



NCCH-DL

User Guide

Motherboard

E1636

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Notices

Federal Communications Commission Statement

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

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



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

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing 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.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**
This chapter describes the features of the motherboard. It includes brief descriptions of the special attributes of the motherboard and the new technology it supports.
- **Chapter 2: Hardware installation**
This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.
- **Chapter 3: Powering up**
This chapter describes the power up sequence and gives information on the BIOS beep codes.
- **Chapter 4: BIOS setup**
This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.
- **Appendix: Reference information**
This appendix includes additional information that you may refer to when configuring the motherboard.

Conventions used in this guide

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: Information that you **MUST** follow to complete a task.



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

Where to find more information

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

1. ASUS Websites

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

2. Optional Documentation

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

NCH-DL specifications summary

CPU	Support for dual Intel® Xeon™ Processors up to 3.4 GHz with Hyper-Threading Technology 1MB L2 cache (for 800 MHz) 512 KB L2 cache (for 533 MHz)
Chipset	Northbridge: Intel® E82875P Memory Controller Hub (MCH) Southbridge: Intel® 6300ESB I/O Controller Hub (ICH)
Front Side Bus (FSB)	800/533 MHz
Memory	Dual-channel memory architecture 4 x 184-pin DDR DIMM sockets for up to 4GB memory Supports PC3200/PC2700/PC2100 unbuffered ECC or non-ECC DDR DIMMs
Expansion slots	1 x AGP Pro/8X 2 x 3.3V/64-bit/66MHz PCI-X 2 x 5V/32-bit/33MHz PCI
Storage	Supported by Southbridge (6300ESB ICH) - 2 x Ultra DMA/100 connectors - 2 x Serial ATA connectors (support RAID 0/RAID 1) Supported by Promise® PDC20319 controller - 4 x Serial ATA connectors - RAID0, RAID1, or RAID0+1 configurations
LAN	Intel 82547GI Gigabit LAN controller (CSA)
IEEE 1394	TI TSB43AB22A IEEE 1394 controller
Audio	ADI AD1980 AC'97 audio CODEC
Special features	ASUS POST Reporter ASUS Q-Fan technology ASUS EZ Flash BIOS ASUS MyLogo2
Rear panel connectors	1 x PS/2 keyboard port 1 x PS/2 mouse port 1 x Parallel port 2 x Serial ports 4 x USB 2.0 ports 1 x 1394 port 1 x LAN port (RJ-45) Line In/Line Out/Microphone ports

(continued on the next page)

NCCH-DL specifications summary

Internal connectors	Floppy disk drive connector Serial ATA connectors IDE connectors GAME/MIDI connector IEEE 1394 connector Chassis intrusion connector Serial ATA RAID connectors Backplane SMBus connector Power connectors Hard disk activity LED connector Front panel audio connector Internal audio connectors CPU and system fan connectors System panel connector
BIOS features	4Mb Flash ROM, Phoenix-Award BIOS, PnP, DMI2.0, WfM2.0, SM BIOS2.3
Industry standard	PCI 2.2, PCI-X 1.0a, USB 2.0
Manageability	WfM 2.0, DMI 2.0, WOL/WOR by PME, chassis intrusion
Power requirement	SSI-type power supply (with 24-pin and 8-pin power plugs)
Form factor	ATX form factor: 12 in x 9.8 in (30.5cm x 24.9cm)
Support CD contents	Device drivers Management software System utilities ASUS contact information

**Specifications are subject to change without notice.*

Chapter 1

This chapter describes the features of the motherboard. It includes brief explanations of the special attributes of the motherboard and the new technology it supports.

Product introduction

Chapter summary

1.1	Welcome!	1-1
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1.1 Welcome!

Thank you for buying the ASUS® NCCH-DL motherboard!

The ASUS NCCH-DL motherboard delivers a host of new features and latest technologies making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

1.2 Package contents

Check your NCCH-DL package for the following items.

- ✓ ASUS NCCH-DL motherboard
- ✓ ASUS support CD
- ✓ 3-in-1 floppy/Ultra ATA cable
- ✓ 6 x SATA cables
- ✓ 3 x SATA power cables
- ✓ Game port cable
- ✓ S/PDIF Out module with cable
- ✓ 1-port 1394 module
- ✓ I/O shield
- ✓ Bag of extra jumper caps
- ✓ CPU heatsink support kit
- ✓ User guide



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

1.3 Special features

1.3.1 Product highlights

Latest processor technology



The motherboard supports dual Intel® Xeon™ Processors via 604-pin surface mount ZIF sockets. The processor has 1MB L2 cache, includes an 800/533 MHz system bus, and features the Intel Hyper-Threading Technology that allows up to 3.4+ GHz core frequencies.

Dual-channel DDR400 memory support



Employing the dual-channel DDR memory architecture, the motherboard provides a solution that doubles the system memory bandwidth to boost system performance. The motherboard supports up to 4 GB of system memory using PC3200/PC2700/PC2100 ECC or non-ECC DDR DIMMs to deliver up to 6.4 GB/s data transfer rate for the latest 3D graphics, multimedia, and Internet applications.

Serial ATA technology



The motherboard supports the new Serial ATA technology through the SATA interfaces and the Intel® 6300ESB ICH and Promise® PDC20319 controllers onboard. The SATA specification allows for thinner, more flexible cables with lower pin count, reduced voltage requirement, and up to 150MB/s data transfer rate.

Multi-RAID solution



The motherboard has the Promise® PDC20319 controller to support multi-RAID solution using Serial ATA/150 hard disks. The RAID0 (striping), RAID1 (mirroring), and RAID 0+1 provide a cost-effective high-performance solution for added system performance and reliability.

USB 2.0 technology



The motherboard implements the Universal Serial Bus (USB) 2.0 specification, dramatically increasing the connection speed from the 12 Mbps bandwidth on USB 1.1 to a fast 480 Mbps on USB 2.0. USB 2.0 is backward compatible with USB 1.1.

Gigabit LAN solution



The Intel® 82547GI Gigabit Ethernet controller allows full-duplex Gigabit performance on LAN on Motherboard (LOM) applications through the Communication Streaming Architecture (CSA). Instead of connecting to the PCI bus, the controller connects to the dedicated CSA bus on the Memory Controller Hub (MCH) thus reducing the PCI bottlenecks by freeing the PCI bus for other I/O operations.

AGP 8X support



The motherboard supports the latest graphic architecture, the AGP Pro/8X interface (a.k.a. AGP 3.0), offering 2.1GB/s bandwidth which is twice that of its predecessor AGP 4X.

IEEE 1394 support



The IEEE 1394 interfaces and the TI TSB43AB22A controller onboard provide high-speed and flexible PC connectivity to a wide range of peripherals and devices compliant to IEEE 1394a standards. The IEEE 1394 allows up to 400Mbps transfer rates through simple, low-cost, high-bandwidth asynchronous (real-time) data interfacing between computers, peripherals, and consumer electronic devices such as camcorders, VCRs, printers, TVs, and digital cameras.

6-channel audio feature



The SoundMAX-class ADI AD1980 AC '97 audio CODEC supports 6-channel 5.1 surround sound output, stereo microphone input, variable Sample Rate Conversion (SRC), professional quality 103-dB out put with 94-dB Signal Noise Ratio (SNR), and analog enumeration capability. The SoundMAX 4 XL software features the AudioESP™ (Audio Enumeration and Sensing Process) that allows intelligent detection of the peripherals plugged into the audio ports and identifies the incompatible devices, if any.

ASUS POST Reporter™



The motherboard offers a new exciting feature called the ASUS POST Reporter™ to provide friendly voice messages and alerts during the Power-On Self-Tests (POST) informing you of the system boot status and causes of boot errors, if any. The bundled Winbond Voice Editor software lets you customize the voice messages in the supported languages.

ASUS Q-Fan technology



The ASUS Q-Fan technology smartly adjusts the fan speeds according to the system loading to ensure quiet, cool, and efficient operation.

ASUS EZ Flash BIOS



With the ASUS EZ Flash, you can easily update the system BIOS even before loading the operating system. No need to use a DOS-based utility or boot from a floppy disk.

ASUS MyLogo2™



This new feature present in the motherboard allows you to personalize and add style to your system with customizable boot logos. The ASUS MyLogo2 is automatically installed when you install ASUS Update from the support CD.

1.3.2 Value-added solutions

Temperature, fan, and voltage monitoring

The CPU temperature is monitored by the Hardware monitor (Winbond H/W monitoring IC W83792D) to prevent overheating and damage. The system fan rotations per minute (RPM) is monitored for timely failure detection. The system voltage levels are monitored to ensure stable supply of current for critical components.

