ASUS® TW510-E2

Dual AMD Opteron™ Pedestal/5U Rackmount Server
Service Guide

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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

S/PDIF Safety Warning

CLASS 1 LED PRODUCT

Heavy System

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

About this guide

Audience

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

Contents

This guide contains the following parts:

1. **Chapter 1: Product Introduction**

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

2. **Chapter 2: Hardware setup**

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

3. **Chapter 3: Installation options**

   This chapter describes how to prepare the barebone server for rack mounting.

4. **Chapter 4: Motherboard information**

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

5. **Chapter 5: BIOS information**

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

6. **Chapter 6: Driver installation**

   This chapter provides information on how to create a RAID set and how to install the drivers for system components. This chapter also describes the software applications that the barebone server supports.

7. **Appendix: Reference information**

   This appendix contains the power supply specifications and 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.

Product introduction

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

ASUS TW510-E2

1.1   System package contents

Check your system package for the following items.

Chassis	ASUS AK25 5U rackmount chassis
Motherboard	ASUS K8N-DL motherboard
Components	600 W single power supply SATA backplane board Front I/O board 52x CD-ROM or DVD-ROM drive Floppy disk drive Chassis fan HDD fan CPU fan and heatsink assembly (x 2)
Cables	AC power cable SATA signal cable SATA power cable SMBus cable
Accessories	Hot-swap HDD trays (including HDD screws) Internal HDD rails (4 pairs) Chassis roller wheels (4 sets) System screws and cables Dummy covers System keys (2 pcs.)
Application CDs	TW510-E2 support CD with ASWM* Computer Associates® eTrust™ anti-virus CD
Documentation	ASUS TW510-E2 user guide ASUS ASWM 2.0 user guide
Optional items	ASUS AK25 rackmount rail kit

*ASUS System Web-based Management

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

1.2 System specifications

The ASUS TW510-E2 is a barebone server system featuring the ASUS K8N-DL motherboard. The server supports dual AMD Opteron™ processors in 940-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.
System dimension	431 mm (H) x 220 mm (W) x 510 mm (D)
Motherboard	ASUS K8N-DL (ATX compatible form factor: 12 in x 10.5 in)
CPU	Dual Socket 940 for AMD Opteron™ 64 processors Supports AMD 64 architecture that enables simultaneous 32-bit and 64-bit computing
Chipset	NVIDIA® CK8-04 Professional
Memory	Dual-channel memory architecture 6 x 184-pin DIMM sockets support registered ECC 400/333/266 MHz DDR memory modules Supports up to 24 GB system memory *(tested only up to 12 GB on this motherboard due to 4 GB DDR availability)*
Storage and RAID	NVIDIA® CK8-04 Professional chipset supports: - 2 x Ultra DMA 100/66/33 - 4 x SATA-II 3Gb/s drives - RAID 0, RAID 1, RAID 0+1, JBOD configurations
LAN	BROADCOM® BMC5751 Gigabit PCI-E LAN controller
Audio	Realtek® ALC850 8-channel CODEC Supports Universal Audio Jack (UAJ®) Technology Supports Audio Sensing and Enumeration Technology 1 x Coaxial S/PDIF Out port 1 x Optical S/PDIF Out port
IEEE 1394	TI 1394a controller supports one IEEE 1394 port
USB	4 x USB 2.0 ports (on the rear panel)
Expansion slots	1 x PCI Express x16 slot 1 x PCI Express x1 slot 2 x PCI slots
Drive bays	1 x 3.25-inch FDD bay 3 x 5.25-inch drive bays

1.2 System specifications

Front panel	4 x USB ports 1 x IEEE 1394 port 1 x Headphone port (Line Out) 1 x Microphone port (Line In)
Rear panel	1 x Parallel port 1 x Serial port (COM1) 1 x IEEE 1394 port 1 x LAN (RJ-45) port 4 x USB 2.0 ports 1 x Optical S/PDIF out port 1 x Coaxial S/PDIF out port 1 x PS/2 keyboard port 1 x PS/2 mouse port 8-channel audio ports
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
Supported OS	Windows® 2000 Professional (Service Pack 4) Windows® XP Professional (Service Pack 2)
Power supply	600 W power supply *(with 24-pin and 8-pin power plugs)*

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

1.3 Front panel features

The TW510-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, optical drive, floppy drive, USB 2.0 ports, audio I/O ports, and an IEEE 1394 port are located on the front panel. For future installation of 5.25-inch devices, two drive bays are available.

To access front I/O ports and floppy disk drive without opening the bezel, hold the tab and move the sliding panel (rightmost panel) to the left as shown.
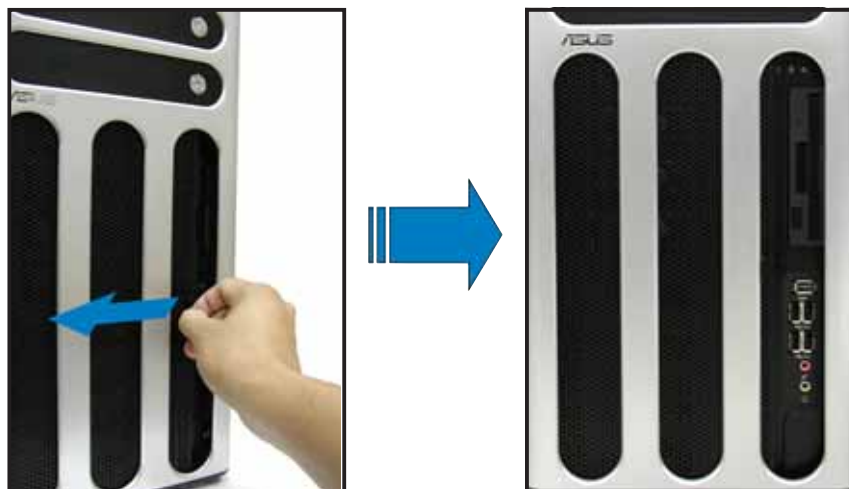
1.4 Rear panel features

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

Rear panel I/O ports
(Refer to the description below.)

Power connector

12 cm system fan

Chassis cover lock

Chassis intrusion switch

Expansion slots

Rear panel I/O ports

PS/2 keyboard port
Coaxial S/PDIF Out port
Optical S/PDIF Out port
Serial port
USB ports
Center/Subwoofer port
Microphone port
Line Out port

PS/2 mouse port
Parallel port
IEEE 1394 port
LAN port
Rear Speaker Out port
Line In port
Side Speaker Out port

1.5   Internal features

The barebone server system includes the basic components as shown.
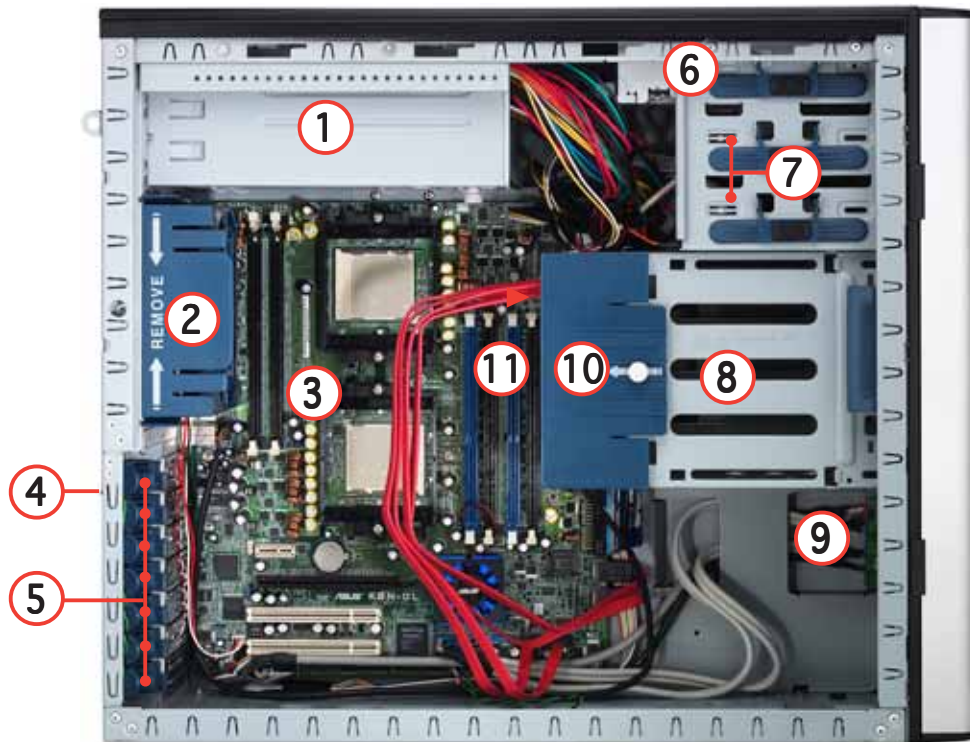
1. Power supply cage
2. Chassis fan
3. K8N-DL motherboard
4. Chassis intrusion switch
5. Expansion card locks
6. Optical drive
7. 2 x 5.25-inch drive bays
8. Hard disk drive cage
9. Front I/O board
10. HDD fan (inside)
11. SATA backplane (hidden)

1.6   LED information

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

Power LED (green)

HDD Access LED (green)

Message LED (red)

Drive Status LED (green/red)

Drive Activity LED (green)
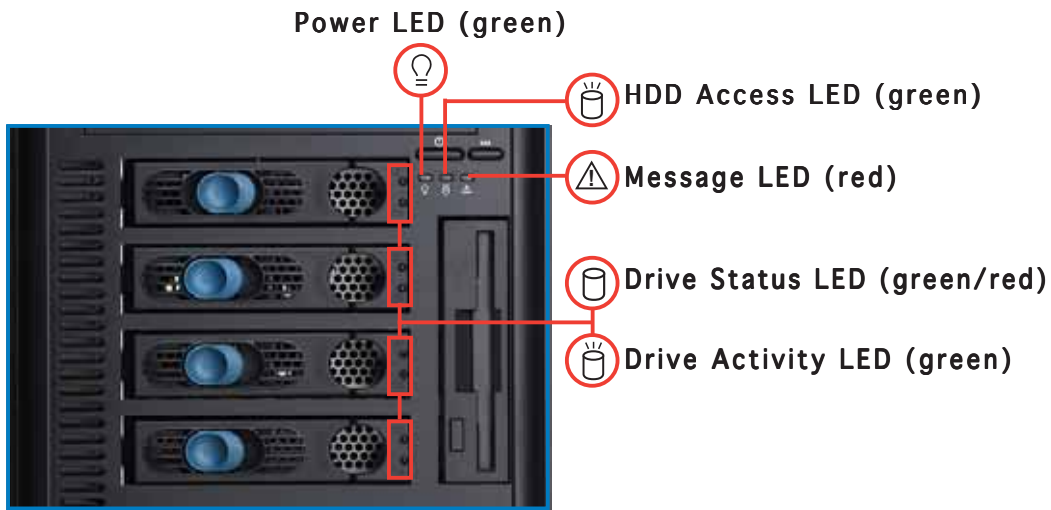
LED	Icon	Display status	Description
System			
Power LED	⏻	ON	System power ON
		Blinking	System is in suspend mode
HDD Access LED		OFF	No activity
		Blinking	Read/write data into the HDD
Message LED	⚠	OFF	System is normal; no incoming event
		Blinking	ASMS indicates a HW monitor event
HDD bays			
Drive Status LED		Green	Bridge board connected to backplane
			Installed HDD is in good condition
		Red	HDD failure
Drive Activity LED		Blinking	Read/write data into the HDD

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

Chapter 2

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

Hardware setup

ASUS TW510-E2

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.

> • Make sure that you unplug the power cord before removing the side cover.
>
> • Take extra care when removing the side cover. Keep your fingers from components inside the chassis that can cause injury, such as the CPU/chassis fan and other sharp-edged parts.

2.1.1   Removing the side cover

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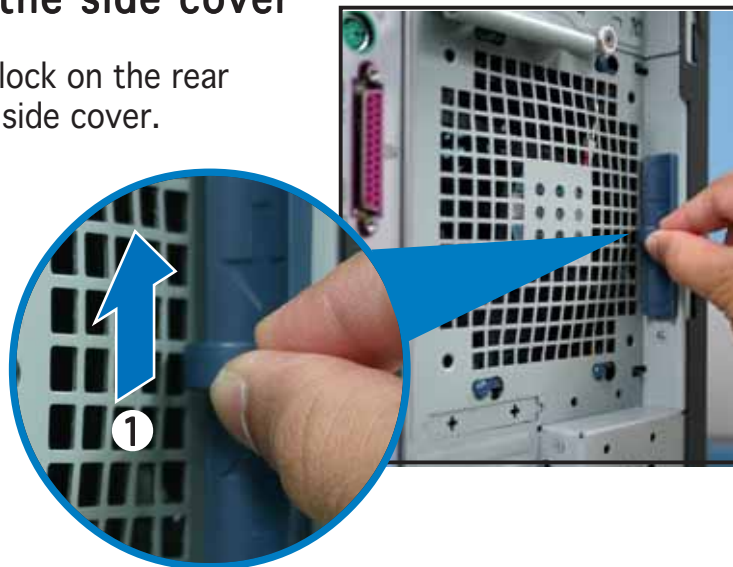
2. Slide the side cover for about half an inch toward the rear until it is disengaged from the chassis.

3. Set the side cover aside.

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.   Align the cover rail with the chassis rail (A), then match and insert the cover top hooks to the elongated holes on the side of the chassis (B). All the four hooks 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.
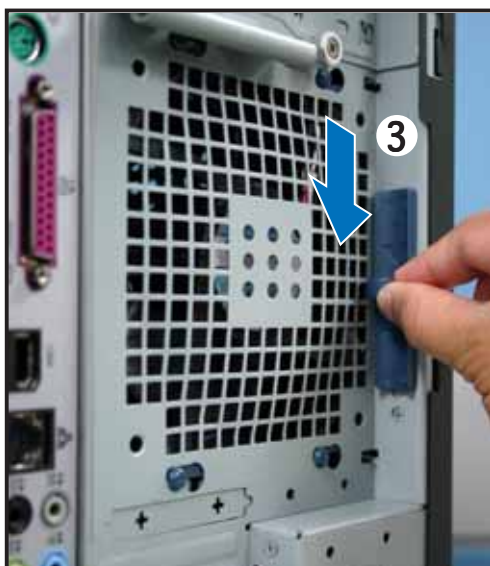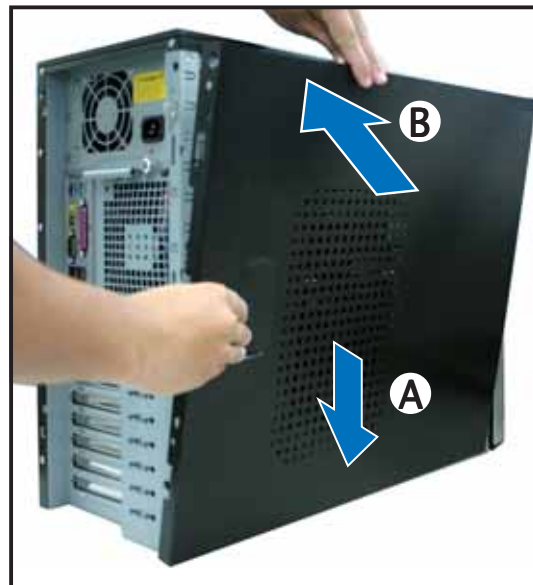
2.2 Motherboard information

The barebone server comes with the K8N-DL motherboard already installed. The motherboard is secured to the chassis by ten (10) 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
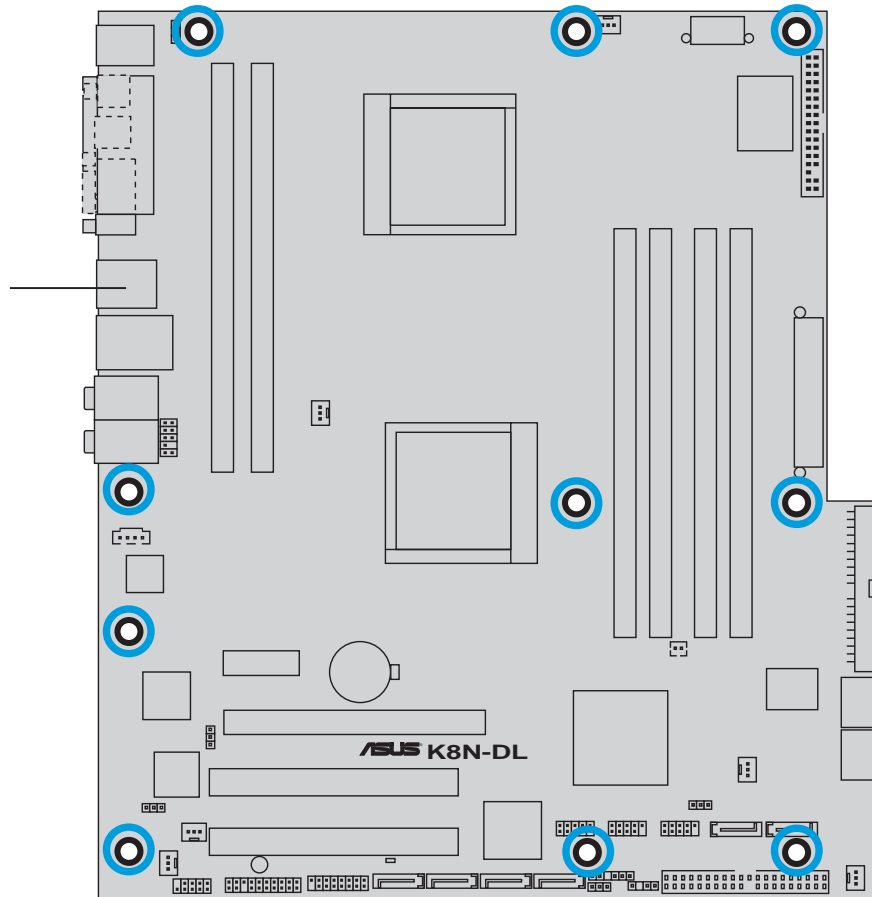
Make sure to unplug the power cord before installing or removing any motherboard component or connection. Failure to do so may cause you physical injury and may damage motherboard components.

2.3 Central Processing Unit (CPU)

2.3.1 Overview

The motherboard comes with dual surface mount 940-pin Zero Insertion Force (ZIF) sockets designed for AMD Opteron™ 64 processors.

The 128-bit-wide data paths of these processors can run applications faster than processors with only 32-bit or 64-bit wide data paths.

Take note of the notched corner on the CPU. This corner should match a specific corner on the socket to ensure correct installation.

Notched corner

2.3.2 Installing the CPU

Note in the above illustration that the CPU has a notched corner. This corner indicates the processor Pin 1 that should match a specific corner of the CPU socket.

> Before installing the CPU, remove the chassis fan attached to the inner side of the rear panel to allow enough space for the installation. Refer to section "2.10 Removable components" for details.
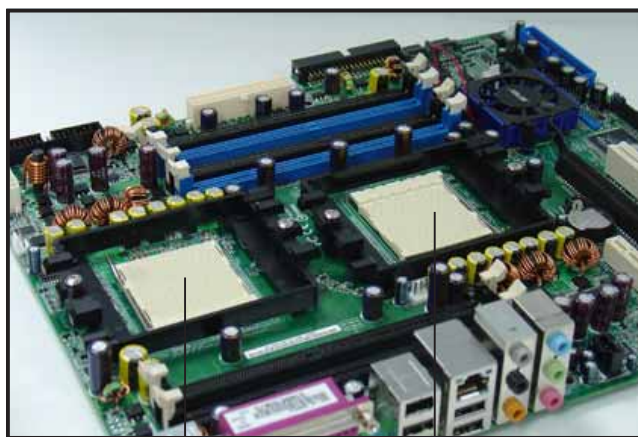
Socket for CPU2   Socket for CPU1

> If installing only one CPU, use the CPU socket marked CPU1.

> ⚠ Incorrect installation of the CPU into the socket may bend the pins and severely damage the CPU!

To install a CPU:

1. Unlock the socket by pressing the lever sideways, then lift it up to a 90°-100° angle.

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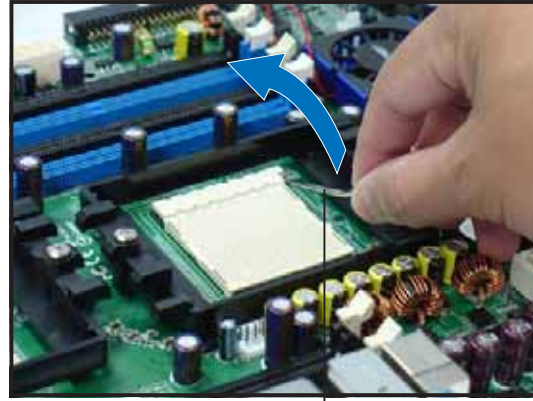
Socket lever

3. Position the CPU above the socket such that the notched corner matches the socket corner with a triangle mark.

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!
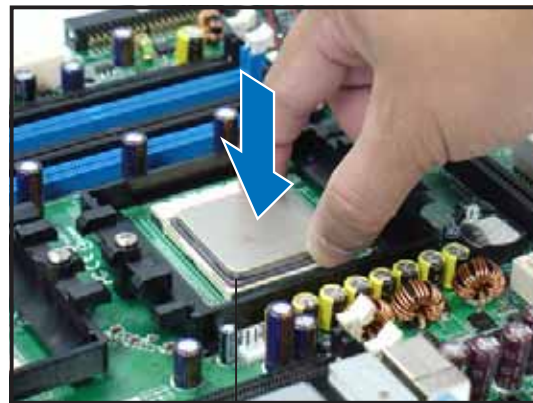
Notched corner

5. When the CPU is in place, 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 5 to install a second CPU.
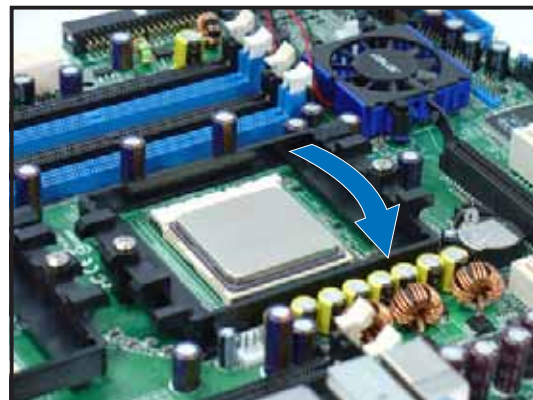
2.3.3 Installing the heatsink and fan

The AMD Opteron™ 64 processors require a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance. Your system comes with two proprietary CPU fan and heatsink assemblies. **Do not** replace these CPU fans with other models.

Follow these steps to install the CPU heatsink and fan.

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

CPU Fan

Retention bracket lock

Retention bracket
CPU Heatsink

Retention Module Base
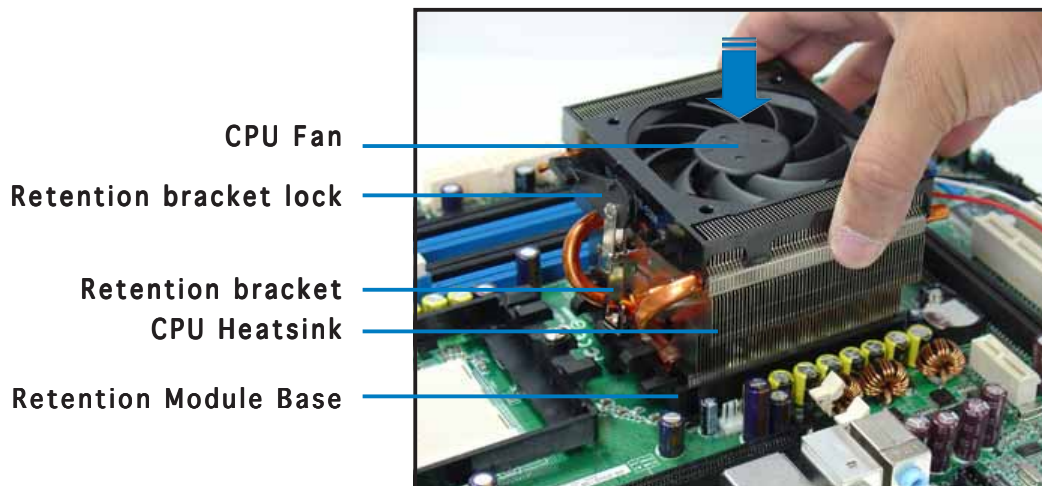
- The retention module base is already installed on the motherboard upon purchase.

- You do not have to remove the retention module base when installing the CPU or installing other motherboard components.

- Make sure that a Thermal Interface Material is properly applied to the CPU heatsink or CPU before you install the heatsink and fan assembly.

2.   Attach one end of the retention bracket to the retention module base.
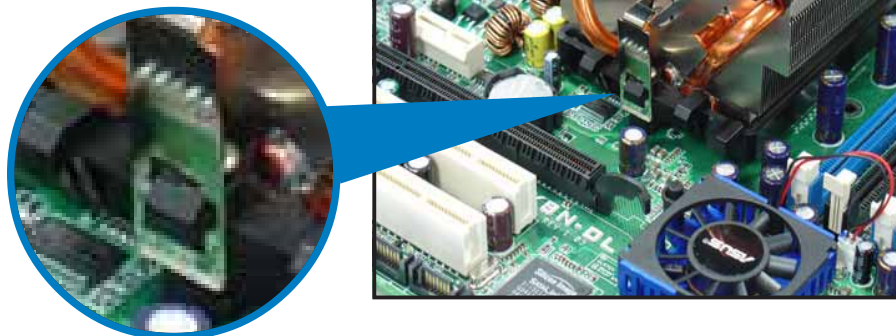
3. Align the other end of the retention bracket (near the retention bracket lock) to the retention module base.

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

5. 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.
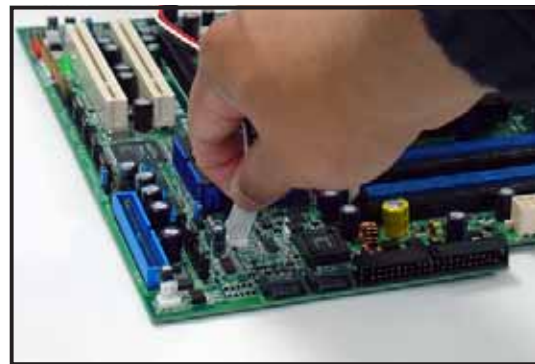
6. Repeat steps 1 to 3 to install the other heatsink if you have installed a second CPU, then connect the fan cable to the 4-pin connector labeled CPU_FAN2.

    The heatsinks appear as shown when installed.

2.4   System memory

2.4.1   Overview

The motherboard comes with six 184-pin Double Data Rate (DDR) Dual Inline Memory Modules (DIMM) sockets.

The following figure illustrates the location of the sockets:

K8N-DL 184-pin DDR DIMM sockets
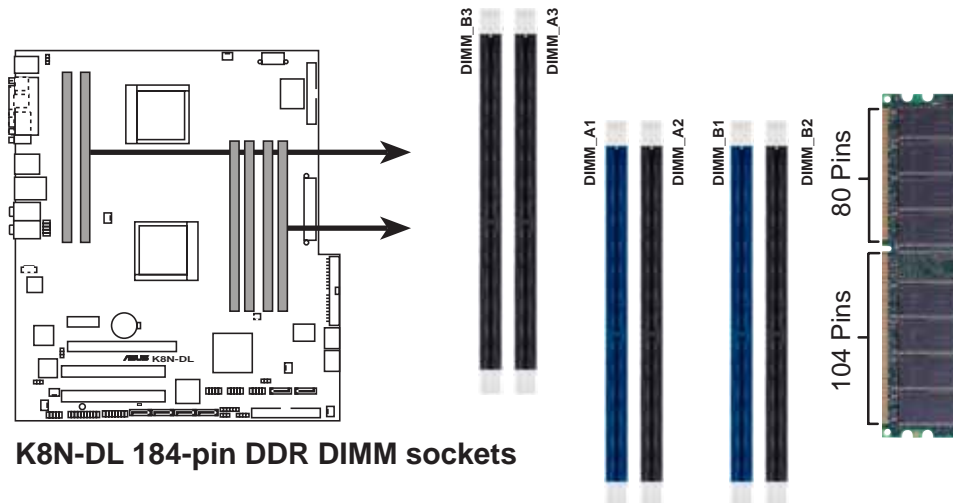
For CPU 1	Sockets
Channel A	DIMM_A1 and DIMM_A2
Channel B	DIMM_B1 and DIMM_B2
For CPU 2	**Sockets**
Channel A	DIMM_A3
Channel B	DIMM_B3

2.4.2 Memory Configurations

You may install 256 MB, 512 MB, 1 GB, 2 GB, or 4 GB registered ECC DDR DIMMs into the DIMM sockets using the memory configurations in this section.

- For dual-channel configuration, the total size of memory module(s) installed per channel must be the same for better performance.
  Single CPU:
     DIMM_A1+DIMM_A2=DIMM_B1+DIMM_B2
  Dual CPU:
     DIMM_A1+DIMM_A2=DIMM_B1+DIMM_B2=DIMM_A3+DIMM_B3

- When using one DDR DIMM module, install into DIMM_A1 slot only.

- When using two DDR DIMM modules, install into DIMM_A1 and DIMM_A2 slots only.

- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.

- Visit the ASUS website for the latest DDR400 Qualified Vendors List (QVL).

