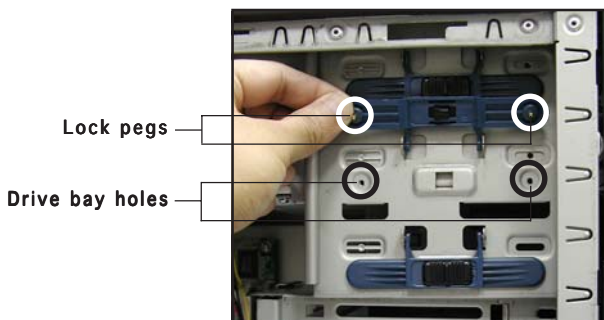
4.   While holding up the drive lock bar, carefully insert a 5.25-inch drive into the bay, until the back of the drive aligns to the rear edge of the drive cage.

Due to space constraints inside the chassis, do not insert the drive all the way at this time. This will allow you enough space to easily connect the drive cables.

5.   Connect the IDE cable to the IDE connector on the back of the drive.

6.   Connect a 4-pin plug from the power supply to the power connector on the back of the drive.

IDE cable
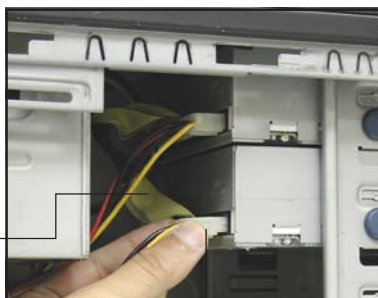
Power plug

7. Make sure that the drive and bay holes align as shown. When in place, the drive protrudes about an inch from the front panel.

8. Pull down the bar lock and insert the lock pegs to the drive/bay holes, then push the drive lock to the right to secure the drive.
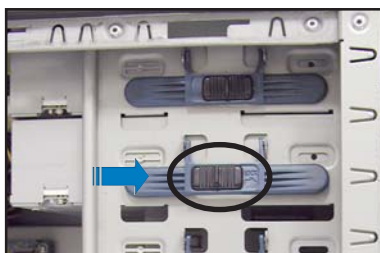
9. On the front panel assembly, detach the plastic bay cover opposite the 5.25-inch drive that you installed by pressing the two hooked tabs on each side of the bay cover.
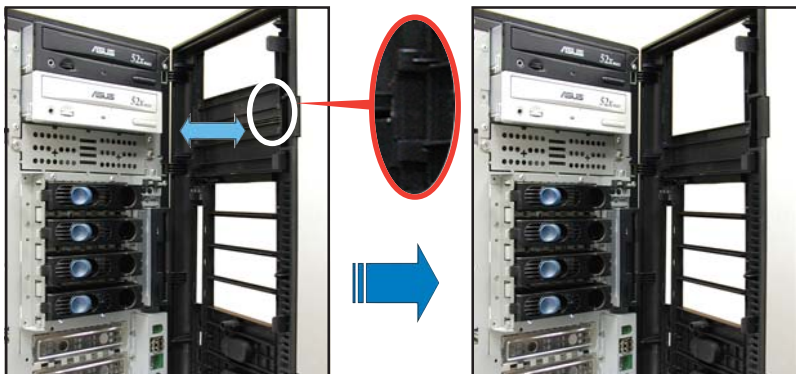
10. Reinstall the front panel assembly when done. Refer to section "2.5.2 Reinstalling the front panel assembly" for instructions.

2.7 Hard disk drives

2.7.1 Installing a hot-swap SCSI HDD

If you purchased an RS8 or RS4 configured model, follow these instructions to install a hot-swap SCSI hard disk drive (HDD).

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

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

Spring lock   Tray lever

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

4. An empty drive tray requires a metal bracket for support. Use a Phillips (cross) screwdriver to remove the bracket when you are ready to install a hard disk in the drive tray.

Metal bracket
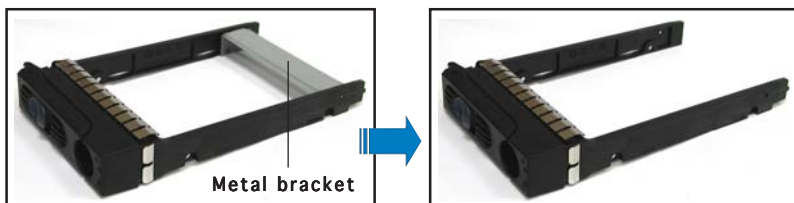
5. Place a SCSI hard disk to the drive tray, and secure it with four screws.

6. Carefully insert drive tray and push it all the way to the depth of the bay until just a small fraction of the tray edge protrudes.

7. Push the tray lever until it clicks, and secures the drive tray in place. The drive tray is correctly placed when its front edge aligns with the bay edge.

2.7.2   Installing an HDD dummy cover

The HDD dummy covers come pre-installed on the front panel bezel. In case you removed the covers, follow these steps to re-install them.

To install an HDD dummy cover:

1.   From the inside of the front panel assembly, insert the flat end of a dummy cover into the slot as shown. The end with the hook tab should be close to the front panel LEDs.

Flat end

2.   Press the dummy cover into the slot opening until the hook tab clicks in place.

Hook tab
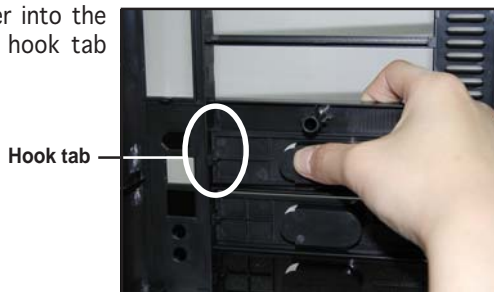
3.   When installed, the dummy cover appears as shown.

2.8   Expansion cards

The chassis is designed with a screwless expansion slot frame on the rear panel. This design feature allows you to install or remove an expansion card in less steps.

> ⚠️ Make sure to unplug the power cord before installing or removing expansion cards. Failure to do so may cause physical injury, and damage to the card and motheboard components!

2.8.1   Installing a standard size expansion card

To install a standard size expansion card:

1.   Remove the plastic card lock opposite the slot where you wish to install the expansion card. Release the card lock by pressing the center tabs and pushing outward. Set the card lock aside for later use.
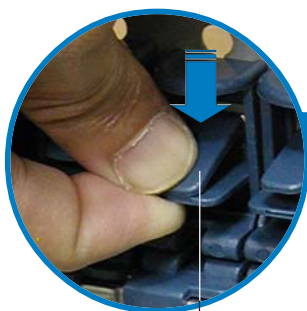
Card lock tab
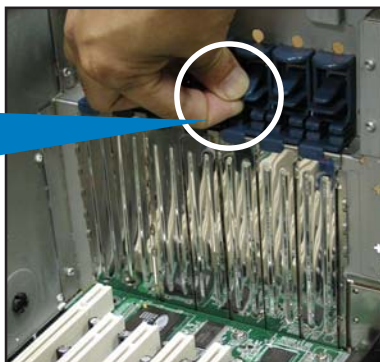
2.   Carefully install an expansion card making sure that it is properly seated on the slot.
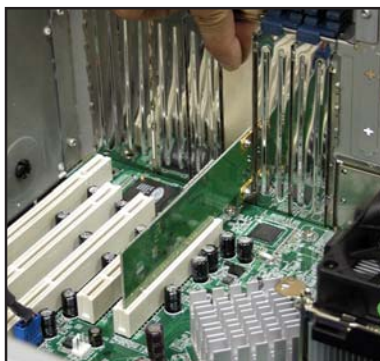
3. When the card is in place, secure
    it with the plastic card lock that
    you removed earlier.
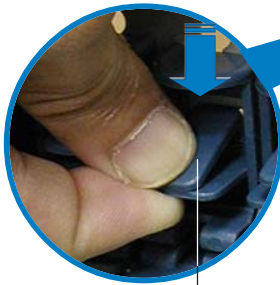
Card lock tab
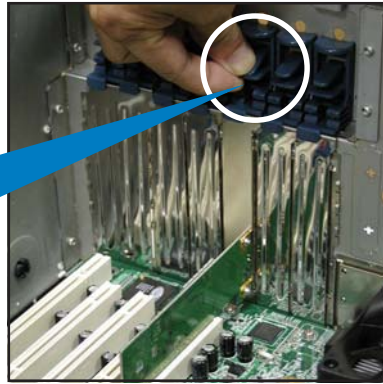
4. Firmly the top of the card lock to secure.

2.8.2 Installing a long expansion card

The **RS4** model supports long expansion cards. Refer to the instructions in this section to install a long expansion card.

To install a long expansion card:

1. Remove the plastic card lock opposite the slot where you wish to install the expansion card. Release the card lock by pressing the center tabs and pushing outward. Set the card lock aside for later use.

2. Tilt the long card as shown while aligning the metal bracket with the slot opening on the rear panel.

3. When the card is inside the chassis, push down the end of the card until it is level with the PCI slot.

4. Push the card connector into the PCI slot until it is securely seated.

5. When the card is in place, secure it with the plastic card lock that you removed earlier.

6. Frimly press the card lock to secure.

2.8.3 Removing an expansion card

To remove an expansion card:

1. Remove the plastic card lock that secures the expansion card.
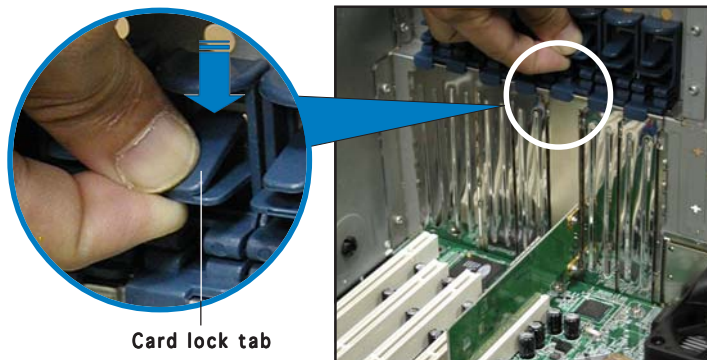
Card lock tab

2. Firmly hold the expansion card and pull it out of the slot.
3. Place the plastic card lock back where you removed it.
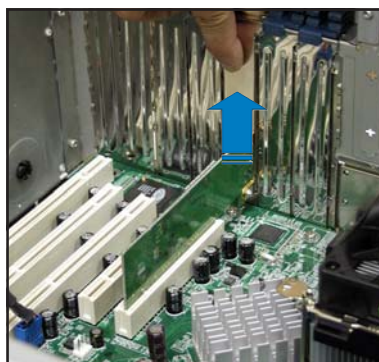
2.9 Cable connections

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

2.9.1 Motherboard connections
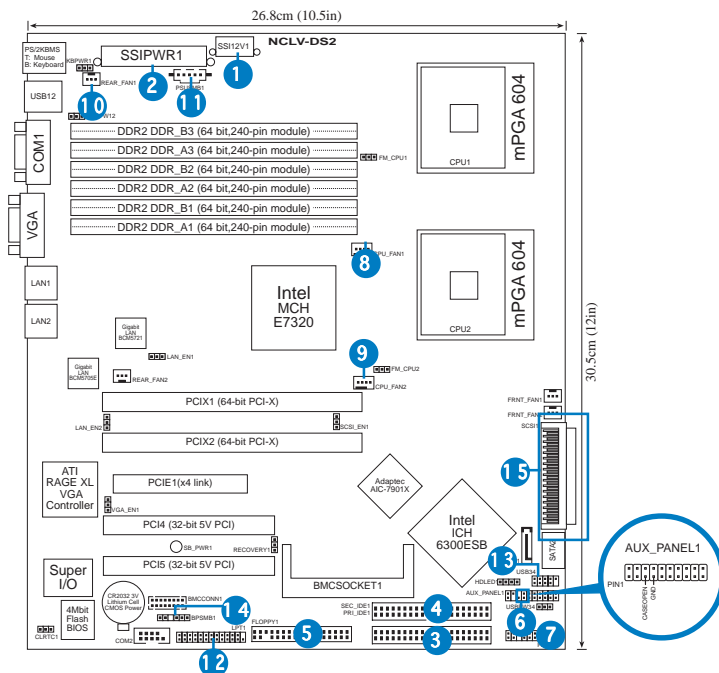
Standard cables connected to the motherboard

1. 8-pin 12V power
2. 24-pin ATX power
3. Primary IDE cable
4. Secondary IDE (optical drive)
5. Floppy disk drive
6. Chassis intrusion
7. Front panel cable
8. CPU fan1
9. CPU fan2
10. Rear fan1
11. Power supply SMBus
12. Parallel port
13. Front USB cable
14. SMBus cable to backplane
15. SCSI ATA RAID connector

📝 Refer to the Chapter 4 user guide for detailed information on the connectors.

2.9.2   SCSI backplane connections
         (in RS8 and RS4 models only)

Two SCSI backplanes come pre-installed in the TS500-E2 RS8 model. One SCSI backplane comes pre-installed in the RS4 model. The SCSI backplane has four 68-pin SCSI connectors to support SCA SCSI hard disks. The backplane design incorporates a hot swap feature to allow easy connection or removal of SCSI hard disks. The LEDs on the backplane connect to the front panel LEDs to indicate HDD access, HDD failure, thermal failure, or fan failure. See section "1.6 LED information."

Front side

The front side of the SCSI backplane faces the front panel when installed. This side includes four SCSI connectors for the hot swap drive trays.
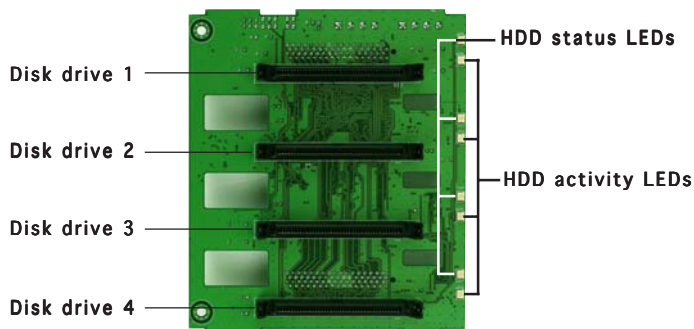
Back side

The back side of SCSI backplane faces the rear panel when installed. This side includes the power connectors, SCSI interfaces for the SCSI/RAID card and terminator, an HDD fan connector, and SMBus connectors.

The picture shows a two-backplane configuration in a cascade connection.

First SCSI backplane
Cascade connection

SCSI terminator
Second SCSI backplane
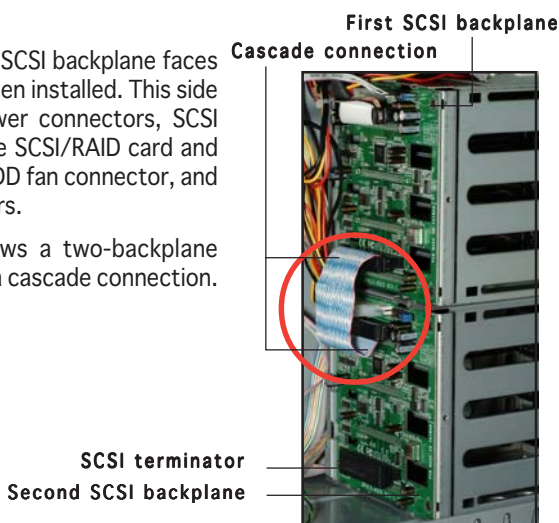
One-backplane configuration
In a **one-backplane** configuration:

• the upper SCSI interface of the backplane connects to the SCSI connector on the motherboard or the SCSI/RAID card

• a SCSI multi-mode terminator (LVD/SE) is connected to the lower SCSI interface of the backplane

Power connectors (connect power plugs from the power supply)

Fan connector (for HDD fan)

68-pin SCSI connector (connects the SCSI cable from the SCSI connector on the motherboard or the SCSI/RAID card)

68-pin SCSI connector (with SCSI multi-mode terminator)

SMBus connector [SMB_IN1] (connects the SMB cable from the motherboard)
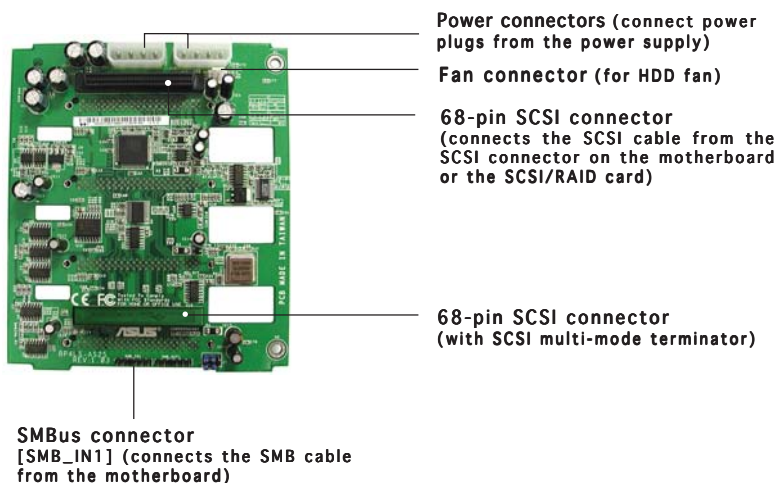
Two-backplane configuration

In a **two-backplane** configuration:

- the upper SCSI interface of the first backplane connects to the SCSI connector on the motherboard or the SCSI RAID card
- the lower SCSI interface connects to the upper SCSI interface of the second backplane
- a SCSI multi-mode terminator (LVD/SE) is placed on the lower SCSI interface of the second backplane

First backplane

Power connectors (connect power plugs from the power supply)

Fan connector (for HDD fan)

68-pin SCSI connector (connects the SCSI cable from the SCSI connector on the motherboard or the SCSI/RAID card)

68-pin SCSI connector (connects the SCSI cable to the second backplane)

SMBus connector [SMB_OUT1] (connects the SMB cable from the SMB_IN1 connector of the second backplane)

SMBus connector [SMB_IN1] (connects the SMB cable from the motherboard)

SMBus connector [SMB_IN1] (connects the SMB cable to the SMB_OUT1 connector of the first backplane)

68-pin SCSI connector (with SCSI multi-mode terminator)

68-pin SCSI connector (connects the SCSI cable from the first backplane)

Fan connector (for HDD fan)

Power connectors (connect power plugs from the power supply)

Second backplane

SCSI backplane jumper settings and HDD ID assignments

The 6-pin jumper **J1** on each of the SCSI backplanes allows you to define your desired SCSI configuration.