ACPI ready

The Advanced Configuration power Interface (ACPI) provides more energy saving features for operating systems that support OS Directed Power Management (OSPM).

Chassis intrusion detection

The motherboard supports chassis intrusion monitoring through the Winbond ASIC.

ASUS Update

This utility allows you to update the motherboard BIOS through a user-friendly interface. Connect to the Internet then to the ASUS FTP site nearest you to obtain the latest BIOS version for your motherboard.

Chapter 2

This chapter describes the hardware setup procedures that you have to perform when installing system components. It includes details on the switches, jumpers, and connectors on the motherboard.

Hardware information

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2.1 Before you proceed

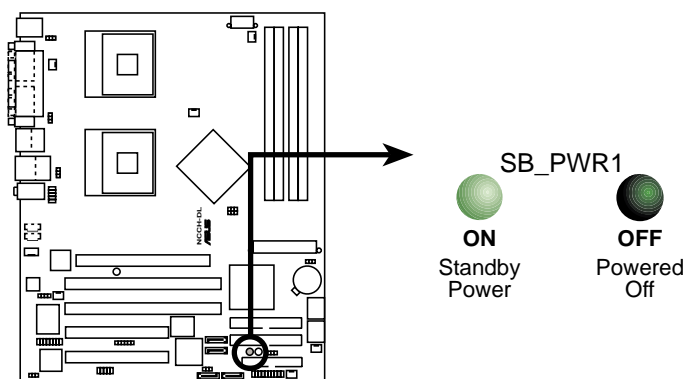
Take note of the following precautions before you install motherboard components or change any motherboard settings.



1. Unplug the power cord from the wall socket before touching any component.
2. Use a grounded wrist strap or touch a safely grounded object or to a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.
3. Hold components by the edges to avoid touching the ICs on them.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
5. **Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply.** Failure to do so may cause severe damage to the motherboard, peripherals, and/or components!
6. Pay careful attention to the warning LEDs on the motherboard to protect the motherboard and to ensure correct installation of components.

Standby power LED

The motherboard comes with a standby power LED. This green LED (SB_PWR1) lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component.



NCCH-DL Standby power LED

AGP warning LED

This LED (WARN1) is a smart protection from motherboard burn out caused by an incorrect AGP card. If you plug in any 3.3V AGP card into the 1.5V AGP slot, this LED lights up thus preventing the system to power up. This LED remains off if you plug in a 1.5V AGP card.

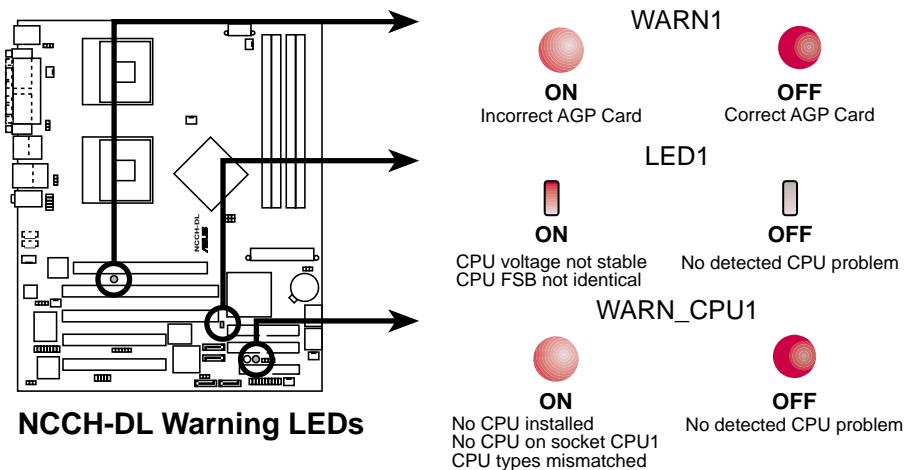
CPU FSB/voltage LED

This LED (LED1) lights up if you installed two CPUs with different front side bus (FSB), or if the CPU voltage is not stable.

CPU warning LED

This red LED (WARN_CPU1) lights up if:

- there is no installed CPU on either one of the sockets
- you installed a CPU on socket CPU2, but not on socket CPU1
(if installing only one CPU, you must install on socket CPU1)
- you installed CPUs of different types, e.g. an Intel® Xeon™ processor with 800 MHz FSB and an Intel® Xeon™ processor with 533 MHz FSB
(install identical CPUs, either two Intel® Xeon™ processors with 800 MHz FSB, or two Intel® Xeon™ processors with 533 MHz FSB)



2.2 Motherboard installation

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.



Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause you physical injury and damage motherboard components.

2.2.1 Placement direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

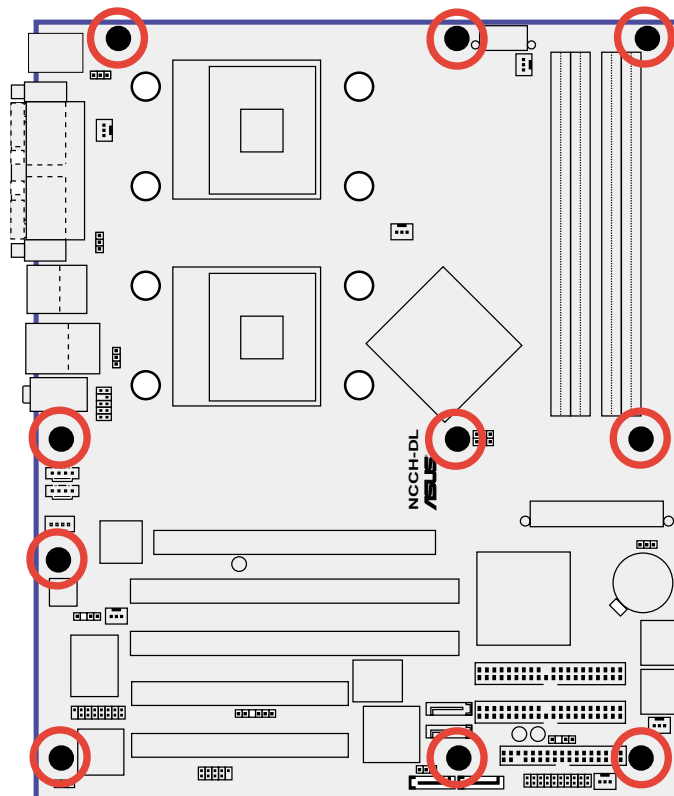
2.2.2 Screw holes

Place ten (10) screws into the holes indicated by solid black circles to secure the motherboard to the chassis.



Do not overtighten the screws! Doing so may damage the motherboard.

Place this side towards
the rear of the chassis



2.2.3 Support plates for motherboard

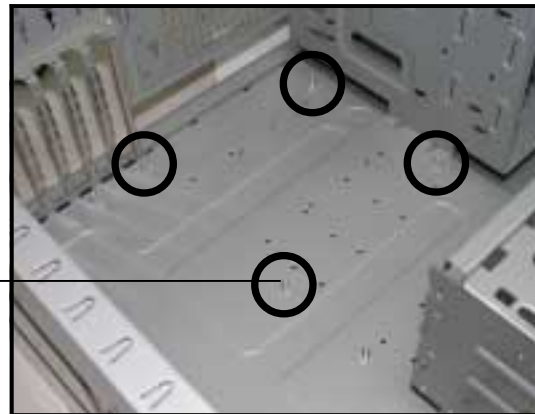
For additional protection from motherboard breakage due to the weight of the CPU heatsinks, your motherboard package comes with a CPU heatsink support kit that consists of:

- 2 x metal support plates
- 1 x contour sheet
- 3 different sets of metal nuts and rubber pads for varied chassis standoffs (each set contains 8 metal nuts and 2 rubber pads)

To install the support plates:

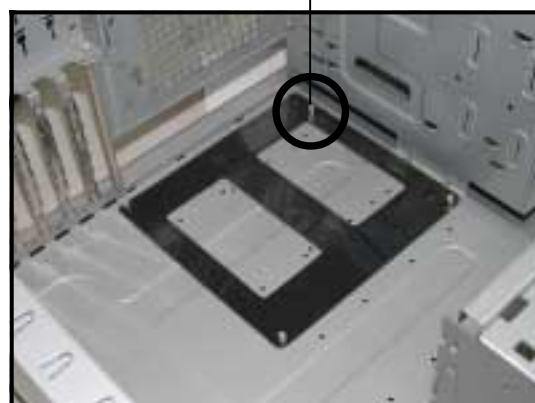
1. Open and lay your system chassis flat on a stable surface, then place the motherboard standoffs on the holes as shown.