2.4.3 Installing a DIMM

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

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

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

DDR DIMM notch

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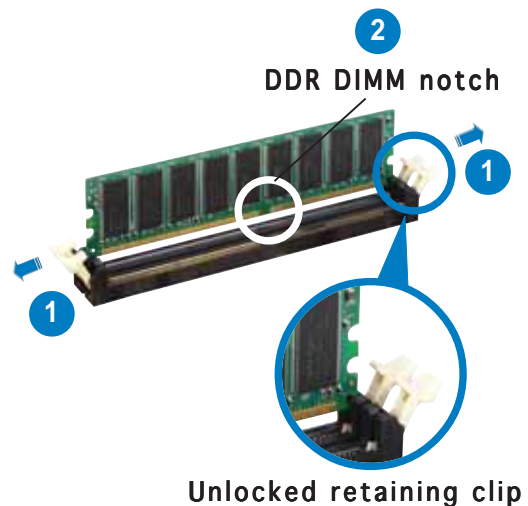
A DDR DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

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

Locked retaining clip
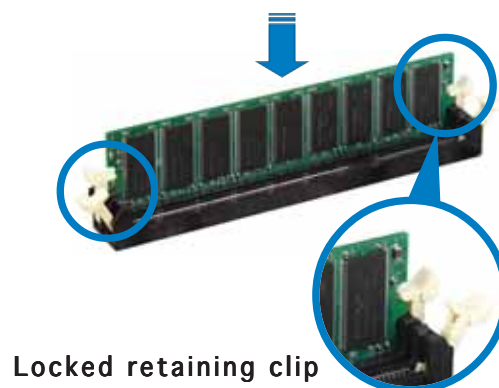
2.4.4 Removing a DIMM

Follow these steps to remove a DIMM.

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

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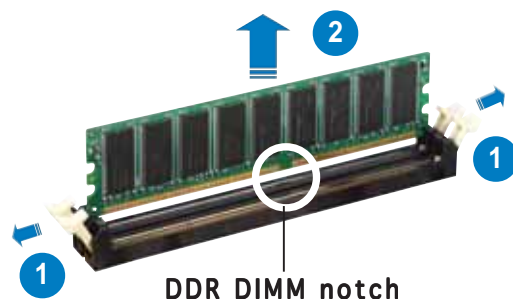
Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

2.5　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.

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

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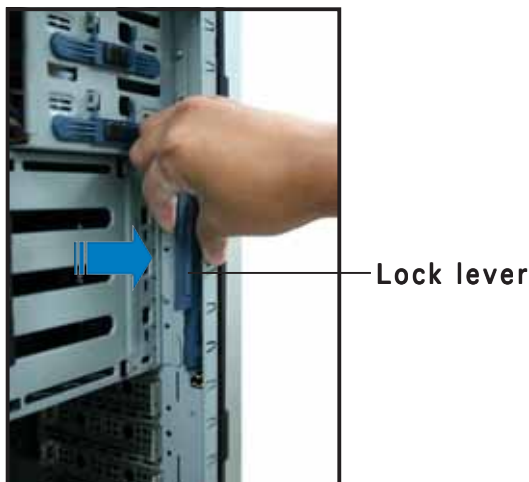
3. Unhook the hinge-like tabs from the holes on the right side of the front panel to completely detach the front panel assembly from the chassis.
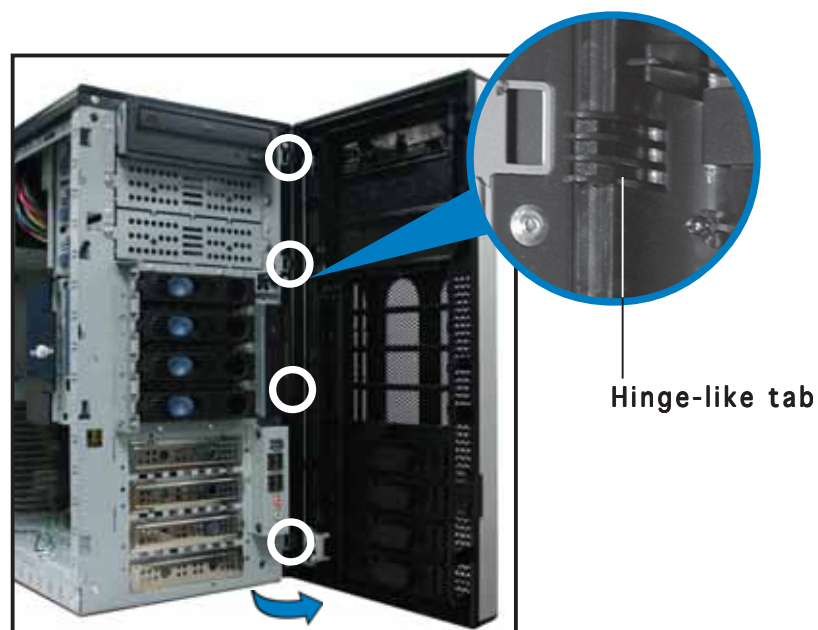
Hinge-like tab

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
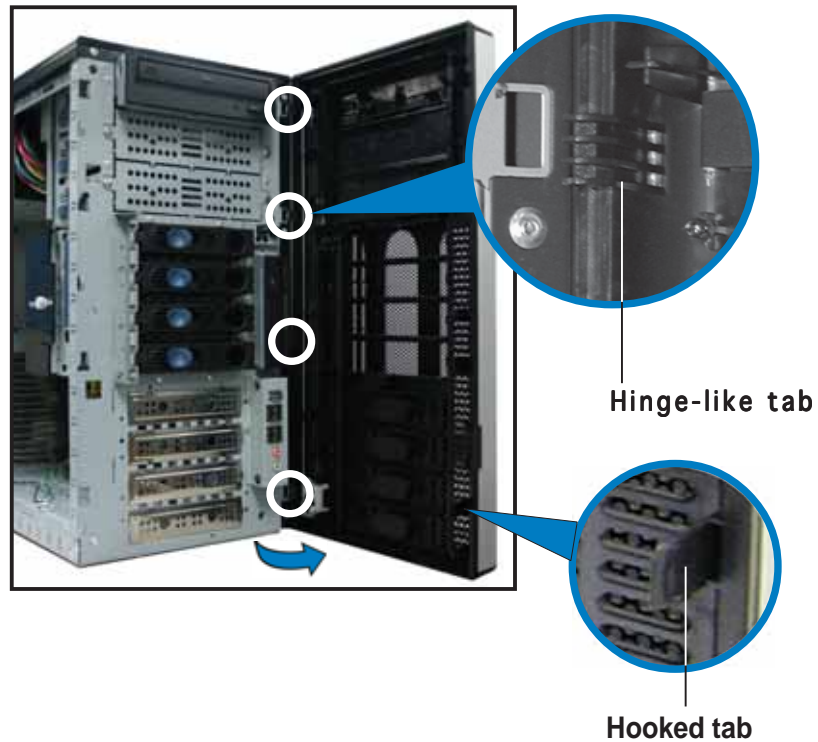
Do not use too much force when removing or when reinstalling the front panel assembly.

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. An optical 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.
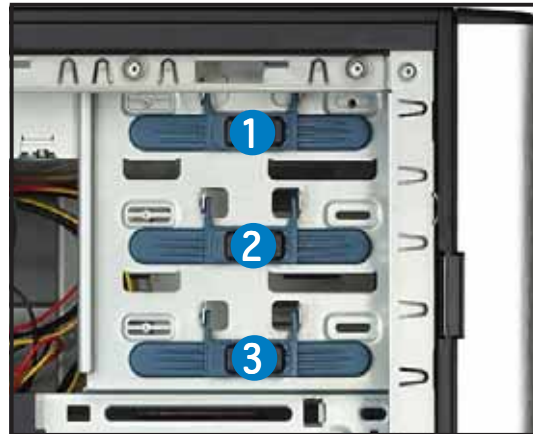
To install a 5.25-inch drive:

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 bay lock ——

Drive lock bar

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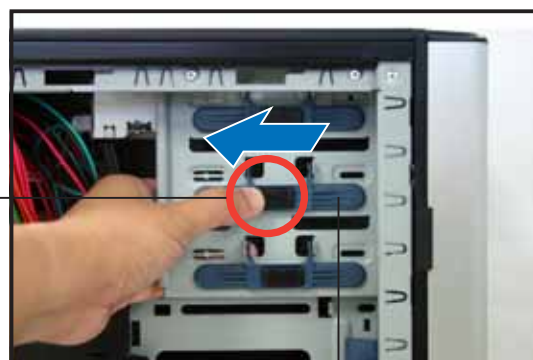
3. When released, pull up the drive bay lock bar. Underneath the lock bar are two pegs that match the holes on the drive bay. This mechanism secures the drive to the bay in place of screws.

Drive bay holes
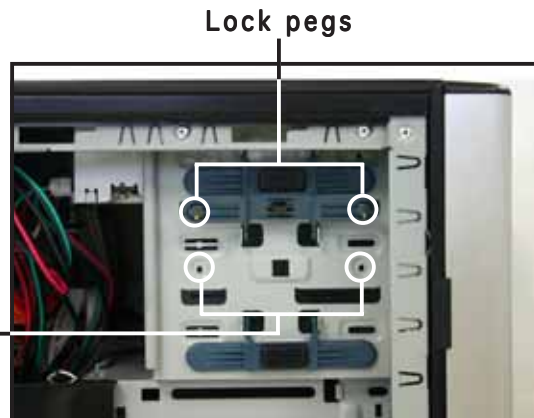
4. While holding up the drive lock bar, carefully insert a 5.25-inch drive into the bay, until the back of the drive aligns to the rear edge of the drive cage.
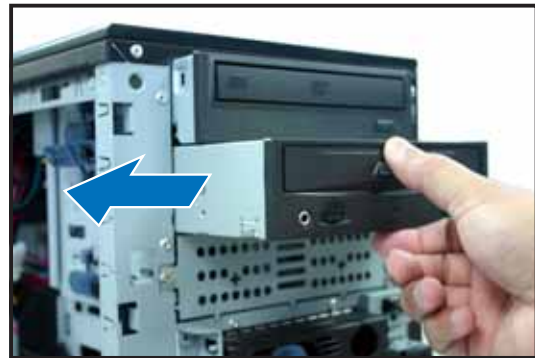
Due to space constraints inside the chassis, do not insert the drive all the way at this time. This will allow you enough space to easily connect the drive cables.

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.
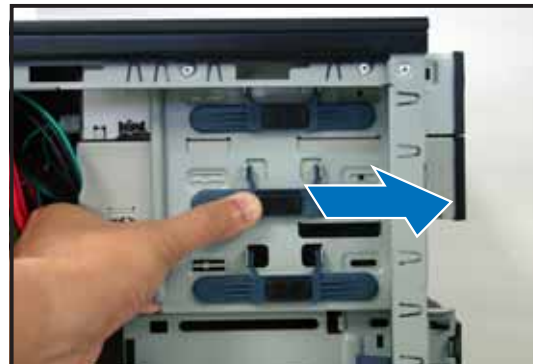
9. On the front panel assembly, detach the plastic bay cover opposite the 5.25-inch drive that you installed by pressing the two hooked tabs on each side of the bay cover.

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 SATA HDD

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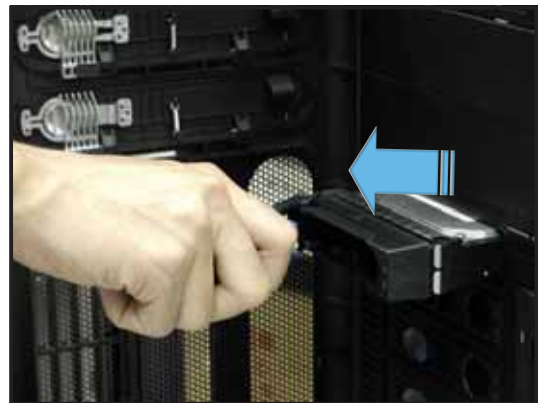
4. An empty drive tray requires a metal bracket for support. Use a Phillips (cross) screwdriver to remove the bracket when you are ready to install a hard disk in the drive tray.

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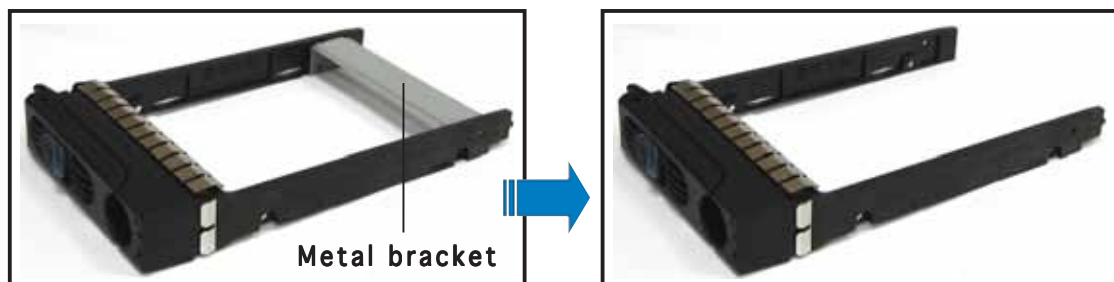
5. Place a SATA hard disk to the drive tray and secure it with four screws.

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 internal SATA HDD

Your package comes with specially designed hard disk drive rails if you want to install the hard disk drives internally (not hot-swap). Depending on which bay you wish to install your hard disk drive, the orientation of the drive rails vary so that the screw holes match those on the drive.

For identification purposes, the drive rails are referred to as "Rail 1" and "Rail 2" as shown below.

Rail 1

Rail handle   Hole 1   Hole 2   Hole 3   Hole 4

Rail 2
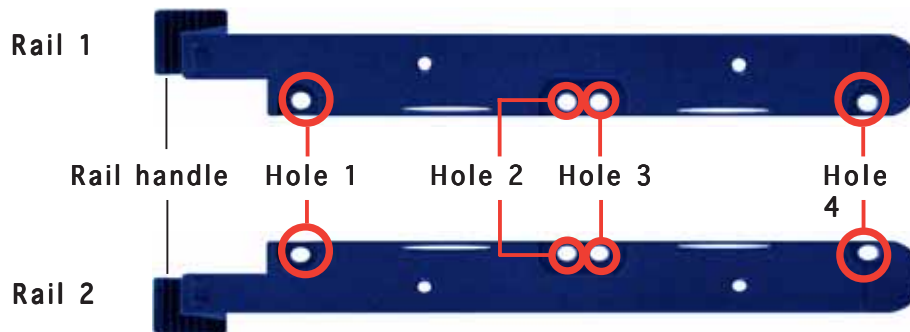
Take note of the correct orientation of the drive rails. There is only one **correct** way to attach the rails when installing drives on the hard disk drive cage.

Installing a SATA hard disk drive to the first hard disk drive cage

To install a SATA hard disk drive to the first hard disk drive cage:

1. Remove the front panel assembly. Refer to section 2.5.1 for instructions.

2. Use a Phillips (cross) screwdriver to attach **Rail 1** to the side of the drive as shown. The rail end should be on the side of the drive connectors.

Rail handle

Drive connectors   Hole 1   Hole 3

---

3.   Attach **Rail 2** to the other side of the drive as shown. The rail end should be on the side of the drive connectors.

Rail handle   Hole 1   Hole 3   Drive connectors

4.   Check the HDD jumper setting. Refer to the label pasted on the HDD for the description of jumper settings. The setting "Cable Select" is recommended.

5.   Carefully insert the drive into a bay on the front panel.

6.   Push the drive all the way to the depth of the bay until the rail locks clicks, indicating that the drive is securely in place.

7.   Connect the 15-pin SATA power plug to the power connector at the back of the drive, then connect the other end to a 4-pin plug (female) from the power supply unit.

8. Connect one end of the supplied 7-pin SATA cable to the SATA connector at the back of the drive.

9. Connect the other end to a SATA connector on the motherboard.

    Refer to Chapter 4 for the location of the SATA connectors.
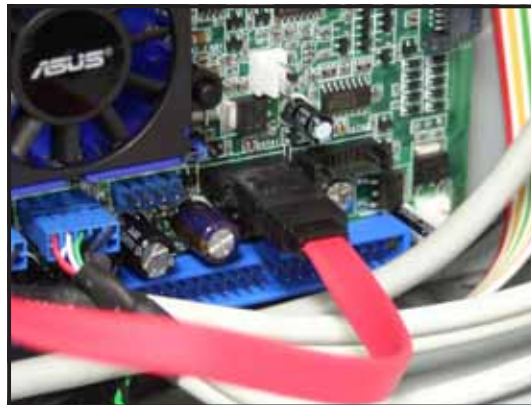
Installing an HDD dummy cover

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.
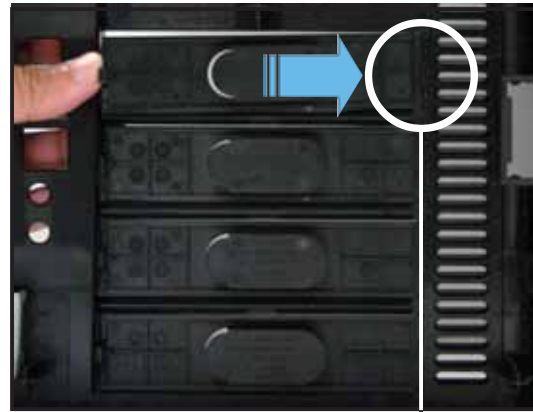
    Flat end

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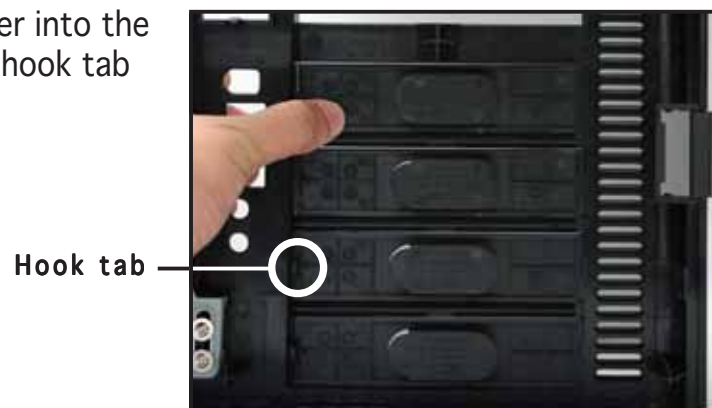
    Hook tab

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 an 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. Remove the metal bracket opposite the slot where you wish to install the expansion card.
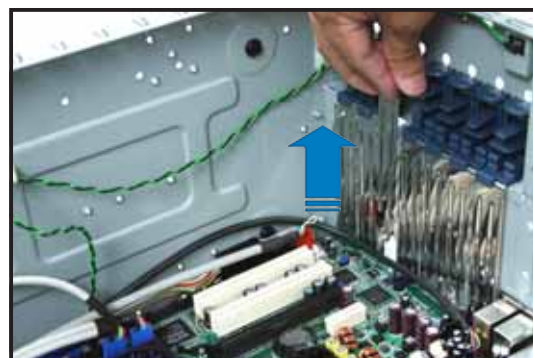
3. Push the expansion card connector to the slot, then make sure that it is properly seated on the slot.

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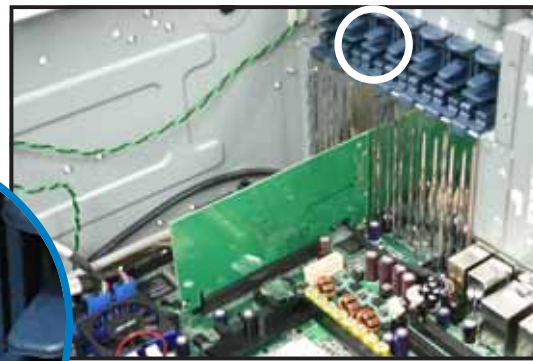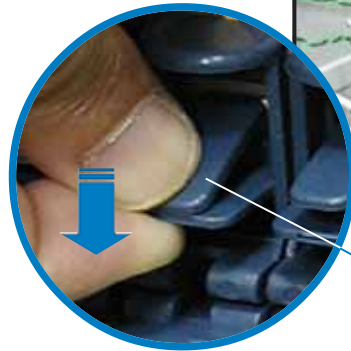
Card lock tab

2.8.2   Removing an expansion card

To remove an expansion card:

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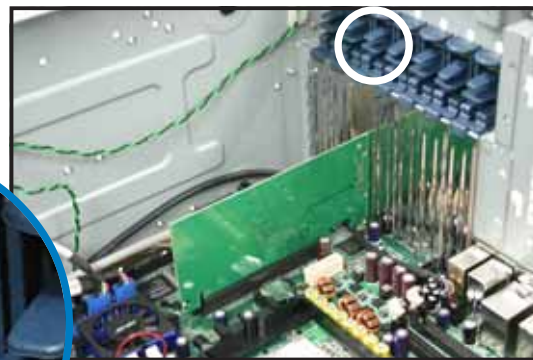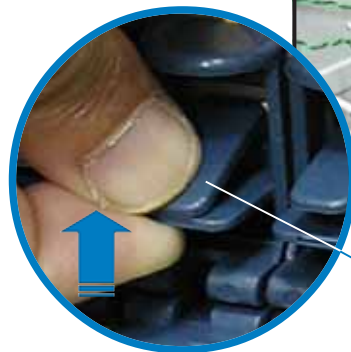
Card lock tab

2.   Firmly hold the expansion card
      and pull it out of the slot.

3.   Replace the slot metal bracket,
      then place the plastic card lock
      back where you removed it.
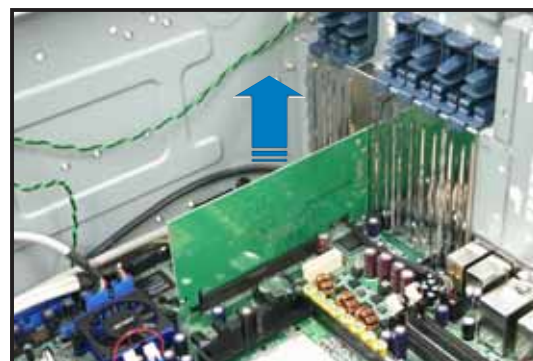
2.9 Cable connections

✎
- 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
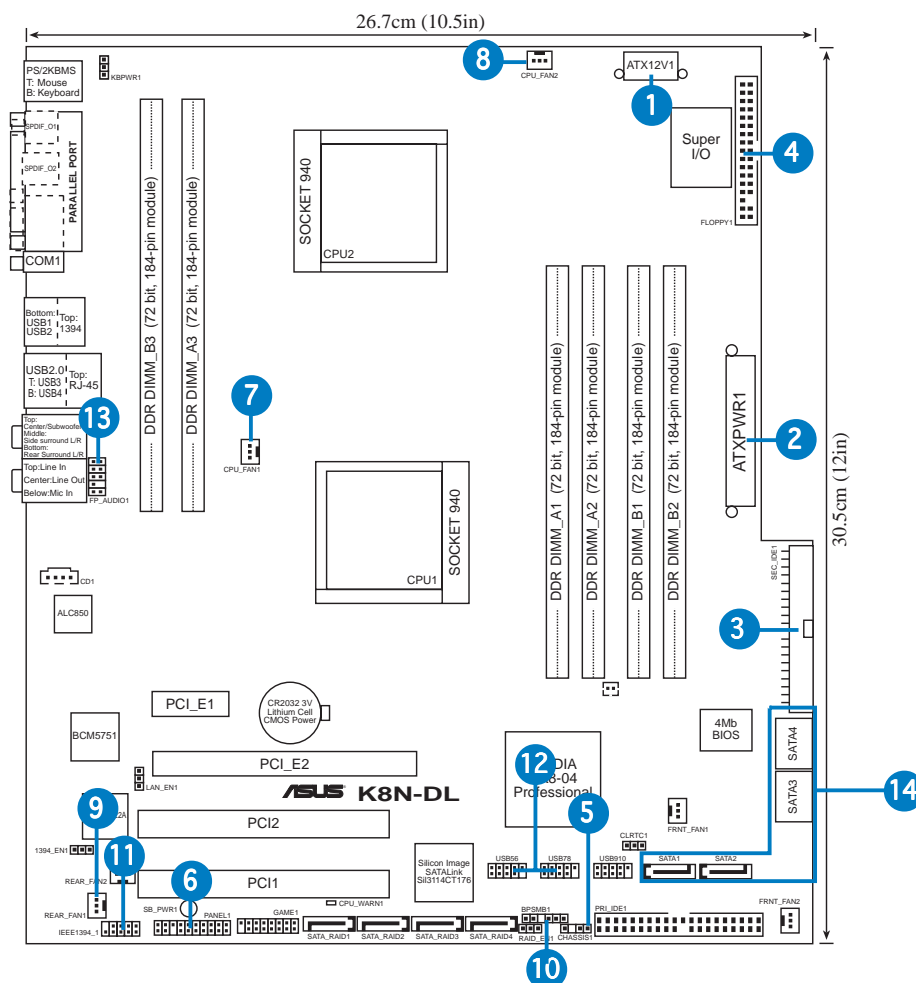
Standard cables connected to the motherboard

1.	8-pin 12V power	8.	CPU fan 2
2.	24-pin ATX power	9.	Chassis fan
3.	Secondary IDE (optical drive)	10.	Power supply SMBus
4.	Floppy disk drive	11.	Front IEEE 1394 cable
5.	Chassis intrusion	12.	Front USB cable
6.	Front panel cable	13.	Front audio cable
7.	CPU fan 1	14.	Serial ATA connectors

✎
Refer to Chapter 4 for detailed information on the motherboard connectors.

2.9.2   SATA backplane connections

A SATA backplane comes pre-installed in the TW510-E2 AA4 model. The SATA backplane has four SATA signal and power connectors to support Serial ATA hard disk drives. The backplane design incorporates a hot swap feature to allow easy connection or removal of SATA hard disks. The LED on the backplane connect to the front panel LED to indicate HDD status. See section "1.6 LED information" for details.

Front side

The front side of the SATA backplane faces the front panel when installed. This side includes four SATA connectors for the hot swap drive trays.
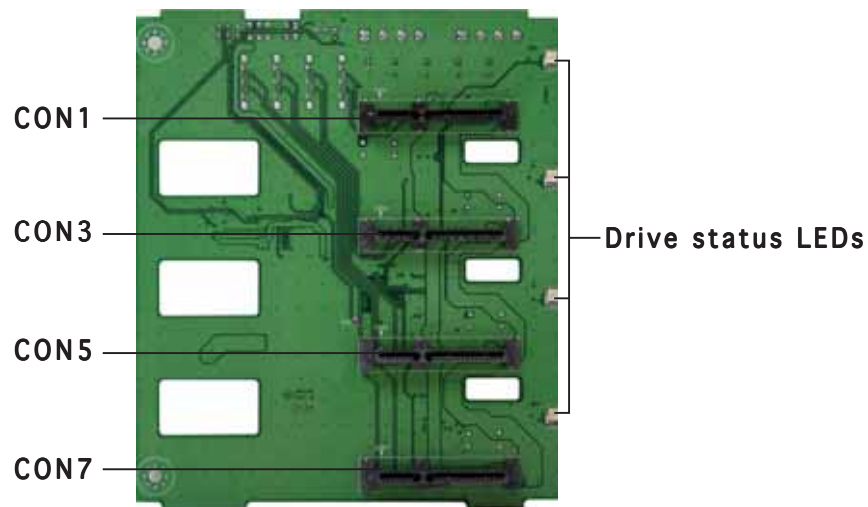
Each SATA connector is labeled (CON1, CON3, CON5, CON7) so you can easily determine their counterpart connectors at the back side of the backplane. Refer to the table for reference.
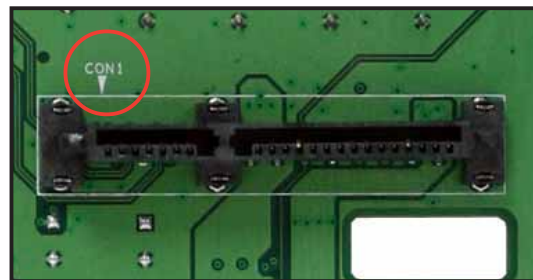
HDD Device	Front side connector	Back side connector
HDD 1	CON1	CON2
HDD 2	CON3	CON4
HDD 3	CON5	CON6
HDD 4	CON7	CON8

Back side

The back side of SATA backplane faces the rear panel when installed. This side includes the power and HDD fan connectors, jumper, SATA interfaces, and SMBus connectors.