The picture below shows the location of jumper J1 with pins 1-3 and 2-4 shorted.
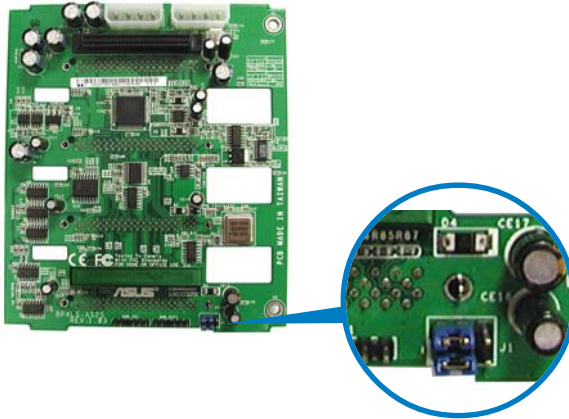
Refer to the following tables for the jumper settings and the appropriate ID# for each SCSI HDD bay.

Setting 1: Using single-channel SCSI/RAID connector

Cascade configuration	
First backplane (BP1) **J1 setting** *(1-3 shorted, 2-4 shorted)*	
Device	**SCSI ID#**
Drive Bay 1	ID0
Drive Bay 2	ID1
Drive Bay 3	ID2
Drive Bay 4	ID3
GEM SAF-TE	ID15
Second backplane (BP2) **J1 setting** *(3-5 shorted, 4-6 shorted)*	
Device	**SCSI ID#**
Drive Bay 5	ID4
Drive Bay 6	ID5
Drive Bay 7	ID6
Drive Bay 8	ID8
GEM SAF-TE	ID11

Setting 2: Using dual-channel SCSI/RAID connectors
(two separate cables connected to each BP)

Non-Cascade configuration	
First backplane (BP1) **J1 setting** (1-3 shorted, 2-4 shorted)	
Device	**SCSI ID#**
Drive Bay 1	ID0
Drive Bay 2	ID1
Drive Bay 3	ID2
Drive Bay 4	ID3
GEM SAF-TE	ID15 (SCSI channel-0)
Second backplane (BP2) **J1 setting** (1-3 shorted, 2-4 shorted)	
Device	**SCSI ID#**
Drive Bay 5	ID0
Drive Bay 6	ID1
Drive Bay 7	ID2
Drive Bay 8	ID3
GEM SAF-TE	ID15 (SCSI channel-1)

In a non-cascade configuration, you must install a SCSI multi-mode terminator on both backplanes.

2.10   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.   Air duct
2.   Chassis fan
3.   HDD blowers
4.   SATA/SCSI backplanes
5.   Floppy disk drive module
6.   Front I/O board

7.   Chassis footpads and roller wheels
8.   Power supply

2.10.1 Air duct

The barebone server system features an air duct that provides cool air from the outside through the chassis side cover vent for the system to maintain optimum thermal performance . The HDD blowers circulate cool air within the system.

To uninstall the air duct:

1.   Press, then slide down the blue tab in the middle of the top lock.

2.   Simultaneously push up the side locks at the lower part of the air duct.

3.   Carefully pull out the air duct out of the chassis, and set it aside.

To reinstall the air duct:

1. Slide in the air duct into the chassis.
2. Align the air duct vent holes to the CPU fans in the system, making sure that there are no obstructing cables.

Air duct vent holes

3. Firmly press the top lock onto the metal railing.
4. Press, then slide up the blue tab in the middle of the top lock.

5. Align the lower part of the air duct to the metal railing.
6. Push firmly until the lock tab snaps into one of the holes of the metal railing.

7. Simultaneously push down the side locks to secure the air duct from the chassis.

2.10.2 Chassis fan

To remove the chassis fan:

1. Disconnect the 3-pin fan cable from the connector REAR_FAN1 on the motherboard.

2. Press the tabs on the outer corners of the system fan, then pull the fan out of the chassis.
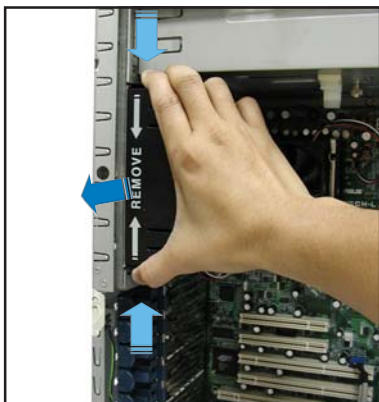
3. Lift the chassis fan case lock hooks, then push the fan from the center of the case until it is detached.

Lock hooks

4. Pull the fan out from the fan case, then set aside.

To reinstall the chassis fan:

1. Insert the new fan to the chassis fan cage.

2. Firmly hold the chassis fan on the side with the tabs and position it into its slot, making sure that the four hooks underneath the fan match the corresponding holes on the rear panel.
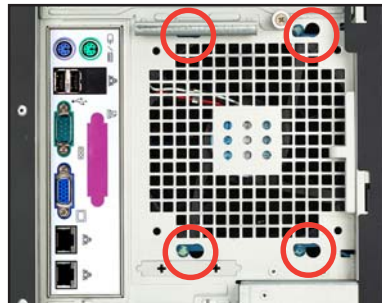
3. Push the fan into the chassis until the four hooks lock securely into the holes on the rear panel.

4. Reconnect the 3-pin fan cable from the connector REAR_FAN1 on the motherboard.

NCLV-DS2 Fan connectors

REAR_FAN1   REAR_FAN2

CPU_FAN1   CPU_FAN2

FRNT_FAN1   FRNT_FAN2
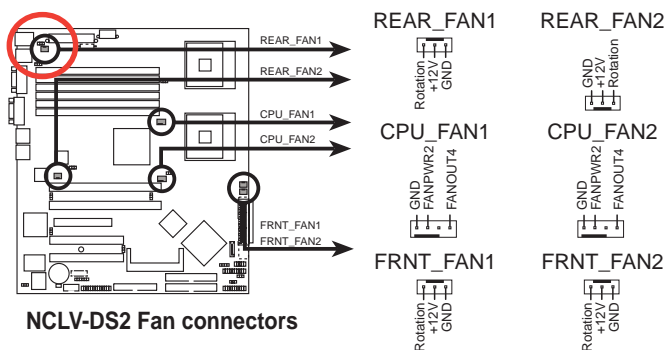
2.10.3 HDD blower

To remove the HDD blower:

1. Lay down the system on its side, on a flat and stable surface.

2. Remove the side cover. Refer to section "2.1.1 Removing the side cover" for instructions.

3. Disconnect the 3-pin fan cable from the fan connector on the backplane.
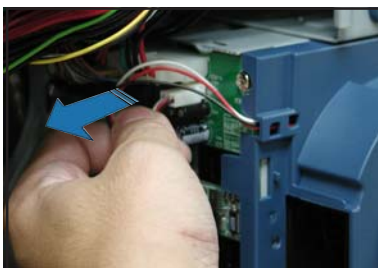
4. Loosen the thumb screw that secures the HDD blower case to the chassis.

5. Firmly grip the blower case as shown, then slide it out of the chassis in the direction of the arrow.

6. Remove the two screws on the blower case using a Phillips screwdriver. Set the screws aside.

7. Remove the blower from the case.

To reinstall the HDD blower:

1.   Replace the blower into the case.
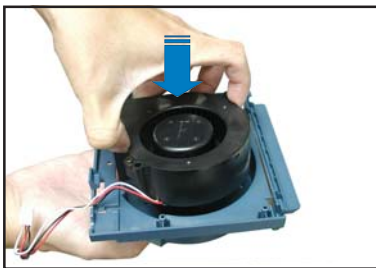
2.   Secure the blower to the case with the two screws you removed earlier.

3.   Slide in the blower case as shown, making sure the side tabs fit into the holes on the HDD cage.

Side tab in HDD cage hole

4. Secure the blower case with the thumb screw.

5. Reconnect the 3-pin fan cable to the fan connector on the backplane.
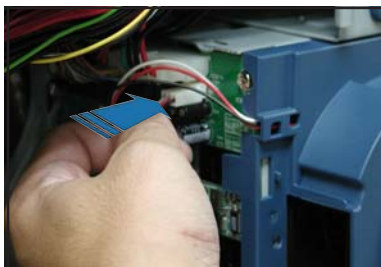
2.10.4 SCSI backplane

To remove the SCSI backplane:

1. Remove the HDD blower case. Refer to section "2.10.2 HDD blowers" for instructions.
2. Disconnect all cables from the SCSI backplane.

> ⚠️ When disconnecting a cable, hold and firmly pull the cable plug. DO NOT pull the cable itself. Doing so may damage the cable!

3. From the inner edge, push the backplane outward so that the outer edge protrudes slightly from the slot.
4. From the outer edge, firmly hold the backplane and carefully slide it out.

To reinstall a SCSI backplane:

1. Position the backplane into its slot with the component side facing the rear panel, and the power connectors on top.

2. Align the backplane with the rail-like dents on the slot to ensure that it fits securely.

Rail-like dents

3. Slide the backplane into the slot until it fits. If correctly installed, the outer edge of the backplane aligns with the corner of the drive cage.

4. Connect the appropriate cables to the backplane. Refer to sections "2.9.2 SCSI backplane connections" for details.

2.10.5 Floppy disk drive

✎ You need to remove the front panel assembly before you can remove the floppy disk drive. Refer to section "2.5.1 Removing the front panel assembly" for instructions.

To remove the floppy disk drive:

1. Remove the screw that secures the drive to the chassis.
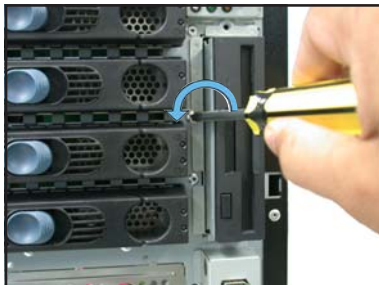
2. Carefully pull out the drive from the chassis until you see the cables connected to the drive.

3. Disconnect the floppy disk cable and power cable from the drive to completely release the drive.

To install a floppy disk drive:

1. Position the floppy drive vertically with the eject button on the left side (close to the HDDs).
2. Connect the drive signal cable and power cable.
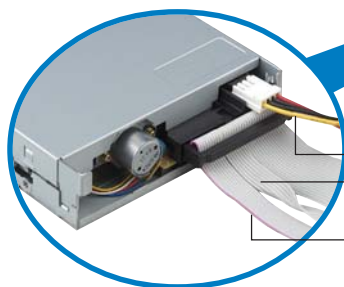
Floppy drive power cable

Floppy drive signal cable

Red stripe to match Pin 1 on the connector

3. Carefully push the drive into the bay until the drive cage fits the front edge of the bay.

4. Secure the drive cage with a screw.

2.10.6 Front I/O board

✎ You need to remove the front panel assembly before you can remove the front I/O board. Refer to section "2.5.1 Removing the front panel assembly" for instructions.

To remove the front I/O board:

1. Remove the screw that secures the front I/O board bracket to the front panel.

2. Carefully pull out the bracket until you see the cables connected to the I/O board.
3. Disconnect all the cables from the I/O board.

4. Remove the screw that secures the I/O board to the bracket.
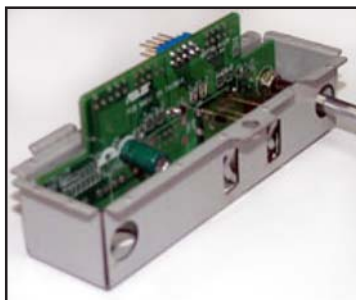
To install the front I/O board:

1. Place the I/O board in the bracket, component side up. Secure the front I/O board to the bracket with a screw.
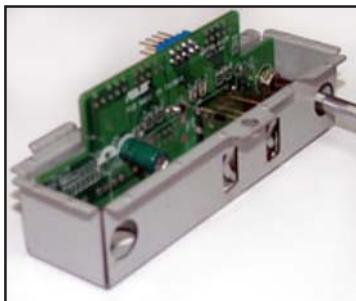
2. Position the I/O board into the bay with the component side to the left (close to the HDDs). Connect the I/O cables to the connectors on the back of the I/O board.
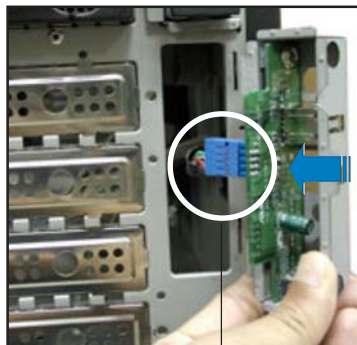
USB 2.0 connector

3. Insert the I/O board into the bay until the bracket fits the front edge of the bay.
4. Secure the I/O board bracket with a screw.
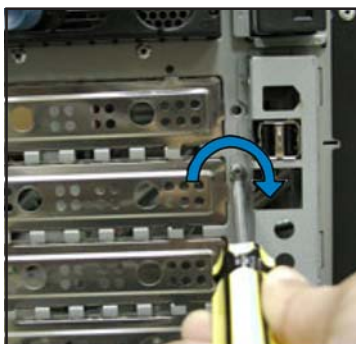
2.10.7 Chassis footpads and roller wheels

The barebone server system is shipped with four footpads attached to the bottom of the chassis for stability. You need to remove these footpads if:

• if you want to replace the footpads with the bundled roller wheels
• you wish to install the system to a rack

    (Refer to "Chapter 3 Installation options" of this user guide, and to the "Rackmount Kit" user guide for instructions)

To remove the footpads:

1. Lay the system chassis on its side.
2. Use a flat screwdriver to flip out the top layer of a footpad.

3. Remove the footpad by rotating it counterclockwise.

4. Repeat steps 2 and 3 to remove the other three footpads.

For convenient transport, install the roller wheels the came with the system package. Each wheel has a brake lock to stabilize the chassis in place.

To install the chassis wheels:

1. Lay the chassis in its side.
2. Locate the designated screw holes for each of the four wheel sets. Take note of the numbers alongside each hole when placing screws.
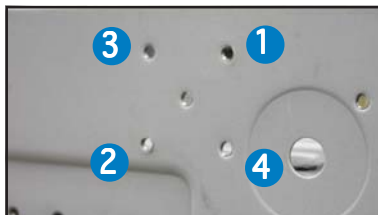
3. Secure each wheel to the bottom of the chassis using four screws.
4. Repeat steps 2 and 3 to install the other three wheels.

Remove the chassis roller wheels if you wish to mount the system to a rack.

To remove the chassis wheels:

1. Lay the system chassis on its side.
2. Use a Phillips screwdriver to remove the screws that secure the wheels to the bottom of the chassis.
3. Repeat step 2 to remove the other three roller wheels.

2.10.8 Power suppy modules

The user can choose from one of the two three power supply configurations:

1 x 650 W single power supply (110 V/220 V autoswitch)

2 x 650 W redundant power supply (110 V/220 V autoswitch)

If you are using a 650 W (2 x 650 W) redundant power supply, make sure to plug the two power cords.

Refer to this section when removing or installing power supply modules to the barebone system.

You MUST disconnect all power cable plugs from the motherboard and other installed devices before removing the power supply modules.

The picture below shows the motherboard and device connectors where the power plugs are connected. Refer to the Appendix at the end of this document for the power supply specifications.
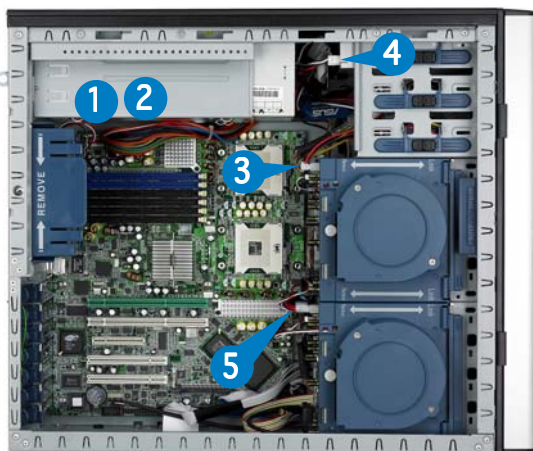
1. 24-pin ATX (motherboard power connector; *hidden behind PSU*)
2. 8-pin +12V (motherboard power connector; *hidden behind PSU*)
3. 2 x 4-pin plugs (SCSI backplane)
4. 4-pin plug (floppy disk drive; *hidden*)
5. 2 x 4-pin plugs (second SCSI backplane, if available)

Make sure to unplug **ALL** power cables from the system devices before removing the power supply module.