Standoff



2. Align the holes of the contour sheet with the standoffs on the base of the chassis. Press the sheet flat making sure that it is completely affixed to the chassis.

Standoff beside
power supply cage



The contour sheet fits in only one orientation. Make sure that the hole located about 1 cm from the corner matches the standoff beside the power supply cage.

3. Determine the height of the standoffs on your chassis, and select the appropriate set of metal nuts and rubber pads from your package.



Use a nut size that is slightly lower than the standoffs on your chassis.

4. Use a plier to attach four nuts to the bolts on the metal support plate.



5. Align a rubber pad to the rectangular mark on the center of the plate, then press to attach.



6. Remove the adhesive label underneath a plate.

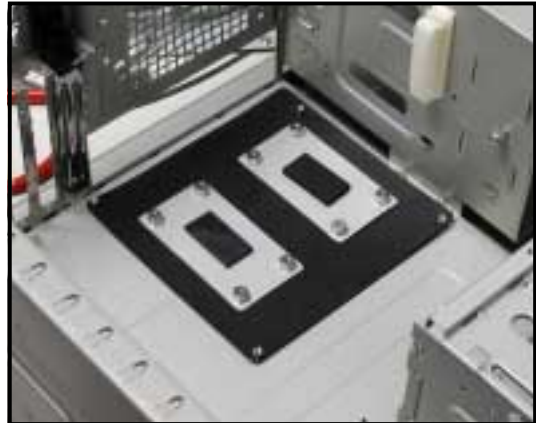


7. Carefully align and place the plate on a rectangular cut on the contour sheet.



Make sure that the metal support plates fit perfectly to the rectangular cuts on the contour sheet; otherwise, the CPU heatsink screws would not align to the metal nuts.

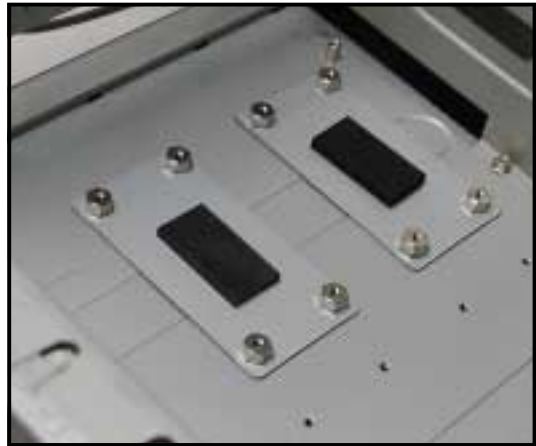
8. Repeat steps 4 and 7 to prepare and install the second plate.



8. Remove the contour sheet from the chassis.

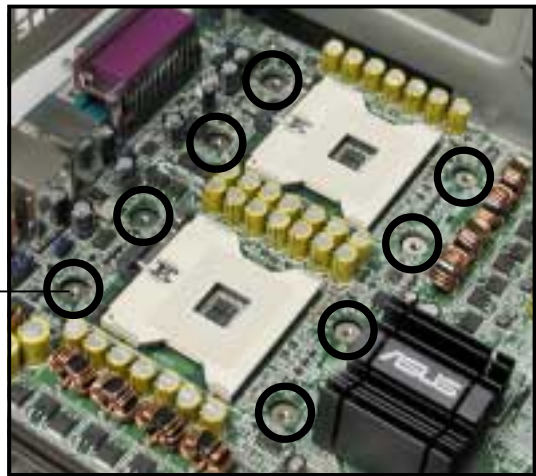


The support plates appear as shown when installed.



9. Install the motherboard with the external I/O ports toward the chassis rear panel. The CPU sockets should be right on top of the support plates.

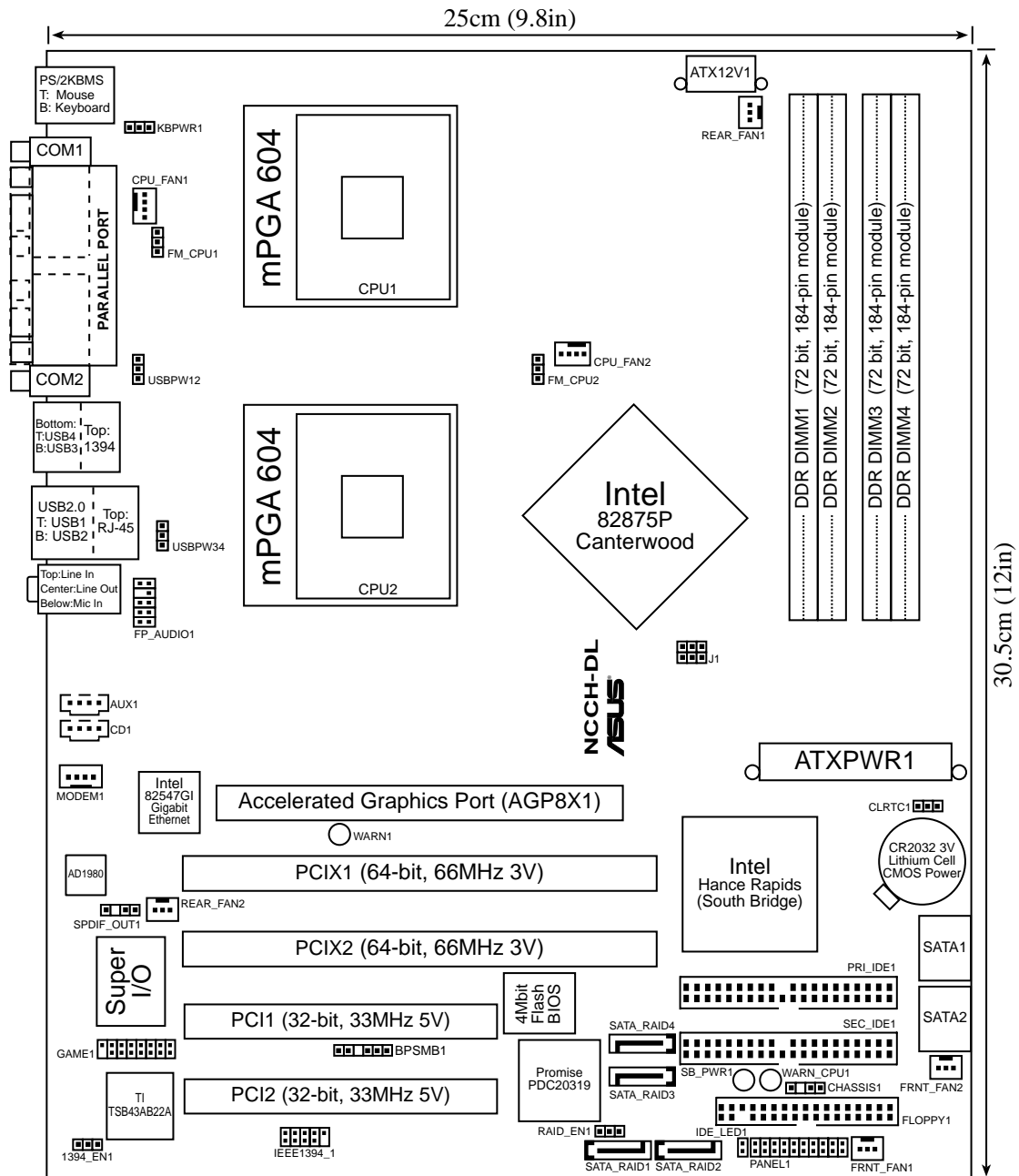
Heatsink hole matched to a nut on the support plate



Make sure that the CPU heatsink holes on the motherboard perfectly match the metal nuts on the support plates; otherwise, you can not install the CPU heatsinks properly.