SMBus connector (upper 6-1 pins)
(connects the SMB cable from the motherboard)

Fan connector
(for HDD fan)

Power SMBus connector (lower 6-1 pins)
(connects the SMB cable from the power supply, when available)

Power connectors
(connect power plugs
from the power supply)

CON2   CON4   CON6   CON8
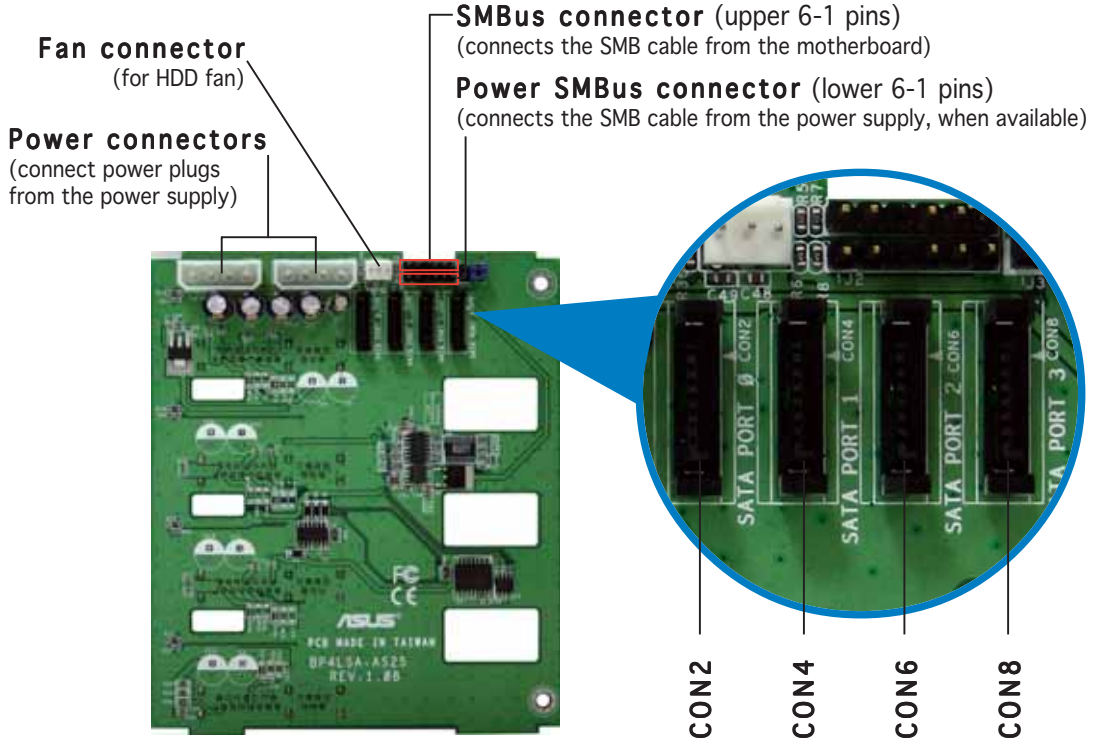
SATA backplane jumper settings and HDD ID assignments

The 6-pin jumper **J1** allows you to define your desired SATA configuration. The picture below shows the location of jumper J1 with pins 1-3 and 2-4 shorted. Refer to the table for the jumper settings and the appropriate ID# for each SATA HDD bay.
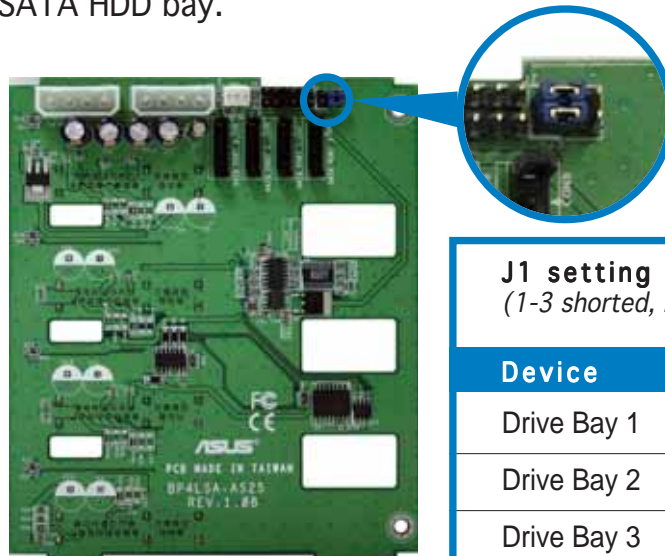
J1 setting (1-3 shorted, 2-4 shorted)	
Device	**SATA BP ID**
Drive Bay 1	CON2
Drive Bay 2	CON4
Drive Bay 3	CON6
Drive Bay 4	CON8

One SATA backplane configuration (AA4)

The back side SATA connectors are attached to the motherboard SATA connectors controlled by the NVIDIA® CK8-04 chip. Refer to the illustration below for the location of the SATA connectors. Refer to the table below for the default SATA cable connections.

Backplane ID	Connected to (on motherboard)
CON2	SATA1
CON4	SATA2
CON6	SATA3
CON8	SATA4
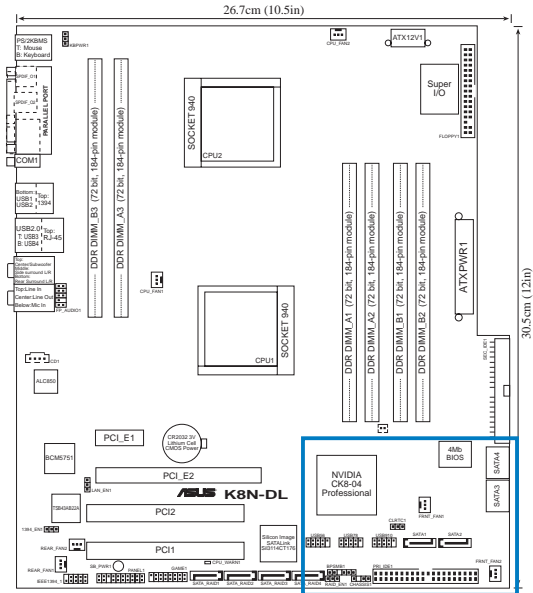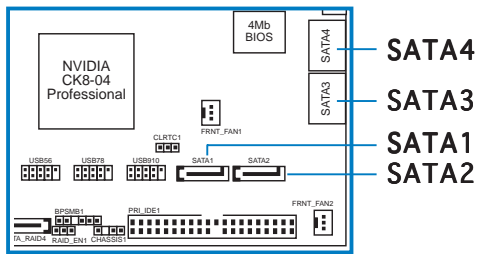
2.10 Removable components

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. Chassis fan
2. HDD blowers
3. SATA backplane(s)
4. Floppy disk drive module
5. Front I/O board
6. Chassis footpads and roller wheels
7. Power supply

2.10.1 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.
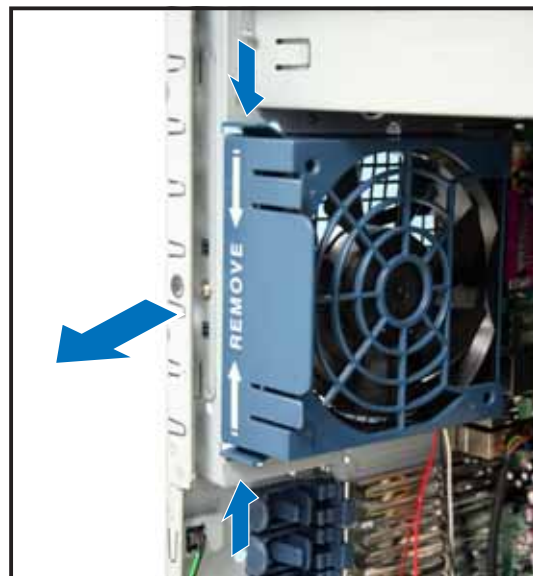
3. Lift the chassis fan case lock hooks, then push the fan from the center of the case until it is detached.

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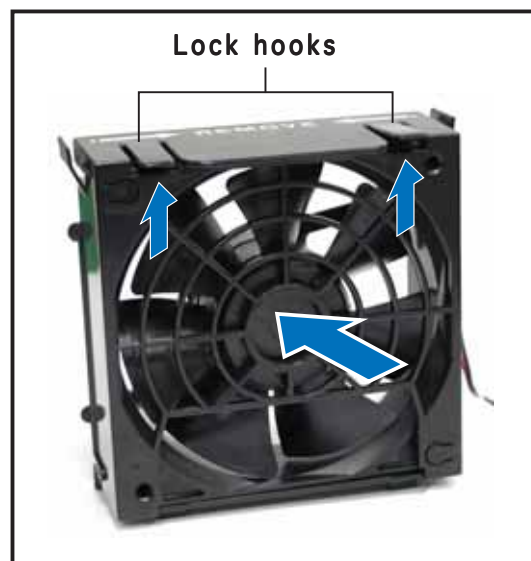
4.   Pull the fan out from the fan case, then set aside.

To reinstall the chassis fan:

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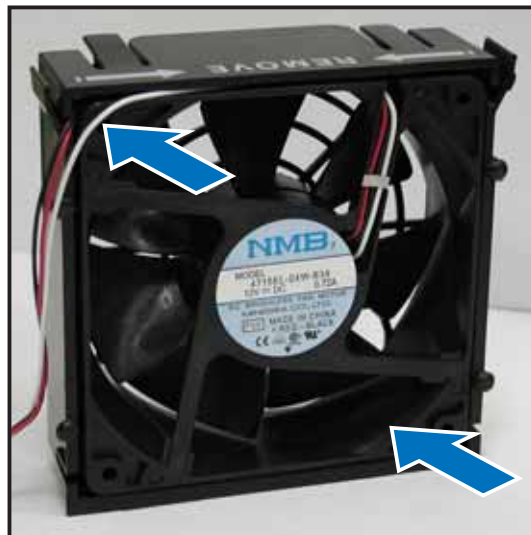
2.   Firmly hold the chassis fan on the side with the tabs and position it into its slot, making sure that the four hooks underneath the fan match the corresponding holes on the rear panel.
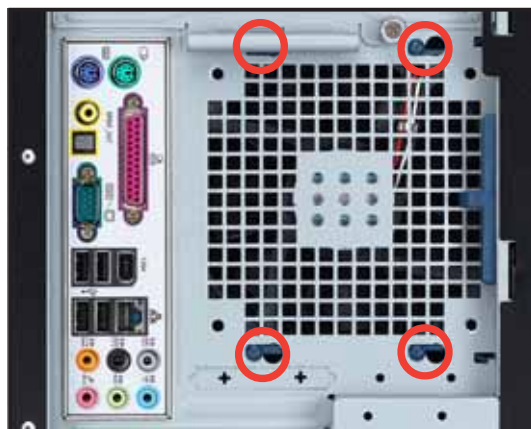
3. Push the fan into the chassis until the four hooks lock securely into the holes on the rear panel.

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

2.10.2 HDD fan

To remove the HDD fan:

1. Loosen the thumb screw that secures the HDD fan cage to the chassis.

2. Hold the outer side of the fan cage, then pull sideways to release it from the chassis.

3. Disconnect the 3-pin fan cable from the fan connector on the backplane before completely detaching the fan cage from the chassis.

Due to space constraints inside the chassis, some cables may interfere with the removal of the fan cage. To easily remove the fan cage, try to slightly push it inward (toward the motherboard) before pulling it out of the chassis.

4. Locate four fan hooks inside the HDD fan case.
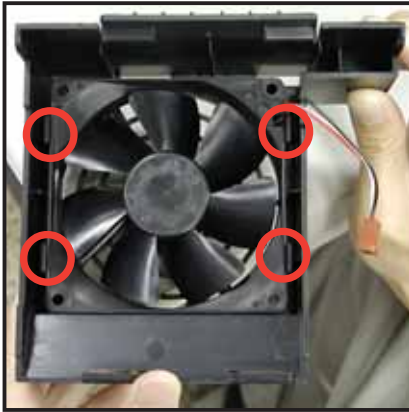
5. Press the fan case hooks outwards until the fan detaches from the case.
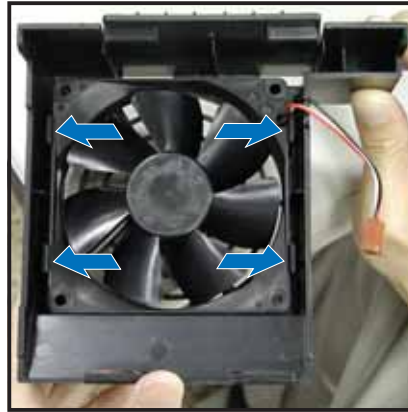
6. Slightly press the center of the fan vent to flush the fan out from the case. Set the HDD fan aside.

To re-install the HDD fan:

1. Insert a new HDD fan to the fan case until it clicks in place.

2. Re-connect the 3-pin fan cable to the fan connector on the backplane.
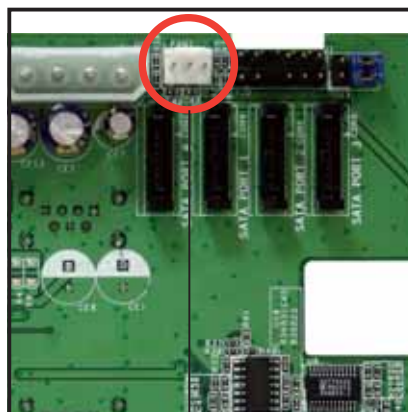
Fan connector on backplane (FAN1)

Chapter 2: Hardware setup

3. Hold the outer side of the HDD fan cage and hook the two side tabs to the inner edge of the drive cage. Make sure that the system cables are not caught up when you place the HDD fan.

Outer side of fan cage   **Side tabs**   **Inner edge of drive cage**

4. Push the outer edge of the fan cage sideways to fit it to the drive cage. You hear a click when the fan cage correctly fits in place.

5. Secure the fan cage with the thumb screw.

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2.10.3 SATA backplane

To remove the SATA backplane:

1. Remove the HDD blower case. Refer to section "2.10.2 HDD fan" for instructions.

2. Disconnect all cables from the SATA 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.
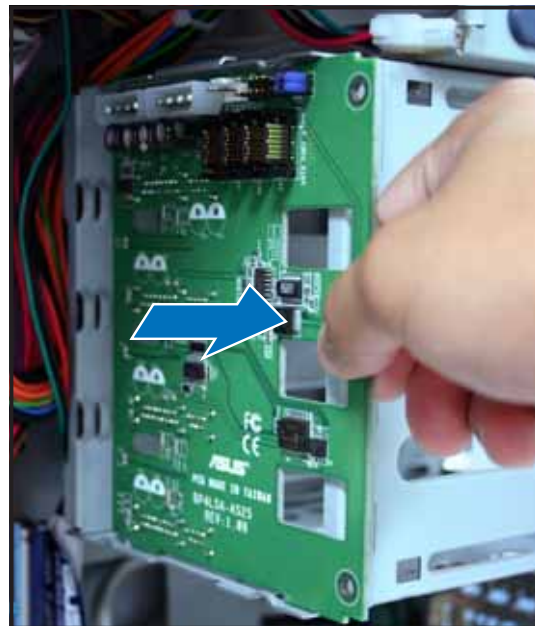
To reinstall a SATA backplane:

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 SATA backplane connections" for details.
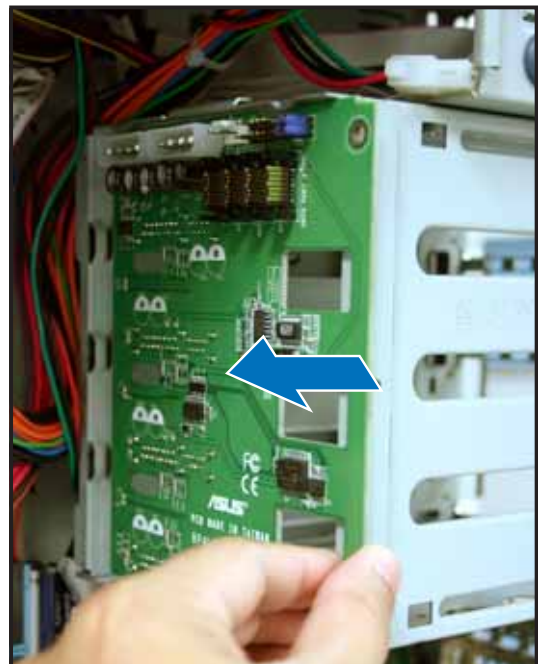
2.10.4 Floppy disk drive

✎ 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.
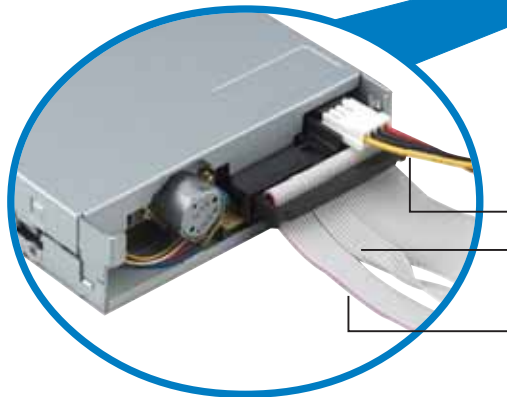
Floppy drive power cable
Floppy drive signal cable

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.

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2.10.5 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.
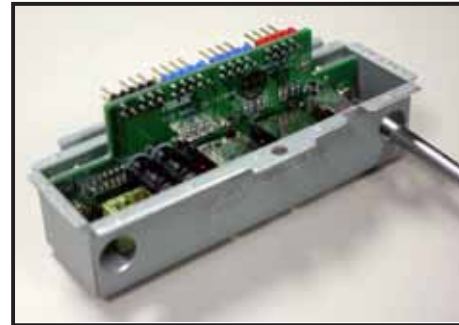
2. Position the I/O board into the bay with the component side to the left (close to the HDDs), then connect the I/O cables to the connectors on the back of the I/O board. Refer to "2.9.1 Motherboard connections" for details on cable connections.
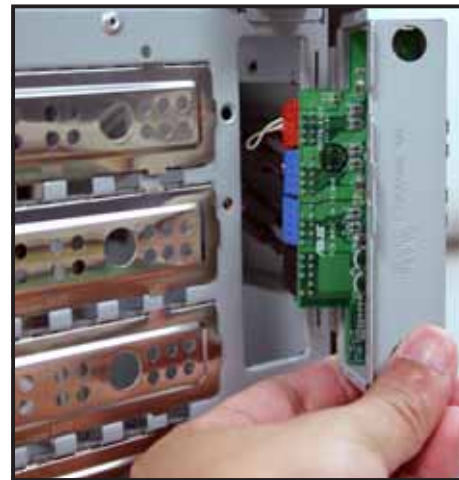
3. Insert the I/O board into the bay until the bracket fits the front edge of the bay.

4. Secure the I/O board bracket with a screw.

2.10.6 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 inside layer of a footpad.

3. Remove the footpad by rotating it counterclockwise.

4. Repeat steps 2 and 3 to remove the other three footpads.
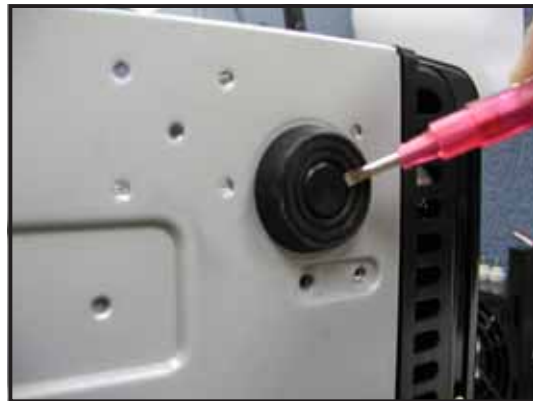
For convenient transport, install the roller wheels the came with the system package. Each wheel has a brake lock to stabilize the chassis in place.

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.
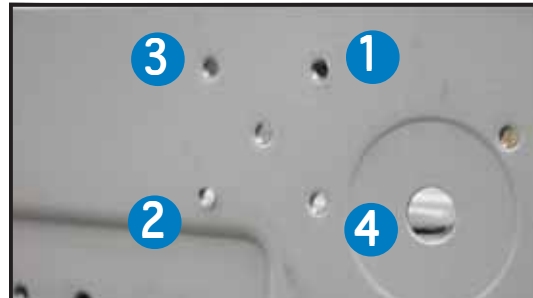
3. Secure each wheel to the bottom of the chassis using four screws.

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.

2.10.7 Power suppy unit

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 unit.

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.
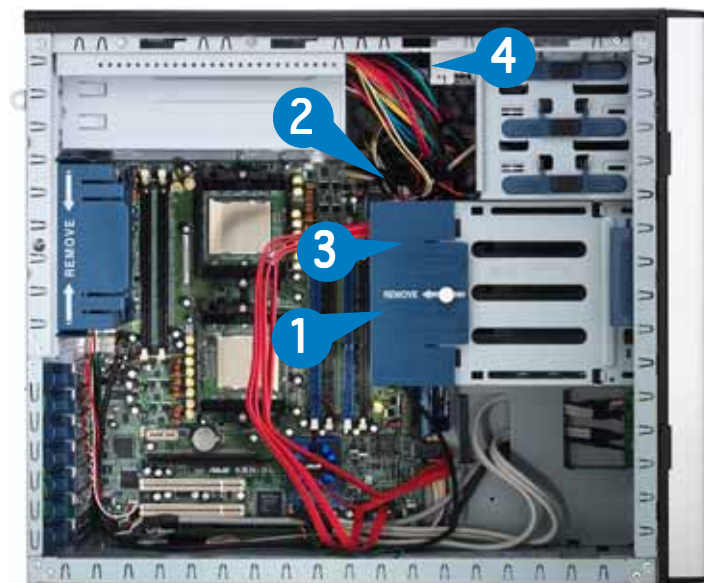
1. 24-pin ATX (motherboard power connector; *hidden behind the drive cage*)
2. 8-pin +12V (motherboard power connector; *hidden behind the drive cage*)
3. 2 x 4-pin plugs (SATA backplane)
4. 4-pin plug (floppy disk drive; *hidden*)

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

To remove the 600 W single power supply module:

1. Loosen the thumb screw that secures the power supply metal plate. Do not remove the thumb screw from the metal plate.

Thumbscrew

2. Hold the metal plate bar and push it downward to release the plate from the chassis. Remove the metal plate completely.

Metal plate bar

3. Use one hand to push the power supply module from inside the power supply cage, then carefully pull out the module from the chassis.

To install a power supply unit:

1. Firmly hold the power supply unit and insert it into the power supply cage.

2. Push the power supply unit all the way in until its outer end aligns with the rear panel.

⚠️ 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!

3. Place the metal plate flat on the outer end of the power supply module, flushed to the top of the chassis, while matching the four hooks with their corresponding holes on the rear panel.

Hook matched to a hole

4. Hold the metal plate bar and push it upward to lock the hooks to their holes. At the same time, you may also push the top of the metal plate to fit it completely.

5. Secure the metal plate with the thumb screw.

Chapter 3

This chapter describes how to prepare the barebone server for rack mounting.

Installation options

ASUS TW510-E2

> *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.*

Preparing the system for rack mounting

Removing the footpads or roller wheels

Refer to section "2.10.6 Chassis footpads and roller wheels" for instructions on removing the footpads or roller wheels.

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)
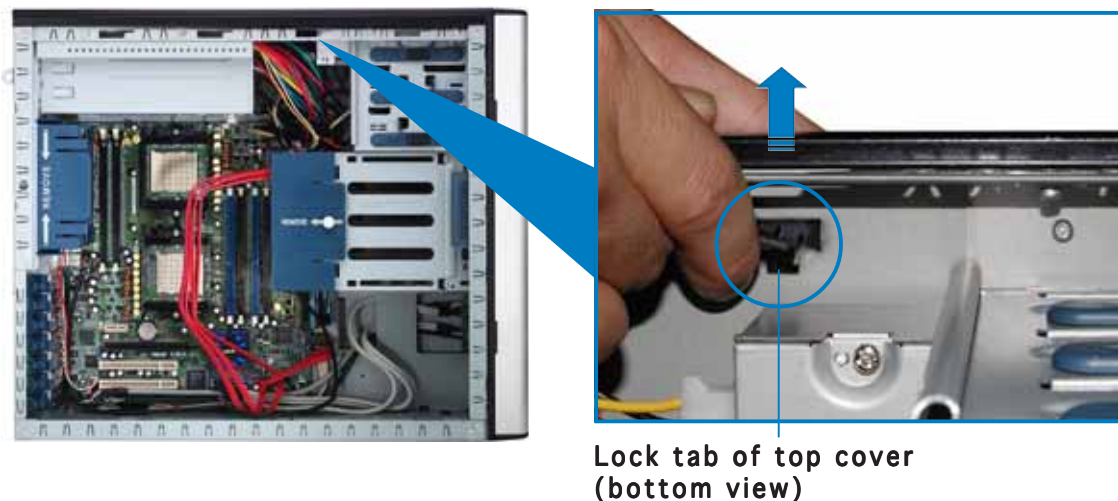
Attaching the rack rails

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

ASUS TW510-E2

4.1   Motherboard layout

26.7cm (10.5in)

30.5cm (12in)
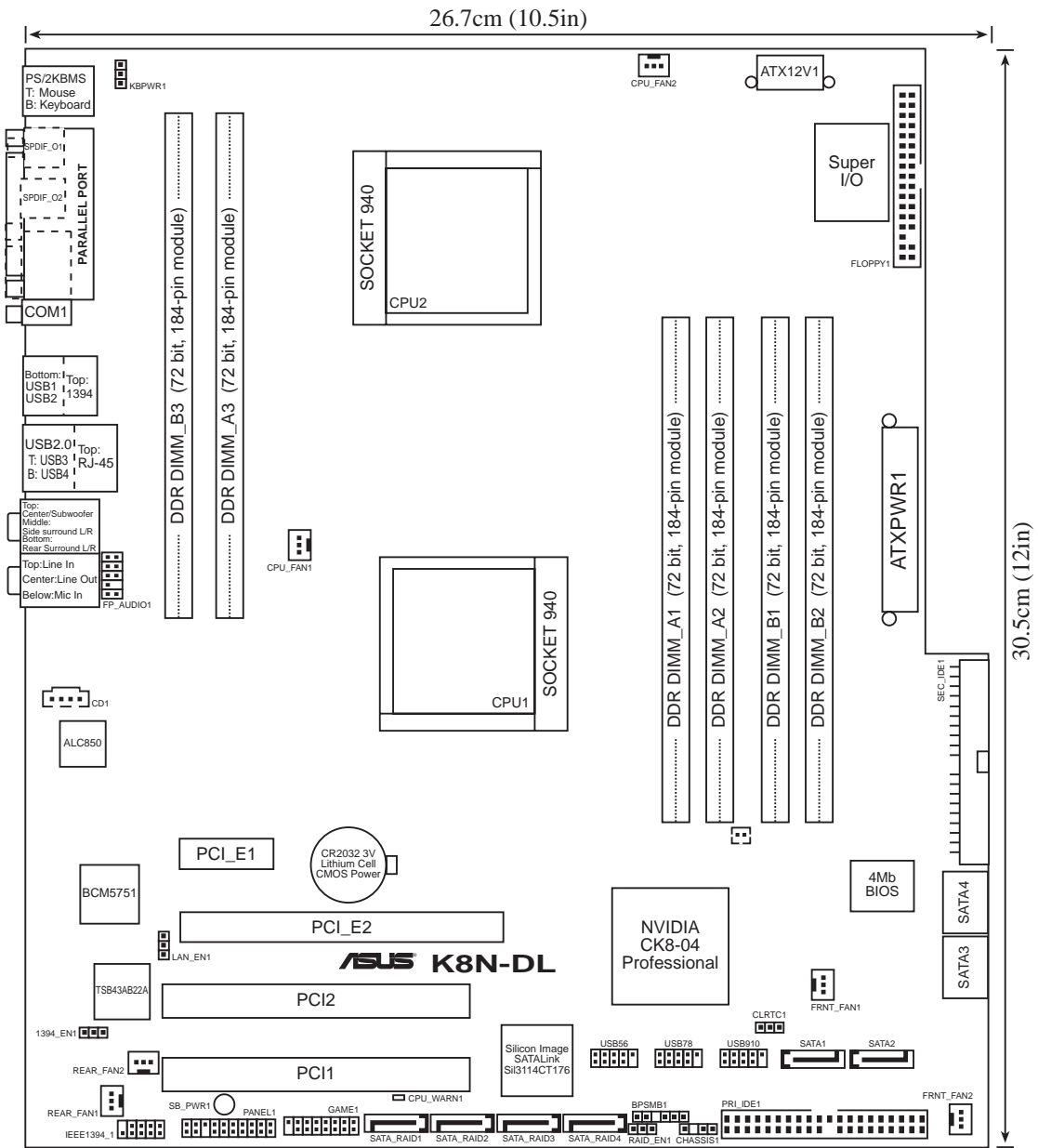
Layout contents

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4.2   Jumpers

1. Clear RTC RAM (CLRTC1)

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

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

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

K8N-DL Clear RTC RAM

CLRTC1

1 2   2 3

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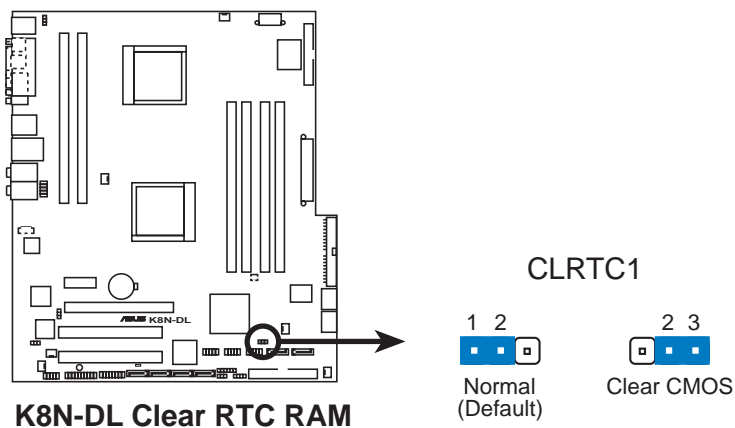
> You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

2. 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.

KBPWR1

1
2

+5V
(Default)

2
3

+5VSB
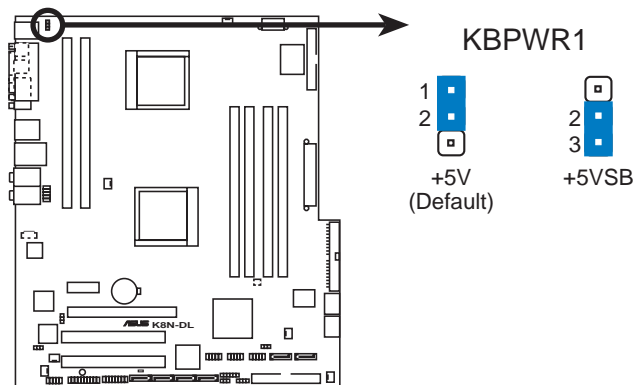
K8N-DL Keyboard power setting

3. 1394 controller setting (3-pin 1394_EN1)

This jumper allows you to enable or disable the onboard TI 1394a IEEE 1394 controller. Set to pins 1-2 to activate the 1394 feature.