To remove a 650 W redundant power supply and dummy cover :

1. Loosen two screws on the dummy cover that secure the power supply to the chassis.

    You can unload this dummy cover and disuse.
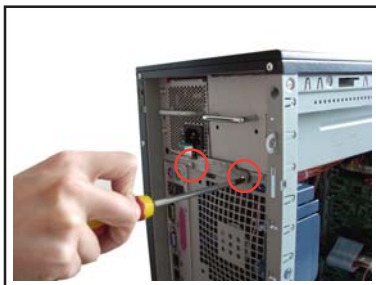
2. Loosen two screws on the power supply cage that secure on the chassis.

3. Use one hand to pull the dummy cover off the chassis.

    Refer the next page (step 2 ~ 4) to remove the power supply and cage.

To remove two 650 W redundant power supplys and cage :

1. Loosen two screws on the
    dummy cover that secure the
    power supply to the chassis.

    ✎   You can unload this dummy
        cover and disuse.
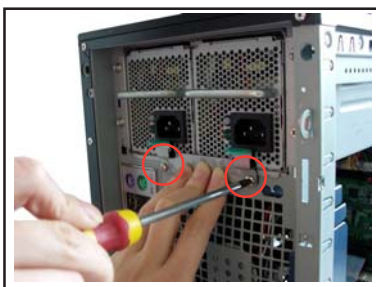
2. Use one hand to push up the
    power lock , and pull back to
    remove the power supply
    module from inside the power
    supply cage.
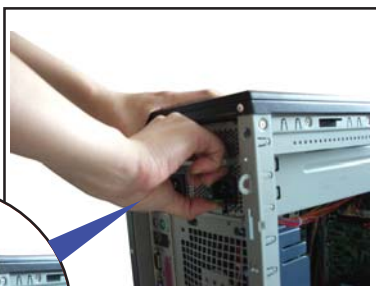
3. Set the power supply aside.
4. Loosen four screws on the
    power supply cage that secure
    on the chassis.
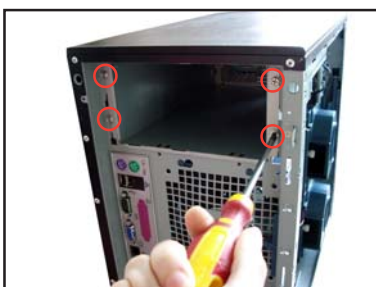
5. Use two hands to pull the power
    supply cage off the chassis.

Before you pull the power supply cage off the chassis, you need to move
the power supply cables . Due to space constraints, the cables may get
entangled with the installed components or other cables, causing the cables
to break!

To install a 650 W redundant power supply :

1. Insert the power supply cage into the chassis.

⚠️ Be careful with the power supply cables when inserting the power supply module into the cage. Due to space constraints, the cables may get entangled with the installed components or other cables, causing the cables to break!

2. Lockup four screws to secure the power supply cage to the chassis.

3. Use one hand to push the power supply module until it fits inplace.

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

Installation options

The items required for the optional configurations described in this chapter are not included in the standard barebone system package. These items are purchased separately.

3.1 Installing a second SCSI drive cage

Perform this installation if you wish to upgrade your 4-SCSI configuration system (RS4 model) to an 8-SCSI configuration (RS8).

RS4   **RS8**
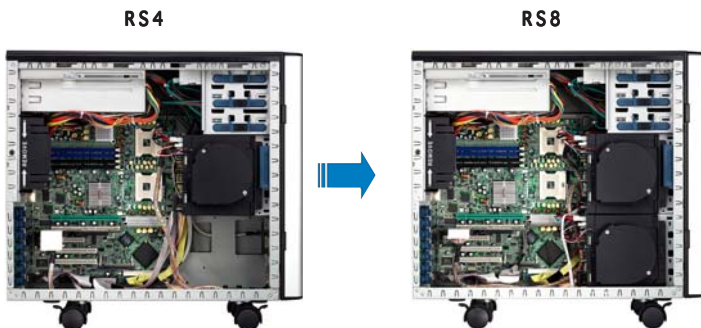
Clear the space under the first SCSI drive cage. Make sure that you disconnect all pre-connected cables so they do not get in the way when you install the second drive cage. If necessary, you may have to remove the motherboard.

To install a second SCSI drive cage:

1. Position the drive cage in the same orientation as the first drive cage. Note that the lock tab on top of the cage faces the rear panel.

   Cage lock tab

2. Carefully slide the drive cage toward the front panel until it fits in place.

3. Make sure that the cage lock tab snaps to the bottom of the first drive cage. When properly installed, the cage should align with the first drive cage.

Cage lock tab snapped securely to the bottom of the first drive cage
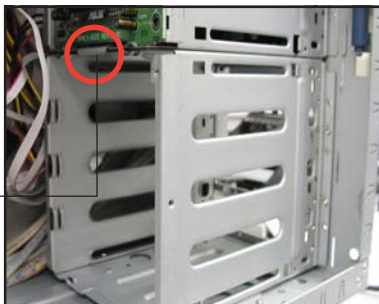
4. From the front side, secure the right side of the cage with two screws.
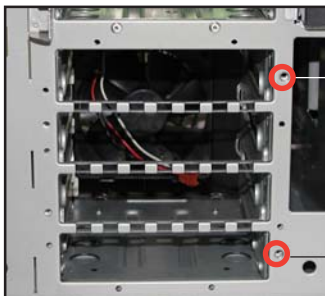
Front screw holes

5. Position the support bracket for the drive trays to the left side of the cage with the three protruding tabs matching the elongated holes on the chassis.

Protruding tabs

Screw holes

Elongated holes for bracket
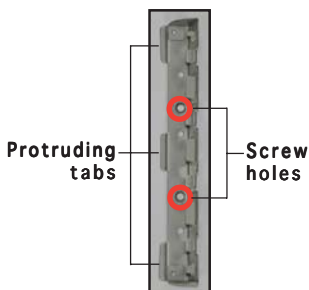
SCSI drive tray support bracket

6.	Insert the tabs into the holes. You may need to swing the bracket a bit from left to right and back to fully insert the tabs.

7.	When the tabs are fully inserted in the holes, swing the bracket to the right until one side is flat to the chassis.
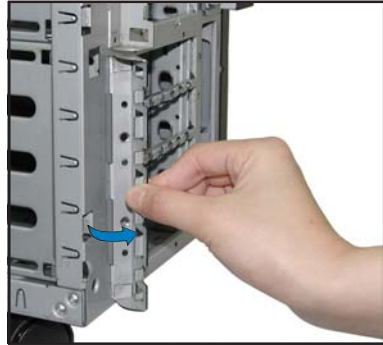
8.	Secure the bracket with two screws in the holes indicated.
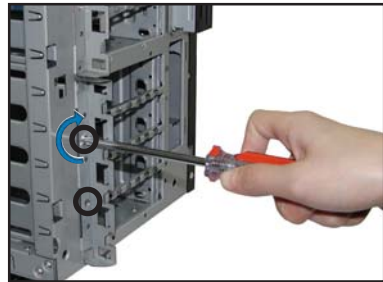
Securing the bracket with the two screws also secures the left side of the SCSI drive cage.

3.2   Installing a power supply module

Perform this installation if you wish to upgrade your barebone server system from 650 W to dual 650 W redundant power supply.

1. Loosen two screws on the dummy cover that secure the power supply to the chassis.

    You can unload this dummy cover and disuse.
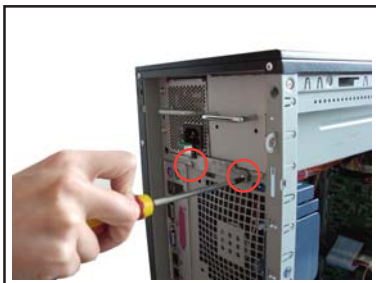
2. Loosen two screws on the power supply cage that secure on the chassis.

3. Use one hand to pull the dummy cover off the chassis.

3. Use one hand to push the power supply module until it fits inplace.
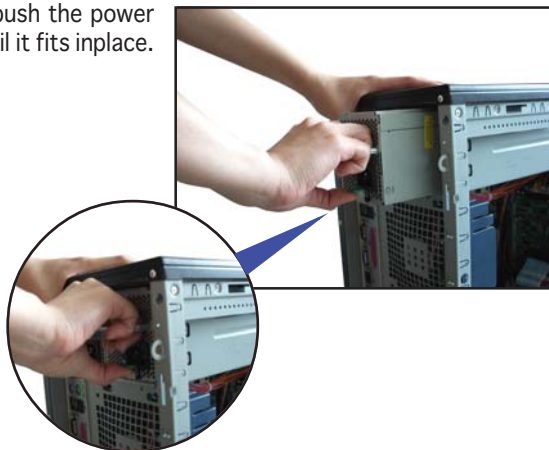
4. The picture shows the power supply module when installed.

3.3   Mounting the system to a rack

3.3.1   Removing the footpads or roller wheels

Refer to section "2.10.7 Chassis roller wheels and footpads" for instructions on removing the footpads or roller wheels.

3.3.2   Removing the top cover

To remove the top cover:

1.   Remove the side cover. Refer to section "2.1.1 Removing the side cover" for instructions.
2.   Remove the front panel assembly. Refer to section "2.5.1 Removing the front panel assembly" for instructions.
3.   Locate the lock tab underneath the top cover and press it outward to release the cover.
4.   Slide the top cover toward the front panel, then lift it up from the chassis.
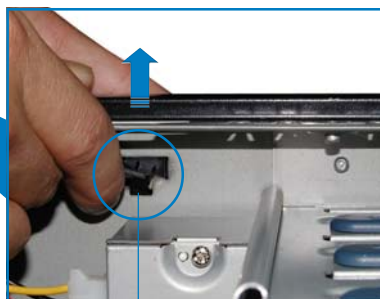
Lock tab of top cover (bottom view)

3.3.3   Attaching the rack rails

Refer to the installation guide that came with the Rackmount Rail Kit for instructions on how to attach the rails and on the barebone server system and the corresponding rails on the industrial rack.

Chapter 4

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

Motherboard info

4.1 Motherboard layout

26.8cm (10.5in)

NCLV-DS2

PS/2KBMS
T: Mouse
B: Keyboard

KBPWR1

SSIPWR1

SSI12V1

REAR_FAN1

PSUSMB1

USB12

USBPW12

COM1

DDR2 DDR_B3 (64 bit,240-pin module)

DDR2 DDR_A3 (64 bit,240-pin module)

FM_CPU1

DDR2 DDR_B2 (64 bit,240-pin module)

DDR2 DDR_A2 (64 bit,240-pin module)

VGA

DDR2 DDR_B1 (64 bit,240-pin module)

DDR2 DDR_A1 (64 bit,240-pin module)

CPU_FAN1

mPGA 604

CPU1

mPGA 604

CPU2

LAN1

LAN2

Intel
MCH
E7320

Gigabit
LAN
BCM5721

LAN_EN1

Gigabit
LAN
BCM5705E

REAR_FAN2

FM_CPU2

CPU_FAN2

FRNT_FAN1

FRNT_FAN2

PCIX1 (64-bit PCI-X)

SCSI1

LAN_EN2

SCSI_EN1

PCIX2 (64-bit PCI-X)

ATI
RAGE XL
VGA
Controller

PCIE1(x4 link)

VGA_EN1

Adaptec
AIC-7901X

PCI4 (32-bit 5V PCI)

SB_PWR1

RECOVERY1

Intel
ICH
6300ESB

SATA2

Super
I/O

PCI5 (32-bit 5V PCI)

SATA1

USB34

BMCSOCKET1

HDLED

AUX_PANEL1

USBPW34

4Mbit
Flash
BIOS

CR2032 3V
Lithium Cell
CMOS Power

BMCCONN1

SEC_IDE1
PRI_IDE1

CLRTC1

BPSMB1

COM2

LPT1

FLOPPY1

PANEL1

30.5cm (12in)

Layout contents

4.2 Jumpers

The grayed out components in the illustrations may not be present in certain models.

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!

CLRTC1

2 1   3 2

Normal   Clear CMOS
(Default)

NCLV-DS2 Clear RTC RAM
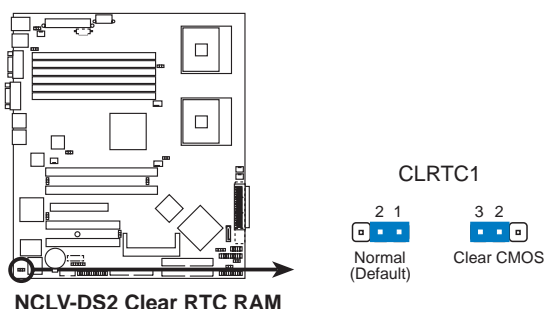
2. CPU fan pin selection (3-pin FM_CPU1, FM_CPU2)

These jumpers allow you to connect either a 3-pin or a 4-pin fan cable plug to the CPU fan connectors (CPU_FAN1, CPU_FAN2). Set these jumpers to pins 1-2 if you are using a 3-pin fan cable plug, or to pins 2-3 if you are using a 4-pin plug.

FM_CPU1

1 2
DC mode
(Default)

2 3
PWM

FM_CPU2

2 1
DC mode
(Default)

3 2
PWM

NCLV-DS2 FM_CPU Setting
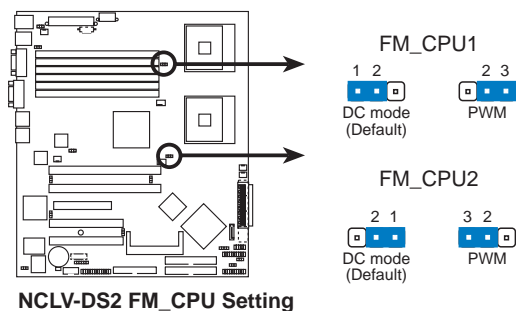
3. USB device wake-up (3-pin USBPW12, USBPW34)

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

USBPW12

1 2
+5V
(Default)

2 3
+5VSB

USBPW34

1 2
+5V
(Default)

2 3
+5VSB

NCLV-DS2 USB device wake-up
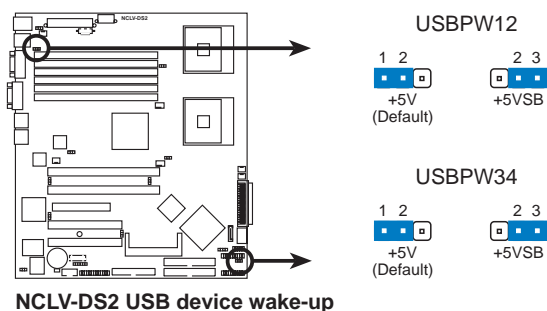
- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.

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

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

4. Keyboard power (3-pin KBPWR1)

This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.
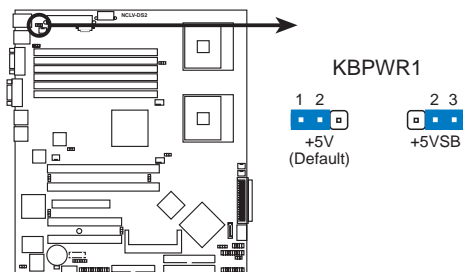
NCLV-DS2 Keyboard power setting

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

These jumpers allow you to enable or disable the onboard ATI Rage XL PCI VGA controller. Set to pins 1-2 to activate the VGA feature.
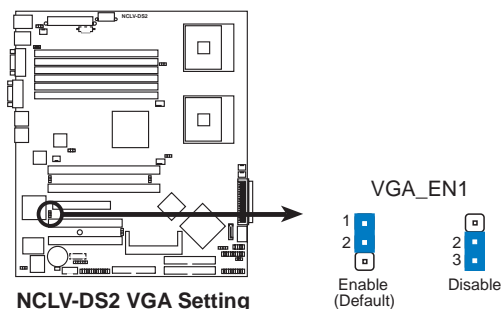
NCLV-DS2 VGA Setting

6. 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.

LAN_EN1

2 1   3 2

Enable   Disable
(Default)

NCLV-DS2 LAN_EN1 setting
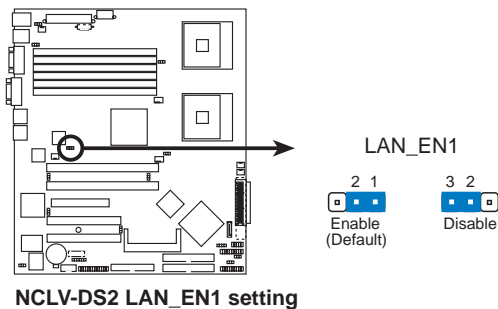
7. Gigabit LAN controller setting (3-pin LAN_EN2)

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.