10. Secure the motherboard with 10 screws. Refer to section “2.2.2 Screw holes” for illustration.

2.2.4 Motherboard layout



2.2.5 Layout contents

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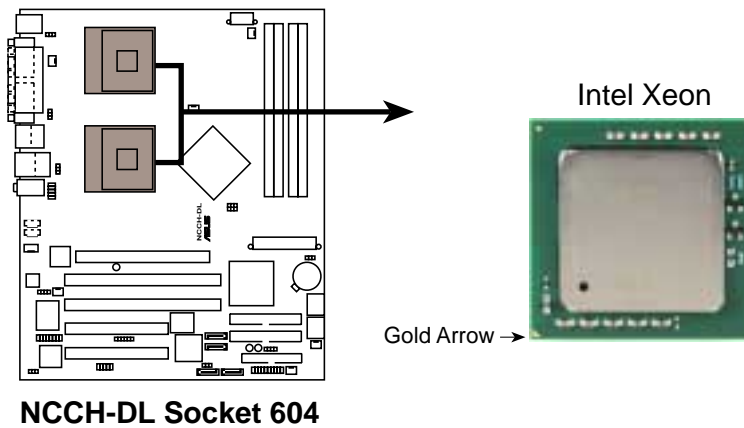
Internal connectors *(continued)*

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2.3 Central Processing Unit (CPU)

2.3.1 Overview

The motherboard comes with dual surface mount 604-pin Zero Insertion Force (ZIF) sockets. The sockets are designed for the Intel® Xeon™ Processor in the 604-pin package.

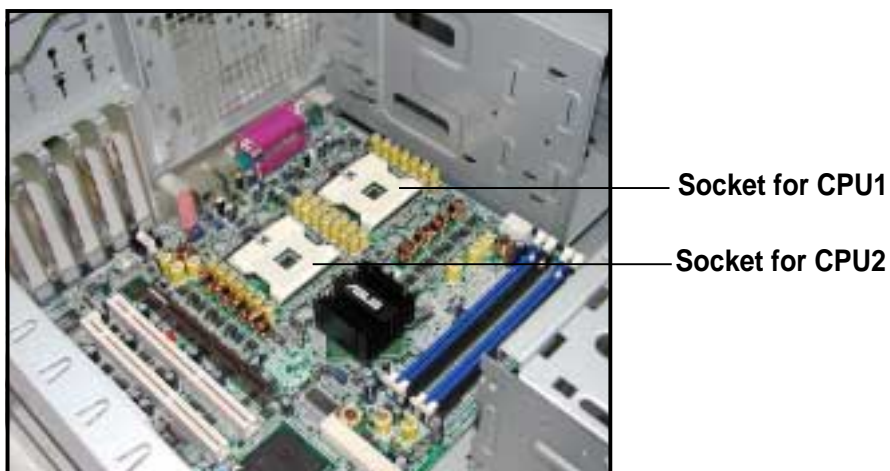


2.3.2 Installing the CPU

Note in the above illustration that the CPU has a gold triangular mark on one corner. This mark indicates the processor Pin 1 that should match a specific corner of the CPU socket.



If installing only one CPU, use the socket CPU1.





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

Follow these steps to install a CPU.

1. Locate the 604-pin ZIF sockets on the motherboard. Flip up the socket lever and push it all the way to the other side.



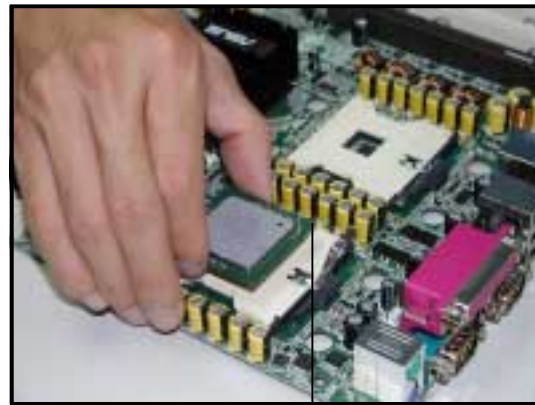
Make sure that the socket lever is pushed back all the way, otherwise the CPU does not fit in completely.



2. Position the CPU above the socket as shown.
3. Carefully insert the CPU into the socket until it fits in place.



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



Marked corner
(gold arrow)

4. Carefully push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.
5. Apply the thermal interface material (thermal grease) to the top of the CPU. This thermal grease should come with the CPU package.
6. Repeat steps 1 to 5 if you wish to install a second CPU.



2.3.3 Installing the CPU heatsink and fan

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

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

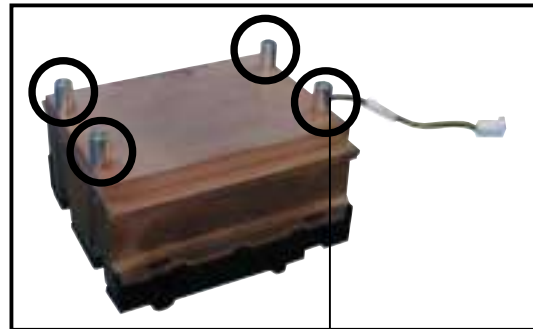


1. Make sure that you have applied the thermal grease to the top of the CPU before installing the heatsink and fan.
2. Refer to the installation manual that came with the CPU package for details on heatsink/fan assembly and installation.

CPU heatsink (top view)



CPU heatsink (bottom view)



Heatsink screw



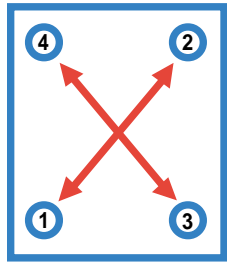
Before installing the CPU heatsinks, ensure that the jumpers FM_CPU1 and FM_CPU2 are set correctly depending on the pin definition of your CPU fan cables. Refer to page 2-24 for information on these jumpers.

To install the CPU heatsink and fan:

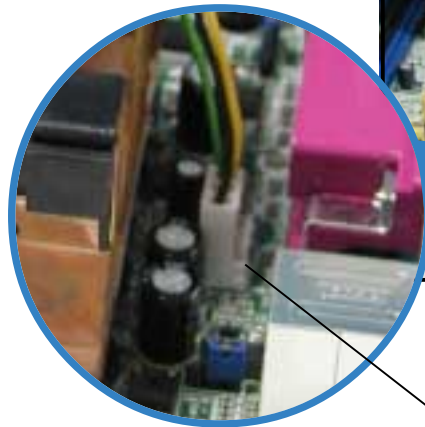
1. Place the heatsink on top of the installed CPU, making sure that the four screws on the heatsink align with the nuts on the support plate.



2. Use a Phillips screwdriver to tighten the four heatsink screws in a diagonal sequence.



3. Connect the fan cable to the 4-pin connector labeled CPU_FAN1.



CPU1 fan connector
(CPU_FAN1)

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



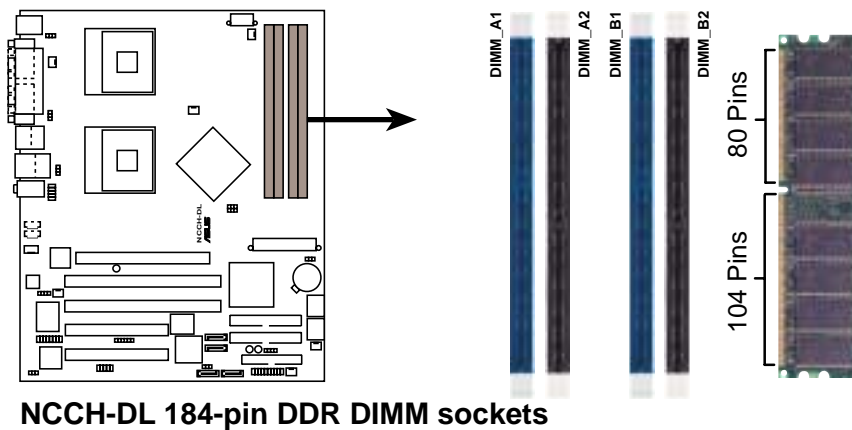
CPU2 fan connector
(CPU_FAN2)

2.4 System memory

2.4.1 Overview

The motherboard comes with four Double Data Rate (DDR) Dual Inline Memory Module (DIMM) sockets.

The following figure illustrates the location of the DDR DIMM sockets.



2.4.2 Memory configurations

You may install unbuffered ECC or non-ECC 64MB, 128MB, 256MB, 512MB, and 1GB DDR DIMMs into the DIMM sockets using the recommended memory configurations.

Important notes



1. Installing DDR DIMMs other than the recommended configurations may cause memory sizing error or system boot failure. Use any of the recommended configurations in Table 1.
2. In dual-channel configurations, install only **identical** (the same type and size) DDR DIMM pairs for each channel.
3. Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
4. Make sure that the memory frequency matches the CPU FSB (Front Side Bus). Refer to Table 2.
5. DIMMs installed into **any three** sockets will function in single-channel mode.
6. When all four sockets are populated with 1GB DIMMs (total 4GB), the system may detect only about 3.6+ GB (less than 4 GB) due to resource allocation of onboard devices.