1394_EN

1 2

Enable
(Default)

2 3
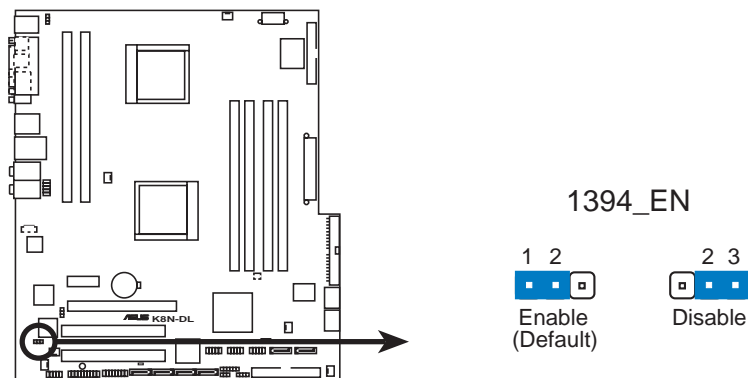
Disable

K8N-DL 1394 function setting

4. Gigabit LAN controller setting (3-pin LAN1_EN1)

This jumper allows you to enable or disable the onboard Broadcom® BCM5751 Gigabit LAN1 controller. Set to pins 1-2 to activate the Gigabit LAN feature.
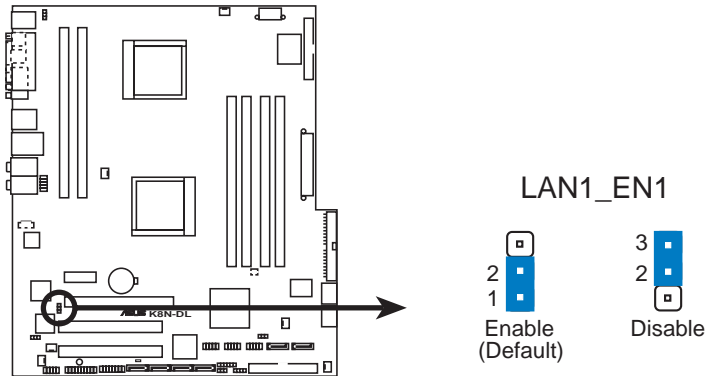
K8N-DL CPU LAN1_EN setting

5. RAID controller setting (3-pin RAID_EN1)

This jumper allows you to enable or disable the onboard Silicon Image® 3114R RAID controller. Set to pins 1-2 to activate the RAID feature.
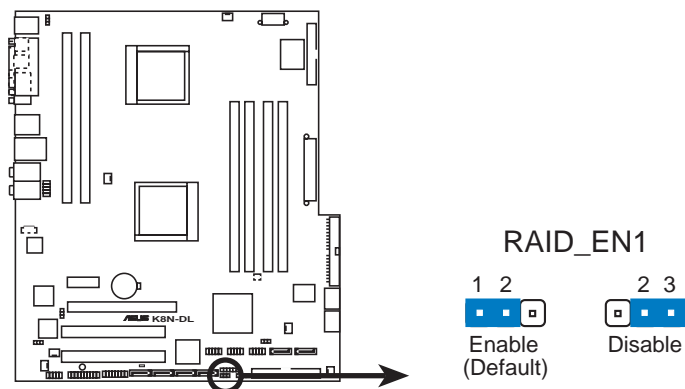
K8N-DL RAID controller setting

4.3   Internal connectors

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

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

FLOPPY1

PIN 1

NOTE: Orient the red markings on the floppy ribbon cable to PIN 1.
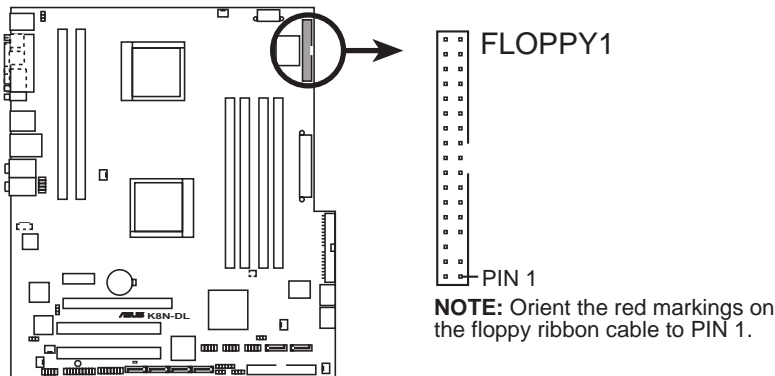
K8N-DL Floppy disk drive connector

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

These connectors are for Ultra DMA 100/66 signal cables. The Ultra DMA 100/66 signal cable has 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.

- • The 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 UltraDMA 100/66 IDE devices.

SEC_IDE1

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

PIN 1

PRI_IDE1
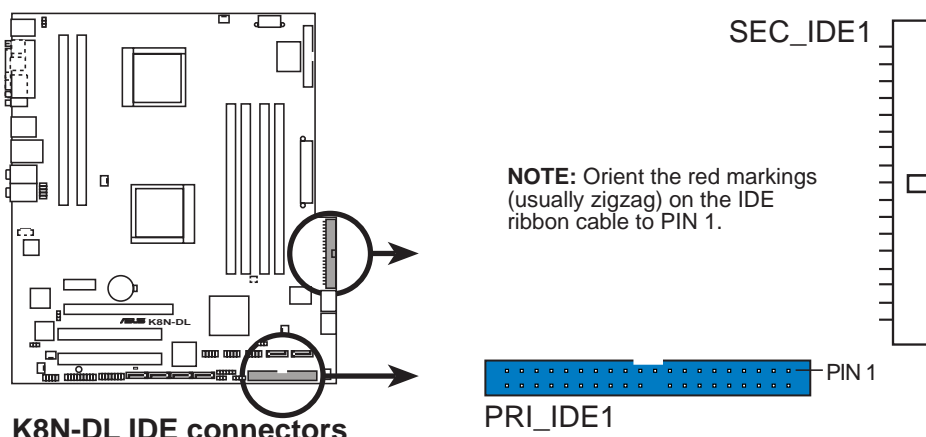
K8N-DL IDE connectors

3. Serial ATA connectors (7-pin SATA1, SATA2, SATA3, SATA4)

Supported by the NVIDIA® nForce4™ chipset, these connectors are for the Serial ATA signal cables for Serial ATA hard disk drives that allows up to 3Gb/s of data transfer rate.

If you installed Serial ATA hard disk drives, you can create a RAID 0, RAID 1, RAID 1+0, or S/W RAID 5 configuration.

K8N-DL SATA connectors
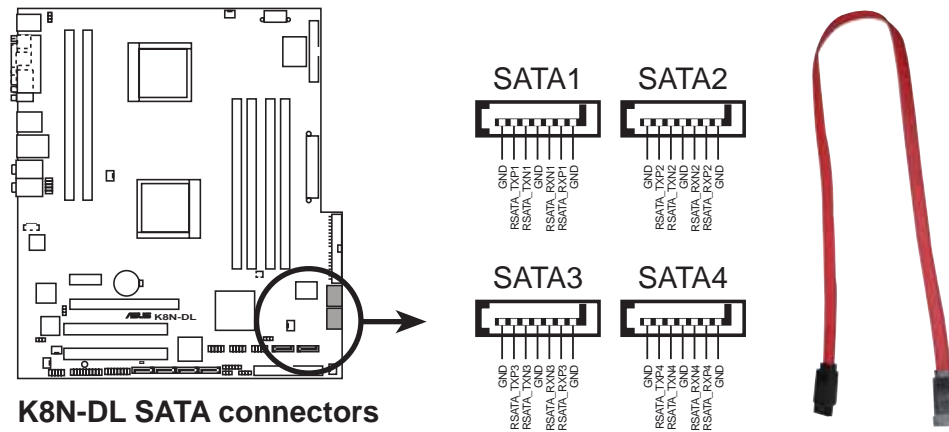
Important note on Serial ATA

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

4. Serial ATA RAID connectors (7-pin SATA_RAID1, SATA_RAID2, SATA_RAID3, SATA_RAID4)

Supported by the Silicon Image® Sil3114 RAID controller, these connectors are for Serial ATA signal cables. These connectors support up to four Serial ATA hard disk drives that can be configured as a disk array through the onboard Silicon Image Sil3114 SATA RAID controller.
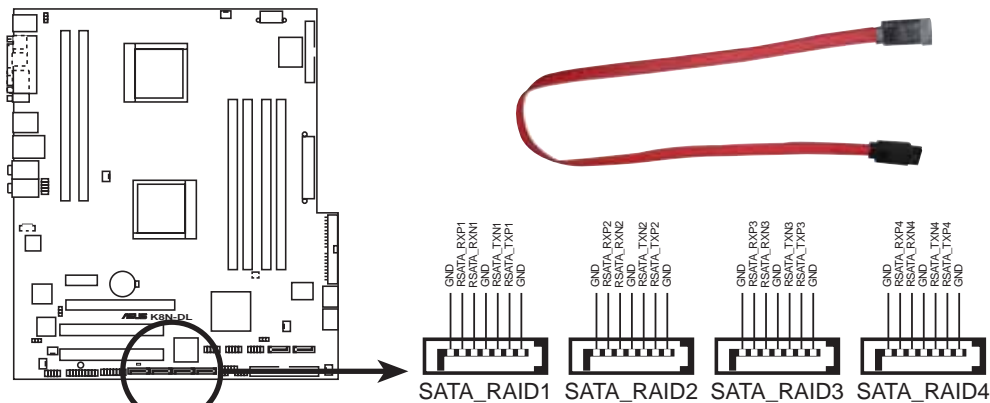
K8N-DL SATA RAID connectors

- Before creating a RAID configuration, make sure that you have connected the Serial ATA cables to these connectors and have installed the Serial ATA hard disks drives; otherwise, you cannot enter the Silicon Image RAID utility and Serial ATA BIOS setup during POST.

- The RAID 5 driver is not Windows Hardware Quality Labs (WHQL) certified.

5. CPU, front, and rear fan connectors (3-pin CPU_FAN1, CPU_FAN2, FRNT_FAN1, FRNT_FAN2, REAR-FAN1, REAR_FAN2)

The fan connectors support cooling fans of 350mA~2000mA (24 W max.) or a total of 1A~3.48A (41.76 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

> • Do not forget to connect the fan cables to the fan connectors. Lack of sufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!
>
> • The ASUS Smart Q-Fan function is supported using the CPU fans (CPU_FAN1, CPU_FAN2) connectors.
>
> • The chipset fan is synchronized with the CPU fans.

K8N-DL Fan connectors

CPU_FAN1
Rotation
+12V
GND

CPU_FAN2
Rotation
+12V
GND

FRNT_FAN1
GND
+12V
Rotation

FRNT_FAN2
GND
+12V
Rotation

REAR_FAN1
Rotation
+12V
GND

REAR_FAN2
GND
+12V
Rotation
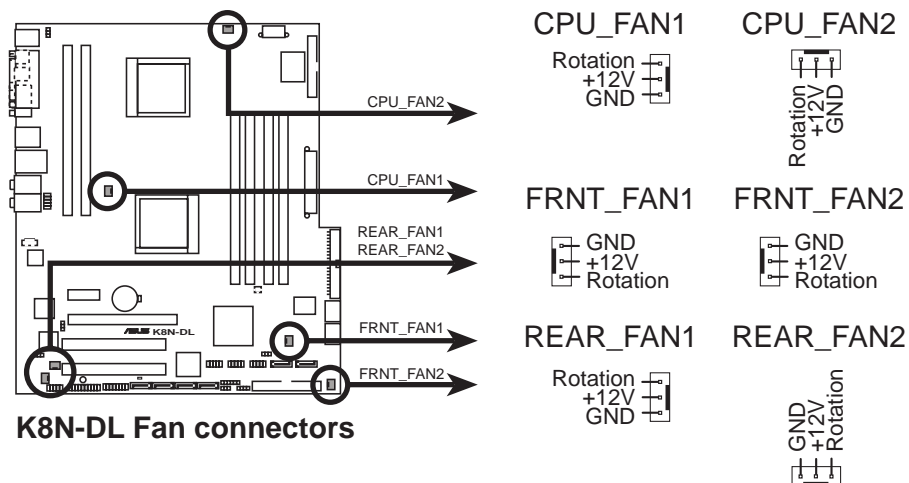
6. Backplane SMBus connector (6-1 pin BPSMB1)

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.

K8N-DL SMBus connector

BPSMB1

FAN_PWM
I2C_4_CLK#
GND
I2C_4_DATA#
+5VSB
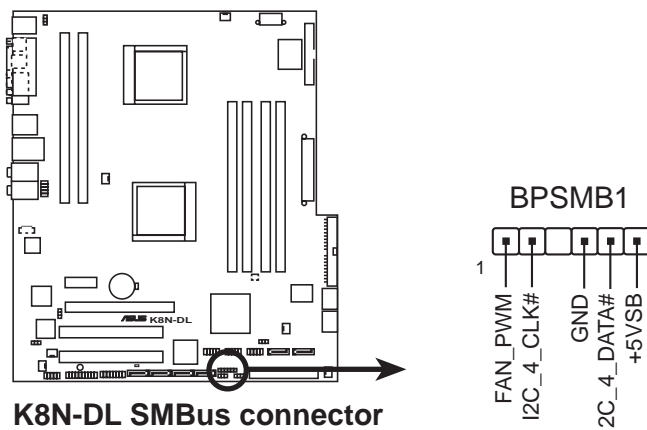
7. USB connectors (10-1 pin USB56, USB78, USB910)

These connectors are for USB 2.0 ports. Connect the USB cable from the USB/GAME port module to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.
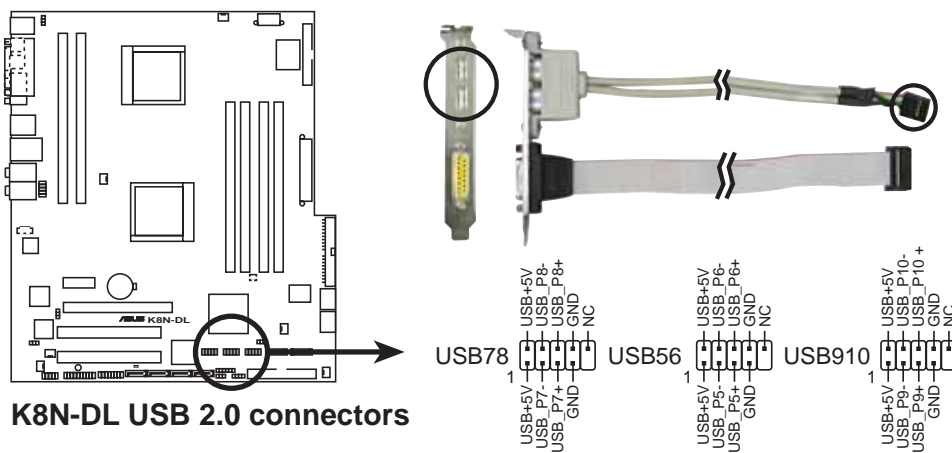
K8N-DL USB 2.0 connectors

⚠ Never connect a **1394 cable** to the USB connectors. Doing so will damage the motherboard!

8. IEEE 1394 connector (10-1 pin IE1394_1)

This connector is for the IEEE 1394a module. Connect the IEEE 1394 module cable to this connector, then install the module to a slot opening at the back of the system chassis.
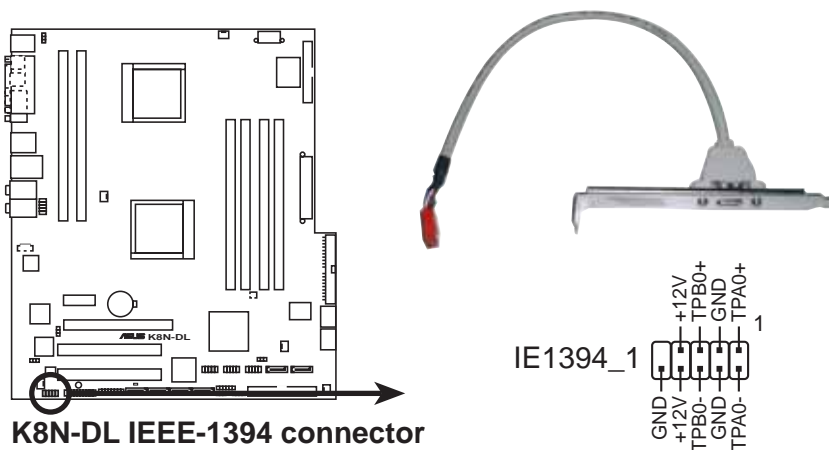
K8N-DL IEEE-1394 connector

⚠ Never connect a **USB cable** to the IEEE 1394 connectors. Doing so will damage the motherboard!

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

These connectors are for an ATX 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.

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

- 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.

- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. See the table below for details.

24-pin Power Connector

+3 Volts	+3 Volts
-12 Volts	+3 Volts
Ground	Ground
PSON#	+5 Volts
Ground	Ground
Ground	+5 Volts
Ground	Ground
-5 Volts	Power OK
+5 Volts	+5V Standby
+5 Volts	+12 Volts
+5 Volts	+12 Volts
Ground	+3 Volts

8-pin

GND GND GND GND

12V 12V 12V 12V

For Power Supply with 20-pin Power Connector

K8N-DL ATX Power connectors
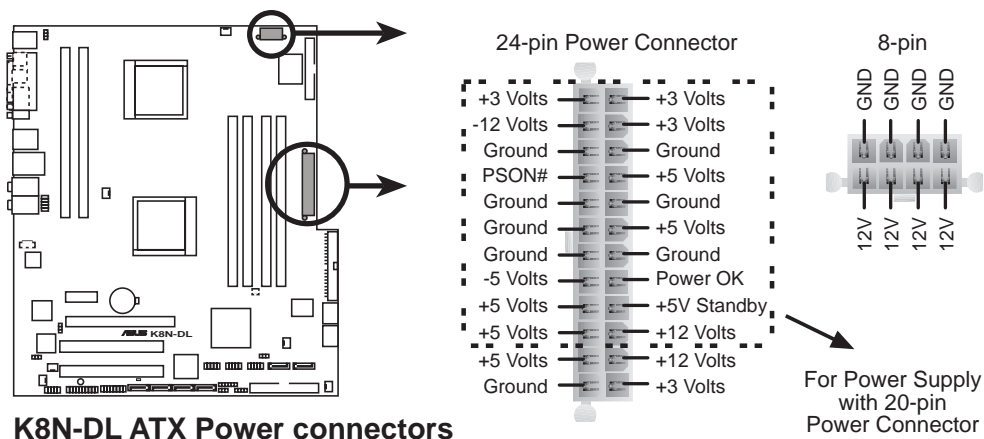
10. GAME/MIDI port connector (16-1 pin GAME1)

This connector is for a GAME/MIDI port. Connect the GAME cable from the USB/GAME port module to this connector, then install the module to a slot opening at the back of the system chassis. The GAME/MIDI port connects a joystick or game pad for playing games, and MIDI devices for playing or editing audio files.

K8N-DL Game connector

GAME1
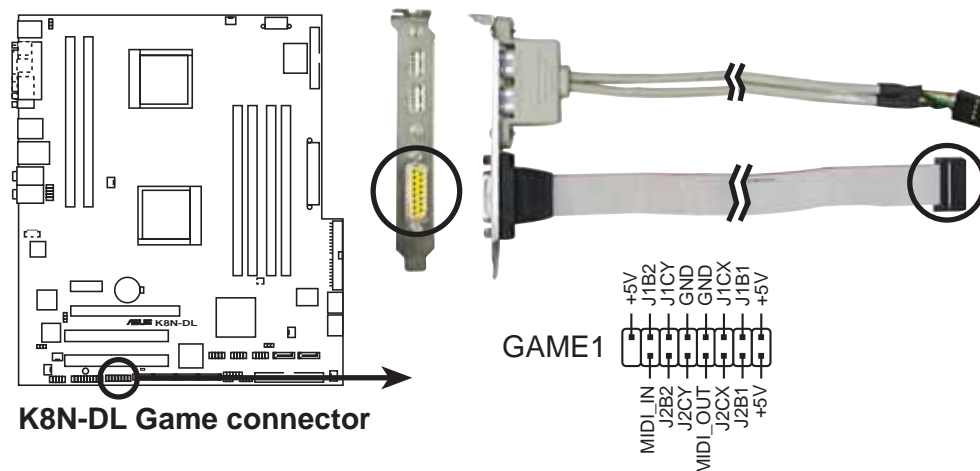
11. Internal audio connector (4-pin CD1)

These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM.

CD1
(Black)

Left Audio Channel
Ground
Ground
Right Audio Channel

K8N-DL Internal audio connector
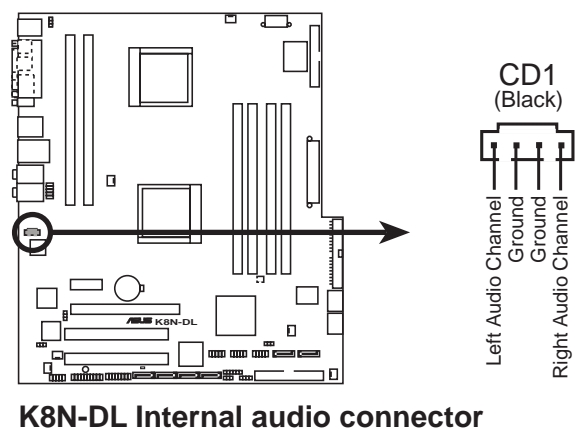
The function of this connector is disabled in 8-channel mode.

12. Chassis intrusion connector (4-1 pin CHASSIS1)

This connector is for a chassis-mounted intrusion detection sensor or switch. Connect one end of the chassis intrusion sensor or switch cable to this connector. The chassis intrusion sensor or switch sends a high-level signal to this connector when a chassis component is removed or replaced. The signal is then generated as a chassis intrusion event.

By default, the pins labeled "Chassis Signal" and "Ground" are shorted with a jumper cap. Remove the jumper caps only when you intend to use the chassis intrusion detection feature.

CHASSIS1

+5VSB_MB

Chassis Signal

GND

(Default)
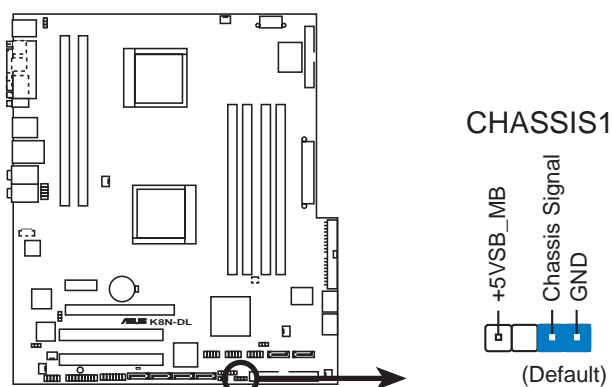
K8N-DL Chassis intrusion connector

13. Front panel audio connector (10-1 pin FP_AUDIO1)

This connector is for a chassis-mounted front panel audio I/O module that supports legacy AC '97 audio standard. Connect one end of the front panel audio I/O module cable to this connector.

FP_AUDIO1

MIC2		AGND
MICPWR		+5VA
Line out_R		BLINE_OUT_R
NC		
Line out_L		BLINE_OUT_L
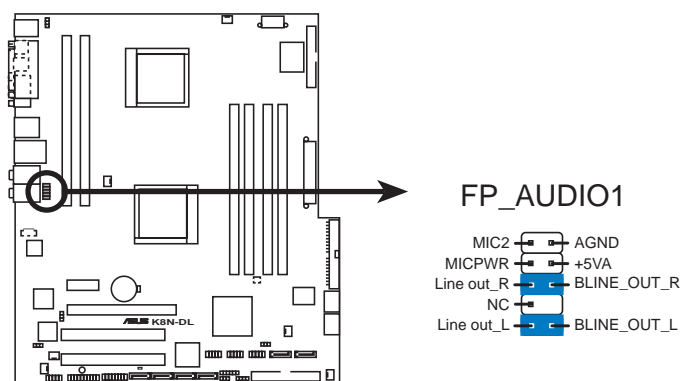
K8N-DL Front panel audio connector

14. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.

K8N-DL System panel connector

* Requires an ATX power supply.
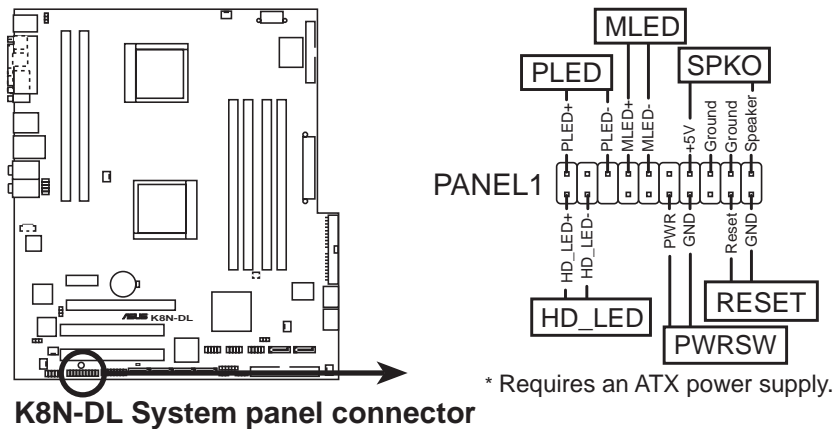
> The system panel connector is color-coded for easy connection. Refer to the connector description below for details.

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

- **Hard disk drive activity (Red 2-pin HDD_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 SPKO)**
  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.

- **Power/Soft-off button (Yellow 2-pin PWRSW)**
  This connector is for the system power button. Pressing the power button turns the system ON or puts the system in SLEEP or SOFT-OFF mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

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

Chapter 5

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

BIOS setup

5.1 Managing and updating your BIOS

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

1. **Award BIOS Flash Utility** (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 EZ Flash** (Updates the BIOS in DOS using a floppy disk or the motherboard support CD.)
4. **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 AwardBIOS Flash 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. Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.ss

   Windows® 2000 environment

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

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

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

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

d. From the Open field, type

   D:\bootdisk\makeboot a:

   assuming that D: is your optical drive.

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

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

5.1.2 Updating the BIOS

The Basic Input/Output System (BIOS) can be updated using the AwardBIOS Flash Utility. Follow these instructions to update the BIOS using this utility.

1. Download the latest BIOS file from the ASUS web site. Rename the file to **K8N-DL.BIN** and save it to a floppy disk.

   Save only the updated BIOS file in the floppy disk to avoid loading the wrong BIOS file.

2. Copy the AwardBIOS Flash Utility (awdflash.exe) from the Software folder of the support CD to the floppy disk with the latest BIOS file.

3. Boot the system in DOS mode using the bootable floppy disk you created earlier.

4. When the **A:>** appears, replace the bootable floppy disk with the floppy disk containing the new BIOS file and the Award BIOS Flash Utility.

5. At the prompt, type **awdflash** then press <Enter>. The Award BIOS Flash Utility screen appears.

```
       AwardBIOS Flash Utility for ASUS V1.01
(C) Phoenix Technologies Ltd. All Rights Reserved


For NF-KC804-K8N-DL-00        DATE: 02/01/2005
Flash Type - SST 49LF004A/B /3.3V

File Name to Program:




Message: Please input File Name!
```

6. Type the BIOS file name in the **File Name to Program** field, then press <Enter>.

```
    AwardBIOS Flash Utility for ASUS V1.01
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF-KC804-K8N-DL-00        DATE: 02/01/2005
Flash Type - SST 49LF004A/B /3.3V

File Name to Program: 1001.bin




Message: Do You Want To Save BIOS (Y/N)
```

7. Press <N> when the utility prompts you to save the current BIOS file. The following screen appears.

8. The utility verifies the BIOS file in the floppy disk and starts flashing the BIOS file.

```
    AwardBIOS Flash Utility for ASUS V1.01
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF-KC804-K8N-DL-00        DATE: 02/01/2005
Flash Type - SST 49LF004A/B /3.3V

File Name to Program: 1001.bin

Program Flashing Memory - 0FE00 OK


      Write OK      No Update      Write Fail

  Warning: Don't Turn Off Power Or Reset System!
```

Do not turn off or reset the system during the flashing process!

9. The utility displays a **Flashing Complete** message indicating that you have successfully flashed the BIOS file. Remove the floppy disk then press <F1> to restart the system.

```
    AwardBIOS Flash Utility for ASUS V1.01
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF-KC804-K8N-DL-00        DATE: 02/01/2005
Flash Type - SST 49LF004A/B /3.3V

File Name to Program: 1001.bin
            Flashing Complete
         Press <F1> to Continue


      Write OK      No Update      Write Fail

F1 Reset
```

5.1.3 Saving the current BIOS file

You can use the AwardBIOS Flash Utility to save the current BIOS file. You can load the current BIOS file when the BIOS file gets corrupted during the flashing process.

> Make sure that the floppy disk has enough disk space to save the file.