LAN_EN2

2   3
1   2

Enable   Disable
(Default)

NCLV-DS2 LAN_EN2 setting
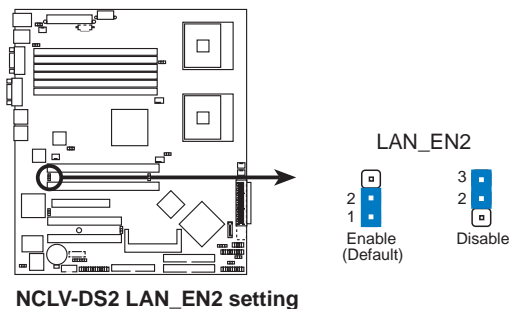
8. SCSI controller setting (3-pin SCSI_EN1)

This jumper allows you to enable or disable the onboard Adaptec® AIC-7901X SCSI U320 controller. Set to pins 1-2 to activate the SCSI feature, and support RAID configurations.

SCSI_EN1

1
2   2
         3

Enable   Disable
(Default)
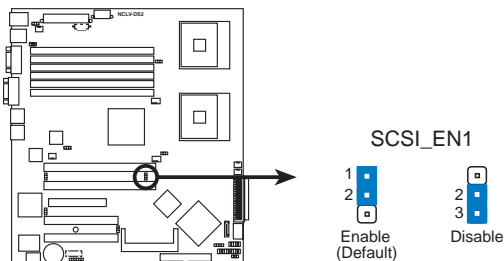
NCLV-DS2 SCSI setting

9. Force BIOS recovery setting (3-pin RECOVERY1)

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

To update the BIOS:

1. Prepare a floppy disk that contains the latest BIOS for the motherboard (xxxx-xxx.ROM) and the AFUDOS.EXE utility.
2. Set the jumper to pins 2-3.
3. Insert the floppy disk then turn on the system to update the BIOS.
4. Shut down the system.
5. Set the jumper back to pins 1-2.
6. Turn on the system.

RECOVERY1

1
2   2
         3

Normal   BIOS Recovery
(Default)
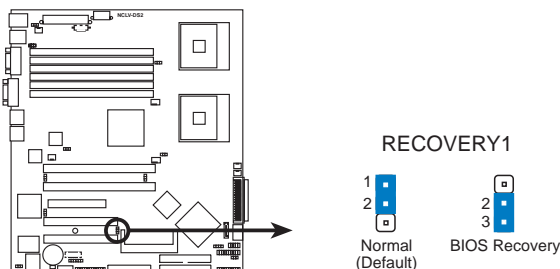
NCLV-DS2 BIOS recovery setting

4.3   Connectors

4.3.1 Rear panel connectors
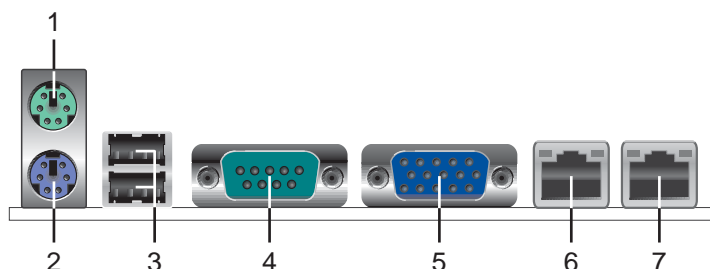
1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
2. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.
3. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
4. **Serial (COM1) port**. This 9-pin communication port is for pointing devices or other serial devices.
5. **VGA port.** This port is for a VGA monitor or other VGA-compatible devices.
6. **Gigabit LAN1 (RJ-45) port.** This ports allow Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.
7. **Gigabit LAN2 (RJ-45) port.** This ports allow Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications

ACT/LINK LED		SPEED LED	
Status	**Description**	**Status**	**Description**
OFF	No link	OFF	10 Mbps connection
GREEN	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1000 Mbps connection

ACT/LINK   SPEED
LED   LED

LAN port
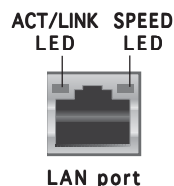
4.4 Internal connectors

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.
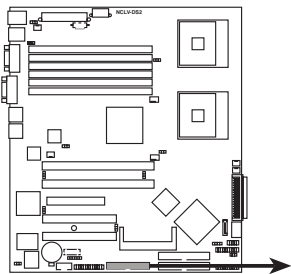
NCLV-DS2 Floppy disk drive connector

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

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

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

SEC_IDE1

PIN 1

PRI_IDE1
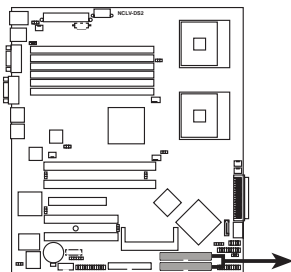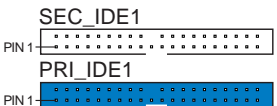
PIN 1

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

NCLV-DS2 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 set LSI Logic Embedded SATA RAID in the Intel® 6300ESB Southbridge chip.

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 S-ATA as RAID** item in the BIOS to [Yes]. See section "4.3.4 IDE Configuration" for details.

SATA2

GND
RSATA_TXP2
RSATA_TXN2
GND
RSATA_RXP2
RSATA_RXN2
GND

SATA1

GND
RSATA_TXP1
RSATA_TXN1
GND
RSATA_RXP1
RSATA_RXN1
GND

NCLV-DS2 SATA connectors
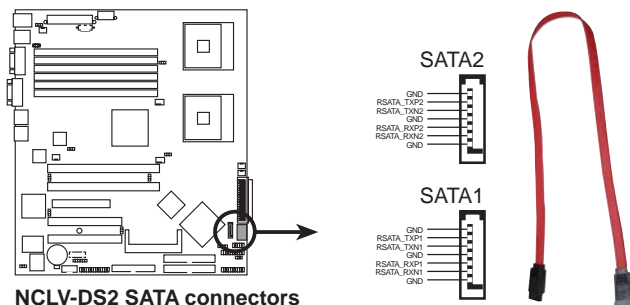
Important notes on Serial ATA

- You must install Windows® 2000 Service Pack 4 or the Windows® XP Service Pack 1 before using Serial ATA hard disk drives. The Serial ATA RAID feature (RAID 0 or 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 connector. Refer to the table on the next page for recommended SATA hard disk drive connections.

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

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

NCLV-DS2
SCSI/SATA card activity LED connector
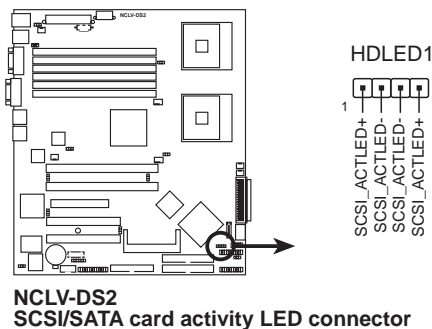
5. Ultra320 SCSI connector (68-pin SCSI1)

This motherboard comes with the Adaptec® AIC-7901X PCI-X SCSI controller that supports one 68-Pin Ultra320 SCSI connector. The SCSI channel can support a maximum of 15 SCSI devices as specified by Ultra320 standards.

NCLV-DS2 Onboard SCSI connector
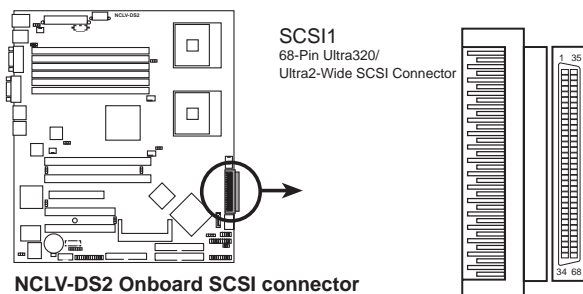
SCSI Connection Notes

This motherboard has a 68-Pin Ultra320 SCSI connector.

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

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

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

USB34

NCLV-DS2 USB 2.0 connector
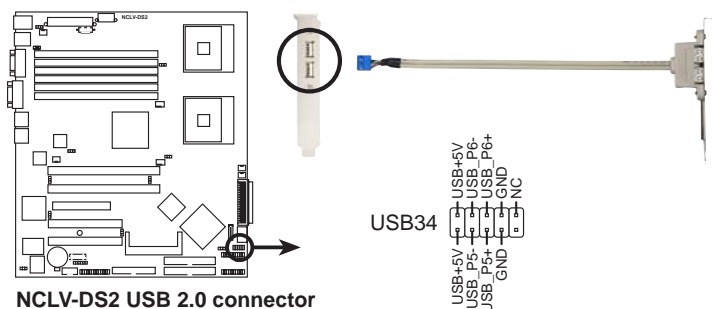
The USB port module is purchased separately.

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.

COM2

PIN 1

NCLV-DS2
Serial port2 (COM2) connector
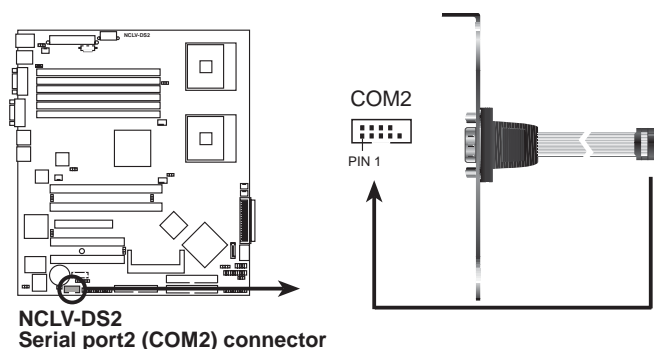
The serial port module is purchased separately.

8. CPU, rear, and front fan connectors (3-pin CPU_FAN1/2, 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-DS2 Fan connectors
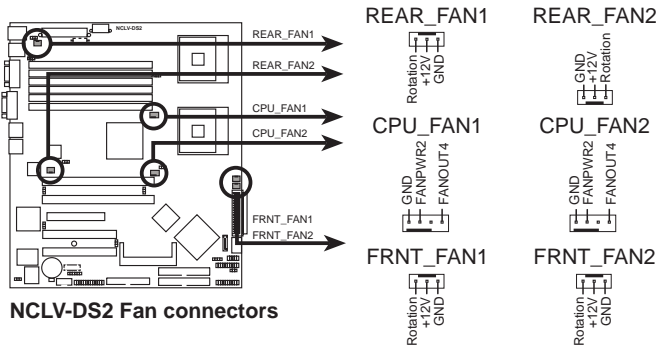
9. BMC connector (16-pin BMCCONN1)

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

NCLV-DS2 BMC connector
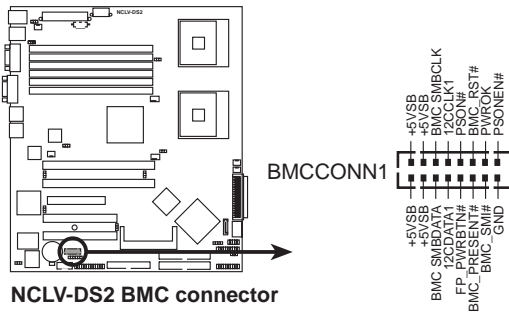
10. Backplane SMBus connector (6-1 pin BPSMB1)

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-DS2 SMBus connector

BPSMB1

NC
I2C_6_CLK#
GND
I2C_6_DATA#
+5V
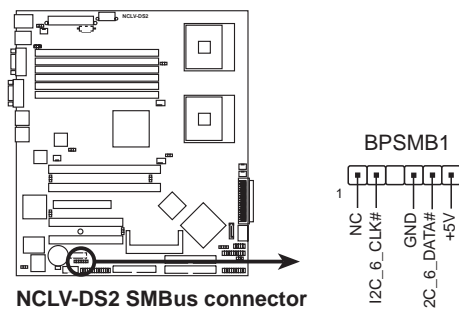
11. Power supply SMBus connector (5-pin PSUSMB1)

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

NCLV-DS2 Power supply SMBus connector

PSU_I2CCLK
PSU_I2CDATA
NC
GND
+3.3V Remote Sense

PSUSMB1
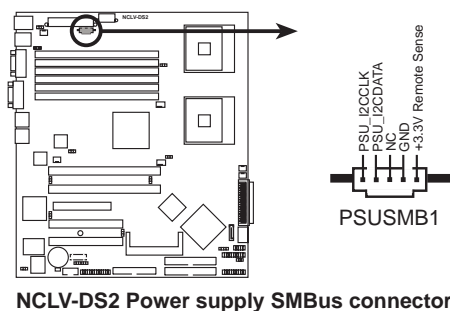
12. ATX power connectors (24-pin ATXPWR1, 8-pin ATX12V1)

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

- Use of an SSI 12 V Specification 2.0-compliant power supply unit (PSU) that provides a minimum power of 600 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-D2 Series 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

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

8-pin

GND
GND
GND
GND

+12V CPU
+12V CPU
+12V CPU
+12V CPU

For Power Supply
with 20-pin
Power Connector
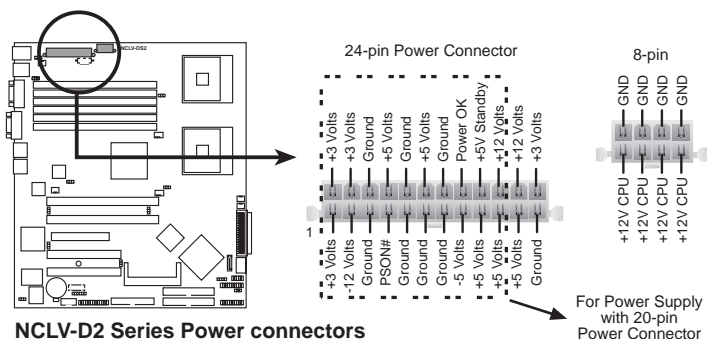
13. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.

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

- **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 (Light Green 2-pin PWRSW)**
  This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- **Reset button (Blue 2-pin RESET)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

NCLV-DS2 System panel connector

PANEL1

HDLED+ / POWERLED+
HDLED- / GND
NMIBTN# / POWERLED-
GND / MLED+
POWERBTN# / MLED-
+5V / NC
NC / GND
RESETBTN# / GND
GND / SPKROUT
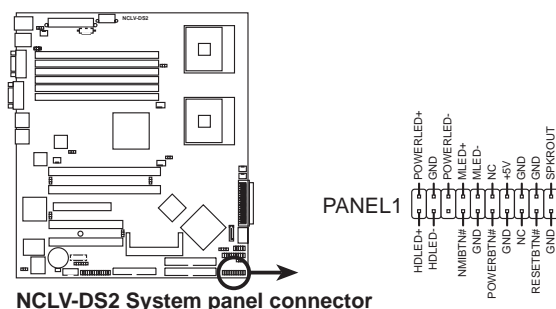
The system panel connector is color-coded for easy connection.

14. Auxiliary panel connector (20-pin AUX_PANEL1)

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

- **Front panel SMB (6-1 pin FPSMB)**
  These leads connect the front panel SMBus cable.

- **LAN activity LED (2-pin LAN1_LED, LAN2_LED)**
  These leads are for Gigabit LAN activity LEDs on the front panel.

- **Chassis intrusion (4-1 pin CHASSIS)**
  These leads are for the intrusion detection feature for chassis with intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to these leads to record a chassis intrusion event.

- **Locator LED (6-pin LOCATOR)**
  These leads are for the locator switch and LED on the front panel.
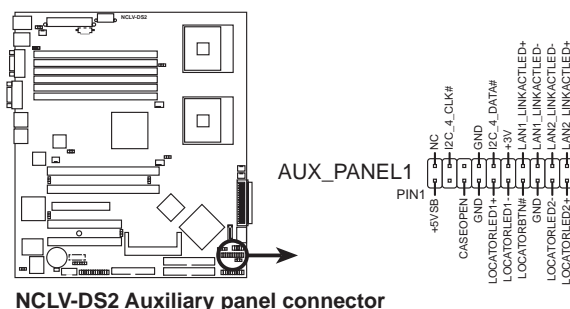
NCLV-DS2 Auxiliary panel connector

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

BIOS information

5.1 Managing and updating your BIOS

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

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

Refer to the corresponding sections for details on these utilities.

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

5.1.1 Creating a bootable floppy disk

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

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

   b. At the DOS prompt, type **format A:/S** then press <Enter>.
   Windows® XP environment

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

   b. Click **Start** from the Windows® desktop, then select **My Computer**.

   c. Select the 3 1/2 Floppy Drive icon.

   d. Click **File** from the menu, then select **Format**. A **Format 3 1/2 Floppy Disk** window appears.

   e. **Windows® XP users:** Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

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 1024 KB free space to save the file.

- The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be same as shown.

---

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.

2. Boot the system in DOS mode, then at the prompt type:

    afudos /o[filename]

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

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

    Main filename   Extension name

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

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

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

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

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

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

2. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.

3. Boot the system in DOS mode, then at the prompt type:

    afudos /i[filename]

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

    ```
    A:\>afudos /iNCLVDS2.rom
    ```

> Use the appropriate BIOS file depending on your motherboard model (e.g. NCLVD2SATA.ROM or NCLVDS2.ROM)

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

    ```
    A:\>afudos /iNCLVDS2.ROM
    AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
    Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

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

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

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

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

```
A:\>afudos /iNCLVDS2.ROM
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

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

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

   Please restart your computer

A:\>
```

5.1.3   ASUS CrashFree BIOS 2 utility

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

> • Prepare the motherboard support CD or the floppy disk containing the updated motherboard BIOS before using this utility.
>
> • Make sure that you rename the original or updated BIOS file in the floppy disk according the exact name of your motherboard, e.g. **NCLVDS2.ROM**.

Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

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

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

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

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "NCLVDS2.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 "NCLVDS2.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 Microsoft® Windows® applications before you update the BIOS using this utility.

Updating the BIOS through the Internet

To update the BIOS through the Internet:

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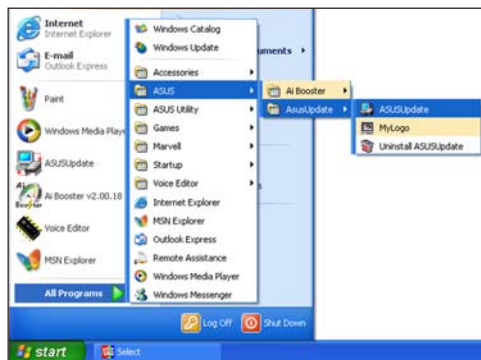
2.	Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.

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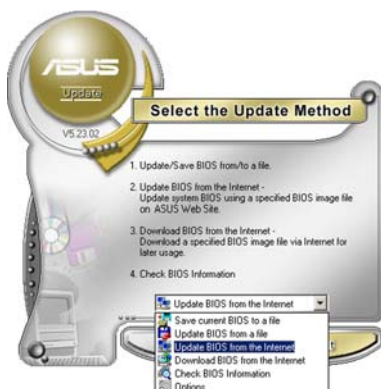
4. From the FTP site, select the BIOS version that you wish to download. Click Next.

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

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

Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

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

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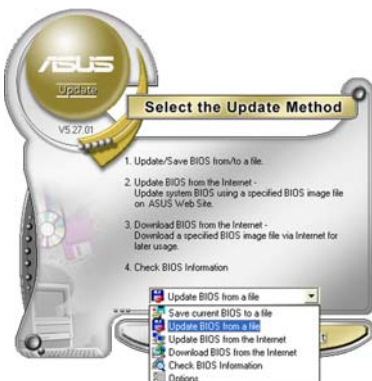
3. Locate the BIOS file from the **Open** window, then click **Save**.

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

5.2   BIOS setup program

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

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

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

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

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

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

- • The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit Menu. See section "4.8 Exit Menu."

- • The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

- • Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

5.2.1   BIOS menu screen

Menu items   Menu bar   Configuration fields   General help

```
                               BIOS SETUP UTILITY
   Main     Advanced     Server     Security     Boot     Exit
  ┌─────────────────────────────────────────────┬────────────────────────┐
  │  System Overview                             │  Use [ENTER]. [TAB],   │
  │                                              │  or [SHIFT-TAB] to     │
  │  System Time              [11:10:19]         │  select a field.       │
  │  System Date              [Thu 04/21/2005]   │                        │
  │                                              │  Use [+] or [-] to     │
  │  Legacy Diskette A        [1.44M, 3.5 in]    │  configure system time.│
  │                                              │                        │
  │  ►   IDE Configuration                       │                        │
  │  ►   Primary IDE Master    [Not Detected]    │                        │
  │  ►   Primary IDE Slave     [Not Detected]    │                        │
  │  ►   Secondary IDE Master  [Not Detected]    │  ◄► Select Screen      │
  │  ►   Secondary IDE Slave   [Not Detected]    │  ↑↓ Select Item        │
  │  ►   Tertiary IDE Master   [Not Detected]    │  +-  Change Option     │
  │  ►   Fourth IDE Master     [Not Detected]    │  F1  General Help      │
  │                                              │  F10 Save and Exit     │
  │  ►   System Information                      │  ESC Exit              │
  │                                              │                        │
  │                                              │                        │
  │       v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.        │
  └──────────────────────────────────────────────────────────────────────┘
```

Sub-menu items   Navigation keys

5.2.2   Menu bar

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

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

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

5.2.3   Navigation keys

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

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

5.2.4 Menu items

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

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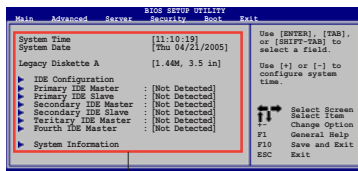
Main menu items

5.2.5 Sub-menu items

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

5.2.6 Configuration fields

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

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

5.2.7 Pop-up window

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

5.2.8 Scroll bar

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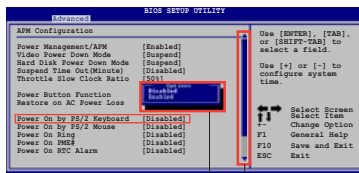
Pop-up window

Scroll bar

5.2.9 General help

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

5.3 Main menu

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

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

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

   System Overview                             Use [ENTER]. [TAB],
                                               or [SHIFT-TAB] to
   System Time           [11:10:19]            select a field.
   System Date           [Thu 04/21/2005]
                                               Use [+] or [-] to
   Legacy Diskette A     [1.44M, 3.5 in]       configure system time.

►   IDE Configuration
►   Primary IDE Master       [Not Detected]
►   Primary IDE Slave        [Not Detected]
►   Secondary IDE Master     [Not Detected]
►   Secondary IDE Slave      [Not Detected]    ◄► Select Screen
►   Tertiary IDE Master      [Not Detected]    ↑↓ Select Item
►   Fourth IDE Master        [Not Detected]    +- Change Option
                                               F1  General Help
►   System Information                         F10 Save and Exit
                                               ESC Exit


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

5.3.1 System Time [xx:xx:xx]

Allows you to set the system time.

5.3.2 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

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

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

5.3.4 IDE Configuration

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

```
                          BIOS SETUP UTILITY
  Main

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


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

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

Onboard IDE Operate Mode [Enhanced Mode]

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

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

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

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

IDE Detect Time Out (Sec) [35]

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

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

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

```
                         BIOS SETUP UTILITY
 Main

 Primary IDE Master                               Select the type of
                                                  device connected to
 Device        : Hard Disk                        the system.
 Vendor        : 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]
 LBA/Large Mode            [Auto]                 ←→  Select Screen
 Block(Multi-sector Transfer)  [Auto]            ↑↓  Select Item
 PIO Mode                  [Auto]                 +-  Change Option
 DMA Mode                  [Auto]                 F1  General Help
 SMART Monitoring          [Auto]                 F10 Save and Exit
 32Bit Data Transfer       [Disabled]             ESC Exit

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

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

Type [Auto]

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

LBA/Large Mode [Auto]

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

Block (Multi-sector Transfer) [Auto]

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

PIO Mode [Auto]

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

DMA Mode [Auto]

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

SMART Monitoring [Auto]

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

32Bit Data Transfer [Disabled]

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

5.3.6 System Information

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

```
                         BIOS SETUP UTILITY
  Main

   System Information

   Model Name     ASUS NCLV-DS2
   Model ID       8001A0

   ASUS-BIOS
   Version        1001.003
   Date           03/16/2005

   ▶ Processor
   ▶ System Memory

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

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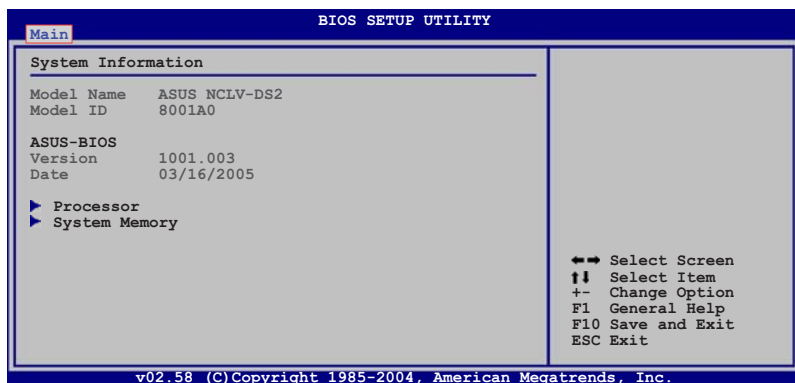
Model Name

Displays the auto-detected ASUS motherboard model.

Model ID

Displays the auto-detected identification number of the motherboard.

ASUS BIOS

Displays the auto-detected BIOS version in the motherboard.

Processor Information

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

```
                            BIOS SETUP UTILITY
  Main

  Processor Information

  *** CPU1 :
  Brand        Intel(R) Xeon(TM) CPU 3.60GHz
  ID/uCode     0F34h/014h
  Ratio Value  Actual 18 Max 18
  Cache Value  L1//16KB  L2/1024KB  L3/0KB

  *** CPU2 :
  Brand        Intel(R) Xeon(TM) CPU 3.60GHz
  ID/uCode     0F34h/014h
  Ratio Value  Actual 18 Max 18
  Cache Value  L1//16KB  L2/1024KB  L3/0KB        ←→  Select Screen
                                                  ↑↓  Select Item
                                                  +-  Change Option
                                                  F1  General Help
                                                  F10 Save and Exit
                                                  ESC Exit

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

System Memory Information

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

```
                            BIOS SETUP UTILITY
  Main

  System Memory Information

  Type         DDR2 400
  Total Memory 512MB
    DIMM01     512MB
    DIMM02     None
    DIMM03     None
    DIMM04     None
    DIMM05     None
    DIMM06     None

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

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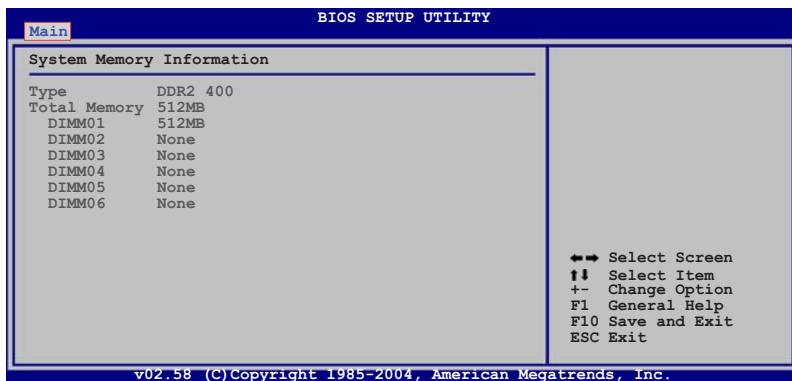
5.4   Advanced menu

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

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

```
                        BIOS SETUP UTILITY
  Advanced
 Advanced Settings                             Configure CPU.

  CPU Configuration
  Chipset Configuration
  PCI/PnP Configuration
  Power Configuration
  USB Configuration
  Super IO Configuration
  Hardware Monitor

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

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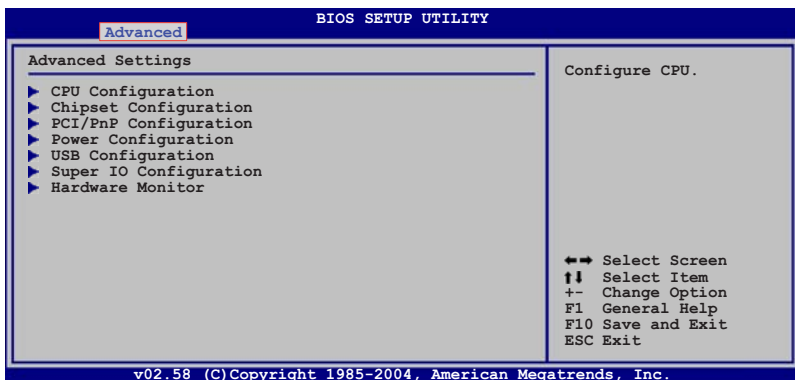
5.4.1   CPU Configuration

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

```
                        BIOS SETUP UTILITY
          Advanced
 Configure Advanced CPU settings               Select MPS Revision.

 MPS Table Version            [1.4]
 Hyper Threading Technology   [Enabled]
 Max CPUID Value Limit        [Disabled]
 Execute Disable Function     [Disabled]
 Enhanced C1 Control          [Auto]
 CPU Internal Thermal Control [Auto]

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

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

MPS Table Version [1.4]

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

Hyper Threading Technology [Enabled]

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

Max CPUID Value Limit [Disabled]

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

Execute Disable Function [Disabled]

When this item is set to [Disabled], the BIOS forces the XD feature flag to always return to (0). Configuration options: [Disabled] [Enabled]

Enhanced C1 Control [Auto]

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

CPU Internal Thermal Control [Auto]

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

5.4.2 Chipset Configuration

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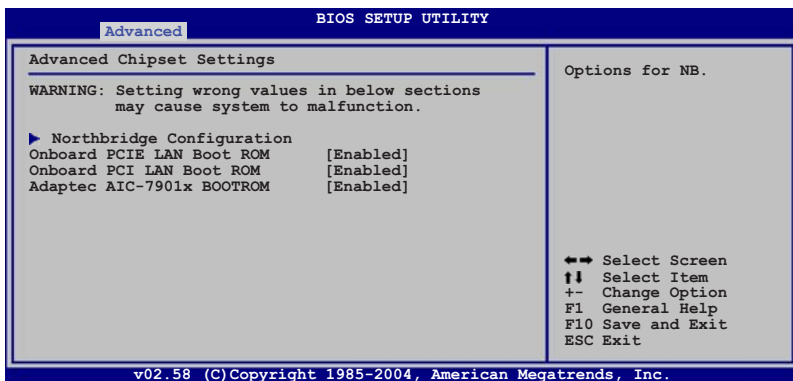
```
                         BIOS SETUP UTILITY
     Advanced

    Advanced Chipset Settings                    Options for NB.

    WARNING: Setting wrong values in below sections
             may cause system to malfunction.

    ▶ Northbridge Configuration
    Onboard PCIE LAN Boot ROM       [Enabled]
    Onboard PCI LAN Boot ROM        [Enabled]
    Adaptec AIC-7901x BOOTROM       [Enabled]


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

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

Onboard PCIE 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 LAN controller. Configuration options: [Disabled] [Enabled]

Adaptec AIC-7901x BOOTROM [Enabled]

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

The Adaptec AIC-7901x BOOTROM item appears only on SCSI model.

NorthBridge Configuration

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

```
                          BIOS SETUP UTILITY
      Advanced
NorthBridge Chipset Configuration                    ENABLE: Allow
                                                     remapping of
Memory Remap Feature            [Enabled]            overlapped PCI memory
Memory Mirroring/Sparing        [Disabled]           above the total
                                                     physical memory.

                                                     DISABLE: Do not allow
                                                     remapping of memory.



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

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

Memory Remap Feature [Enabled]

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

Memory Mirroring/Sparing [Disabled]

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

5.4.3 PCI/PnP Configuration

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

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

```
                          BIOS SETUP UTILITY
    Advanced

  Advanced PCI/PnP Settings                       NO: Lets the BIOS
                                                  configure all the
  Plug and Play OS            [No]                 devices int he system.
  PCI Latency Timer          [64]                  YES: Lets the
  Allocate IRQ to PCI VGA    [Yes]                 operating system
  Pallete Snooping           [Disabled]            configure Plug and
  PCI IDE BusMaster          [Enabled]             Play (PnP) devices not
                                                  required for boot if
  IRQ-3  assigned to         [PCI Device]          your system has a Plug
  IRQ-4  assigned to         [PCI Device]          ans Play operating
  IRQ-5  assigned to         [PCI Device]          system.
  IRQ-7  assigned to         [PCI Device]
  IRQ-9  assigned to         [PCI Device]          ◄► Select Screen
  IRQ-10 assigned to         [PCI Device]          ↑↓ Select Item
  IRQ-11 assigned to         [PCI Device]          +- Change Option
  IRQ-14 assigned to         [PCI Device]          F1  General Help
  IRQ-15 assigned to         [PCI Device]          F10 Save and Exit
                                                  ESC Exit

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

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: [Yes] [No]

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]

IRQ-xx assigned to [PCI Device]

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

5.4.4   Power Configuration

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

```
                          BIOS SETUP UTILITY
        ┌──────────┐
        │ Advanced │
  ──────┴──────────┴────────────────────────────────────────────────
   Power Configuration                          Include ACPI APIC
                                                table pointer to RSDT
   ACPI APIC Support            [Enabled]       pointer list.
                                                IMPORTANT!!!
 ▶ APM Configuration                            Do not change the APIC
                                                support settings after
                                                OS installation;
                                                otherwise, a system
                                                boot failure may
                                                occur.


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

        v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```
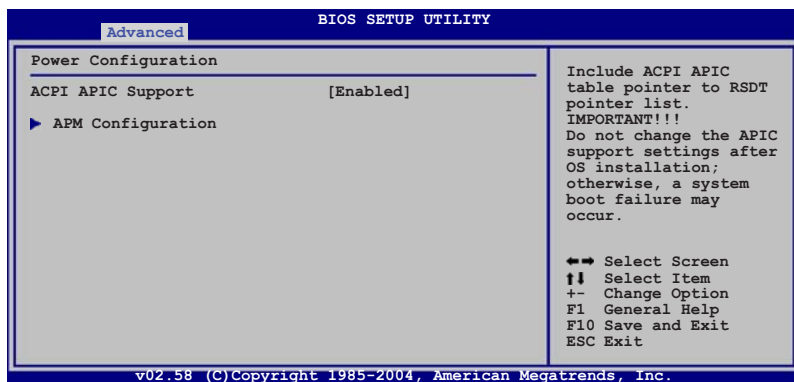
ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the 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]

APM Configuration

```
                              BIOS SETUP UTILITY
     Advanced

APM Configuration                                    Enable or disable APM.