Table 1 Recommended memory configurations

Mode		Sockets			
		DIMM_A1 (blue)	DIMM_A2 (black)	DIMM_B1 (blue)	DIMM_B2 (black)
Single-channel	(1)	Populated	—	—	—
	(2)	—	Populated	—	—
	(3)	—	—	Populated	—
	(4)	—	—	—	Populated
Dual-channel	(1)	Populated	—	Populated	—
	(2)	—	Populated	—	Populated
	(3)*	Populated	Populated	Populated	Populated

* For dual-channel configuration (3), you may:

- install identical DIMMs in all four sockets
- or
- install identical DIMM pair in DIMM_A1 and DIMM_B1 (blue sockets) and identical DIMM pair in DIMM_A2 and DIMM_B2 (black sockets)

Table 2 Memory frequency/CPU FSB synchronization

CPU FSB	DDR DIMM Type	Memory Frequency
800 MHz	PC3200	400 MHz
533 MHz	PC2700	333 MHz
400 MHz	PC2100	266 MHz



Obtain DDR DIMMs only from ASUS qualified vendors for better system performance. Visit the ASUS website (www.asus.com) for the latest QVL.

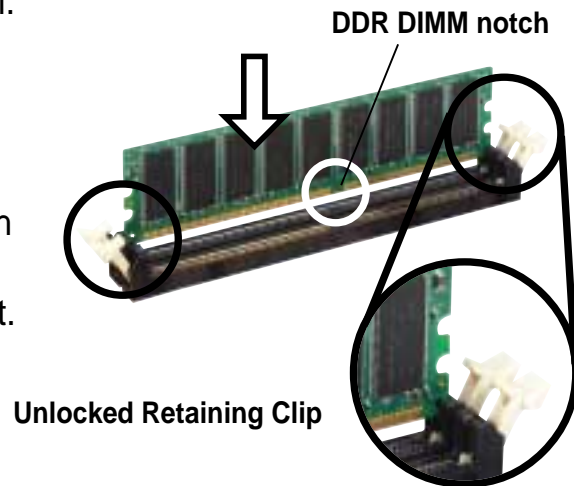
2.4.3 Installing a DIMM



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.

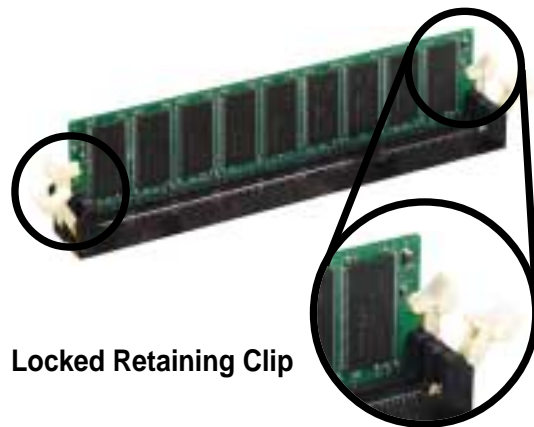
Follow these steps to install a DIMM.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.



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.

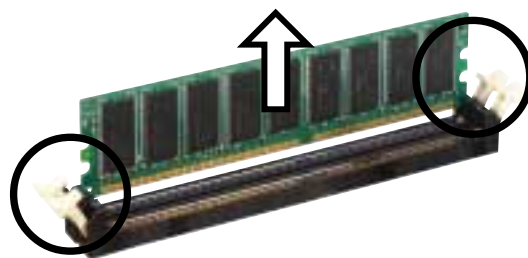
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



2.4.4 Removing a DIMM

Follow these steps to remove a DIMM.

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



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

2. Remove the DIMM from the socket.

2.5 Expansion slots

In the future, you may need to install expansion cards. The motherboard has two 64-bit PCI-X slots, two 32-bit PCI slots, and an AGP slot. The following sub-sections describe the slots and the expansion cards that they support.



Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

2.5.1 Installing an expansion card

Follow these steps to install an expansion card.

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

2.5.2 Configuring an expansion card

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

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 4 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

Standard interrupt assignments

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

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

IRQ assignments for this motherboard

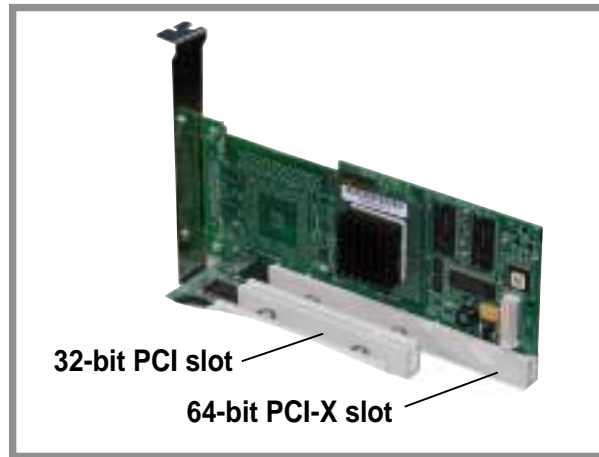
	INTA#	INTB#	INTC#	INTD#
PCI slot 1	IRQF#	IRQG#	IRQH#	IRQE#
PCI slot 2	IRQG#	IRQH#	IRQE#	IRQF#
PCI-X slot 1	P1_IRQ0#	P1_IRQ1#	P1_IRQ2#	P1_IRQ3#
PCI-X slot 2	P1_IRQ1#	P1_IRQ2#	P1_IRQ3#	P1_IRQ0#
AGP Pro/8x slot	INTA#	INTB#	—	—
Onbd. USB controller #1	IRQ_A#	—	—	—
Onbd. USB controller #2	IRQ_D#	—	—	—
Onbd. USB 2.0 controller	IRQ_H#	—	—	—
Onbd. LAN controller (Intel 82547GI)	IRQ_F#	—	—	—
Onbd. RAID controller (Promise PDC20319)	IRQ_H#	—	—	—
Onbd. IDE controller	IRQ_C#	—	—	—
Onbd. SATA controller (6300ESB ICH)	IRQ_C#	—	—	—
Onbd. 1394 controller (TSB43AB22A)	IRQ_E#	—	—	—
Onbd. audio controller (AD1980)	IRQ_B#	—	—	—



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

2.5.3 PCI/PCI-X slots

The PCI and PCI-X slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI/PCI-X specifications.



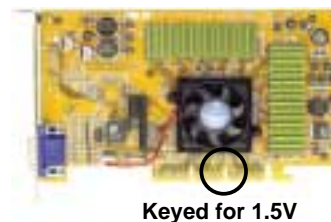
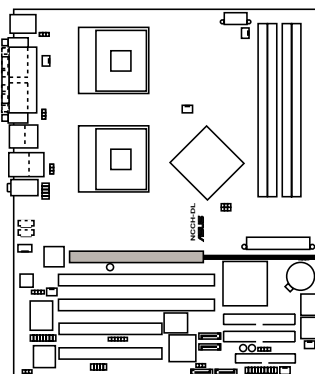
When installing long PCI cards, it is recommended that you install them in PCI_X slot 1 or PCI-X slot 2. Long PCI cards installed in PCI slots 1 and 2 may interfere with the SATA connectors.

2.5.4 AGP Pro slot

This motherboard has an Accelerated Graphics Port (AGP) Pro slot that supports AGP 8X (+0.8V) cards and AGP 4X (+1.5V) cards. When you buy an AGP card, make sure that you ask for one with +0.8V or +1.5V specification. Note the notches on the card golden fingers to ensure that they fit the AGP slot on your motherboard.



Install only +0.8V or +1.5V AGP cards. This motherboard does not support 3.3V AGP cards. The WARN1 LED lights up if you installed an incorrect AGP card. Refer to page 2-2 for the LED location.