To save the current BIOS file using the AwardBIOS Flash Utility:

1. Follow steps 1 to 6 of the previous section.

2. Press <Y> when the utility prompts you to save the current BIOS file. The following screen appears.

```
        AwardBIOS Flash Utility for ASUS V1.01
   (C) Phoenix Technologies Ltd. All Rights Reserved

   For NF-KC804-K8N-DL-00        DATE: 02/01/2005
   Flash Type - SST 49LF004A/B /3.3V

   File Name to Program: 1001.bin

   Save current BIOS as:


    Message:
```

3. Type a filename for the current BIOS file in the **Save current BIOS as** field, then press <Enter>.

```
        AwardBIOS Flash Utility for ASUS V1.01
   (C) Phoenix Technologies Ltd. All Rights Reserved

   For NF-KC804-K8N-DL-00        DATE: 02/01/2005
   Flash Type - SST 49LF004A/B /3.3V

   File Name to Program: 1001.bin
                Checksum: DAD6H
   Save current BIOS as:  old.bin


    Message: Please Wait!
```

4. The utility saves the current BIOS file to the floppy disk, then returns to the BIOS flashing process.

```
        AwardBIOS Flash Utility for ASUS V1.01
   (C) Phoenix Technologies Ltd. All Rights Reserved

   For NF-KC804-K8N-DL-00        DATE: 02/01/2005
   Flash Type - SST 49LF004A/B /3.3V

   File Name to Program: 1001.bin
              Now Backup System BIOS to
                        File!


    Message: Please Wait!
```

5.1.4   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.

Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

1.   Turn on the system.

2.   Insert the motherboard support CD to the optical drive.

3.   The utility displays the following message and automatically checks the CD for the BIOS file.

```
Award BootBlock BIOS v1.0
Copyright (c) 2000, Award Software, Inc.

BIOS ROM checksum error
Detecting IDE ATAPI device...
```

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

```
Award BootBlock BIOS v1.0
Copyright (c) 2000, Award Software, Inc.

BIOS ROM checksum error
Detecting IDE ATAPI device...
   Found CDROM, try to Boot from it... Pass
```

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 a floppy disk

To recover the BIOS from the support CD:

1. Remove any CD from the optical drive, then 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.

```
Award BootBlock BIOS v1.0
Copyright (c) 2000, Award Software, Inc.

BIOS ROM checksum error
Detecting IDE ATAPI device...
```

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

```
Award BootBlock BIOS v1.0
Copyright (c) 2000, Award Software, Inc.

BIOS ROM checksum error
Detecting IDE ATAPI device...
   Found CDROM, try to Boot from it... Fail

Detecting floppy drive A media...
```

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.

5.1.5 ASUS EZ Flash utility

The ASUS EZ Flash feature allows you to update the BIOS without having to go through the long process of booting from a floppy disk and using a DOS-based utility. The EZ Flash utility is built-in the BIOS chip so it is accessible by pressing <Alt> + <F2> during the Power-On Self Tests (POST).

To update the BIOS using EZ Flash:

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

2. Save the BIOS file to a floppy disk, then restart the system.

3. Press <Alt> + <F2> during POST to display the following.

```
Insert Disk then press Enter or ESC to continue POST
```

4. Insert the floppy disk that contains the BIOS file to the floppy disk drive then press <Enter>. The following screen appears.

```
        AwardBIOS Flash Utility for ASUS V1.01
(C) Phoenix Technologies Ltd. All Rights Reserved

For NF-KC804-K8N-DL-00          DATE: 02/01/2005
Flash Type - SST 49LF004A/B /3.3V

File Name to Program:




Message: Please wait...
```

5. When the correct BIOS file is found, EZ Flash performs the BIOS update process and automatically reboots the system when done.

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

5.1.6 ASUS Update utility

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

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

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

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

Installing ASUS Update

To install ASUS Update:

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

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

Updating the BIOS through the Internet

To update the BIOS through the Internet:

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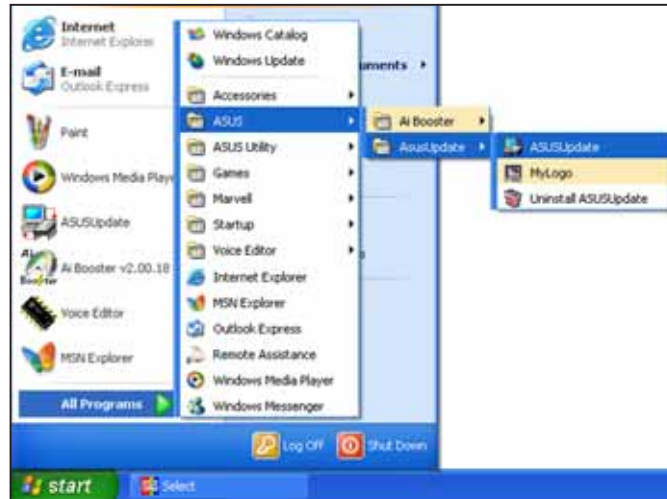
2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.

3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

4.   From the FTP site, select the
      BIOS version that you wish to
      download. Click **Next**.

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

![pencil icon]   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 Low-Pin Count (LPC) chip that you can update using the provided utility described in section "5.1 Managing and updating your BIOS."

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

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

The LPC chip 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 Default Settings** item under the Exit Menu. See section "5.7 Exit Menu."

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

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

5.2.1 BIOS menu screen

Menu items Menu bar   Configuration fields   General help

```
                Phoenix-Award BIOS CMOS Setup Utility
   Main   Advanced   Power   Boot   Exit

    System Time              15 : 30 : 36            Select Menu
    System Date              Wed, Feb 2 2005
                                                 Item Specific Help▶
    Legacy Diskette A        [1.44M, 3.5 in.]
    Floppy 3 Mode Support    [Disabled]          Change the internal
                                                 clock.
  ▶ Primary IDE Master       [None]
  ▶ Primary IDE Slave        [None]
  ▶ Secondary IDE Master     [None]
  ▶ Secondary IDE Slave      [None]
  ▶ Third IDE Master         [None]
  ▶ Fourth IDE Master        [None]
  ▶ IDE Channel 4 Master     [None]
  ▶ IDE Channel 5 Master     [None]

    Base Memory                 256K
    Extended Memory          261120K
    Total Memory             262144K

  F1:Help        ↑↓ : Select Item    -/+: Change Value      F5: Setup Defaults
  ESC: Exit      →←: Select Menu    Enter: Select Sub-menu  F10: Save and Exit
```

Sub-menu items   Legend bar

5.2.2 Menu bar

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

Main   For changing the basic system configuration

Advanced   For changing the advanced system settings

Power   For changing the advanced power management (APM)
           configuration

Boot   For changing the system boot configuration

Exit   For selecting the exit options and loading default
           settings

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

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5.2.3 Legend bar

At the bottom of the Setup screen is a legend bar. The keys in the legend bar allow you to navigate through the various setup menus. The following table lists the keys found in the legend bar with their corresponding functions.

Navigation Key	Function
<F1>	Displays the General Help screen
<F5>	Loads setup default values
<Esc>	Exits the BIOS setup or returns to the main menu from a sub-menu
Left or Right arrow	Selects the menu item to the left or right
Up or Down arrow	Moves the highlight up or down between fields
Page Down or – (minus)	Scrolls backward through the values for the highlighted field
Page Up or + (plus)	Scrolls forward through the values for the highlighted field
<Enter>	Brings up a selection menu for the highlighted field
<F10>	Saves changes and exit

5.2.4 Menu items

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

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

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 "6.2.7 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.

```
                    Phoenix-Award BIOS CMOS Setup Utility
     Main    Advanced    Power    Boot    Exit

       System Time                   15 : 30 : 36            Select Menu
       System Date                   Wed, Feb 2 2005
       Legacy Diskette A             [1.44M, 3.5 in.]      Item Specific Help▶
       Floppy 3 Mode Support         [Disabled]
                                ┌─────────────────────────────┐nge the internal
      ▶ Primary IDE Mast        │ Legacy Diskette A:          │ck.
      ▶ Primary IDE Slav        │                             │
      ▶ Secondary IDE Ma        │ Disabled        ..... [ ]   │
      ▶ Secondary IDE Sl        │ 360K , 5.25 in. ..... [ ]   │
      ▶ Third IDE Master        │ 1.2M , 5.25 in. ..... [ ]   │
      ▶ Fourth IDE Maste        │ 720K , 3.5 in.  ..... [ ]   │
      ▶ IDE Channel 4 Ma        │ 1.44M, 3.5 in.  ..... [▪]   │
      ▶ IDE Channel 5 Ma        │ 2.88M, 3.5 in.  ..... [ ]   │
                                │                             │
        Base Memory             │                             │
        Extended Memory         │ ↑↓:Move  ENTER:Accept  ESC:Abort │
        Total Memory            └─────────────────────────────┘

     F1:Help          ↑↓ : Select Item      -/+: Change Value      F5: Setup Defaults
     ESC: Exit        →←: Select Menu     Enter: Select Sub-menu   F10: Save and Exit
```

Pop-up menu

5.2.8 General help

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

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5.3 Main menu

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

> Refer to section "5.2.1 BIOS menu screen" for information on the menu screen items and how to navigate through them.

```
                    Phoenix-Award BIOS CMOS Setup Utility
   Main    Advanced    Power    Boot    Exit

      System Time                    15 : 30 : 36              Select Menu
      System Date                    Wed, Feb 2 2005
                                                          Item Specific Help▶
      Legacy Diskette A              [1.44M, 3.5 in.]
      Floppy 3 Mode Support          [Disabled]           Change the internal clock.

   ▶ Primary IDE Master              [None]
   ▶ Primary IDE Slave               [None]
   ▶ Secondary IDE Master            [None]
   ▶ Secondary IDE Slave             [None]
   ▶ Third IDE Master                [None]
   ▶ Fourth IDE Master               [None]
   ▶ IDE Channel 4 Master            [None]
   ▶ IDE Channel 5 Master            [None]

      Base Memory                       xxxK
      Extended Memory                xxxxxxK
      Total Memory                   xxxxxxK

   F1:Help          ↑↓ : Select Item      -/+: Change Value        F5: Setup Defaults
   ESC: Exit        →←: Select Menu        Enter: Select Sub-menu   F10: Save and Exit
```

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 Floppy 3 Mode Support [Disabled]

This feature allows reading and writing of 1.2 MB (as opposed to 1.44 MB) data on a 3.5-inch floppy disk. This is required to support Japanese standard floppy drives. Configuration options: [Disabled] [Drive A]

5.3.5 Base/Extended/Total Memory [xxxxxxK]

The base memory, extended memory, and the total memory values are auto-detected. These fields are not user-configurable.

> While entering Setup, the BIOS automatically detects the presence of 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.

5.3.6 Primary IDE Master

```
              Phoenix-Award BIOS CMOS Setup Utility
    Main

                    Primary IDE Master                    Select Menu

    PIO Mode                      [Auto]           Item Specific Help▶▶
    UDMA Mode                     [Auto]
                                                   Set a PIO mode for the
    Primary IDE Master            [Auto]           IDE device. Mode0 through
    Access Mode                   [Auto]           4 successive increase in
                                                   performance.
    Capacity                      0 MB

    Cylinder                      0
    Head                          0
    Precomp                       0
    Landing Zone                  0
    Sector                        0
    Transfer Mode                 None
    S.M.A.R.T Status              None


    F1:Help          ↑↓ : Select Item    -/+: Change Value     F5: Setup Defaults
    ESC: Exit        →←: Select Menu    Enter: Select Sub-menu  F10: Save and Exit
```

The BIOS automatically detects the values opposite the dimmed items (Capacity, Cylinder, Head, Precomp, Landing Zone, Sector, and Transfer Mode, and S.M.A.R.T Status). These values are not user-configurable. These items show "0" or "None" if no IDE device is installed in the system.

PIO Mode

Sets the PIO mode for the IDE device. The settings Mode 0 to 4 allow successive increase in performance. Configuration options: [Auto] [Mode 0] [Mode 1] [Mode 2] [Mode 3] [Mode 4]

UDMA Mode

When this item is set to [Auto], the UDMA capability allows improved transfer speeds and data integrity for supported IDE devices. Configuration options: [Disabled] [Auto]

Primary IDE Master [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic detection is successful, the BIOS automatically fills in the correct values for the remaining fields on this sub-menu. If the hard disk was already formatted on a previous system, the BIOS may detect incorrect parameters. Select [Manual] to manually enter the IDE hard disk drive parameters. Refer to the next section "Manually detecting an IDE drive." If no drive is installed select [None]. Configuration options: [None] [Auto] [Manual]

Access Mode [Auto]

Allows selection of the sector addressing mode. The default [Auto] allows automatic detection of an IDE hard disk drive. Select [CHS] for this item if you set the Primary IDE Master to [Manual] to manually enter the drive information. Configuration options: [CHS] [LBA] [Large] [Auto]

Manually detecting an IDE drive

To manually enter the drive information, set the Primary IDE Master item to [Manual], and the Access Mode item to [CHS].

```
              Phoenix-Award BIOS CMOS Setup Utility
  Main

              Primary IDE Master                    Select Menu

   PIO Mode                   [Auto]           Item Specific Help▶▶
   UDMA Mode                  [Auto]
                                               Set a PIO mode for the
   Primary IDE Master         [Manual]         IDE device. Mode0 through
   Access Mode                [CHS]            4 successive increase in
                                               performance.
    Capacity                   0 MB

   Cylinder                     0
   Head                         0
   Precomp                      0
   Landing Zone                 0
   Sector                       0
   Transfer Mode              None
   S.M.A.R.T Status           None


  F1:Help         ↑↓ : Select Item   -/+: Change Value    F5: Setup Defaults
  ESC: Exit       →←: Select Menu  Enter: Select Sub-menu  F10: Save and Exit
```

> ⚠ Before attempting to configure a hard disk drive, make sure you have the correct configuration information supplied by the drive manufacturer. Incorrect settings may cause the system to fail to recognize the installed hard disk.

To enter the number of cylinder, head, precomp, landing zone, sector per track for the drive, highlight an item, key-in the value that you obtained from the drive label or documentation, then press <Enter>.

To enter a value, you may also highlight the item, then press <Enter> to display a pop-up menu. Type in the value indicated in the drive label or documentation, the press <Enter>.

Capacity

Displays the auto-detected hard disk capacity.

Cylinder

Shows the number of the hard disk cylinders.

Head

Shows the number of the hard disk read/write heads.

Precomp

Displays the precompressed volumes on the hard disk, if any.

Landing Zone

Displays the drive's maximum usable capacity as calculated by the BIOS based on the drive information that you entered.

Sector

Shows the number of sectors per track.

Transfer Mode

Shows the data transfer mode if the hard disk supports this feature. Otherwise, this item is grayed out and shows the value [None].

S.M.A.R.T Status

Shows the Smart Monitoring, Analysis, and Reporting Technology (S.M.A.R.T) status if the hard disk supports this feature. Otherwise, this item is grayed out and show the value [None].

> After entering the IDE hard disk drive information, use a disk utility, such as FDISK, to partition and format new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to "Active."

5.3.7 Primary IDE Slave

When configuring a drive as Primary IDE Slave, refer to section "6.3.6 Primary IDE Master" for the menu item descriptions.

5.3.8 Secondary IDE Master

When configuring a drive as Secondary IDE Master, refer to section "6.3.6 Primary IDE Master" for the menu item descriptions.

5.3.9 Secondary IDE Slave

When configuring a drive as Secondary IDE Slave, refer to section "6.3.6 Primary IDE Master" for the menu item descriptions.

5.3.10 Third IDE Master

When configuring a drive as Primary IDE Slave, refer to section "6.3.6 Primary IDE Master" for the menu item descriptions which are not discussed in this section.

```
             Phoenix-Award BIOS CMOS Setup Utility
  Main

        Primary IDE Master                      Select Menu

   Extended IDE Drive        [Auto]        Item Specific Help▶▶
   Access Mode               [Auto]
                                           Set a PIO mode for the
   Capacity                  0 MB          IDE device. Mode0 through
                                           4 successive increase in
   Cylinder                  0             performance.
   Head                      0
   Precomp                   0
   Landing Zone              0
   Sector                    0
   Transfer Mode             None
   S.M.A.R.T Status          None



  F1:Help       ↑↓ : Select Item    -/+: Change Value     F5: Setup Defaults
  ESC: Exit     →←: Select Menu    Enter: Select Sub-menu  F10: Save and Exit
```

Extended IDE Drive

When set to [Auto], allows automatic selection of the extended IDE drive installed, if any. Set this item to [None] if there is no extended IDE drive, or if you do not wish to detect the drive even if installed. Configuration options: [None] [Auto]

Access Mode [Auto]

Allows selection of the sector addressing mode.
Configuration options: [Large] [Auto]

5.3.11 Fourth IDE Master

When configuring a drive as Fourth IDE Master, refer to section "6.3.6 Primary IDE Master" and section "6.3.10 Third IDE Master" for the menu item descriptions.

5.3.12 IDE Channel 4 Master

When configuring a drive as IDE Channel 4 Master, refer to section "6.3.6 Primary IDE Master" and section "6.3.10 Third IDE Master" for the menu item descriptions.

5.3.13 IDE Channel 5 Master

When configuring a drive as IDE Channel 5 Master, refer to section "6.3.6 Primary IDE Master" and section "6.3.10 Third IDE Master" for the menu item descriptions.

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.

```
                Phoenix-Award BIOS CMOS Setup Utility
   Main   Advanced   Power   Boot   Exit

 ▶ CPU Configuration                        Select Menu
 ▶ Memory Configuration
 ▶ Chipset                                  Item Specific Help▶▶
 ▶ Onboard Device
 ▶ PCIPnP                                   Press Enter to set
 ▶ USB Configuration




 F1:Help        ↑↓ : Select Item    -/+: Change Value      F5: Setup Defaults
 ESC: Exit      →←: Select Menu    Enter: Select Sub-menu   F10: Save and Exit
```

5.4.1   CPU Configuration

```
                Phoenix-Award BIOS CMOS Setup Utility
        Advanced

                      CPU Configuration                    Select Menu

   CPU Internal Cache              [Enabled]      Item Specific Help▶▶
   External Cache                  [Enabled]
   CPU Frequency                   [200.0]        Disable/Enable CPU L1/L2
   AMD K8 Cool 'n' Quiet Control   [Enabled]      cache.




 F1:Help        ↑↓ : Select Item    -/+: Change Value      F5: Setup Defaults
 ESC: Exit      →←: Select Menu    Enter: Select Sub-menu   F10: Save and Exit
```

CPU Internal Cache [Enabled]

Disables or enables the CPU L1/L2 cache.
Configuration options: [Disabled] [Enabled]

External Cache [Enabled]

Disables or enables the CPU L3 cache.
Configuration options: [Disabled] [Enabled]

CPU Frequency [200.0]

Allows you to select the CPU frequency.
Configuration options: [200.0] [201.0] [202.0] ... [400.0]

AMD K8 Cool 'n' Quiet Control [Enabled]

Disables or enables the AMD K8 Cool 'n' Quiet feature.
Configuration options: [Disabled] [Enabled]

5.4.2 Memory Configuration

This menu shows the memory configuration settings. Select an item then press <Enter> to display a pop-up menu with the configuration options.

```
                Phoenix-Award BIOS CMOS Setup Utility
        Advanced
┌──────────────────────────────────────────────┬──────────────────────────┐
│         Memory Configuration                  │      Select Menu         │
├──────────────────────────────────────────────┼──────────────────────────┤
│   Timing Mode                    [Auto]       │   Item Specific Help▶▶    │
│   Memclock Index Value (Mhz)     [200Mhz]     │                          │
│   CAS# Latency (Tcl)             [2.5]        │   <Enter> to select DRAM  │
│   Min RAS# Active Time (Tras)    [ 8T]        │   configuration by [Auto] │
│   RAS# to CAS# Delay (Trcd)      [ 4T]        │   (recommended). [Manual  │
│   Row Precharge Time (Trp)       [ 2T]        │   allows you to set each  │
│   Node Memory Interleaving       [Disabled]   │   configuration on your   │
│   S/W Memory Hole Remapping      [Enabled]    │   own.                    │
│   MTRR Mapping Mode              [Continuous] │                          │
│   Master ECC Enabled             [Enabled]    │                          │
│   ECC Memory Interlock           [At Least One]│                         │
│   ECC MCE Enable                 [Disabled]   │                          │
│   Chip-Kill Mode Enable          [Disabled]   │                          │
│   ECC Redirection                [Disabled]   │                          │
│   DRAM Background Scrubber       [Disabled]   │                          │
│   L2 Cache Background Scrubber   [Disabled]   │                          │
│   DCache Background Scrubber     [Disabled]   │                          │
├──────────────────────────────────────────────┴──────────────────────────┤
│  F1:Help        ↑↓ : Select Item    -/+: Change Value    F5: Setup Defaults│
│  ESC: Exit      →←: Select Menu    Enter: Select Sub-menu  F10: Save and Exit│
└──────────────────────────────────────────────────────────────────────────┘
```

Timing Mode [Auto]

When set to [Auto], BIOS detects the DRAM configurations automatically. Setting to [Manual] allows you to set the DRAM timing configurations from the available options. Configuration options: [Auto] [Manual]

> The items **Memclock Index Value**, **CAS# latency**, **Min RAS# Active Time**, **RAS# to CAS# Delay**, and **Row Precharge Time** become configurable only when the Timing Mode item is set to [Manual].

Memclock Index Value (Mhz) [200MHz]

Allows selection of the DRAM frequency. Configuration options: [100Mhz] [133Mhz] [166Mhz] [200Mhz]

CAS# Latency (Tcl) [2.5]

Sets the latency (in clocks) between the DRAM read command and the time the data actually becomes available.
Configuration options: [2] [2.5] [3]

Min RAS# Active Time (Tras) [8T]

Controls the number of DRAM clocks used for DRAM parameters. Configuration options: [5T] [6T] [7T] [8T] [9T] [10T] [11T] [12T] [13T] [14T] [15T]

RAS# to CAS# Delay (Trcd) [4T]

Controls the latency between the DRAM active command and the read/write command. Configuration options: [2T] [3T] [4T] [5T] [6T] [7T]

Row Precharge Time (Trp) [2T]

Controls the idle clocks after issuing a precharge command to the DRAM. Configuration options: [2T] [3T] [4T] [5T] [6T] [7T]

Node Memory Interleaving [Disabled]

Enables or disables memory interleaving. Configuration options: [Disabled] [Enabled]

S/W Memory Hole Remapping [Enabled]

Allows memory hoisting/remapping of the memory-mapped I/O address hole to above 4GB system memory. Configuration options: [Disabled] [Enabled]

MTRR Mapping Mode [Continuous]

Allows selection of [Continuous] for standard mode, or [Discreet] for aggressive mode. Configuration options: [Continuous] [Discreet]

Master ECC Enable [Enabled]

Enables or disables ECC check/correct mode. Configuration options: [Disabled] [Enabled]

ECC Memory Interlock [At Least One]

Allows selection for DIMMs that are ECC-compliant. Configuration options: [At Least One] [All are]

ECC MCE Enable [Disabled]

When set to [Enabled], a machine-check exception (#MC) occurs whenever an machine-check error that may not be corrected is encountered. Configuration options: [Disabled] [Enabled]

Chip-Kill Mode Enable [Disabled]

When set to [Enabled], allows ECC checking to be based on a 128/16 data/ECC rather than on a 64/8 data/ECC. You may only enable this feature in 128-bit DRAM data width mode. Configuration options: [Disabled] [Enabled]

ECC Redirection [Disabled]

When set to [Enabled], correctable errors are corrected as the data is passed to the requestor. The data in the DRAM is not corrected if this item is set to [Disabled]. Configuration options: [Disabled] [Enabled]

DRAM Background Scrubber [Disabled]

Specifies the scrub rate of the next address to be scrubbed by the DRAM scrubber. Configuration options: [Disabled] [40.0ns]

L2 Cache Background Scrubber [Disabled]

Specifies the scrub rate of the next address to be scrubbed by the L2 cache scrubber. Configuration options: [Disabled] [40.0ns]

DCache Background Scrubber [Disabled]

Specifies the scrub rate of the next address to be scrubbed by the data cache scrubber. Configuration options: [Disabled] [40.0ns]

5.4.3 Chipset

This menu shows the chipset configuration settings. Select an item then press <Enter> to display a pop-up menu with the configuration options.

```
                  Phoenix-Award BIOS CMOS Setup Utility
     ┌──────────┐
     │ Advanced │
     └──────────┘
 ┌──────────────────── Chipset ─────────────────────┬─── Select Menu ────┐
 │  OnChip IDE Channel0        [Enabled]            │ Item Specific Help▶▶ │
 │  OnChip IDE Channel1        [Enabled]            │                      │
 │  Hyper Transport Frequency  [4x]                 │ Disable/Enable OnChip IDE │
 │  Hyper Transport Width      [↓16 ↑16]            │ Channel0.            │
 │  Errata 94 Enhanced         [Auto]               │                      │
 │  System BIOS Cacheable      [Disabled]           │                      │
 │  Spread Spectrum            [Enabled]            │                      │
 │  SATA Spread Spectrum       [Disabled]           │                      │
 │  PCIE Spread Spectrum       [Disabled]           │                      │
 │  SSE/SSE2 Instructions      [Enabled]            │                      │
 │  Init Display First         [PCI Slot]           │                      │
 │  IDE DMA Transfer Access    [Enabled]            │                      │
 │  Serial-ATA 1               [Enabled]            │                      │
 │  SATA DMA Transfer          [Enabled]            │                      │
 │  Serial-ATA 2               [Enabled]            │                      │
 │  SATA2 DMA Transfer         [Enabled]            │                      │
 │  IDE Prefetch Mode          [Enabled]            │                      │
 ├───────────────────────────────────────────────────────────────────────┤
 │ F1:Help        ↑↓ : Select Item    -/+: Change Value    F5: Setup Defaults │
 │ ESC: Exit      →←: Select Menu   Enter: Select Sub-menu  F10: Save and Exit │
 └───────────────────────────────────────────────────────────────────────┘
```

OnChip IDE Channel0 [Enabled]

Enables or disables the on-chip IDE channel 0. Configuration options: [Disabled] [Enabled]

OnChip IDE Channel1 [Enabled]

Enables or disables the on-chip IDE channel 1. Configuration options: [Disabled] [Enabled]

Hyper Transport Frequency [4x]

Allows selection of hyper transport frequency.
Configuration options: [1x] [2x] [3x] [4x] [5x]

Hyper Transport Width [↓16 ↑16]

Allows selection of hyper transport frequency.
Configuration options: [↓8 ↑8][↓16 ↑8] [↓8 ↑16] [↓16 ↑16]

Errata 94 Enhanced [Auto]

Configuration options: [Auto] [Disabled]

System BIOS Cacheable [Disabled]

Enables or disables the cache function of the system BIOS.
Configuration options: [Disabled] [Enabled]

Spread Spectrum [Enabled]

Enables or disables the CPU spread spectrum.
Configuration options: [Disabled] [Enabled]

SATA Spread Spectrum [Disabled]

Enables or disables SATA spread spectrum.
Configuration options: [Disabled] [Enabled]

PCIE Spread Spectrum [Disabled]

Enables or disables PCIE spread spectrum.
Configuration options: [Disabled] [Enabled]

SSE/SSE2 Instructions [Enabled]

Enables or disables the SSE instructions.
Configuration options: [Disabled] [Enabled]

Init Display First [PCI Slot]

Allows you to select the graphics controller to use as primary boot device.
Configuration options: [PCI Slot] [PCIEx]

IDE DMA Transfer Access [Enabled]

Enables or disables the switch to support IDE DMA transfer.
Configuration options: [Disabled] [Enabled]

Serial-ATA 1 [Enabled]

Enables or disables the on-chip SATA1 (ports 1 and 2).
Configuration options: [Disabled] [Enabled]

SATA DMA Transfer [Enabled]

Enables or disables the switch to support SATA DMA transfer.
Configuration options: [Disabled] [Enabled]

Serial-ATA 2 [Enabled]

Enables or disables the on-chip SATA2 (ports 3 and 4). Configuration
options: [Disabled] [Enabled]

SATA2 DMA Transfer [Enabled]

Enables or disables the switch to support SATA2 DMA transfer.
Configuration options: [Disabled] [Enabled]

IDE Prefetch Mode [Enabled]

Enables or disables the IDE Prefetch mode. Configuration options:
[Disabled] [Enabled]

5.4.4 Onboard Device

This menu shows the onboard device configuration settings. Select an item
then press <Enter> to display a pop-up menu with the configuration
options, or a sub-menu with additional items.

```
              Phoenix-Award BIOS CMOS Setup Utility
        ┌─────────────┐
        │  Advanced   │
 ┌──────┴─────────────┴───────────────────────────┬──────────────────────┐
 │            Onboard Device                        │     Select Menu      │
 ├──────────────────────────────────────────────── ┼──────────────────────┤
 │                                                  │ Item Specific Help▶▶  │
 │  Speech IC Reporter          [Enabled]           │                      │
 │  Report IDE Error            [Disabled]          │ Disable/Enable Speech│
 │  Report System Booting       [Disabled]          │ IC controller.       │
 │  Onboard Silicon SATALink    [Disabled]          │                      │
 │  Onboard 1394                [Enabled]           │                      │
 │  Onboard Broadcom 5751 LAN   [Enabled]           │                      │
 │  Onboard LAN Boot ROM        [Enabled]           │                      │
 │  Onboard AC97 Audio          [Enabled]           │                      │
 │▶ NVRAID Configuration                            │                      │
 │▶ Super I/O Device                                │                      │
 │                                                  │                      │
 │                                                  │                      │
 │                                                  │                      │
 ├──────────────────────────────────────────────────┴──────────────────────┤
 │ F1:Help        ↑↓ : Select Item    -/+: Change Value    F5: Setup Defaults│
 │ ESC: Exit      →←: Select Menu    Enter: Select Sub-menu  F10: Save and Exit│
 └──────────────────────────────────────────────────────────────────────────┘
```

Speech IC Reporter [Enabled]

Enables or disables the speech IC controller.
Configuration options: [Disabled] [Enabled]

Report IDE Error [Disabled]

Enables or disables the speech IC IDE error report.
Configuration options: [Disabled] [Enabled]

Report System Booting [Disabled]

Enables or disables the speech IC system error report.
Configuration options: [Disabled] [Enabled]

Onboard Silicon SATALink [Enabled]