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

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

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

        v02.58 (C)Copyright 1985-2004, 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 (Minute) [Disabled]

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

Throttle Slow Clock Ratio [50%]

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

Power Button 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]

5.4.5 USB Configuration

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

```
                           BIOS SETUP UTILITY
      Advanced

   USB Configuration                              Enables USB host
                                                  controllers.
   Module Version - 2.23.2-7.4

   USB Devices Enabled:
              None

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

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

         v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```
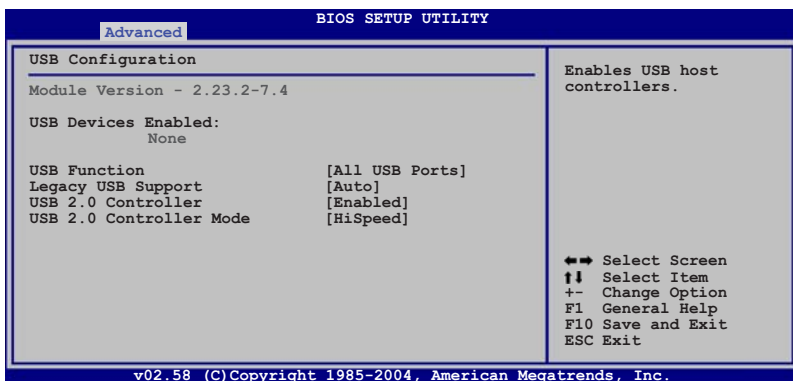
> The **Module Version** and **USB Devices Enabled** items show the auto-detected values. If no USB device is detected, the **USB Devices Enabled** item shows **None**.

USB Function [All USB Ports]

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

Legacy USB Support [Auto]

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

USB 2.0 Controller [Enabled]

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

USB 2.0 Controller Mode [HiSpeed]

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

5.4.6 Super IO Configuration

```
                              BIOS SETUP UTILITY
   Advanced

 Configure Win627THF 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]



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

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

Serial Port1 Address [3F8/IRQ4]

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

Serial Port2 Address [2F8/IRQ3]

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

Parallel Port Address [378]

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

Parallel Port Mode [Normal]

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

Parallel Port IRQ [IRQ7]

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

4.4.7 Hardware Monitor

```
                          BIOS SETUP UTILITY
     Advanced

  Hardware Monitor                                   CPU1 Temperature.

  CPU1 Temperature              [49°C/120°F]
  CPU2 Temperature              [47°C/114°F]
  MB Temperature                [39°C/102°F]
  CPU1 Fan Speed                [5038RPM]
  CPU2 Fan Speed                [5045RPM]
  Front1 Fan Speed              [N/A]
  Front2 Fan Speed              [N/A]
  Rear1 Fan Speed               [N/A]
  Rear2 Fan Speed               [N/A]

  Smart Fan Control             [Enabled]           ←→  Select Screen
  CPU1 Temperature              [60]                ↑↓  Select Item
  CPU2 Temperature              [60]                +-   Change Option
  MB Temperature                [50]                F1   General Help
                                                    F10  Save and Exit
  VCORE1 Voltage                [ 1.236V]           ESC  Exit

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

Use the down arrow key to display additional items.

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

        v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.
```
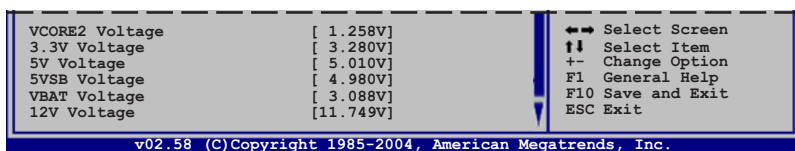
CPU1/CPU2 Temperature [xxxºC/xxxºF]
MB Temperature [xxxºC/xxxºF]

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

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

Smart Fan Control [Enabled]

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

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

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

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

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

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

5.5   Server menu

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

```
                              BIOS SETUP UTILITY
    Main    Advanced    Server    Security    Boot    Exit
 ┌──────────────────────────────────────────┬─────────────────────────┐
 │  Server Features                          │  Configure Remote       │
 │ ─────────────────────────────            │  Access.                │
 │  ▶ Remote Access  Configuration           │                         │
 │                                           │                         │
 │                                           │                         │
 │                                           │                         │
 │                                           │                         │
 │                                           │                         │
 │                                           │                         │
 │                                           │  ◄► Select Screen       │
 │                                           │  ↑↓  Select Item        │
 │                                           │  +-  Change Option      │
 │                                           │  F1  General Help       │
 │                                           │  F10 Save and Exit      │
 │                                           │  ESC Exit               │
 │                                           │                         │
 └──────────────────────────────────────────┴─────────────────────────┘
```
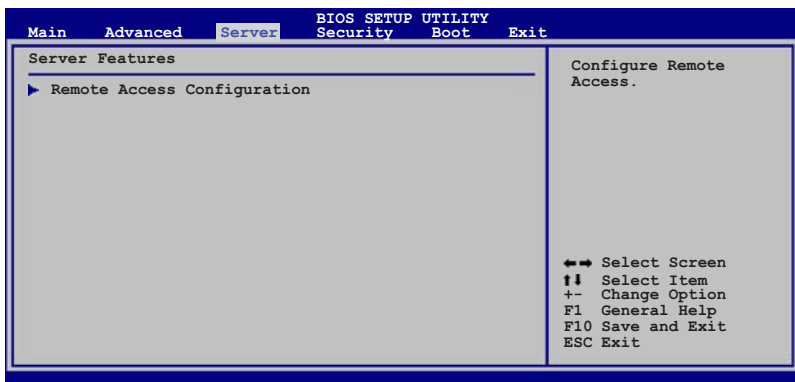
5.5.1   Remote Access Configuration

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
        Server
 ┌──────────────────────────────────────────┬─────────────────────────┐
 │  Configure Remote Access type and parameters │                      │
 │ ─────────────────────────────            │  Select Remote Access   │
 │  Remote Access              [Enabled]     │  type.                  │
 │                                           │                         │
 │  Serial port number         [COM1]        │                         │
 │  Serial Port Mode           [115200 8,n,1]│                         │
 │  Flow Control               [None]        │                         │
 │  Redirection After BIOS POST [Always]     │                         │
 │                                           │                         │
 │  Terminal Type              [ANSI]        │                         │
 │  VT-UTF8 Combo Key Support   [Disabled]   │                         │
 │                                           │                         │
 │                                           │  ◄► Select Screen       │
 │                                           │  ↑↓  Select Item        │
 │                                           │  +-  Change Option      │
 │                                           │  F1  General Help       │
 │                                           │  F10 Save and Exit      │
 │                                           │  ESC Exit               │
 │                                           │                         │
 │     v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.        │
 └──────────────────────────────────────────┴─────────────────────────┘
```
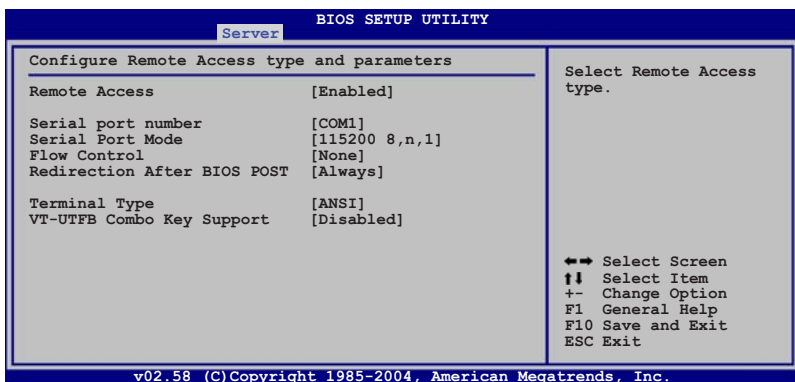
> When the **Remote Access** item is set to [Disabled], all the other items
> do not appear.

Remote Access [Enabled]

Enables or disables the remote access feature. Setting this item to [Enabled] displays other connectivity items (see the screen below). 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]

5.6   Security

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

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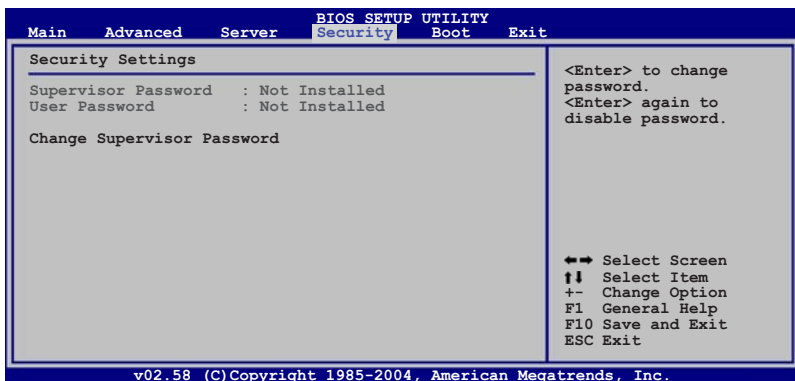
Change Supervisor Password

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

To set or change a supervisor password:

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

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

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

To clear the supervisor password:

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

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

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

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

User Access Level [Full Access]

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

No Access prevents user access to the Setup utility.

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

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

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

Change User Password

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

To set a user password:

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

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

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

Clear User Password

Select this item to clear the user password.

Password Check [Setup]

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

5.7   Boot menu

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

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

   Boot Settings                              Specifies the Boot
   ──────────────────────────────────────    Device Priority
   ▶  Boot Priority                           sequence.

   ▶  Boot Settings Configuration




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

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

5.7.1   Boot Device Priority

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

   Boot Device Priority                       Specifies the boot
   ──────────────────────────────────         sequence from the
   1st Boot Device        [1st FLOPPY DRIVE]   available devices.
   2nd Boot Device        [MBA v7.6.6 Slot 02]
   3rd Boot Device        [MBA v7.6.6 Slot 04] A device enclosed in
                                               parenthesis has been
                                               disabled in the
                                               corresponding menu.



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

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

1st Boot Device [1st FLOPPY DRIVE]
2nd Boot Device [MBA v7.6.6 Slot 02]
3rd Boot Device [MBA v7.6.6 Slot 04]

These items specify the boot device priority sequence from the available
devices. Configuration options: [1st FLOPPY DRIVE] [MBA v7.6.6 Slot 02]
[MBA v7.6.6 Slot 04] [Disabled]

5.7.2 Boot Settings Configuration

```
                        BIOS SETUP UTILITY
                               Boot

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



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

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

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

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

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

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

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

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

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

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

5.8   Exit menu

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

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

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




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

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

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

Exit & Save Changes

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

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

Exit & Discard Changes

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

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

Discard Changes

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

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

Load Setup Defaults

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

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

Chapter 4: BIOS information

This chapter provides instructions for creating and configuring RAID for different system components.

RAID Configuration

6.1   Setting up RAID

The motherboard comes with the following RAID solutions:

NCLV-DS2 model
- **Adaptec® AIC-7901X PCI-X SCSI** controller supports SCSI hard disk drives and RAID 0, RAID 1, and RAID 0+1 configurations.

6.1.1   RAID definitions

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

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

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

6.1.2 Installing hard disk drives

The motherboard supports both Serial ATA and SCSI (NCLV-DS2 model only) hard disk drives for RAID configuration. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SCSI hard disks for RAID configuration:

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

6.2   Adaptec SCSISelect(TM) Utility

The Adaptec SCSISelect(TM) Utility allows you to create RAID 0, RAID 1, and RAID 10 set(s) from SCSI hard disk drives connected to the SCSI connector supported by the embedded Adaptec® SCSI controller.

To enter the Adaptec SCSISelect(TM) Utility:

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

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

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

6.4.1 Configuring the SCSI controller

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

6.4.2 Enabling the HostRAID controller

To enable the Adaptec HostRAID controller:

1.   Use the arrow keys to select the **HostRAID** item in the Configuration section.
2.   Press <Enter> to set the item to **Enabled**.
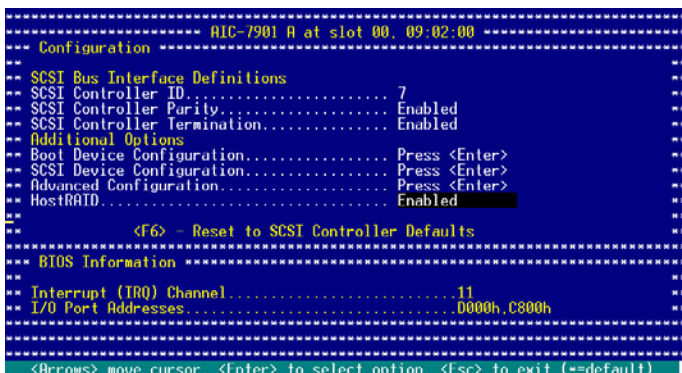
3.   Press <Esc> to exit.
4.   When the utility prompts you to save the changes, select **Yes**, then press <Enter>.

The screen returns to the options menu.

6.4.3 Creating a RAID 0 set (Stripe)

To create a RAID 0 set for Performance:

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

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

```
********************** AIC-7901 A at slot 00, 09:02:00 **********************
*** Create, Spare, Delete, Rebuild, Verify, Bootable *************************
**                                                                        **
**    ID  Type                  Vendor   Product          Size   Status   **
**  ********************************************************************   **
**    0  Hard Drive            SEAGATE  ST318432LC        18GB   Free      **
**    1  Hard Drive            SEAGATE  ST318432LC        18GB   Free      **
**    2  Hard Drive            SEAGATE  ST318432LC        18GB   Free      **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
********************************************************************************
********************************************************************************
        <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

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

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

```
********************** AIC-7901 A at slot 00, 09:02:00 **********************
*** Create RAID *************************************************************
**                                                                        **
**            ID  Vendor   Product           Size                         **
**          ****************************************************           **
**            0  SEAGATE  ST318432LC         18GB                         **
**            1  SEAGATE  ST318432LC         18GB                         **
**            2  SEAGATE  ST318432LC         18GB                         **
**                                                                        **
**                                                                        **
**          ****************** Select RAID Type *****************          **
**          * RAID-0  (High Performance, No Fault Tolerance)  *           **
**          * RAID-1  (Fault Tolerance)                       *           **
**          * RAID-10 (Fault Tolerance, High Performance)     *           **
**          *************************************************            **
**                                                                        **
**          ***************** Striping Requirements *****************      **
**          *              Min 2 drives, Max 4 drives.          *          **
**          ***************************************************            **
**                                                                        **
********************************************************************************
        <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

Refer to the **Striping Requirements** note at the bottom of the screen to determine the number of hard disk drives required for the selected RAID type.
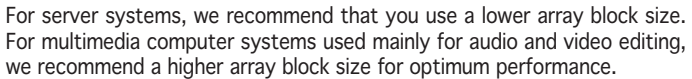
4. Use the arrow keys to select a RAID set member, then press <SpaceBar> to mark. An **X** mark appears after the selected HDD.

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

```
********************** AIC-7901 A at slot 00, 09:02:00 **********************
*** RAID-0: Select RAID members ********************************************
**                                                                        **
**          ID   Vendor    Product              Size                      **
**          ********************************************************       **
**          0   SEAGATE   ST318432LC           18GB    X                   **
**          1   SEAGATE   ST318432LC           18GB    X                   **
**          2   SEAGATE   ST318432LC           18GB    X                   **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
****************************************************************************
**************************************************************************
                        <Space> select drives
            <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

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

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

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

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

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

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

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

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

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

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

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

```
*********************
* Build Completed.  *
*********************
```

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

```
********************** AIC-7901 A at slot 00, 09:02:00 **********************
*** Create, Spare, Delete, Rebuild, Verify, Bootable ***********************
**                                                                        **
**    ID  Type              Vendor   Product        Size   Status         **
**  *****************************************************************      **
**  B  0  Striped (R0)      ADAPTEC  HR-ICH         55GB   Optimal        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
***************************************************************************
       <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

6.4.4 Creating a RAID 1 set (Mirror)

To create a RAID 1 set for Fault Tolerance:

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

```
*********************** AIC-7901 A at slot 00, 09:02:00 ***********************
*** Create RAID ***************************************************************
**                                                                           **
**              ID  Vendor   Product          Size                           **
**              ****************************************                      **
**               0  SEAGATE  ST318432LC       18GB                           **
**               1  SEAGATE  ST318432LC       18GB                           **
**               2  SEAGATE  ST318432LC       18GB                           **
**                                                                           **
**                                                                           **
**              ***************** Select RAID Type *****************          **
**              * RAID-0  (High Performance, No Fault Tolerance)  *          **
**              * RAID-1  (Fault Tolerance)                       *          **
**              * RAID-10 (Fault Tolerance, High Performance)     *          **
**              **********************************************     *          **
**                                                                           **
**                                                                           **
**              **************** Mirroring Requirements ***************       **
**              *              Min 2 drives, Max 2 drives.          *       **
**              **************************************************** *       **
**                                                                           **
*******************************************************************************
         <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

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

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

```
*********************** AIC-7901 A at slot 00, 09:02:00 ***********************
*** RAID-1: Select RAID members **********************************************
**                                                                           **
**              ID  Vendor   Product          Size                           **
**              ****************************************                      **
**               0  SEAGATE  ST318432LC       18GB    X                      **
**               1  SEAGATE  ST318432LC       18GB    X                      **
**               2  SEAGATE  ST318432LC       18GB                           **
**                                                                           **
**                                                                           **
**                                                                           **
**                                                                           **
**                                                                           **
**                                                                           **
**                                                                           **
**                                                                           **
**                                                                           **
**                                                                           **
**                                                                           **
*******************************************************************************
                        <Space> select drives
         <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6.4.5 Creating a RAID 10 set (Stripe+Mirror)

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

1. After enabling the HostRAID, the utility returns to the initial menu. Use the arrow keys to select **Configure/View HostRAID Settings**, then press <Enter>.
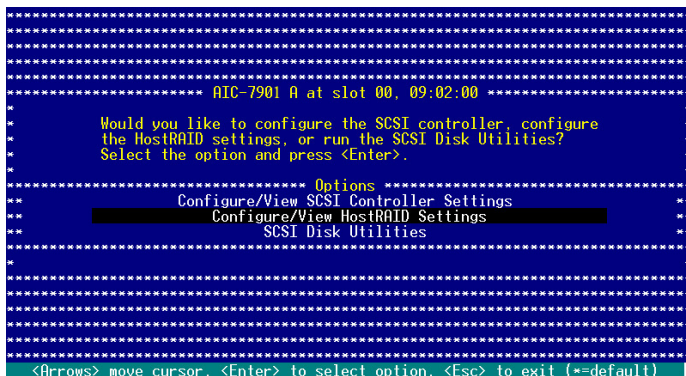
2. The utility displays the SCSI hard disk drives installed in your computer and the menu options. Press <**C**>.