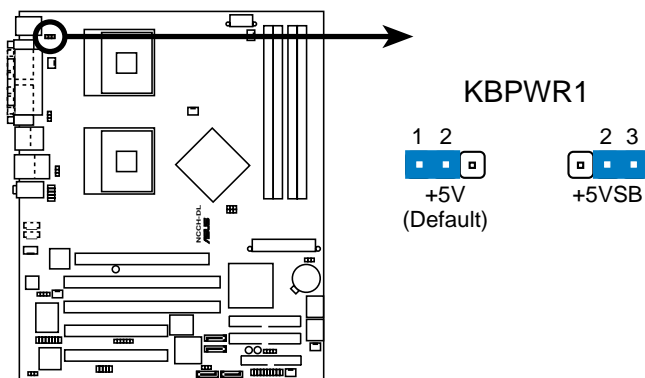


NCCH-DL Accelerated Graphics Port (AGP)

2.6 Jumpers

1. Keyboard power (3-pin KBPWR1)

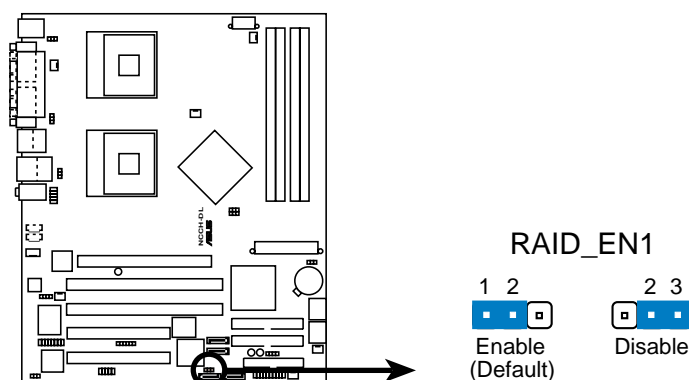
This jumper allows you to enable (pins 2-3) or disable (pins 1-2) the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) if you wish to wake up the computer when you press a key on the keyboard. This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS. Refer to Chapter 4 for information.



NCCH-DL Keyboard power setting

2. RAID controller setting (3-pin RAID_EN1)

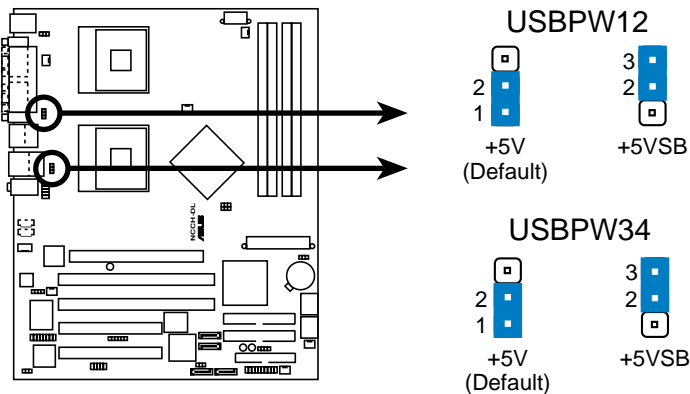
This jumper allows you enable or disable the Promise® PDC20319 RAID controller.



NCCH-DL RAID controller setting

3. USB device wake-up (3-pin USBPW12, USBPW34)

Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).



NCCH-DL USB device wake up



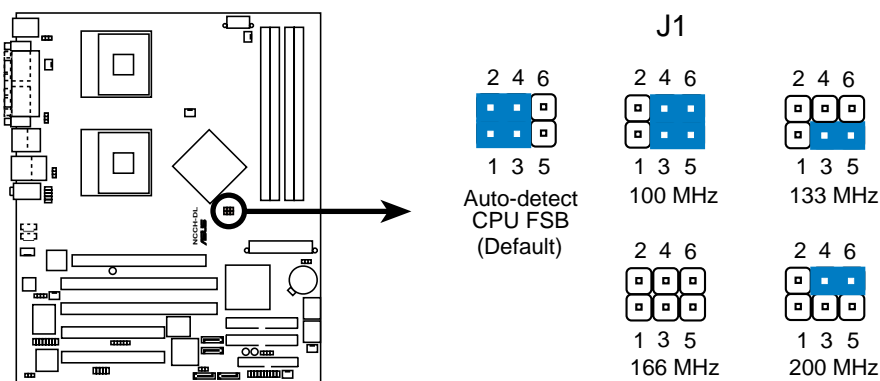
1. The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port. Otherwise, the system would not power up.
2. The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

4. CPU external frequency selection (6-pin J1)

This jumper allows you to select the CPU external frequency (or bus clock).



To ensure system stability, it is recommended that you keep the default setting.



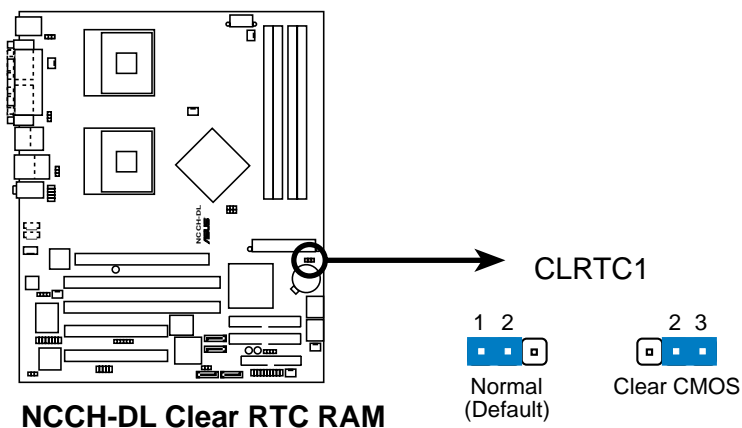
NCCH-DL CPU external frequency selection

5. Clear RTC RAM (3-pin CLRTC1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. The RAM data in CMOS, that include system setup information such as system date, time, and system setup parameters, and passwords, is powered by the onboard button cell battery.

To erase the RTC RAM:

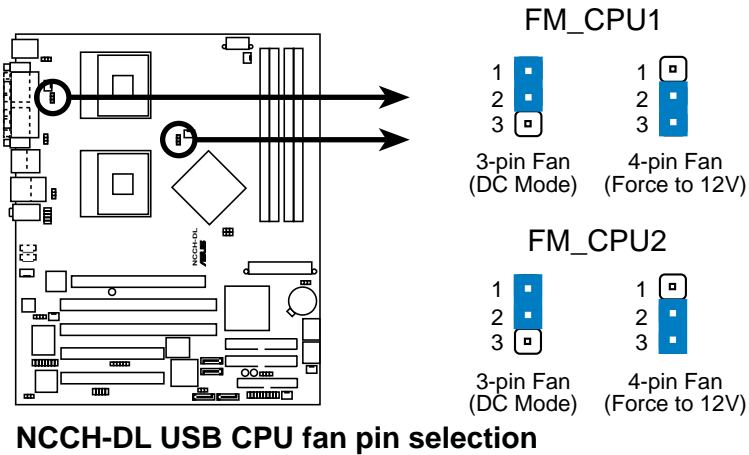
1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.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



Except when clearing the RTC RAM, never remove the cap on CLRTC1 jumper default position. Removing the cap will cause system boot failure!

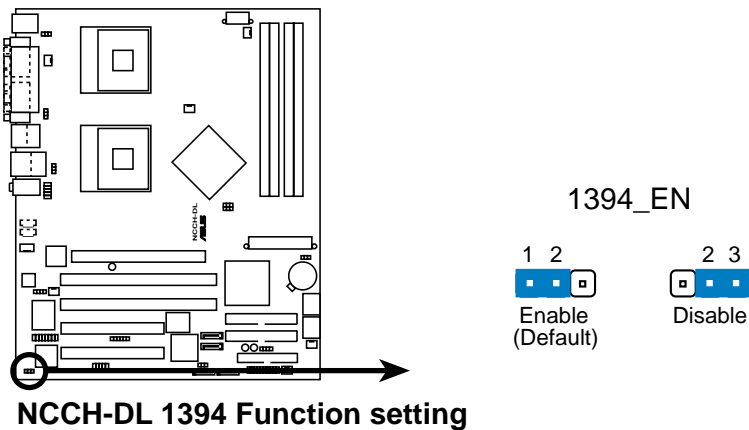
6. CPU fan pin selection (3-pin FM_CPU1, FM_CPU2)

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



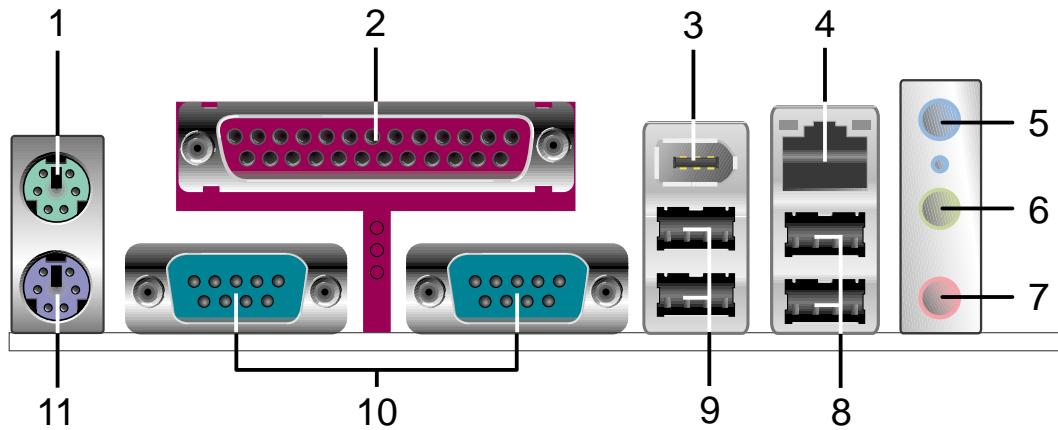
7. IEEE 1394 setting (3-pin 1394_EN)

These jumpers allow you to enable or disable the onboard IEEE 1394 controller. Set to pins 1-2 to activate the 1394 feature.