Enables or disables the onboard Silicon Image SATALink device.
Configuration options: [Disabled] [Enabled]

Onboard 1394 [Enabled]

Enables or disables the onboard 1394 controller.
Configuration options: [Disabled] [Enabled]

Onboard Broadcom 5751 LAN [Enabled]

Enables or disables the onboard LAN controller.
Configuration options: [Disabled] [Enabled]

Onboard AC97 Audio [Enabled]

Enables or disables the onboard AC97 audio controller. Configuration
options: [Disabled] [Enabled]

NVRAID Configuration

This sub-menu contains RAID-related function items. Select the items that
you wish to enable to create a RAID set.

```
              Phoenix-Award BIOS CMOS Setup Utility
        Advanced

             NVRAID Configuration                      Select Menu

    RAID Enable                [Disabled]      Item Specific Help▶▶▶
    IDE Primary Master   RAID  [Disabled]
    IDE Primary Slave    RAID  [Disabled]      Disable/Enable NVIDIA
    IDE Secondary Master RAID  [Disabled]      RAID feature.
    IDE Secondary Slave  RAID  [Disabled]
    First SATA Master    RAID  [Disabled]
    Second SATA Master   RAID  [Disabled]
    Third SATA Master    RAID  [Disabled]
    Fourth SATA Master   RAID  [Disabled]




  F1:Help        ↑↓: Select Item     -/+: Change Value    F5: Setup Defaults
  ESC: Exit      →←: Select Menu    Enter: Select Sub-menu  F10: Save and Exit
```

RAID Enable [Disabled]

Enables or disables the NVIDIA RAID feature.
Configuration options: [Disabled] [Enabled]

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IDE Primary Master/Slave, IDE Secondary Master/Slave RAID [Disabled]

When enabled, allows you to use the device/s for creating a RAID set.
Configuration options: [Disabled] [Enabled]

First/Second/Third/Fourth SATA Master RAID [Disabled]

When enabled, allows you to use the device/s for creating a RAID set.
Configuration options: [Disabled] [Enabled]

Super I/O Device

This sub-menu contains RAID-related function items. Select the items that
you wish to enable to create a RAID set.

```
              Phoenix-Award BIOS CMOS Setup Utility
        Advanced

                  Super I/O Device                      Select Menu

       Serial Port1 Address          [3F8/IRQ4]      Item Specific Help▶▶▶
       Onboard Parallel Port         [378/IRQ7]
       Parallel Port Mode            [SPP]           Set base I/O address
       EPP Mode Select               EPP1.7          for serial port 1.
       ECP Mode Use DMA              3
       Game Port Address             [201]
       Midi Port Address             [330]
       Midi Port IRQ                 [10]




       F1:Help          ↑↓ : Select Item      -/+: Change Value       F5: Setup Defaults
       ESC: Exit        →←: Select Menu     Enter: Select Sub-menu    F10: Save and Exit
```

Serial Port1 Address [3F8/IRQ4]

Allows you to select the serial port 1 base address.
Configuration options: [Disabled] [3F8/IRQ4] [2F8/IRQ3] [3E8/IRQ4]
[2E8/IRQ3] [Auto]

Onboard Parallel Port [378/IRQ7]

Allows you to select the parallel port base address.
Configuration options: [Disabled] [378/IRQ7] [278/IRQ5] [3BC/IRQ7]

Parallel Port Mode [SPP]

Allows you to select the parallel port mode.
Configuration options: [SPP] [EPP] [ECP] [ECP+EPP] [Normal]

EPP Mode Select [EPP1.7]

Allows you to select the version of EPP mode. This item becomes configurable only if the **Parallel Port Mode** is set to [ECP] or [ECP+EPP]. Configuration options: [EPP1.9] [EPP1.7]

ECP Mode Use DMA [3]

Allows you to configure the parallel port DMA channel for the selected ECP mode. This item becomes configurable only if the **Parallel Port Mode** is set to [ECP] or [ECP+EPP]. Configuration options: [1] [3]

Game Port Address [201]

Allows you to select the game port address.
Configuration options: [Disabled] [201] [209]

Midi Port Address [330]

Allows you to select the MIDI port address.
Configuration options: [Disabled] [330] [300] [290]

Midi Port IRQ [10]

Allows you to select the MIDI port IRQ.
Configuration options: [5] [10]

5.4.5 PCIPnP

This menu shows the PCIPnP configuration settings. Select an item then press <Enter> to display a pop-up menu with the configuration options.

```
                  Phoenix-Award BIOS CMOS Setup Utility
      Advanced
┌────────────────────────────────────────────┬──────────────────────────────┐
│                PCIPnP                        │         Select Menu          │
├────────────────────────────────────────────┼──────────────────────────────┤
│  Resources Controlled By       [Auto]       │   Item Specific Help▶▶        │
│  IRQ Resources                               │                              │
│                                              │   BIOS can automatically     │
│  PCI/VGA Pallete Snoop         [Disabled]    │   configure all the boot     │
│                                              │   and Plug and Play          │
│  ** PCI Express relative items **            │   compatible devices. If     │
│  Maximum Payload Size          [4096]        │   you choose Auto, you       │
│                                              │   cannot select IRQ DMA      │
│                                              │   and memory base address    │
│                                              │   fields, since BIOS         │
│                                              │   automatically assigns      │
│                                              │   them.                      │
│                                              │                              │
├────────────────────────────────────────────┴──────────────────────────────┤
│  F1:Help        ↑↓ : Select Item      -/+: Change Value    F5: Setup Defaults│
│  ESC: Exit      ➔←: Select Menu   Enter: Select Sub-menu   F10: Save and Exit│
└────────────────────────────────────────────────────────────────────────────┘
```

Resources Controlled By [Auto]

Allows automatic or manual assignments of IRQ resources to boot devices and Plug and Play devices. Configuration options: [Auto] [Manual]

> When the item **Resources Controlled By** is set to [Auto], the item IRQ Resources is grayed out and not user-configurable. Refer to the section "IRQ Resources" for information on how to enable this item.

PCI/VGA Pallet Snoop [Disabled]

Some non-standard VGA cards, like graphics accelerators or MPEG video cards, may not show colors properly. Setting this field to [Enabled] corrects this problem. If you are using a standard VGA card, leave this field to the default setting [Disabled]. Configuration options: [Disabled] [Enabled]

Maximum Payload Size [4096]

Sets the maximum TLP payload size (in bytes) for PCI Express devices. Configuration options: [128] [256] [512] [1024] [2048] [4096]

IRQ Resources

✎ Set the item **Resources Controlled By** to [Manual] to enable the item **IRQ Resources** and assign the interrupts depending on the type of installed PCI devices.

```
                 Phoenix-Award BIOS CMOS Setup Utility
        Advanced

                         PCIPnP                          Select Menu

   Resources Controlled By          [Manual]             Item Specific Help▶
 ▶ IRQ Resources
                                                         BIOS can automatically
   PCI/VGA Pallete Snoop            [Disabled]           configure all the boot
                                                         and Plug and Play
   ** PCI Express relative items **                      compatible devices. If
   Maximum Payload Size             [4096]               you choose Auto, you
                                                         cannot select IRQ DMA
                                                         and memory base address
```

```
                 Phoenix-Award BIOS CMOS Setup Utility
        Advanced

                       IRQ Resources                     Select Menu

   IRQ-3  assigned to           [PCI Device]             Item Specific Help▶▶▶
   IRQ-4  assigned to           [PCI Device]
   IRQ-5  assigned to           [PCI Device]             Legacy ISA for devices
   IRQ-7  assigned to           [PCI Device]             compliant with the
   IRQ-9  assigned to           [PCI Device]             original PC AT bus
   IRQ-10 assigned to           [PCI Device]             specification, PCI/ISA
   IRQ-11 assigned to           [PCI Device]             PnP for devices
   IRQ-12 assigned to           [PCI Device]             compliant with the Plug
   IRQ-14 assigned to           [PCI Device]             and Play standard
   IRQ-15 assigned to           [PCI Device]             whether designed for PCI
                                                         or ISA bus architecture.




 F1:Help          ↑↓ : Select Item     -/+: Change Value      F5: Setup Defaults
 ESC: Exit        →←: Select Menu     Enter: Select Sub-menu   F10: Save and Exit
```

IRQ-xx assigned to [PCI Device]

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

5.4.6 USB Configuration

This menu shows the USB configuration settings. Select an item then press <Enter> to display a pop-up menu with the configuration options.

```
                    Phoenix-Award BIOS CMOS Setup Utility
      Advanced
┌────────────────────────────────────────────────┬───────────────────────────┐
│               USB Configuration                 │       Select Menu         │
├────────────────────────────────────────────────┼───────────────────────────┤
│                                                 │   Item Specific Help▶▶     │
│  USB Controller               [Enabled]         │                           │
│  USB2.0 Controller            [Enabled]         │   Enable/Disable USB 2.0  │
│  USB Legacy Mode Support      [Enabled]         │   and legay controller.   │
│                                                 │                           │
│                                                 │                           │
│                                                 │                           │
│                                                 │                           │
│                                                 │                           │
│                                                 │                           │
│                                                 │                           │
│                                                 │                           │
│                                                 │                           │
├────────────────────────────────────────────────┴───────────────────────────┤
│  F1:Help        ↑↓ : Select Item      -/+: Change Value    F5: Setup Defaults│
│  ESC: Exit      →←: Select Menu     Enter: Select Sub-menu  F10: Save and Exit│
└──────────────────────────────────────────────────────────────────────────────┘
```
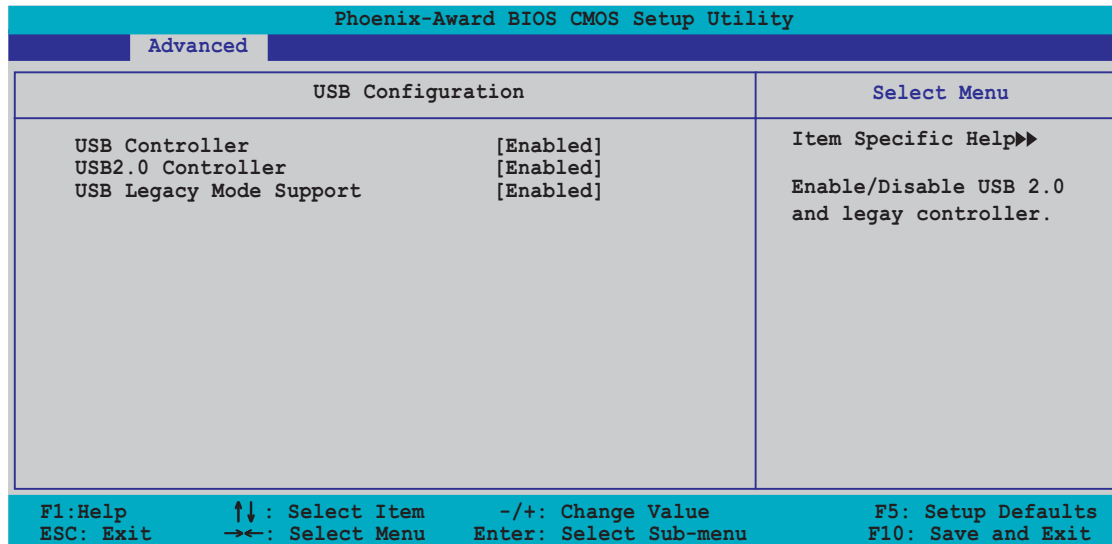
USB Controller [Enabled]

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

USB2.0 Controller [Enabled]

Allows you to enable or disable the USB 2.0 controller. Setting this item to [Enabled] allows the built-in high speed USB support in the BIOS to turn on automatically when you install high speed USB devices.
Configuration options: [Disabled] [Enabled]

USB Legacy Mode Support [Enabled]

Allows you to enable or disable support for the legacy USB devices.
Configuration options: [Disabled] [Enabled]

5.5 Power menu

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

```
         Phoenix-Award BIOS CMOS Setup Utility
  Main    Advanced   Power   Boot   Exit

    ACPI APIC Support            [Enabled]            Select Menu
    ACPI Suspend Type            [S1&S3]
  ▶ APM Configuration                            Item Specific Help▶
  ▶ Hardware Monitor
                                                 Enable/Disable ACPI
                                                 support for Operating
                                                 System.




  F1:Help       ↑↓ : Select Item    -/+: Change Value      F5: Setup Defaults
  ESC: Exit     →←: Select Menu      Enter: Select Sub-menu  F10: Save and Exit
```
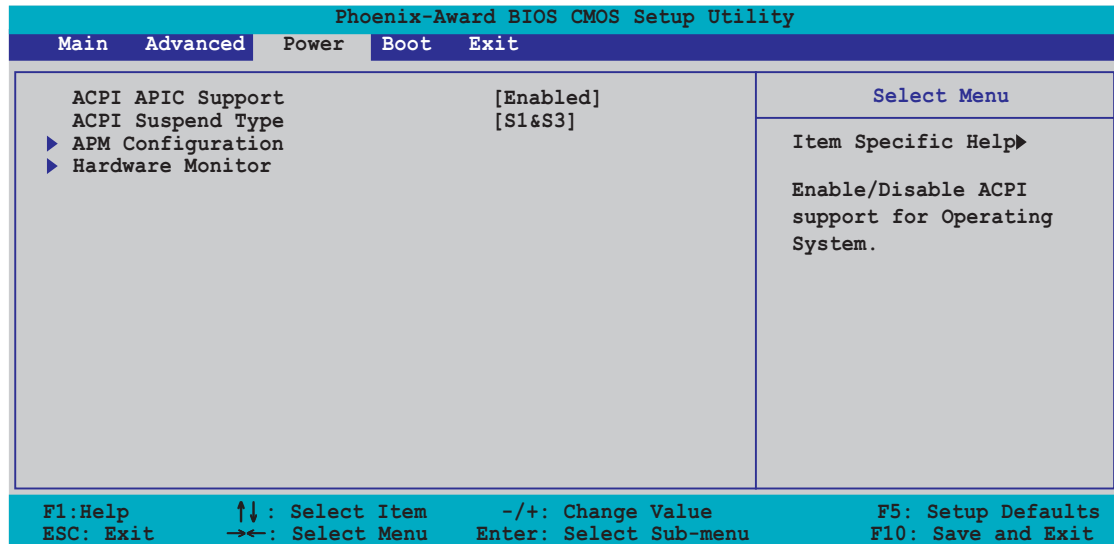
ACPI APIC Support [Enabled]

Allows you to enable or disable the ACPI feature on the operating system.
Configuration options: [Disabled] [Enabled]

ACPI Suspend Type [S1&S3]

Allows you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend.
Configuration options: [S1(POS)] [S3(STR)] [S1&S3]

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5.5.1   APM Configuration

This menu shows the Advanced Powed Management (APM) configuration settings. Select an item then press <Enter> to display a pop-up menu with the configuration options.

```
                  Phoenix-Award BIOS CMOS Setup Utility
          Power

         APM Configuration                         Select Menu

    Power Management            [User Define]    Item Specific Help▶▶
    HDD Power Down              [Disabled]
    Video Off Method           [PDMS Support]    This field allows you to
    Soft-Off by PBTN           [Instant-Off]     set the automatic power
    Restore on AC Power Loss   [Power Off]       saving features.
    Power On By PCI Devices     [Disabled]
    WOR(RI#) From Soft-Off      [Disabled]
    USB Wake-Up From S1/S3      [Disabled]
    Power-On By Alarm           [Disabled]
    Day of Month Alarm            0
    Time (hh:mm:ss)             0 :  0 :  0
    Power On Function          [Disabled]
    Power On By PS/2 Mouse      [Disabled]


  F1:Help          ↑↓ : Select Item      -/+: Change Value      F5: Setup Defaults
  ESC: Exit        →←: Select Menu     Enter: Select Sub-menu    F10: Save and Exit
```

Power Management [User Define]

Allows you to set the automatic power saving features.
Configuration options: [User Define] [Min Saving] [Max Saving]

HDD Power Down [Disabled]

Shuts down any hard disk drives in the system after a period of inactivity as set in this field.
Configuration options: [Disabled] [1 Min] [2 Min]... [15 Min]

Video Off Method [DPMS Support]

Allows you to select the video off method. The Display Power Management System (DPMS) feature allows the BIOS to control the video display card if it supports DPMS. [Blank Screen] only blanks the screen. Use this for monitors without power management or "green" features.
Configuration options: [Blank Screen] [V/H Sync+Blank] [DPMS Support]

Soft-Off By PBTN [Instant-Off]

When set to [Instant-Off], the system goes to soft-off when you press the power button for less than 4 seconds. When set to [Delay 4 Sec], the system power goes off when you press the power button for more than 4 seconds. Configuration options: [Delay 4 Sec] [Instant-Off]

Restore on AC Power Loss [Power Off]

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

Power On By PCI Devices [Disabled]

Allows you to enable or disable the PME to generate a wake-up event. Configuration options: [Disabled] [Enabled]

WOR(RI#) From Soft-Off [Disabled]

Allows you to enable or disable wake-up on ring. Configuration options: [Disabled] [Enabled]

USB Wake-up From S1/S3 [Disabled]

Allows you to enable or disable wake-up from S1/S3 by USB keyboard or mouse. Configuration options: [Disabled] [Enabled]

Power On By Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake-up event. When this item is enabled, the items **Date of Month Alarm** and **Time (hh:mm:ss) Alarm** items become user-configurable with set values. Configuration options: [Disabled] [Enabled]

Day of Month Alarm [0]

To set the date of alarm, highlight this item and press <Enter> to display the Day of Month Alarm pop-up menu. Key-in a value within the specified range then press <Enter>. Configuration options: [Min=0] [Max=31]

Time (hh:mm:ss) Alarm [0 : 0 : 0]

To set the time of alarm:

1. Highlight this item and press <Enter> to display a pop-up menu for the hour field.
2. Key-in a value (Min=0, Max=23), then press <Enter>.
3. Press <TAB> to move to the minutes field then press <Enter>.
4. Key-in a minute value (Min=0, Max=59), then press <Enter>.
5. Press <TAB> to move to the seconds field then press <Enter>.
6. Key-in a value (Min=0, Max=59), then press <Enter>.

Power On Function [Disabled]

Allows you to define specific keys on the keyboard to turn on the system. Configuration options: [Disabled] [Ctrl+ESC] [Space Bar] [Power Key] [Any Key]

Power Up 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]

5.5.2   Hardware Monitor

This menu shows the hardware monitoring status. Select an item, then press Enter to display a pop-up menu with the configuration options.

```
            Phoenix-Award BIOS CMOS Setup Utility
                 Power

           Hardware Monitor                        Select Menu

 ▶ Voltage Monitor                            Item Specific Help▶▶
 ▶ Smart Q-Fan Configuration
   System Temperature          39°C/102°F     Press enter to view.
   CPU1 Temperature            39°C/102°F
   CPU2 Temperature            29°C/84°F
   CPU   Fan1 speed            2925 RPM
   CPU   Fan2 speed            2925 RPM
   Front Fan1 speed               0 RPM
   Front Fan2 speed               0 RPM
   Rear  Fan1 speed               0 RPM
   Rear  Fan2 speed               0 RPM




 F1:Help        ↑↓ : Select Item    -/+: Change Value    F5: Setup Defaults
 ESC: Exit      →←: Select Menu   Enter: Select Sub-menu  F10: Save and Exit
```

Voltage Monitor

```
                   Phoenix-Award BIOS CMOS Setup Utility
                 Power

                        Voltage Monitor                        Select Menu

         CPU VCORE A (V)              1.53 V          Item Specific Help▶▶▶
         CPU VCORE B (V)              N/A
         +3.3  Voltage               3.28 V
         +12V  Voltage              11.91 V
         +1.5V Voltage               1.56 V
         +2.5V Voltage               2.54 V
         +5VCC Voltage               4.99 V
         +5VSB Voltage               4.96 V
          VBAT Voltage               3.10 V

         CPU1 DDR Voltage           [2.60V]
         CPU2 DDR Voltage           [2.60V]
         Chipset Voltage            [1.50V]
         CPU1 Voltage Control       [Default VID+100mV]
         CPU2 Voltage Control       [Default VID+100mV]
         Hyper Transport Voltage    [1.20V]

    F1:Help        ↑↓ : Select Item     -/+: Change Value      F5: Setup Defaults
    ESC: Exit      →←: Select Menu      Enter: Select Sub-menu  F10: Save and Exit
```

CPU VCORE A/B (V), +3.3 Voltage, +12V Voltage, +1.5V Voltage, +2.5V Voltage, +5VCC Voltage, +5VSB Voltage, VBAT Voltage

These fields show the auto-detected voltages through the onboard voltage regulators.

CPU1 DDR Voltage
CPU2 DDR Voltage

Allow you to adjust the DDR voltage.
Configuration options: [2.60V] [2.70V] [2.80V] [2.90V]

Chipset Voltage

Allow you to adjust the chipset voltage.
Configuration options: [1.50V] [1.60V] [1.70V] [1.80V]

CPU1 Voltage Control
CPU2 Voltage Control

Allow you to select the CPU voltages.
Configuration options: [Default VID or plus 100mV] [Default VID]

Hyper Transport Voltage

Allow you to adjust the chipset voltage.
Configuration options: [1.20V] [1.25V] [1.30V] [1.35V]

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Smart Q-Fan Configuration

```
                    Phoenix-Award BIOS CMOS Setup Utility
                 Power

            Smart Q-Fan Configuration                    Select Menu

         Smart Fan Control              [Disabled]     Item Specific Help▶▶
         System Target Temperature          50
         CPU1 Target Temperature            55         Press enter to select
         CPU1 Target Temperature            55         enable/disable Smart Fan.

         F1:Help        ↑↓ : Select Item    -/+: Change Value       F5: Setup Defaults
         ESC: Exit      →←: Select Menu     Enter: Select Sub-menu  F10: Save and Exit
```

Smart Fan Control [Disabled]

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

> • The System/CPU1/CPU2 Target Temperature items become
>   configurable only when you set Smart Fan Control to [Enabled].
>
> • When the actual system/CPU1/CPU2 temperature becomes equal to
>   the target temperature set in the following fields, the respective fan
>   will run at full speed.

System Target Temperature [50]

Allows you to set the target temperature for the system.
Configuration options: [Min=20] [Max=50]

CPU1 Target Temperature [55]

Allows you to set the target temperature for CPU1.
Configuration options: [Min=30] [Max=60]

CPU2 Target Temperature [55]

Allows you to set the target temperature for CPU1.
Configuration options: [Min=30] [Max=60]

5.6 Boot menu

The Boot menu items allow you to change the system boot settings. Select an item then press Enter to display a sub-menu with additional items, or show a pop-up menu with the configuration options.

```
                  Phoenix-Award BIOS CMOS Setup Utility
   ┌──────────────────────────────────────────────────────────────────────┐
   │  Main   Advanced   Power   Boot   Exit                                 │
   ├────────────────────────────────────────────┬───────────────────────────┤
   │                                            │       Select Menu        │
   │  ▶ Boot Device Priority                    ├───────────────────────────┤
   │                                            │  Item Specific Help▶     │
   │  ▶ Hard Disk Boot Priority                 │                           │
   │  ▶ Removable Device Priority               │  Select Boot Device      │
   │                                            │  Priority                │
   │  ▶ Boot Settings Configuration             │                           │
   │  ▶ Security                                │                           │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   ├────────────────────────────────────────────┴───────────────────────────┤
   │  F1:Help        ↑↓: Select Item      -/+: Change Value    F5: Setup Defaults │
   │  ESC: Exit      →←: Select Menu    Enter: Select Sub-menu  F10: Save and Exit │
   └──────────────────────────────────────────────────────────────────────┘
```

5.6.1 Boot Device Priority

```
                  Phoenix-Award BIOS CMOS Setup Utility
   ┌──────────────────────────────────────────────────────────────────────┐
   │                          Boot                                          │
   ├────────────────────────────────────────────┬───────────────────────────┤
   │          Boot Device Priority               │       Select Menu        │
   │                                            ├───────────────────────────┤
   │   1st Boot Device         [Removable]      │  Item Specific Help▶▶    │
   │   2nd Boot Device         [CDROM]          │                           │
   │   3rd Boot Device         [Hard Disk]      │  Select your boot device │
   │                                            │  priority                │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   │                                            │                           │
   ├────────────────────────────────────────────┴───────────────────────────┤
   │  F1:Help        ↑↓: Select Item      -/+: Change Value    F5: Setup Defaults │
   │  ESC: Exit      →←: Select Menu    Enter: Select Sub-menu  F10: Save and Exit │
   └──────────────────────────────────────────────────────────────────────┘
```

1st Boot Device [Removable]
2nd Boot Device [CDROM]
3rd Boot Device [Hard Disk]

These items allow you to select your boot device priority. Configuration options: [Removable] [Hard Disk] [CDROM] [Legacy LAN] [Disabled]

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5.6.2   Hard Disk Boot Priority

```
                Phoenix-Award BIOS CMOS Setup Utility
                         Boot
┌──────────────────────────────────────────┬─────────────────────────┐
│        Hard Disk Boot Priority            │     Select Menu         │
├──────────────────────────────────────────┼─────────────────────────┤
│                                           │  Item Specific Help▶▶   │
│  1.  Bootable Add-in Cards                │                         │
│                                           │  Use <up> or <down>     │
│                                           │  arrow to select a      │
│                                           │  device, the press <+>  │
│                                           │  to move it up, or      │
│                                           │  <-> to move it down    │
│                                           │  the list. Press <ESC>  │
│                                           │  to exit this menu.     │
│                                           │                         │
│                                           │                         │
│                                           │                         │
│                                           │                         │
│                                           │                         │
│                                           │                         │
│                                           │                         │
├───────────────────────────────────────────┴─────────────────────────┤
│ F1:Help       ↑↓ : Select Item    -/+: Change Value   F5: Setup Defaults │
│ ESC: Exit     →←: Select Menu   Enter: Select Sub-menu  F10: Save and Exit │
└──────────────────────────────────────────────────────────────────────┘
```

5.6.3   Removable Device Priority

```
                Phoenix-Award BIOS CMOS Setup Utility
                         Boot
┌──────────────────────────────────────────┬─────────────────────────┐
│       Removable Device Priority           │     Select Menu         │
├──────────────────────────────────────────┼─────────────────────────┤
│                                           │  Item Specific Help▶▶   │
│  1.  Floppy Disks                         │                         │
│                                           │  Use <up> or <down>     │
│                                           │  arrow to select a      │
│                                           │  device, the press <+>  │
│                                           │  to move it up, or      │
│                                           │  <-> to move it down    │
│                                           │  the list. Press <ESC>  │
│                                           │  to exit this menu.     │
│                                           │                         │
│                                           │                         │
│                                           │                         │
│                                           │                         │
│                                           │                         │
│                                           │                         │
│                                           │                         │
├───────────────────────────────────────────┴─────────────────────────┤
│ F1:Help       ↑↓ : Select Item    -/+: Change Value   F5: Setup Defaults │
│ ESC: Exit     →←: Select Menu   Enter: Select Sub-menu  F10: Save and Exit │
└──────────────────────────────────────────────────────────────────────┘
```

5.6.4   Boot Settings Configuration

```
              Phoenix-Award BIOS CMOS Setup Utility
                          Boot

       Boot Settings Configuration              Select Menu

   Boot Other Device            [Enabled]        Item Specific Help▶▶
   Quick Power On Self Test     [Enabled]
   Halt On                      [All, But Keyboard]   Select your boot device
   Boot Up Floppy Seek          [Disabled]            priority.
   Boot Up NumLock Status       [On]
   Typematic Rate Setting       [Disabled]
   Typematic Rate (Chars/Sec)   6
   Typematic Delay (Msec)       250




   F1:Help        ↑↓ : Select Item     -/+: Change Value     F5: Setup Defaults
   ESC: Exit      →←: Select Menu      Enter: Select Sub-menu  F10: Save and Exit
```

Boot Other Device [Enabled]

Allows you to enable or disable selection of other boot device.
Configuration options: [Disabled] [Enabled]

Quick Power On Self Test [Enabled]

This field speeds up the Power-On-Self Test (POST) routine by skipping
certain tests while booting, thereby decreasing the boot time.
Configuration options: [Disabled] [Enabled]

Halt On [All, But Keyboard]

Sets the system to halt on errors according to the system functions
specified in each option. Configuration options: [All Errors] [No Errors]
[All, But Keyboard] [All , But Diskette] [All, But Disk/Key]

Boot Up Floppy Seek [Disabled]

When enabled, the BIOS will seek the floppy disk drive to determine
whether the drive has 40 or 80 tracks. Configuration options: [Disabled]
[Enabled]

Boot Up NumLock Status [On]

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

Typematic Rate Setting [Disabled]

Allows you to enable or disable the keyboard typematic rate setting. Set to [Enabled] to configure the Type Rate and Type Delay items. Configuration options: [Disabled] [Enabled]

The items **Typematic Rate (Chars/Sec)** and **Typematic Delay** become configurable only when the item Typematic Setting is enabled.
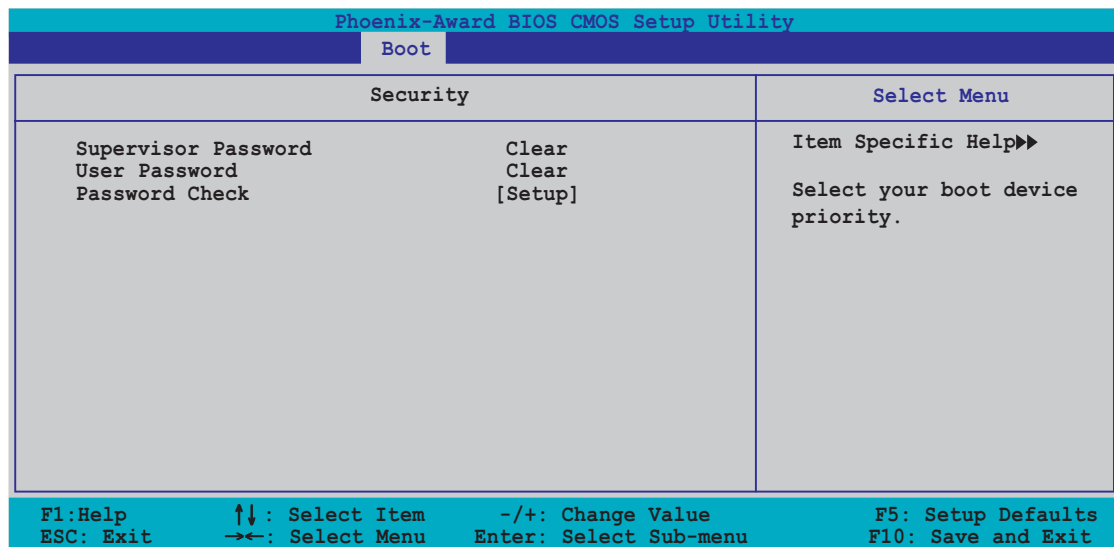
Typematic Rate (Chars/Sec) [6]

Allows you to select the rate at which character repeats when you hold a key. Configuration options: [6] [8] [10] [12] [15] [20] [24] [30]

Typematic Delay (Msec) [250]

Allows you to set the delay before key strokes begin to repeat. Configuration options: [250] [500] [750] [1000]

5.6.5 Security

```
           Phoenix-Award BIOS CMOS Setup Utility
                    Boot

          Security                        │   Select Menu

   Supervisor Password        Clear       │ Item Specific Help▶▶
   User Password              Clear       │
   Password Check             [Setup]     │ Select your boot device
                                          │ priority.
                                          │
                                          │
                                          │
                                          │
                                          │
                                          │
                                          │
                                          │
                                          │

 F1:Help        ↑↓ : Select Item    -/+: Change Value      F5: Setup Defaults
 ESC: Exit      →←: Select Menu    Enter: Select Sub-menu   F10: Save and Exit
```

Supervisor Password [Clear]
User Password [Clear]

These fields allow you to set passwords:

To set a password:

1. Select an item then press <Enter>.

2. Type in a password using a combination of a maximum of eight (8)
    alpha-numeric characters, then press <Enter>.

3. When prompted, confirm the password by typing the exact characters
    again, then press <Enter>. The password field setting is changed to
    Set.