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

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

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

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

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

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

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

```
************ Assign RAID Name ************
* Enter 1 to 15 alphabetic or numeric   *
* characters. Press <Enter> when finished. *
*         ******************             *
*         *7901           *             *
*         ******************             *
*****************************************
```

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

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

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

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

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

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

```
*********************
* Build Completed.  *
*********************
```

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

```
*********************** AIC-7901 A at slot 00, 09:02:00 **********************
*** Create, Spare, Delete, Rebuild, Verify, Bootable ***********************
**                                                                        **
**    ID  Type                 Vendor   Product        Size   Status      **
**    ═══════════════════════════════════════════════════════════════     **
**    4   Stripe/Mirror (R10)  ADAPTEC  7901           147GB  Optimal      **
**    9   Hard Drive           FUJITSU  MAT3073NC      74GB   Free         **
**    10  Hard Drive           FUJITSU  MAT3073NC      74GB   Free         **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**                                                                        **
**************************************************************************
*********************************************************************
       <Arrows> move cursor, <Enter> accept option, <Esc> exit
```

6.4.6 Adding a spare drive to a RAID 10 set

To add a spare drive to a RAID 10 set:

1. Press <**S**> from the **Configure/View Host RAID Settings** menu.
2. Select **Add Spare** from the Options menu, then press <Enter>.
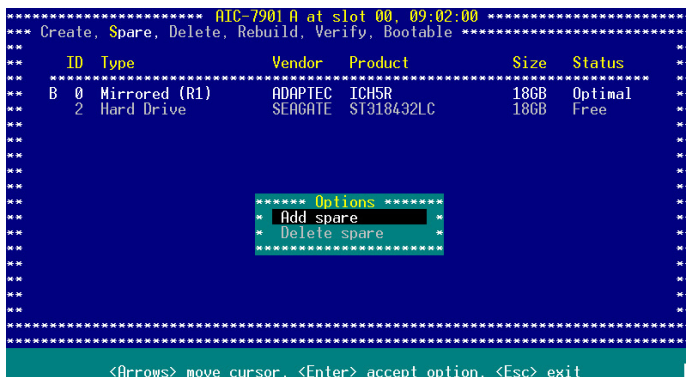
3. Use the arrow keys to select the spare drive from the list, then press <Enter>.
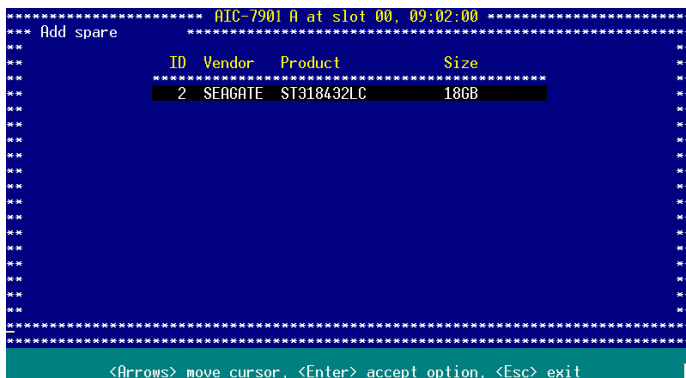
4. When a confirmation dialogue box appears, select <Yes>, then press <Enter>.

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

6.4.7 Deleting a RAID 10 set spare drive

To delete a RAID 10 set spare drive:

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

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

```
*********************** AIC-7901 A at slot 00, 09:02:00 ***********************
*** Delete spare        ***********************************************************
**                                                                            **
**              ID  Vendor   Product          Size                            **
**              ************************************************               **
**               2  SEAGATE  ST318432LC       18GB                            **
**                                                                            **
**                                                                            **
**                                                                            **
**                                                                            **
**                                                                            **
**                                                                            **
**                                                                            **
**                                                                            **
**                                                                            **
**                                                                            **
**                                                                            **
**                                                                            **
**                                                                            **
*******************************************************************************
*******************************************************************************
          <Arrows> move cursor, <Enter> accept option, <Esc> exit
```
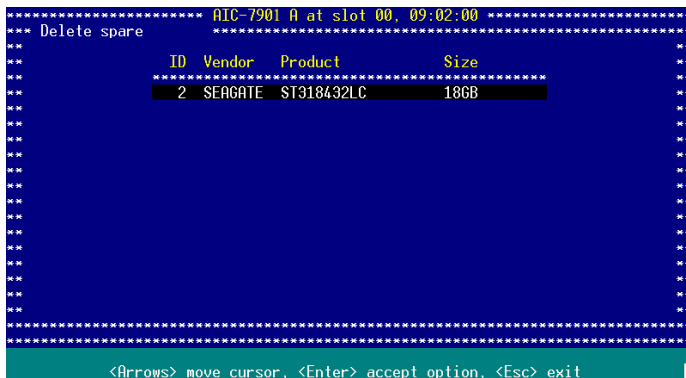
3. When a confirmation dialogue box appears, select <Yes>, then press <Enter> to delete the spare drive.

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

4. Press <ESC> to exit the utility.

6.4.8   Deleting a RAID set

To delete a RAID set:

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

2.   For RAID 0 and RAID 10 set, go to step 3. For a RAID 1 set, select a delete option from the menu (see below), then go to step 3.
   - **Drive ID 1** - Deletes all data on drive 1
   - **Drive ID 2** - Deletes all data on drive 2
   - **Drive ID 1 & 2** - Deletes all data on both drives
   - **None** - Breaks the array but keeps all existing data on both drives

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

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

4.   Press <ESC> to exit the utility.
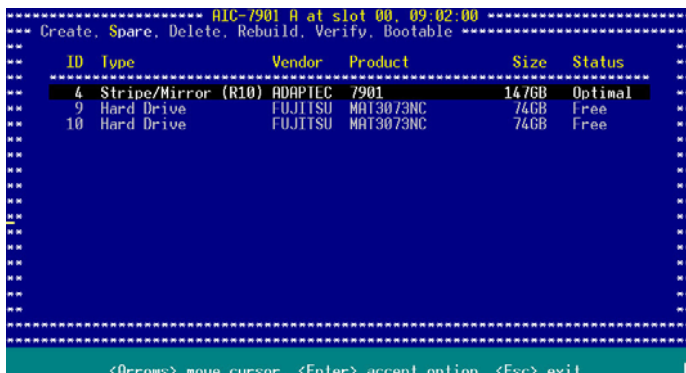
6.4.9 Rebuilding a RAID set

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

To rebuild a RAID set:

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

2. Press <**R**>.

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

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

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

6.4.10 Verifying a RAID set hard disk drive

To verify a RAID set hard disk drive:

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

```
********************************************************************************
********************************************************************************
********************************************************************************
********************************************************************************
****************** AIC-7901 A at slot 00, 09:02:00 *********************
*                                                                              *
*       Would you like to configure the SCSI controller, configure            *
*       the HostRAID settings, or run the SCSI Disk Utilities?                 *
*       Select the option and press <Enter>.                                   *
*                                                                              *
*********************************** Options **********************************
**            Configure/View SCSI Controller Settings                       **
**                 Configure/View HostRAID Settings                         **
**                      SCSI Disk Utilities                                  **
********************************************************************************
*                                                                              *
********************************************************************************
********************************************************************************
********************************************************************************
********************************************************************************
    <Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)
```

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

```
******************* AIC-7901 A at slot 00, 09:02:00 *********************
*****                                                                    *****
******* Select SCSI Disk and press <Enter> *****************************
*****                                                                    *****
*****  SCSI ID #0:             SEAGATE  ST318432LC                       *****
*****  SCSI ID #1:             SEAGATE  ST318432LC                       *****
*****  SCSI ID #2:             SEAGATE  ST318432LC                       *****
*****  SCSI ID #3:             No device                                 *****
*****  SCSI ID #4:             No device                                 *****
*****  SCSI ID #5:             No device                                 *****
*****  SCSI ID #6:             No device                                 *****
*****  SCSI ID #7:             Adaptec AIC-7902                          *****
*****  SCSI ID #8:             No device                                 *****
*****  SCSI ID #9:             No device                                 *****
*****  SCSI ID #10:            No device                                 *****
*****  SCSI ID #11:            SDR      GEM318                           *****
*****  SCSI ID #12:            No device                                 *****
*****  SCSI ID #13:            No device                                 *****
*****  SCSI ID #14:            No device                                 *****
*****  SCSI ID #15:            No device                                 *****
*****                                                                    *****
*****                                                                    *****
    <Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)
```

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

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

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

6.4.11 Making a RAID set bootable

To make a RAID set bootable:

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

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

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

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

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

Chapter 7

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

Driver Installation

7.1   RAID driver installation

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

7.1.1   Creating a RAID driver disk

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

Windows® 2000/2003 Server

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

To create a RAID driver disk from Windows® environment:

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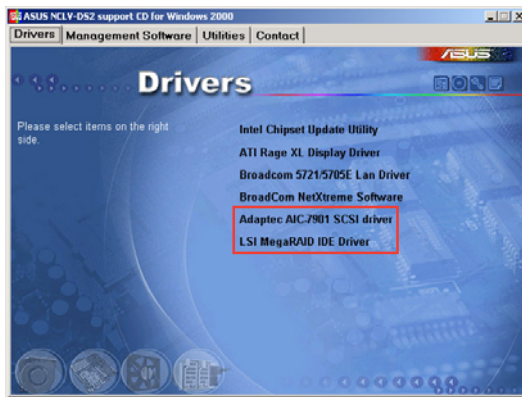
OR

Browse the contents of the support CD to locate the driver disk utility.

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

Red Hat® Enterprise ver. 3.0

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

1. Insert a blank formatted high-density floppy disk to the floppy disk drive.

2. Decompress the zipped file into the floppy disk from the following path in the support CD:

    For **Intel® 6300ESB** RAID driver disk:

    > **\Drivers\6300ESB\Driver\Linux\
    >   dud-rh30-megaide-v5.08u-generic-1.img**

    For **Adaptec® AIC-7901X** RAID driver disk (NCLV-DS2 model only):

    > **\Drivers\Adaptec\SCSI\Driver\Linux 2.0.12\
    >   aic79xx-2.0.12-i686-rhel3.img**

3. Eject the floppy disk.

7.1.2 Installing the RAID controller driver

Windows® 2000/2003 Server OS

During Windows® 2000/2003 Server OS installation

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

1.   Boot the computer using the Windows® 2000/2003 Server installation CD. The **Windows® 2000/2003 Setup** starts.
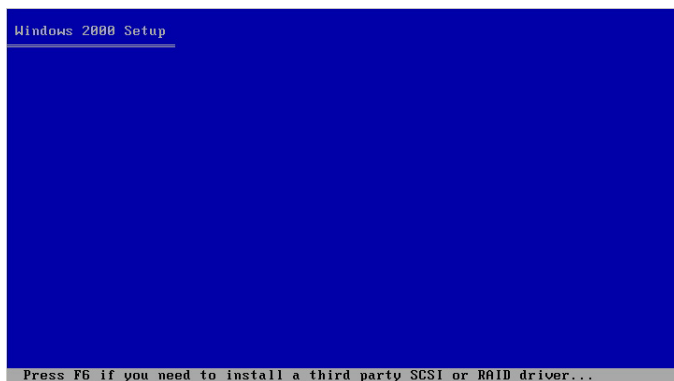
2.   Press <F6> when the message "**Press F6 if you need to install a third party SCSI or RAID driver...**" appears at the bottom of the screen.

3.   When prompted, press **<S>** to specify an additional device.
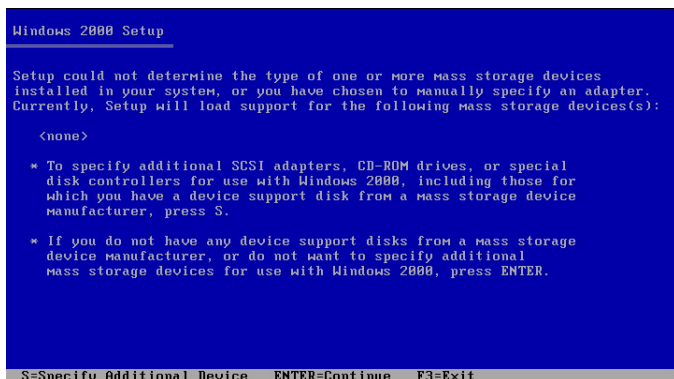
4. Insert the RAID driver disk you created earlier to the floppy disk drive, then press <Enter>.
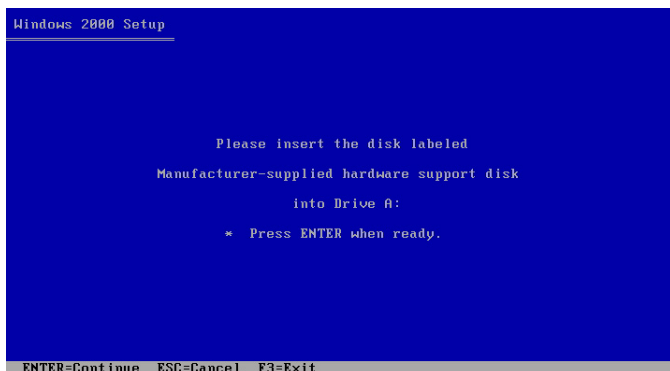
5. Select the RAID controller driver from the list, then press <Enter>.
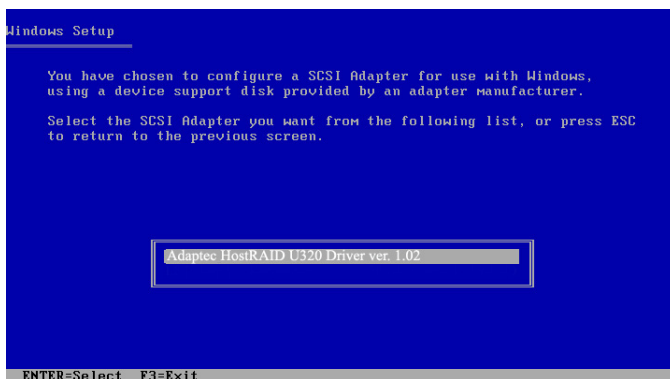
-   For **Adaptec® AIC-7901X SCSI RAID** driver, select **Adaptec HostRAID U320 Driver ver. 1.02 for Windows 2000/XP/2003**.