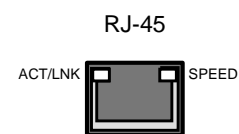
2.7 Connectors

2.7.1 Rear panel connectors



- 1. PS/2 mouse port.** This green 6-pin connector is for a PS/2 mouse.
- 2. Parallel port.** This 25-pin port connects a parallel printer, a scanner, or other devices.
- 3. IEEE 1394 port.** This port connects IEEE 1394-compliant devices like camcorders, VCRs, printers, or digital cameras.
- 4. LAN port (RJ-45).** This Gigabit LAN port (controlled by Intel 82547GI) allows connection to a Local Area Network (LAN) via a network hub.

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



- 5. Line In port.** This Line In (light blue) port connects a tape player or other audio sources. In 6-channel mode, the function of this port becomes Rear Speaker Out.
- 6. Line Out port.** This Line Out (lime) port connects a headphone or a speaker. In 6-channel mode, the function of this port becomes Front Speaker Out.
- 7. Microphone port.** This Mic (pink) port connects a microphone. In 6-channel mode, the function of this port becomes Bass/Center.

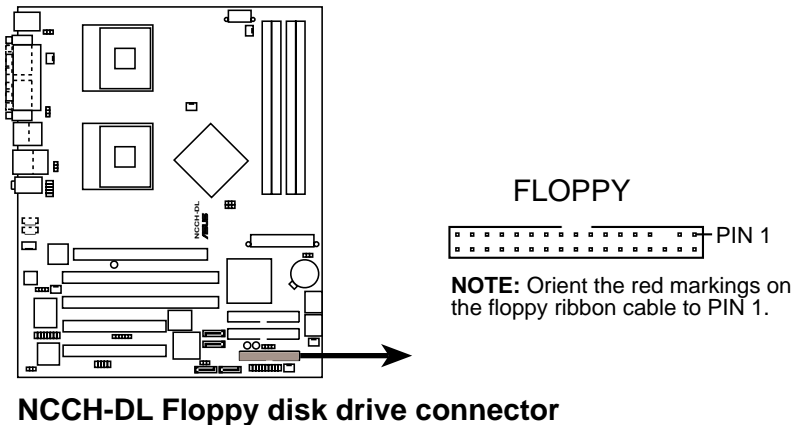
Port	Headset/		
	2-channel	4-channel	6-channel
Light blue	Line In	Rear Speaker Out	Rear Speaker Out
Lime	Line Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Bass/Center

8. **USB 2.0 ports 3 and 4.** These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
9. **USB 2.0 ports 1 and 2.** These 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
10. **Serial ports.** These 9-pin communication ports (COM1/COM2) are for pointing devices or other serial devices.
11. **PS/2 keyboard port.** This purple connector is for a PS/2 keyboard.

2.7.2 Internal connectors

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

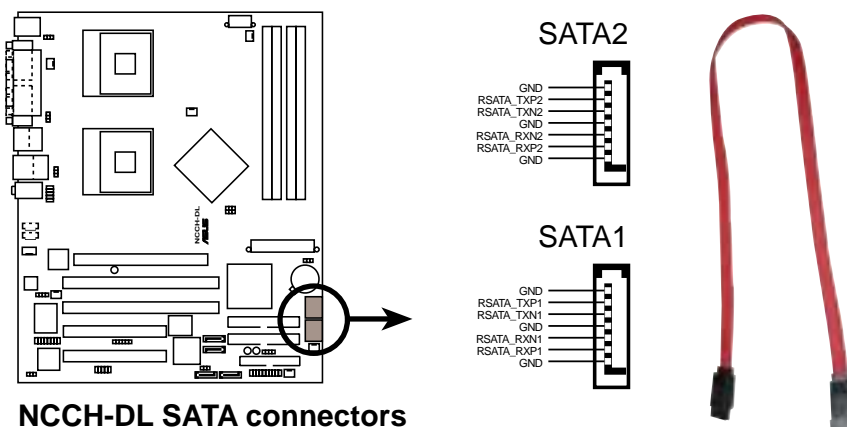
This connector supports the provided floppy drive ribbon cable. After connecting one end to the motherboard, connect the other end to the floppy drive.



2. Serial ATA connectors (7-pin SATA1, SATA2)

These next generation connectors support the thin Serial ATA cables for Serial ATA hard disks. The current Serial ATA interface allows up to 150 MB/s data transfer rate, faster than the standard parallel ATA with 133 MB/s (Ultra ATA/133).

If you installed Serial ATA hard disks, you may create a RAID 0/RAID 1 configuration using the RAID feature of the Intel® 6300ESB ICH. Refer to page 4-19 for the SATA configuration.

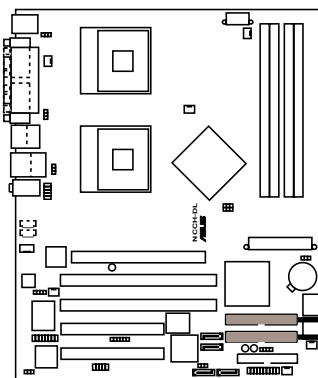


3. IDE connectors (40-1 pin PRI_IDE[blue], SEC_IDE [white])

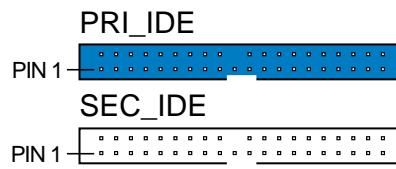
This connector supports the provided UltraDMA/100/66 IDE hard disk ribbon cable. Connect the cable's blue connector to the primary (recommended) or secondary IDE connector, then connect the gray connector to the UltraDMA/100/66 slave device (hard disk drive) and the black connector to the UltraDMA/100/66 master device.



- Refer to the hard disk drive label or documentation when setting the device as master or slave.
- Pin 20 on each IDE connector is removed to match the covered hole on the UltraDMA cable connector. This prevents incorrect orientation when you connect the cables.



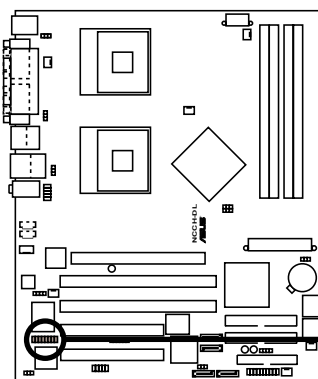
NCCH-DL IDE connectors



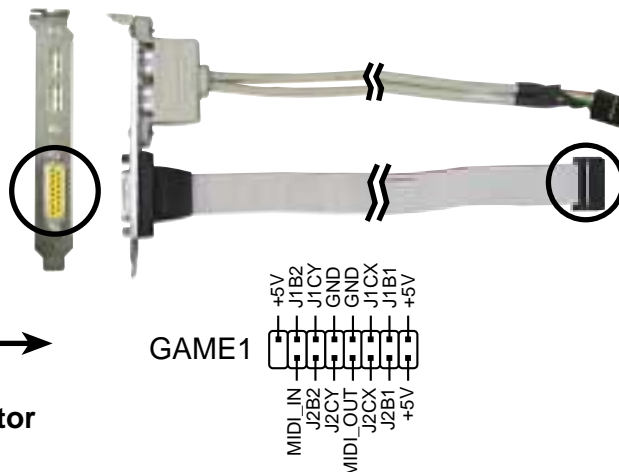
NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to pin 1.

4. GAME/MIDI connector (16-1 pin GAME1)

This connector supports a GAME/MIDI module. Connect the GAME/MIDI cable to this connector. The GAME/MIDI port on the module connects a joystick or a game pad for playing games, and MIDI devices for playing or editing audio files.