To clear the password:

1. Select the password field and press <Enter> twice. The following
    message appears:

```
   PASSWORD DISABLED !!!
    Press any key to continue...
```

2. Press any key to continue. The password field setting is changed to
    Clear.

A note about passwords

The Supervisor password is required to enter the BIOS Setup program preventing unauthorized access. The User password is required to boot the system preventing unauthorized use.
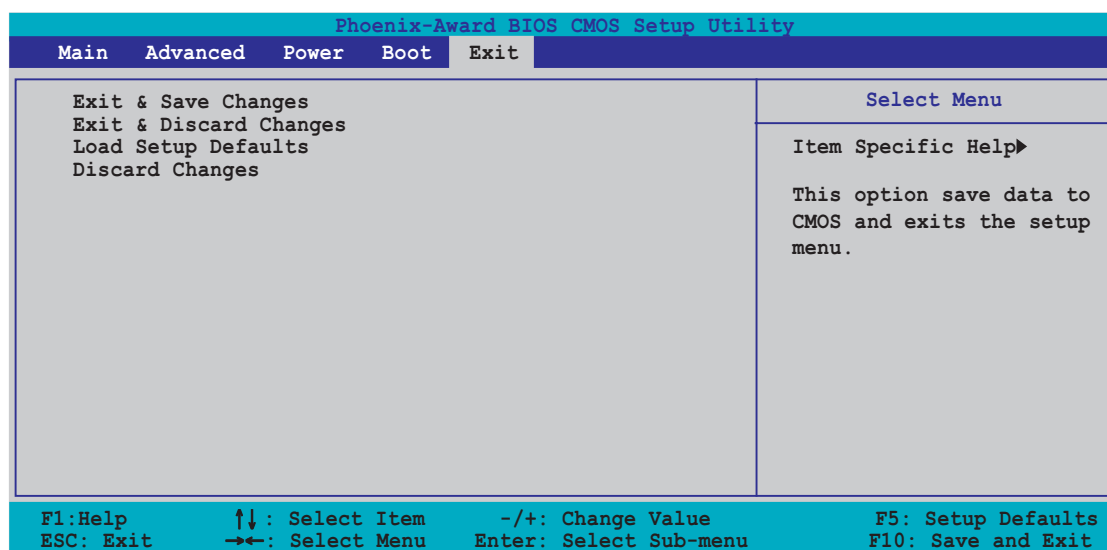
Forgot your password?

If you forget your password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. The RAM data containing the password information is powered by the onboard button cell battery. If you need to erase the CMOS RAM, refer to section "4.2 Jumpers" for instructions.

Password Check

This field requires you to enter the password before entering the BIOS setup or the system. Select [Setup] to require the password before entering the BIOS Setup. Select [System] to require the password before entering the system. Configuration options: [Setup] [System]

5.7   Exit menu

The Exit menu items allow you to load the BIOS setup default settings, save or discard any changes you made, or exit the Setup utility.

```
                    Phoenix-Award BIOS CMOS Setup Utility
    Main    Advanced    Power    Boot    Exit
┌─────────────────────────────────────────────────────┬────────────────────────┐
│   Exit & Save Changes                                │      Select Menu       │
│   Exit & Discard Changes                             ├────────────────────────┤
│   Load Setup Defaults                                │   Item Specific Help▶  │
│   Discard Changes                                    │                        │
│                                                      │   This option save data to │
│                                                      │   CMOS and exits the setup │
│                                                      │   menu.                │
│                                                      │                        │
│                                                      │                        │
│                                                      │                        │
│                                                      │                        │
│                                                      │                        │
│                                                      │                        │
├──────────────────────────────────────────────────────────────────────────────┤
│   F1:Help          ↑↓ : Select Item     -/+: Change Value      F5: Setup Defaults │
│   ESC: Exit        →←: Select Menu    Enter: Select Sub-menu   F10: Save and 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 (with a blinking [Y]):

- press <Enter> to save and exit
- type [N], then press <Enter>, or simply press <Esc>, to cancel the command and return to the Exit menu

Exit & Discard Changes

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

When a confirmation window appears (with a blinking [Y]):

- press <Enter> to discard your changes and exit
- type [N], then press <Enter>, or simply press <Esc>, to cancel the command and return to the Exit menu

Load Setup Defaults

Select this option then press <Enter>, or simply press <F5>, to load the optimized values for each of the Setup menu items.

When a confirmation window appears (with a blinking [Y]):

- press <Enter> to load the default values
- type [N], then press <Enter>, or simply press <Esc>, to cancel the command and return to the Exit menu

---

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Discard Changes

Select this option to discard the changes that you made, and restore the previously saved values.

When a confirmation window appears (with a blinking [Y]):

* press <Enter> to discard any changes, and load the previously saved values
* type [N], then press <Enter>, or simply press <Esc>, to cancel the command and return to the Exit menu

This chapter provides information on how to create a RAID set and how to install the drivers for system components. This chapter also describes the software applications that the barebone server supports.

Driver installation

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6.1   RAID configurations

The system motherboard comes with the NVIDIA CK-04 RAID controller that allows you to configure Serial ATA hard disk drives as RAID sets. The motherboard supports the following RAID configurations.

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

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

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

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

> If you want to boot the system from a hard disk drive included in a created RAID set, copy first the RAID driver from the support CD to a floppy disk before you install an operating system to the selected hard disk drive. Refer to section "6.2 Creating a RAID driver disk" for details.

6.1.1   Installing hard disks

The motherboard supports Ultra DMA 100/66 IDE and Serial ATA hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

Installing Parallel ATA hard disks

To install IDE hard disks for a RAID configuration:

1.   Set the jumpers of each hard disk as Master/Master or Slave/Slave.
2.   Install the hard disks into the drive bays.
3.   Connect the HDD signal cables.
4.   Connect a 4-pin power cable to the power connector on each drive.

Installing Serial ATA (SATA) hard disks

To install the SATA hard disks for a RAID configuration:

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

> Refer to the RAID controllers user manual on the support CD for detailed information on RAID configurations.

6.1.2   RAID configuration utility

You can create a RAID set using the utility embedded in each RAID controller. For example, you can use the **NVIDIA® RAID Utility** if you installed SATA hard disk drives on the SATA connectors supported by the NVIDIA CK-04 Southbridge. Refer to the succeeding sections for details on how to enter the RAID configuration utility.

6.1.3 NVIDIA® RAID configurations

The motherboard includes a high performance SATA RAID controller integrated in the NVIDIA® CK-04 chip. The RAID controller supports RAID 0, RAID 1, RAID 1+0, and JBOD using four independent Serial ATA channels.

Setting the BIOS RAID items

After installing the hard disk drives, make sure to set the necessary RAID items in the BIOS before setting your RAID configuration.

To set the BIOS RAID items:

1. Enter the BIOS Setup during POST.
2. Go to the **Advanced** menu, select **Onboard Device**, then press <Enter>.
3. Select the **NVRAID Configuration** option, then press <Enter>.
4. Select the **RAID Enabled** item, then press <Enter> to display the configuration options.
5. Select **[Enabled]** from the options, then press <Enter>.
6. Save your changes, then exit the BIOS Setup.

> • For detailed information on the NVIDIA® RAID configuration, refer to the "NVIDIA® RAID User's Manual" in the system or motherboard support CD.
>
> • The RAID BIOS setup screens shown in this section are for reference only, and may not exactly match the items on your screen.

Entering the NVIDIA® RAID Utility

To enter the NVIDIA® RAID Utility:

1. Restart the computer.
2. During POST, press <F10> to display the utility main menu.

```
            NVIDIA RAID Utility  Oct 5 2004
                - Define a New Array -

RAID Mode: Striping              Striping Block: Optimal

Free Disks                       Array Disks
Loc    Disk Model Name           Loc    Disk Model Name

1.0.M  XXXXXXXXXXXXXXXXXX
1.1.M  XXXXXXXXXXXXXXXXXX   [→] Add
2.0.M  XXXXXXXXXXXXXXXXXX
2.1.M  XXXXXXXXXXXXXXXXXX




                           [←] Del




    [F6] Back  [F7] Finish  [TAB] Navigate  [↑↓] Select  [ENTER] Popup
```
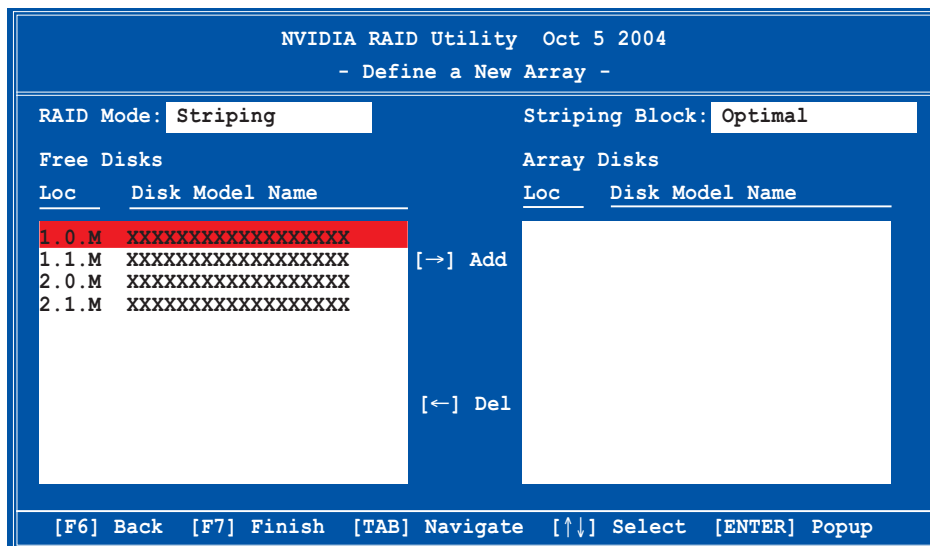
At the bottom section of the screen are the navigation keys. These keys allow you to move through and select menu options.

```
[F6] Back  [F7] Finish  [TAB] Navigate  [↑↓] Select  [ENTER] Popup
```

> The navigation keys vary depending on the menu level or option.
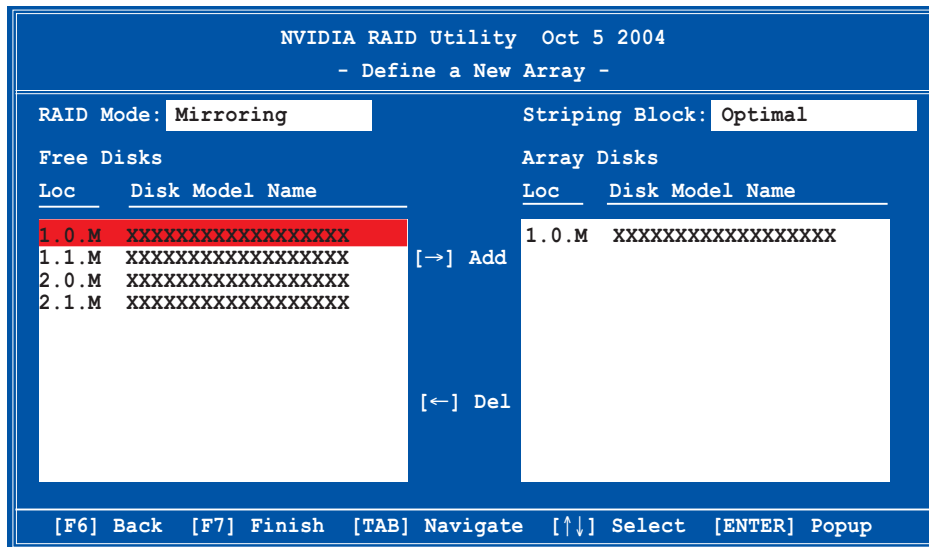
## Creating a RAID 0 set (Stripe)

To create a RAID 0 set:

1. From the **Define a New Array** menu, select **RAID Mode**, then press <Enter>. A pop-up menu appears.

2. Use the up or down arrow keys to select **Striping**, then press <Enter>.

```
    Mirroring
    Striping
    Stripe Mirroring
    Spanning
```
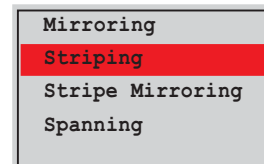
3. Press <TAB> to move to the **Striping Block** option, then press <Enter>.

4. Use the up or down arrow keys to select the stripe block size appropriate to your drive usage, then press <Enter>.

```
    8K      ↑
    16K
    32K
    64K
    128K
    Optim   ↓
```
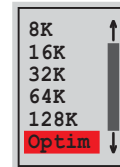
    The available stripe size values range from 8KB to 128KB. The default stripe size is 128 KB. You must choose the stripe size value based on the projected drive usage. For low disk usage, select 8 KB/16 KB. For typical disk usage, select 64 KB. Select 128KB for performance disk usage.

> **TIP.** For server systems, use of a lower array block size is recommended. For multimedia computer systems used mainly for audio and video editing, a higher array block size is recommended for optimum performance.

5.	Press <TAB> to move to the **Free Disks** section.

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

```
          NVIDIA RAID Utility  Oct 5 2004
               - Define a New Array -

RAID Mode: Striping              Striping Block: Optimal

Free Disks                       Array Disks

Loc    Disk Model Name           Loc    Disk Model Name

1.0.M  XXXXXXXXXXXXXXXXXX        1.0.M  XXXXXXXXXXXXXXXXXX
1.1.M  XXXXXXXXXXXXXXXXX    [→] Add
2.0.M  XXXXXXXXXXXXXXXXX
2.1.M  XXXXXXXXXXXXXXXXX


                             [←] Del



  [F6] Back   [F7] Finish   [TAB] Navigate   [↑↓] Select   [ENTER] Popup
```
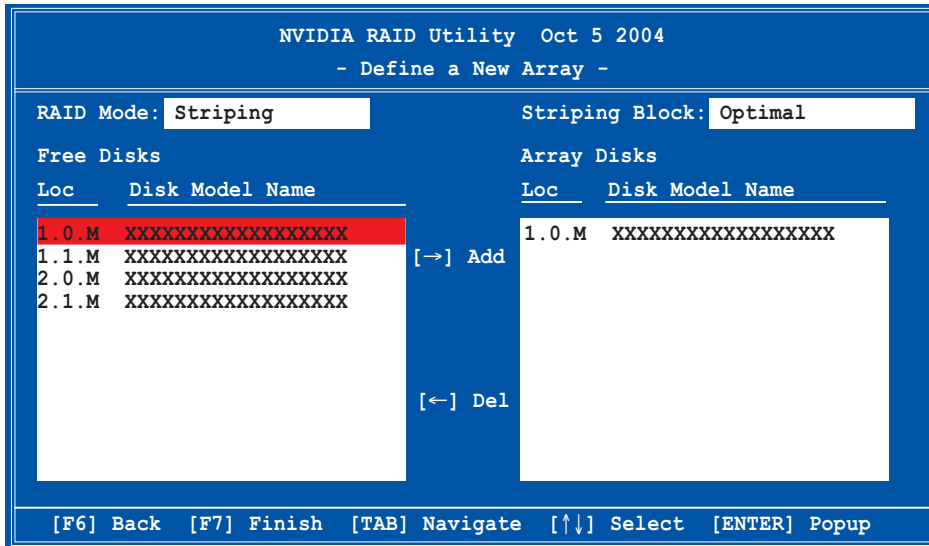
7.	After selecting the hard disk drives, press <F7> to create the RAID 0 set. A pop-up window appears.

```
Clear disk data?
[Y] YES     [N] Cancel
```
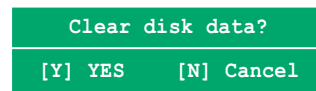
8.	Press <Y> to delete all data from the hard disk drives, or <N> to continue creating the RAID set without deleting the data on the disks.

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

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

```
          NVIDIA RAID Utility  Oct 5 2004
                  - Array List -


     Boot   Id  Status    Vendor   Array Model Name

     No     4   Healthy   NVIDIA    STRIPING  XXX.XXG









  [Ctrl-X]Exit   [↑↓]Select   [B]Set Boot   [N]New Array   [ENTER]Detail
```
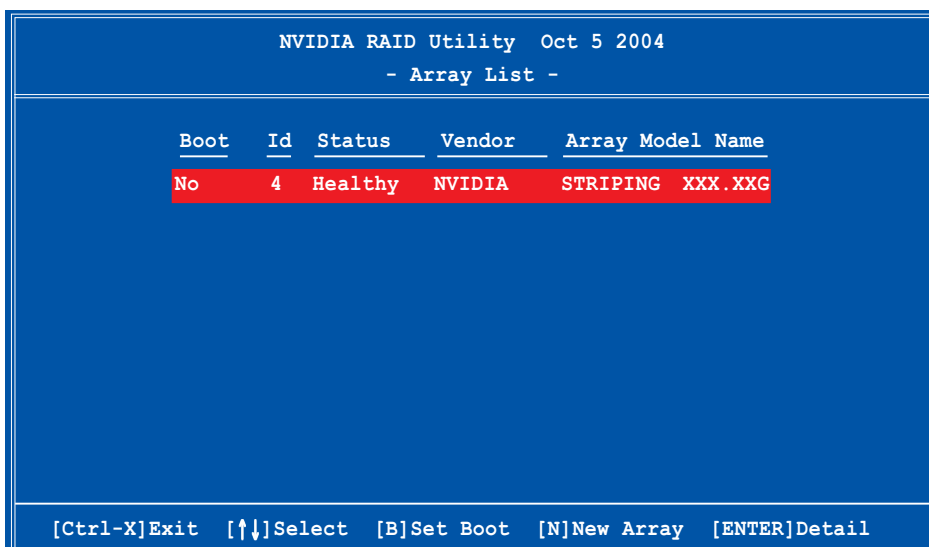
Creating a RAID 1 set (Mirror)

To create a RAID 1 set:

1. From the **Define a New Array** menu, select **RAID Mode**, then press <Enter>. A pop-up menu appears.

2. Use the up or down arrow keys to select **Mirroring**, then press <Enter>.
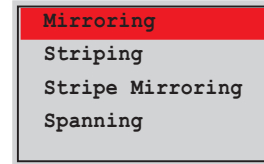
```
Mirroring
Striping
Stripe Mirroring
Spanning
```

5. Press <TAB> to move to the **Free Disks** section.

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

```
                    NVIDIA RAID Utility   Oct 5 2004
                        - Define a New Array -

 RAID Mode: Mirroring              Striping Block: Optimal

 Free Disks                        Array Disks
 Loc      Disk Model Name          Loc      Disk Model Name

 1.0.M   XXXXXXXXXXXXXXXXXX        1.0.M   XXXXXXXXXXXXXXXXXX
 1.1.M   XXXXXXXXXXXXXXXXXX
 2.0.M   XXXXXXXXXXXXXXXXXX   [→] Add
 2.1.M   XXXXXXXXXXXXXXXXXX


                            [←] Del




  [F6] Back   [F7] Finish   [TAB] Navigate   [↑↓] Select   [ENTER] Popup
```

7. After selecting the hard disk drives, press <F7> to create the RAID 1 set. A pop-up window appears.

```
      Clear disk data?
 [Y] YES     [N] Cancel
```
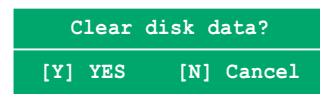
8. Press <Y> to delete all data from the hard disk drives and continue creating the RAID set. Press <N> to backup exisitng data to a target hard disk drive.

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

9. The utility displays the created RAID 1 set. Press <Ctrl+X> to save your settings and exit the utility.0

Rebuilding a RAID set

To rebuild a RAID set:

1. From the **Array List**, use the up or down arrow keys to select the RAID set you want to rebuild, then press <Enter>. The RAID set details appear.

```
                NVIDIA RAID Utility   Oct 5 2004
                        - Array List -

        Boot   Id   Status    Vendor    Array Model Name
        No     4    Healthy   NVIDIA    STRIPING  XXX.XXG
        No     3    Healthy   NVIDIA    MIRRORING XXX.XXG




        [Ctrl-X]Exit   [↑↓]Select   [B]Set Boot   [N]New Array   [ENTER]Detail
```

2. Press <R>.

3. Use the up or down arrow keys to select a the RAID set you want to rebuild, then press <F7>. A confirmation message appears.

```
                Array 1 : NVIDIA MIRROR   XXX.XXG
                        - Array Detail -
   RAID Mode: Striping
   Striping Width: 1              Striping Block: 64K

   Adapt   Channel   M/S      Index   Disk Model Name          Capacity
   2       1         Master   0       XXXXXXXXXXXXXXXX         XXX.XXGB
   1       0         Master   1       XXXXXXXXXXXXXXXX         XXX.XXGB




                [↑↓] Select [F6] Back   [F7] Finish
```
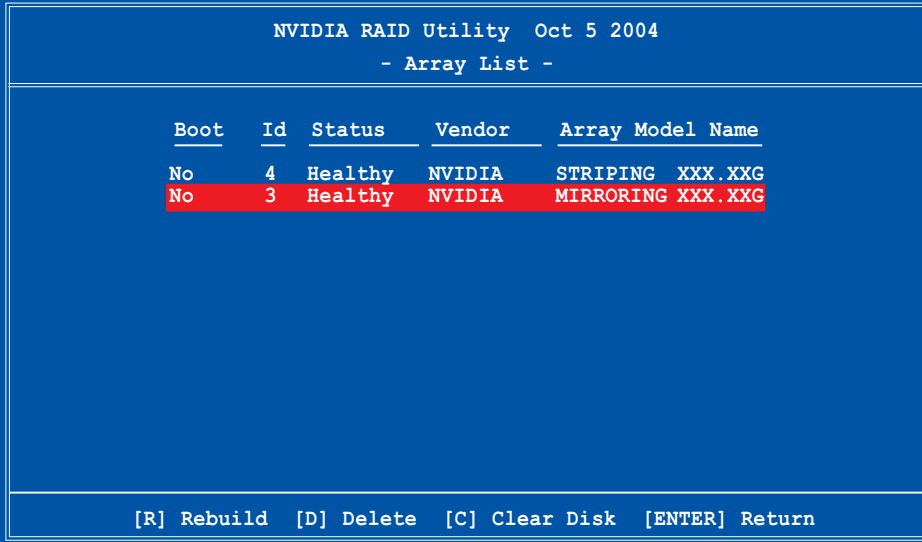
4. Press <Enter> to start rebuilding the array, or <Esc> to cancel. The **Array List** screen displays the RAID set after rebuilding.

```
        Rebuild array?
[Enter] OK    [Esc] Cancel
```

Deleting a RAID array

To delete a RAID array:
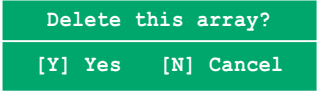
1. From the **Array List**, use the up or down arrow keys to select the RAID set you want to delete, then press <Enter>. The RAID set details appear.

```
            NVIDIA RAID Utility   Oct 5 2004
                    - Array List -

        Boot   Id  Status     Vendor    Array Model Name

        No     4   Healthy    NVIDIA    STRIPING  XXX.XXG
        No     3   Healthy    NVIDIA    MIRRORING XXX.XXG








        [R] Rebuild  [D] Delete  [C] Clear Disk  [ENTER] Return
```

2. When the array details appear, press <D> to delete the RAID set. A confirmation message appears.

3. Press <Y> to delete the array, or press <N> to cancel.

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

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

4. The **Define a New Array** menu appears when you press <Y>. Create a new RAID set following the instructions in the previous sections..

Clearing the disk data

⚠️ You will lose all data when you clear a disk!

To clear the disk data:

1. From the **Array List**, use the up or down arrow keys to select a RAID set, then press <Enter>. The RAID set details appear.

```
              NVIDIA RAID Utility   Oct 5 2004
                     - Array List -

       Boot   Id  Status     Vendor    Array Model Name
       No     4   Healthy    NVIDIA    STRIPING  XXX.XXG
       No     3   Healthy    NVIDIA    MIRRORING XXX.XXG




    [Ctrl-X]Exit   [↑↓]Select   [B]Set Boot   [N]New Array   [ENTER]Detail
```

2. When the array details appear, select the hard disk drive you want to clear, then press <C>. A confirmation message appears.

```
            Array 1 : NVIDIA MIRROR  XXX.XXG
                     - Array Detail -

    RAID Mode: Striping
     Striping Width: 1          Striping Block: 64K

    Adapt   Channel  M/S      Index  Disk Model Name            Capacity
    2       1        Master   0      XXXXXXXXXXXXXXXXX          XXX.XXGB
    1       0        Master   1      XXXXXXXXXXXXXXXXX          XXX.XXGB




        [R] Rebuild   [D] Delete   [C] Clear Disk   [ENTER] Return
```

3. Press <Y> to clear the disk data, or press <N> to cancel.Press <C> to clear disk. The following confirmation message appears.

```
    Clear disk data?

    [Y] Yes    [N] Cancel
```

6.2 Creating a RAID driver disk

A floppy disk with the RAID driver is required when installing Windows®
2000/XP operating system on a hard disk drive that is included in a RAID
set. You can create a RAID driver disk in DOS (using the Makedisk
application in the support CD) or in Windows® environment.

To create a RAID driver disk in DOS environment:

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

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

The Makedisk menu appears.