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

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

To an existing Windows® 2000/2003 Server OS

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

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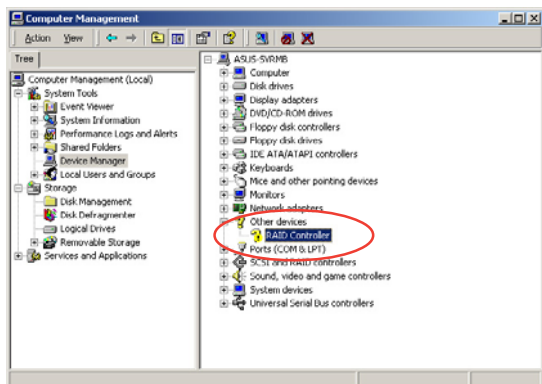
5. Right-click the **RAID controller** item, then select **Properties**.
6. Click the **Driver** tab, then click the **Update Driver** button.
7. The **Upgrade Device Driver Wizard** window appears. Click **Next**.
8. Insert the RAID driver disk you created earlier to the floppy disk drive.
9. Select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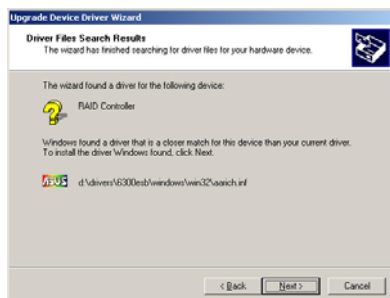
To verify the RAID controller driver installation:

1.   Right-click the **My Computer** icon on the Windows® desktop , then select **Properties** from the menu.
2.   Click the **Hardware** tab, then click the **Device Manager** button.
3.   Click the "+" sign before the item **SCSI and RAID controllers**.
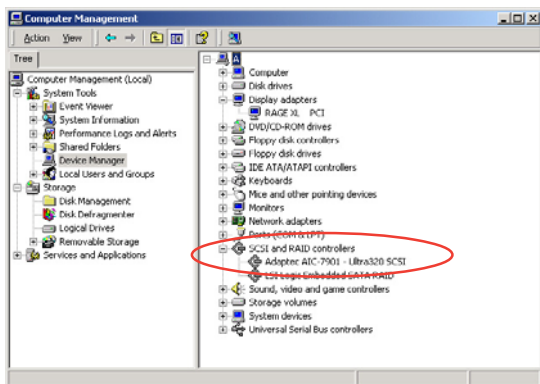
- •   For <u>NCLV-DS2</u> model, the **Adaptec AIC-7901 - Ultra320 SCSI** items should appear.
4.   Right-click the RAID controller driver item, then select **Properties** from the menu.
5.   Click the **Driver** tab, then click the **Driver Details** button to display the RAID controller drivers.
6.   Click **OK** when finished.

Red Hat® Enterprise ver. 3.0

To install the Adaptec® AIC-7901X SCSI RAID controller driver when installing a Red Hat® Enterprise ver. 3.0 operating system:

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

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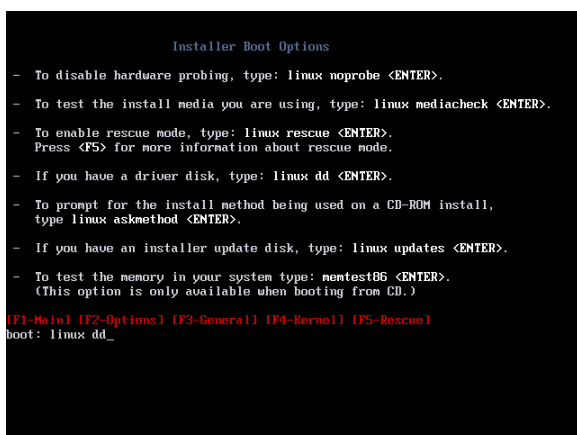
3. Select **Yes** using the <Tab> key when asked if you have the driver disk. Press <Enter>
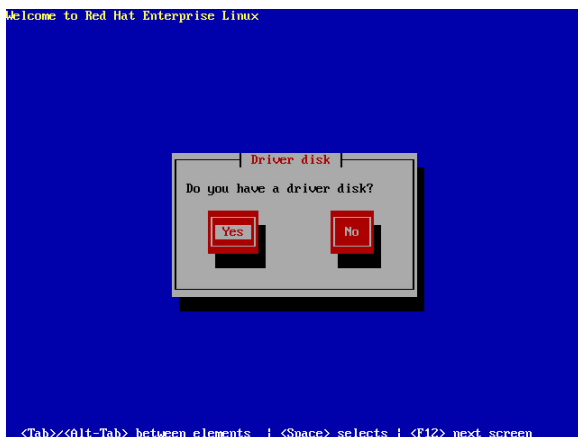
4. Select **fd0** using the <Tab> key when asked to select the driver disk source. Press <Tab> to move the cursor to **OK**, then press <Enter>.
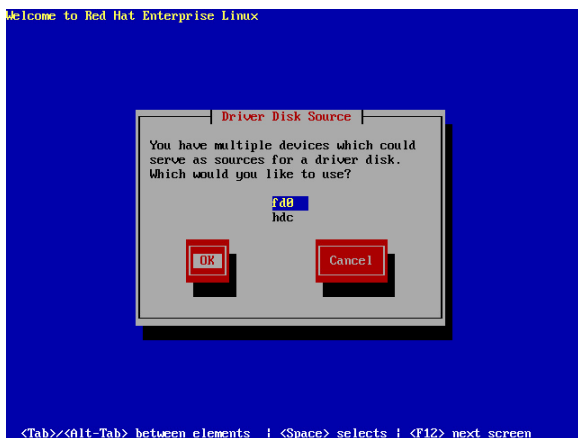
5.   When prompted, insert the Red Hat® Enterprise ver. 3.0 RAID driver
      disk to the floppy disk drive, select **OK,** then press <Enter>.
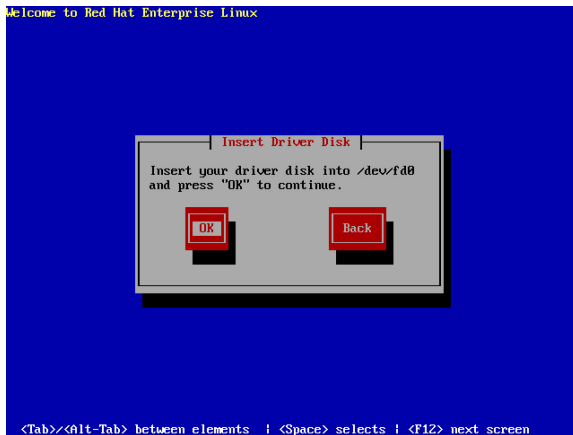
      The drivers for the RAID controller are installed to the system.

6.   When asked if you will load additional RAID controller drivers:
      •   Select **Yes**, then install the additional RAID controller drivers for
          the Adaptec® AIC-7901X.
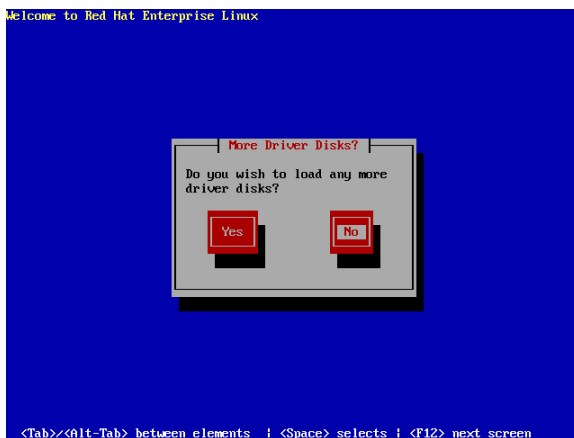
7.   Follow screen instructions to continue the OS installation.

7.2   LAN driver installation

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

7.2.1   Windows® 2000/2003 Server

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

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

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

3.   Click the **Broadcom 5721/5705E LAN Driver** option to begin installation.
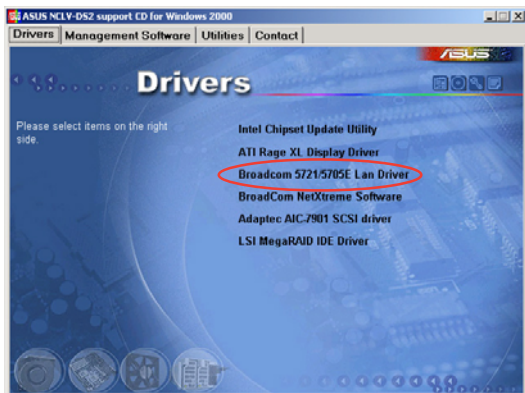
4. Click **Next** when the InstallShield Wizard window appears. Follow screen instructions to continue installation.
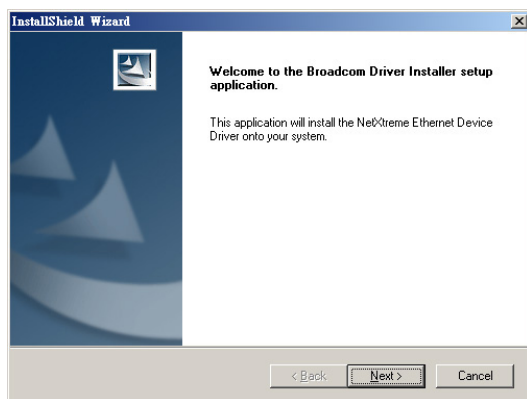
7.2.2 Red Hat® Enterprise ver. 3.0

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

Installing the source RPM package

To install the source RPM package:

1. Install the source RPM package:

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

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

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

   > The RPM path is different for different Linux distributions.

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

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

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

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

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

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

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

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

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

   or

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

4. Load the driver:

   ```
   insmod bcm5700
   ```

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

Building the driver from the TAR file

To build the driver from the TAR file:

1. Create a directory and extract the TAR files:

    ```
    tar xvzf bcm5700-<version>.tar.gz
    ```

2. Build the driver bcm5700.o as a loadable module for the running kernel:

    ```
    cd bcm5700-<version>/src
    make
    ```

3. Test the driver by loading it:

    ```
    insmod bcm5700.o
    ```

4. Install the driver and man page:

    ```
    make install
    ```

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

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

7.3   VGA driver installation

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

7.3.1   Windows® 2000 Server

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

To install the ATI® RAGE XL VGA driver:

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

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

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

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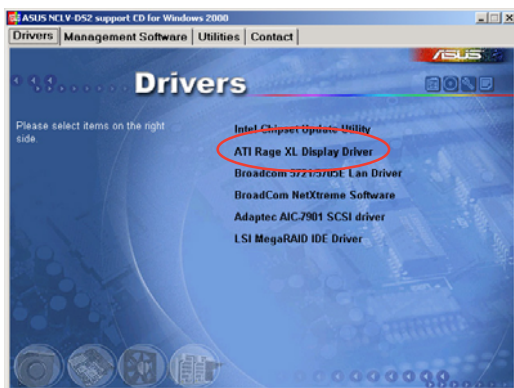
4.   The **ATI Windows 2000 Driver** window appears. Click **Next**. Follow screen instructions to complete installation.
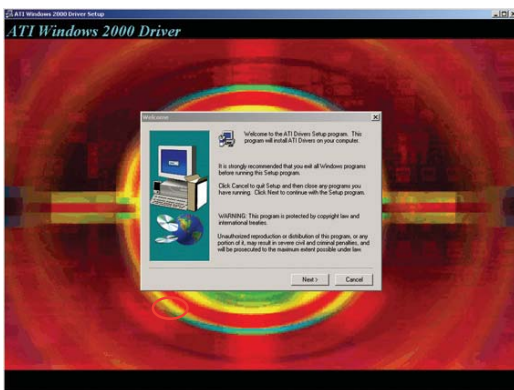
7.3.2 Windows® 2003 Server

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

7.3.3 Red Hat® Enterprise ver. 3.0

The Red Hat® Enterprise ver. 3.0 operating system automatically recognizes the ATI® RAGE XL VGA driver during system installation. There is no need to install an additional driver(s) to support the onboard VGA.

7.4 Management applications and utilities installation

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

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

7.4.1 Running the support CD

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

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

7.4.2 Drivers menu

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

> The screen display and driver options vary under different operating system versions.
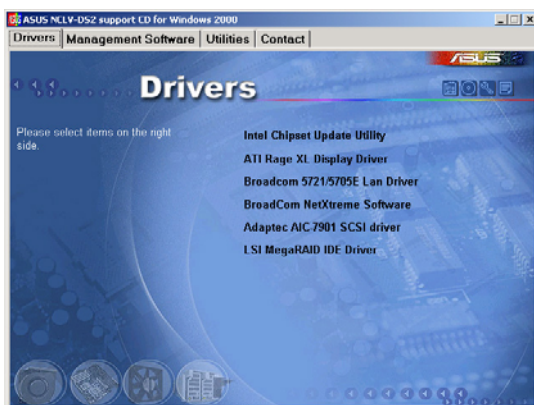
7.4.3 Management Software menu

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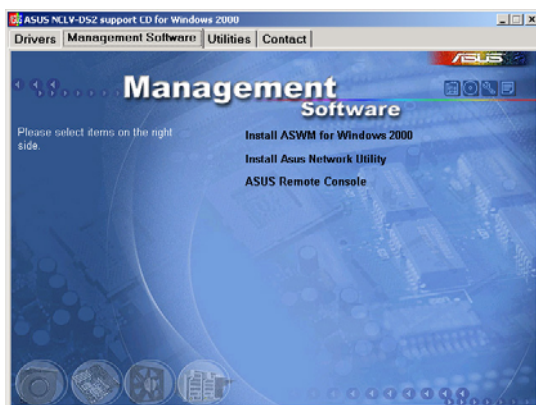
7.4.4 Utilities menu

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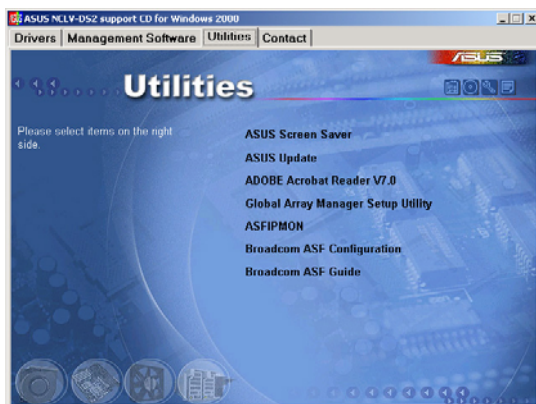
7.4.5 Contact information

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

Appendix

This appendix gives information on the standard and redundant power supply that came with the barebone server. This section also provides a troubleshooting guide for solving common problems when using the barebone server.

Reference information

ASUS TS500-E2

A.1   650 W dual/redundant power supply

A.1.1   General description

The 650 W dual/redundant-type power supply has 10 plugs. Take note of the devices that you should connect to the plugs.
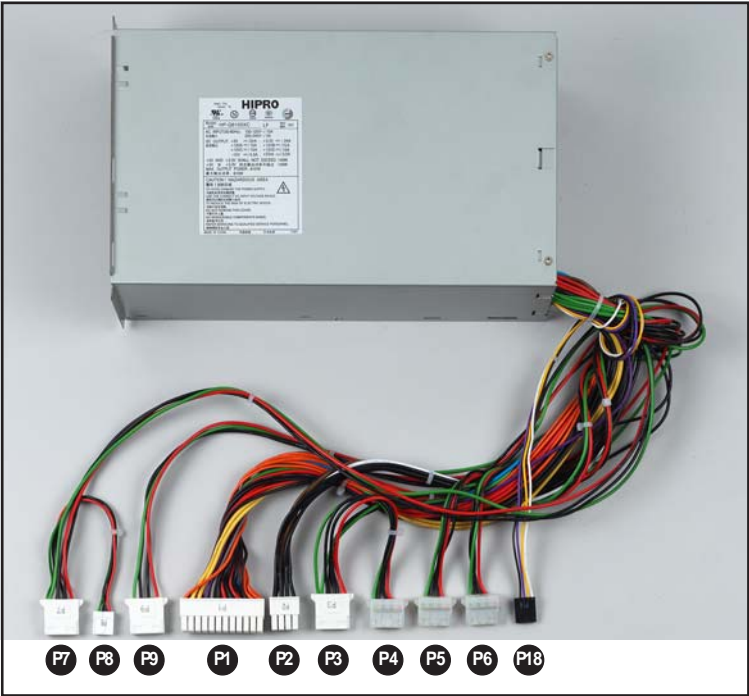
P 7	Peripheral device (available);Connect this to SCSI backplane 2
P 8	Floppy disk drive
P 9	Peripheral device (available);Connect this to SCSI backplane 2
P 1	Motherboard 24-pin ATX power connector
P 2	Motherboard 8-pin +12V AUX power connector
P 3	Peripheral device (available)
P 4	Optical drive
P 5	Peripheral device (available);Connect this to SCSI backplane 1
P 6	Peripheral device (available);Connect this to SCSI backplane 1
P 1 8	Power SMBus connector

A.1.2 Specifications

Input characteristics

Input Voltage

Normal Range	100 to 240 Vac
Minimum	90 Vac
Maximum	264 Vac
Input Frequency Range	47Hz to 63Hz

DC Output characteristics

Output Voltage	Max (A)	Max Power (W)
+3.33V	40	580
+5V	50	580
+12V	34	580
-12V	1.0	12
-5V	0.5	2.5
+5VSB	2.0	15

Operating conditions

Efficiency	65 % minimum
Hold-up Time	16 mS
Over Power Protection	overloaded to 110 ~ 150 %
Hold-up Time	16 mS
Temperature	104º F to 122º F (40º C - 50º C)
Relative Humidity	20% - 90% non-condensing at 104º F (40º C)
Altitude	Sea level to 10,000 ft
Mean Time Between Failures	MTBF > 100,000 hours at 25º C

A.2 Simple fixes

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

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

Problem	Action
The system continuously beeps after it was turned on	1. Check the memory modules and make sure you installed supported DIMMs. 2. Make sure that the DIMMs are properly installed on the sockets.
The message "Non-system disk or disk error" appears	1. Check if a bootable HDD is active. 2. Check if the HDDs are properly installed.
Network connection not available	1. Make sure that the network cable is connected to the LAN port on the rear panel. 2. Make sure that you have installed the LAN drivers from the support CD.