```
1) FreeDOS command prompt
2) Run AWDFlash to Flash BIOS
3) Create Silicon Image SATA SoftRAID 5 miniport for Windows driver
4) Create nVIDIA nForce(TM) RAID driver for Win2000 32 bit driver
5) Create nVIDIA nForce(TM) RAID driver for WinXP 32 bit driver
6) Create nVIDIA nForce(TM) RAID driver for Win2003 32 bit driver
Please choose 1 ~ 6
```

5. Place a blank, high-density floppy disk to the floppy disk drive.

> When you insert a floppy disk with data, the utility erases all the data
> before copying the RAID drivers.

6. Type the number before the option you like to select, then press
   <Enter>. For example, if you want to create an nVIDIA nForce(TM)
   RAID driver disk for a 32-bit Windows 2000 system, press <4>, then
   press <Enter>.
7. The RAID drivers are copied to the floppy disk. After creating a RAID
   driver disk, eject the floppy disk, then write-protect it to prevent
   computer virus infection.

To create a RAID driver disk in Windows® environment:

1. Place the motherboard support CD in the optical drive.
2. When the **Drivers** menu appears, click **NVIDIA nForce(TM) RAID Driver Disk** to create an nVIDIA nForce RAID driver disk.
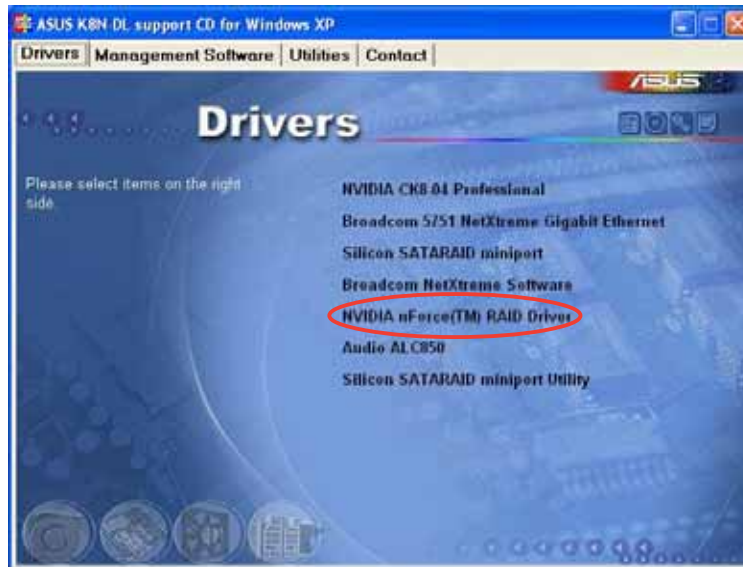
To install the RAID driver:

1. Install an operating system to the selected hard disk drive. During installation, the computer prompts you to press the **F6** key if you are installing a third-party SCSI or RAID driver.
2. Press <F6>, then insert the RAID driver disk to the floppy disk drive.
3. Follow screen instructions to install the RAID drivers.

6.3   LAN driver installation

This section provides instructions on how to install the Broadcom® Gigabit LAN controller drivers on a Windows® 2000/XP OS.

To install the LAN controller drivers:

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 5751 NetXtreme Gigabit Ethernet** option to begin installation.
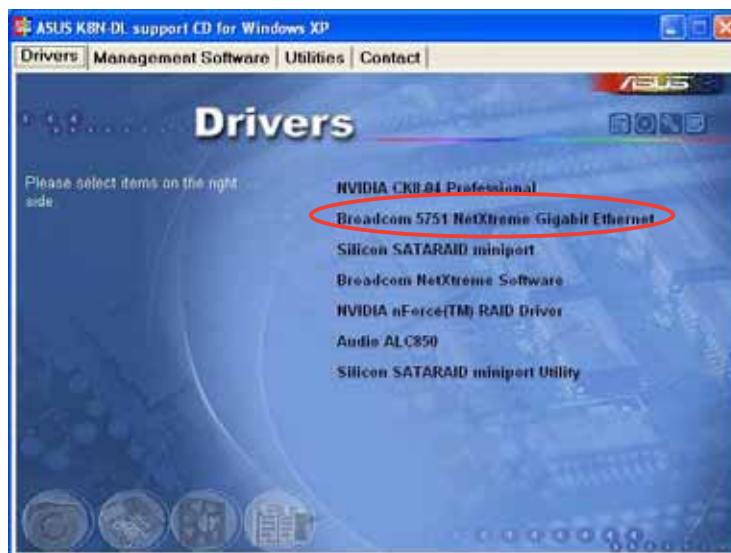
4.   Click **Next** when the InstallShield Wizard window appears. Follow screen instructions to continue installation.
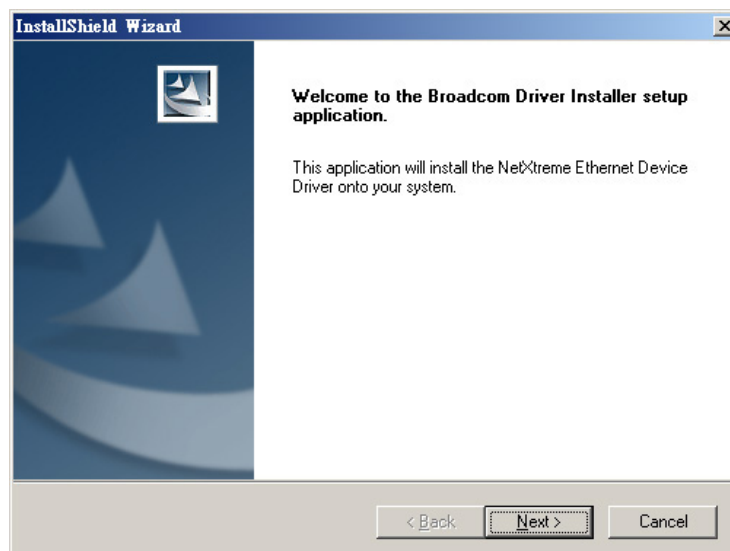
6.4   Support CD information

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

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

6.4.1   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.
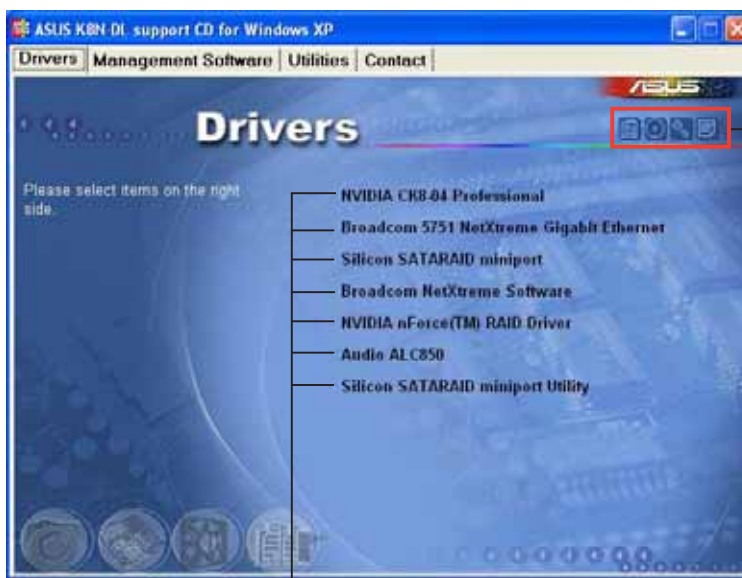
Click an icon to display support CD/motherboard information

Click an item to install

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

6.4.2 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.
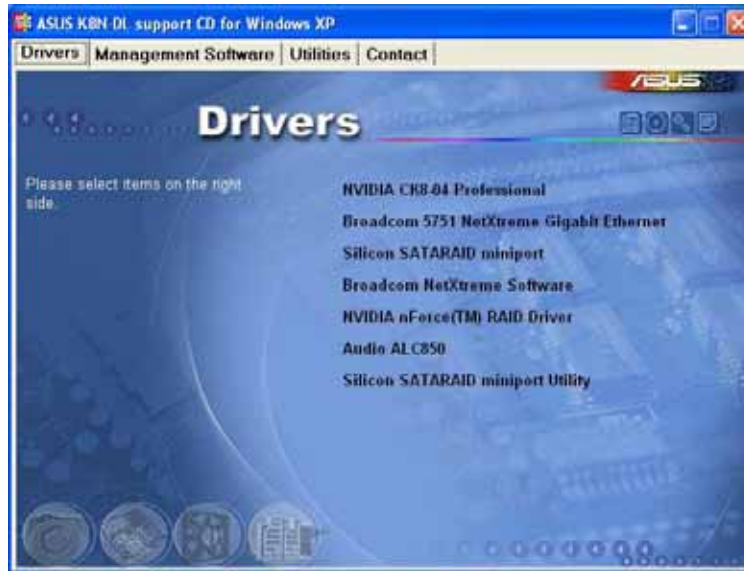
NVIDIA CK8-04 Professional
Installs the driver for the NVIDIA CK8-04 chip.

Broadcom 5751 NetXtreme Gigabit Ethernet
Installs the Broadcom 5751 NetXtreme Gigabit Ethernet driver.
See page 6-13 for details.

Silicon SATARAID miniport
Installs the driver for the Silicon Image SATA RAID controller.

Broadcom NetXtreme Software
Installs the Broadcom NetXtreme software application. Refer to the application help file for details.

NVIDIA nForce(TM) RAID Driver
Creates a driver disk for the NVIDIA nForce(TM) RAID controller.

Audio ALC650
Installs the drivers and utility for the onboard audio controller.
See page 6-18 for details.

Silicon SATARAID miniport Utility
Installs the Silicon Image SATA RAID utility. Refer to the application help file for details.

6.4.3 Management Software

The **Management Software** menu shows the available server management software applications.

Install ASUS Network Utility

Installs the ASUS Network Utility. Refer to the application help file for details.

6.4.4 Utilities

The **Utilities** menu shows the available software applications for your barebone server.
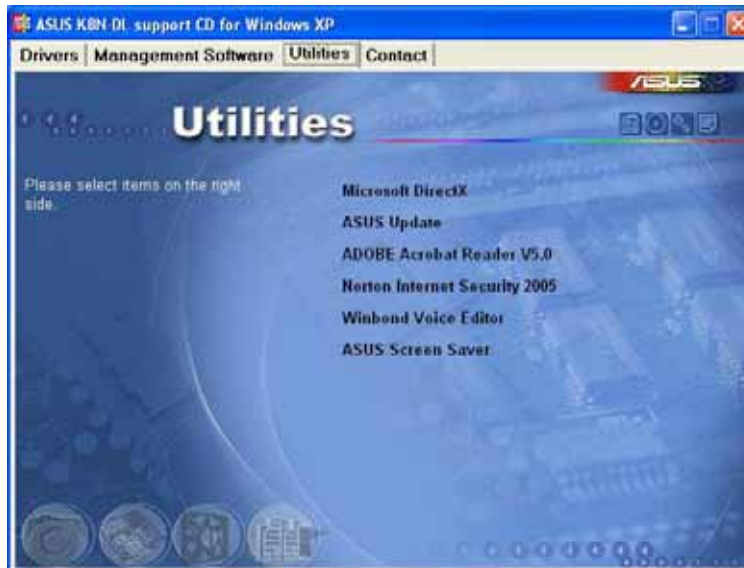
Microsoft DirectX

The Microsoft DirectX® is a multimedia technology that enhances computer graphics and sounds. DirectX® improves the multimedia features of your computer so you can enjoy watching TV and movies, capturing videos, or playing games in your computer.

ASUS Update

The ASUS Update utility that allows you to update the motherboard BIOS in Windows® environment. This utility requires an Internet connection either through a network or an Internet Service Provider (ISP).

ADOBE Acrobat Reader V5.0

The Adobe Acrobat® Reader V5.0 is for opening, viewing, and printing documents in Portable Document Format (PDF).

Norton Internet Security 2005

The anti-virus utility scans, identifies, and removes computer viruses. View the online help for detailed information.

Winbond Voice Editor

The Voice Editor application allows you to record and customize wave files for the ASUS POST Reporter™ utility. Use this program to change the default vocal POST messages. See page 6-27 for details.

ASUS Screen Saver

Bring life to your idle screen by installing the ASUS screen saver.

6.5 Software information

6.5.1 Realtek Audio Control Panel

The Realtek® ALC850 AC '97 audio CODEC provides 8-channel audio capability to deliver the ultimate audio experience on your PC. The software provides Jack-Sensing function (Line-In, Line-Out, Mic-In), S/PDIF out support and interrupt capability. The ALC850 also includes the Realtek® proprietary UAJ® (Universal Audio Jack) technology for three ports (Line-In, Line-Out and Mic-In), eliminating cable connection errors and giving users plug and play convenience.

Follow the installation wizard to install the **Audio ALC850** from the support CD that came with the system package.

If the Realtek audio software is correctly installed, you will find the SoundEffect icon on the taskbar.

From the taskbar, double-click on the **SoundEffect** icon to display the **Realtek Audio Control Panel**.

Realtek SoundEffect icon

The Jack-sensing and UAJ® technology features are supported on the Line-In, Line-Out, and Mic jacks only.

Sound Effect options

The Realtek® ALC850 Audio CODEC allows you to set your listening environment, adjust the equalizer, set the karaoke, or select pre-programmed equalizer settings for your listening pleasure.

To set the sound effect options:

1. From the Realtek Audio Control Panel, click the **Sound Effect** button.

2. Click the shortcut buttons to change the acoustic environment, adjust the equalizer, or set the karaoke to your desired settings.

3. The audio settings take effect immediately after you click on the buttons.

4. Click the Exit (**X**) button on the upper-right hand corner of the window to exit.

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S/PDIF options

The Sony/Philips Digital Interface (S/PDIF) options allows you to change your S/PDIF output settings.

To set the S/PDIF options:

1. From the Realtek Audio Control Panel, click the **SPDIF** button.
2. Click the option buttons to change your S/PDIF out settings.
3. Click the Exit (**X**) button on the upper-right hand corner of the window to exit.

Speaker Configuration

This option allows you to set your speaker configuration.

To set the speaker configuration:

1. From the Realtek Audio Control Panel, click the **Speaker Configuration** button.

2. Select from the combo list box your current speaker setup, then click **Auto Test** to test your settings.

3. Click the **UAJ Automatic** button to enable or disable the Universal Audio Jack(UAJ®) technology feature.

4. Click the Exit (**X**) button on the upper-right hand corner of the window to exit.

AI Audio feature

The AI Audio feature works through the connector sensing option that allows you to check if your audio devices are connected properly.

To start the connector sensing:

1. From the Realtek Audio Control Panel, click the **Connector Sensing** button.

2. Click the **Bracket** button to display connected audio devices.

3. Click the **Option** button to change sensing options.

4. Click the **Start** button to start connection sensing. A progress bar displays current connector sensing status.

> Make sure to exit all audio applications before starting this function.

5. When finished, the utility prompts the Realtek® EZ-connection dialog box showing your current audio connections. The text at the bottom of the box explains your audio connection status. An *X mark* denotes an incorrect connection.
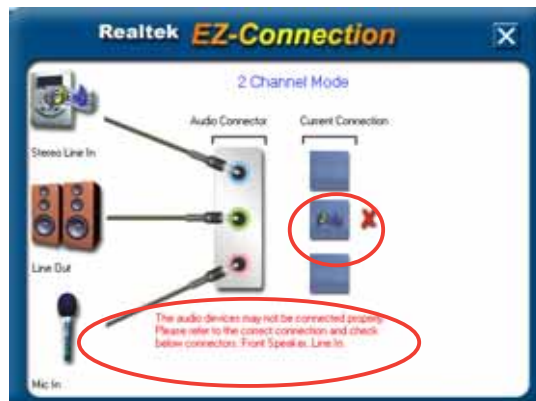
6. If there are detected problems, make sure that your audio cables are connected to the proper audio jack and repeat connector sensing.

7. Click the **X** button to exit EZ-connection dialog box.

8. Click the Exit (**X**) button on the upper-right hand corner of the window to exit audio control panel.

HRTF Demo

This option shows a demo of the Head-Related Transfer Functions (HRTF).

To start the HRTF demo:

1. From the Realtek Audio Control Panel, click the **HRTF Demo** button.

2. Click the option buttons to change the sound, moving path or EAX settings.

3. Click the **Play** button to start or the **Stop** button to stop.

4. Click the Exit (**X**) button on the upper-right hand corner of the window to exit.

General settings

This option shows the audio settings and allows you to change the language setting or toggle the SoundEffect icon display on the Windows taskbar.

To display the general settings:

1. From the Realtek Audio Control Panel, click the **General** button.
2. Click the option button to enable or disable the icon display on the Windows taskbar.
3. Click the **Language** combo list box to change language display.
4. Click the Exit (**X**) button on the upper-right hand corner of the window to exit.

Rear panel audio ports function variation

The functions of the Line Out (lime), Line In (blue), Mic (pink), Center/ Subwoofer (Yellow Orange), Rear Speaker Out (Black), and Side Speaker Out (Gray) ports on the rear panel change when you select the 4-channel, 6-channel or 8-channel audio configuration as shown in the following table.

	Headset/ 2-channel	4-channel	6-channel	8-channel
Light Blue	Line In	Line In	Line In	Line In
Lime	Line Out	Front Speaker Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In	Mic In
Yellow Orange	-	-	Center/Subwoofer	Center/Subwoofer
Black	-	Rear Speaker Out	Rear Speaker Out	Rear Speaker Out
Gray	-	-	-	Side Speaker Out

6.5.2 ASUS POST Reporter™

This motherboard includes the Winbond speech controller to support a special feature called the ASUS POST Reporter™. This feature lets you hear vocal messages during POST that alerts you of system events and boot status. In case of a boot failure, you will hear the specific cause of the problem.

These POST messages are customizable using the Winbond Voice Editor software that came with your package. You can record your own messages to replace the default messages.

Vocal POST messages

Following is a list of the default POST messages and the corresponding actions you can take:

POST Message	Action
No CPU installed	• Install a supported processor to the CPU socket. See section "2.3 Central Processing Unit (CPU)" for details.
System failed CPU test	• Check the CPU if properly installed. • Call ASUS technical support for assistance. See the ASUS contact information on the inside front cover of this user guide.
System failed memory test	• Install supported DDR DIMMs into the memory sockets. • Check if the DIMMs on the DIMM sockets are properly installed. • Make sure that your DIMMs are not defective. • Refer to section "2.4 System memory" for instructions on installing a DIMM.
System failed VGA test	• Install a PCI graphics card into one of the PCI slots, or a PCI Express VGA card into the PCI Express x16 slot. • Make sure that your graphics card is not defective.
System failed due to CPU	• Check your CPU overclocking settings in the BIOS setup and restore the default CPU parameters.
No keyboard detected	• Check if your keyboard is properly connected to the purple PS/2 connector on the rear panel. • See section "2.7.1 Rear panel connectors" for the location of the connector.
No IDE hard disk detected	• Make sure you have connected an IDE hard disk drive to one of the IDE connectors on the motherboard.

POST Message	Action
CPU temperature too high	• Check if the CPU fan is working properly.
CPU fan failed	• Check the CPU fan and make sure it turns on after you apply power to the system. • Make sure that your CPU fan supports the fan speed detection function.
CPU voltage out of range	• Check your power supply and make sure it is not defective. • Call ASUS technical support for assistance. See the "ASUS contact information" on the inside front cover of this user guide.
Computer now booting from operating system	• No action required

You can enable or disable the ASUS POST Reporter™ in the **Speech IC Reporter** item in the BIOS setup. See section 5.4.4 for details.

6.5.3 Winbond Voice Editor

The Winbond Voice Editor software allows you to customize the vocal POST messages. You can install this application from the support CD.

> To avoid conflicts, do not run the Winbond Voice Editor while running the ASUS PC Probe application.

Launching the Voice Editor

You can launch the program from the Windows® desktop by clicking **Start > All Programs > Winbond Voice Editor > Voice Editor**.

The Winbond Voice Editor screen appears.
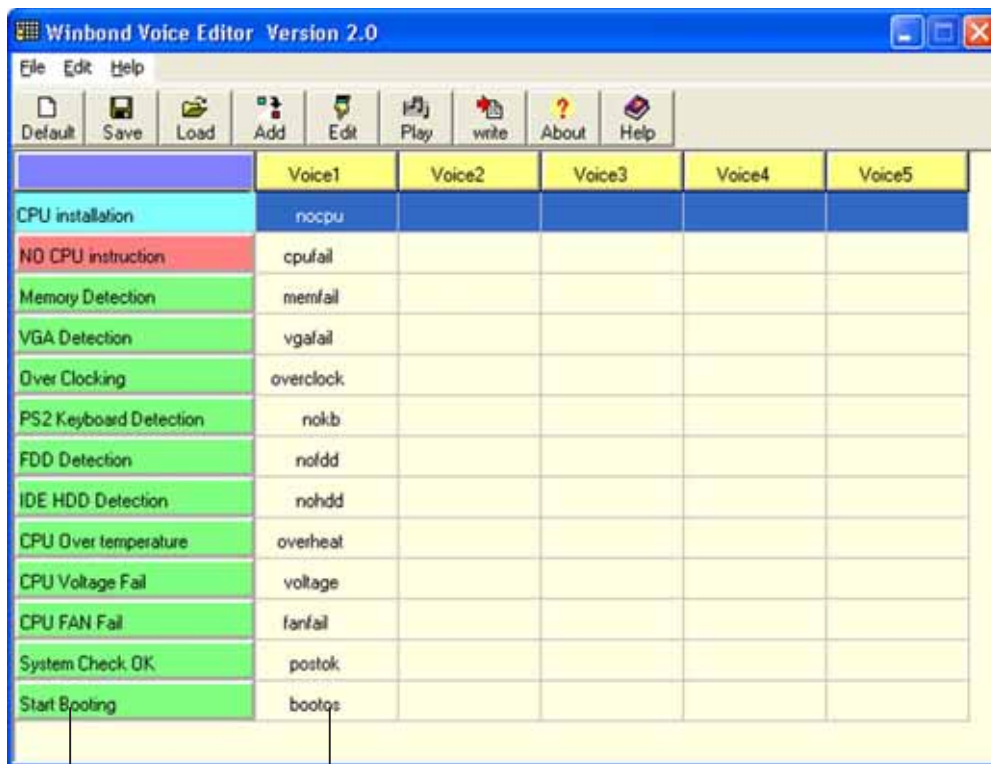
POST Events   Default Messages

Playing the default wave files

To play the default wave files, simply click on a POST event on the left side of the screen, then click the Play button.

> The default language setting is English.

Changing the default language

To change the default language:

1. Click the **Load** button from the Voice Editor main window. A window with the available languages appears.
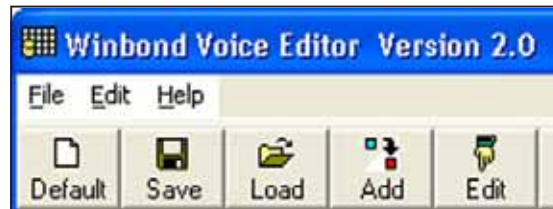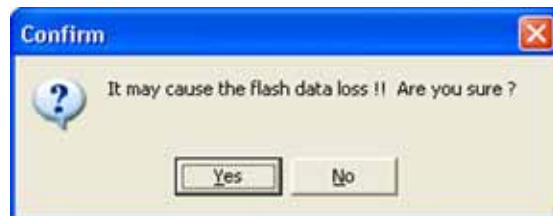
2. Select your desired language, then click **Open**.

    The event messages for the language you selected appear on the Voice Editor main window.
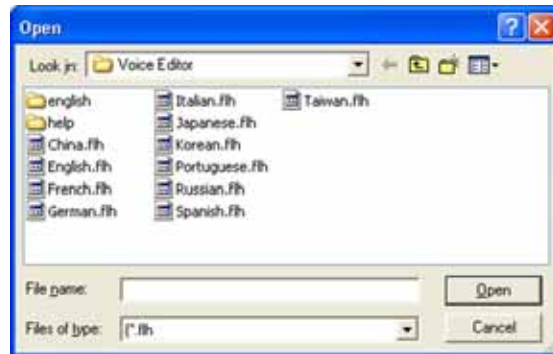
Not all events on some languages have a corresponding message due to file size constraints.

3. Click the **Write** button from the Voice Editor main window to update the EEPROM.

4. Click **Yes** to confirm.

The next time you boot your computer, the ASUS Post Reporter announces the messages in the selected language.

Customizing your POST messages

The Voice Editor application allows you to record your own POST messages if your language is not supported or if you wish to to replace the pre-installed wave files.

To customize your POST messages.

1. Launch the Voice Editor application and note the list of POST events on the leftmost column of the screen.

2. Prepare your message for each event.

3. Use a recording software (e.g. Windows® Recorder) to record your messages, then save the messages as wave files (.WAV).

---

* The total compressed size for all the wave files must not exceed 1Mbit, so keep your messages as short as possible.

* To keep file sizes small, save your files at a low quality. For example, use 8-bit, mono quality at 22Khz sampling rate.

* Create a separate folder for your wave files so you can locate them easily.

---

4. From the Voice Editor screen, click the **Add** button to display the **Add Wave File** window.

5. Copy the wave files that you recorded to the database, then close the window when done.


---
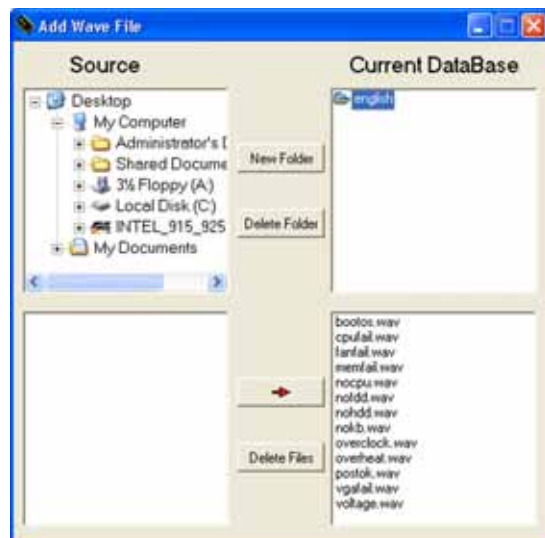
6. Select a POST event on the Voice Editor main window, then click the **Edit** button. The **Event Sound Editor** window appears.

7. Locate and select your wave file for the event, then click on the arrow opposite Voice1. The file you select appears on the space next to it.

8. Click **OK** to return to the Voice Editor main window.

9. Do steps 6 to 8 for the other events.

10. When done, click **Save**. A window appears prompting you to save your configuration.

11. Type a file name with an **.flh** extension, then click Save.
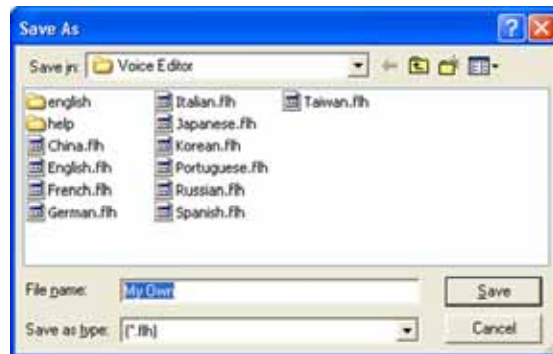
12. Click the **Write** button to compress the file and copy into the EEPROM.

13. Click **Yes** on the confirmation window that appears.
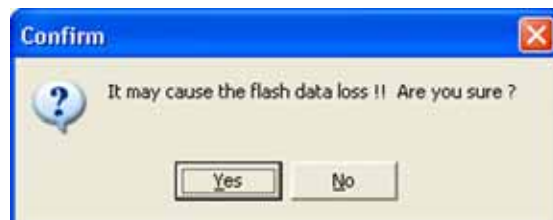
If you receive an error message telling you that the files exceed the total allowable size, do any or all of the following:

•   Shorten your messages.

•   Save the wave files at a lower quality

•   Do not include seldom-used events like FDD Detection, IDE HDD Detection, etc.

Appendix

This appendix contains the power supply specifications and provides a troubleshooting guide for solving common problems when using the barebone server.
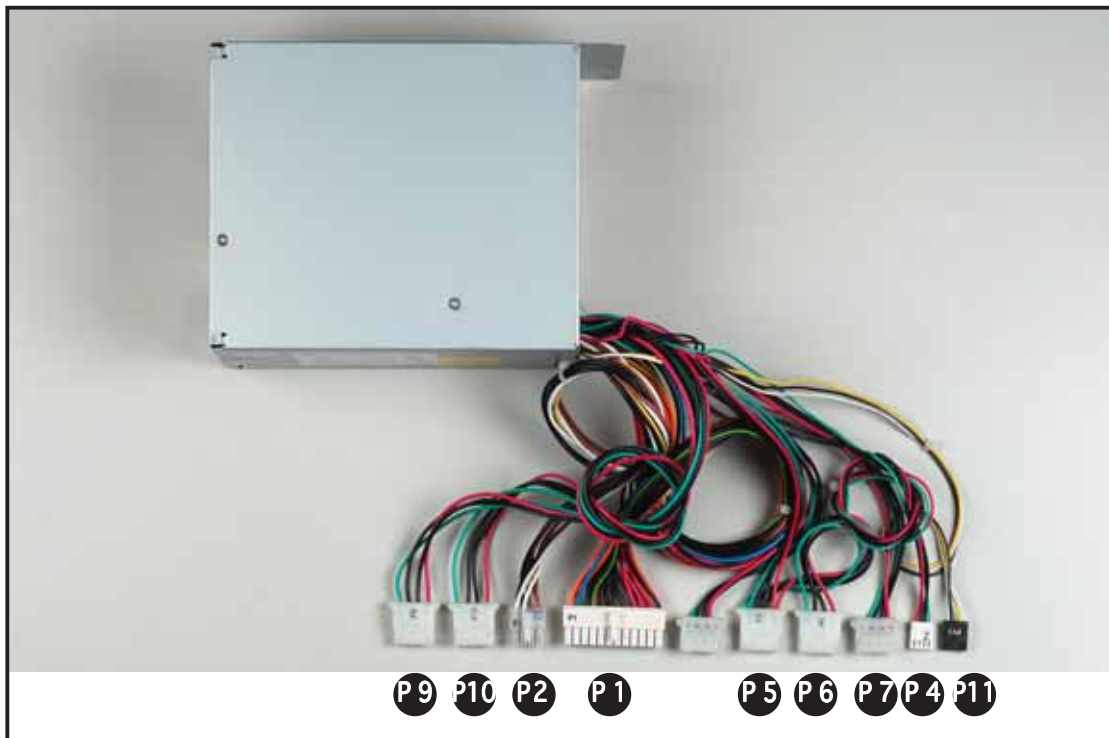
Reference information

ASUS TW510-E2

A.1 600 W single power supply

A.1.1 General description

The 600 W SSI-type single power supply with universal AC input includes PFC and ATX-compliant output cables and connectors. The power supply has nine plugs labeled P1 to P11 (no P3). Take note of the devices to which you should connect the plugs.

P 9	Peripheral device (available); connect this to the second SCSI/SATA backplane
P 10	Peripheral device (available); connect this to the second SCSI/SATA backplane
P 2	Motherboard 8-pin +12V AUX power connector
P 1	Motherboard 24-pin ATX power connector
P 5	Peripheral device (optical drive)
P 6	Peripheral device (available)
P 7	Auxiliary power connector; connect this to the first SCSI/SATA backplane
P 4	Floppy disk drive
P 11	Power SMBus connector

A.1.2 Specifications

Input Characteristics

Input Voltage Range

Normal Range	110 to 127 V ~ 10 A
Auto Range	200 to 240 V ~ 5 A

Input Frequency Range   50 Hz to 60 Hz

DC Output characteristics

Output Voltage	Max (A)
+3.33V	24
+5V	24
+12V	43
-12V	0.5
-5V	0.5
+5VSB	2.0

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.

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