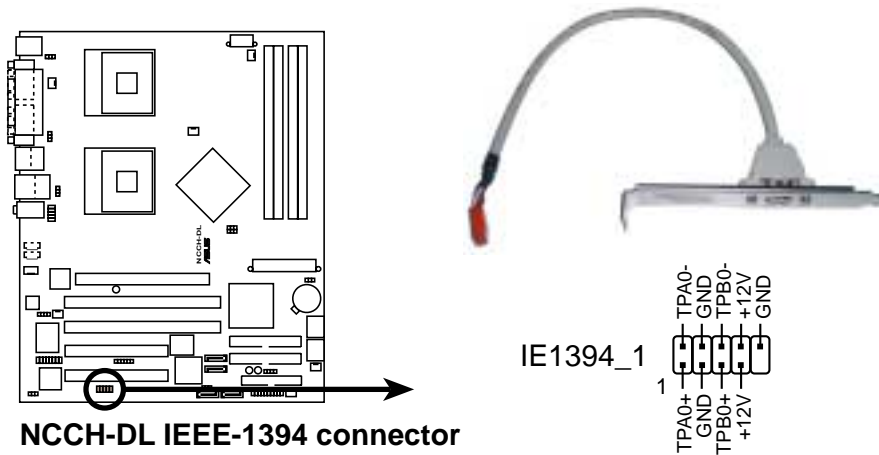


NCCH-DL Game connector



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

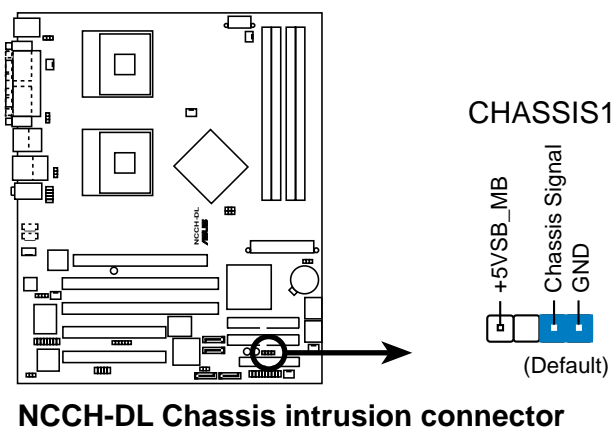
This connector is for a 1394 module. Attach the 10-1 pin 1394 cable plug from the module to this connector. You may also connect a 1394-compliant internal hard disk to this connector.



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

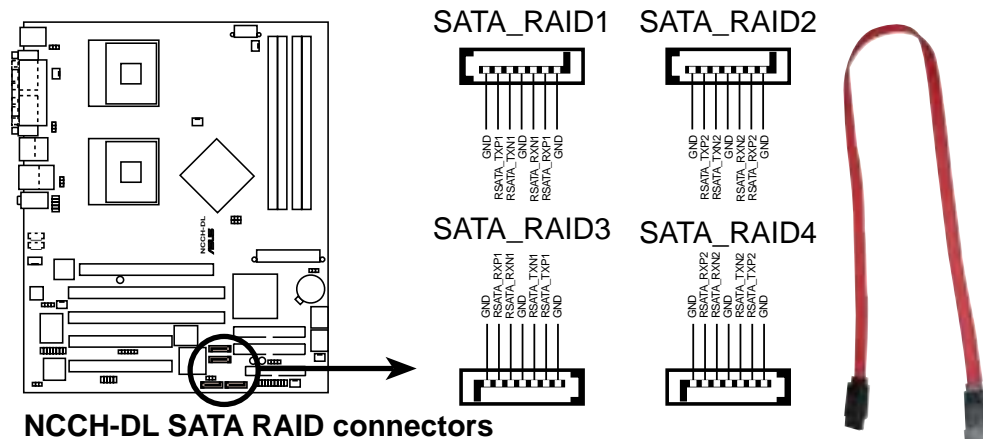
This lead is for a chassis designed with intrusion detection feature. This requires an external detection mechanism such as a chassis intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to this lead to record a chassis intrusion event.

By default, the pins labeled “Chassis Signal” and “Ground” are shorted with a jumper cap. If you wish to use the chassis intrusion detection feature, remove the jumper cap from the pins.



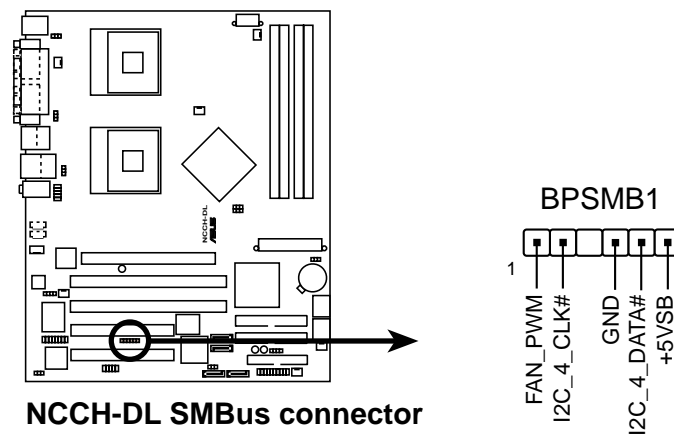
7. Serial ATA RAID connectors (7-pin SATA_RAID1, SATA_RAID2)

These Serial ATA connectors support SATA hard disks that you may configure as a RAID set. Through the onboard Promise® PDC20319 RAID controller, you may create a RAID0, RAID1, or RAID0+1 configuration. Configure the onboard device and SATA items in BIOS to use the RAID feature. Refer to page 4-17 for information.



8. 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.

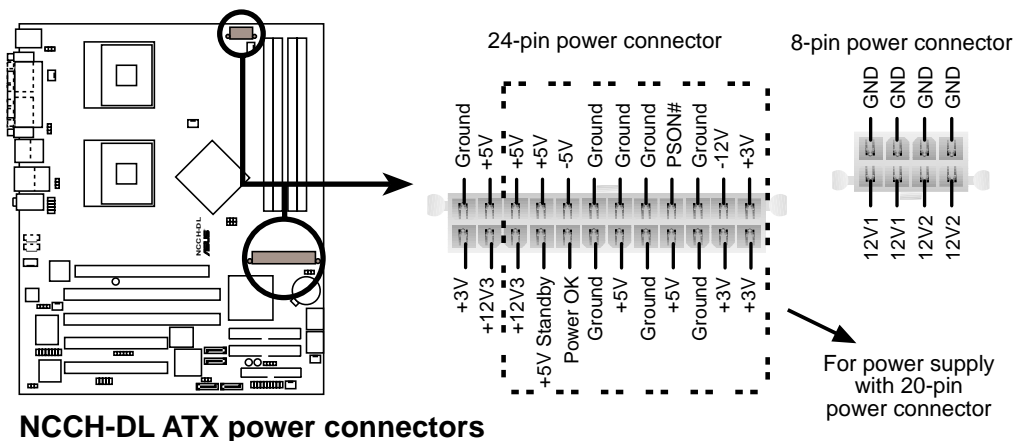


9. Power connectors (24-pin ATXPWR1, 8-pin ATX12V1)

These connectors connect to an SSI-type 12V power supply. The plugs from the power supply are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

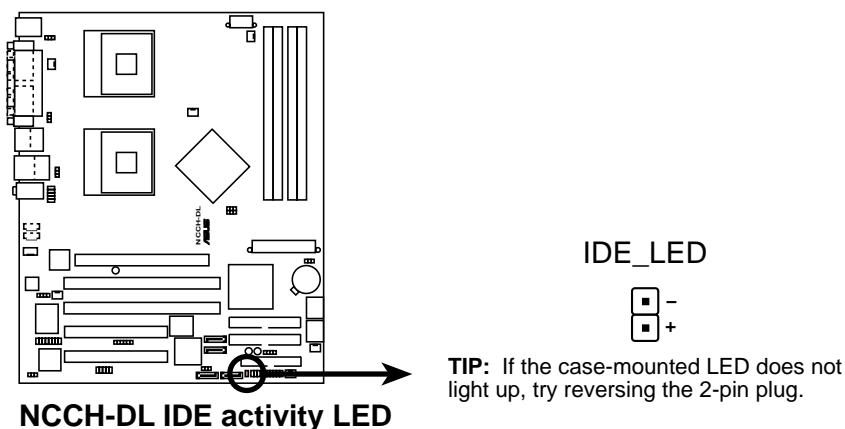


1. Do not forget to connect the 8-pin +12V power plug. Otherwise, the system does not boot up.
2. When using Intel® Xeon™ 800 MHz processor, make sure that your power supply can provide a total of 27A, minimum of three +12V output leads and at least 1A on the +5V standby lead (+5VSB).
3. The minimum recommended wattage is 600W. The system may become unstable or may not boot up if the power is inadequate.



10. Hard disk activity LED connector (2-pin IDELED1)

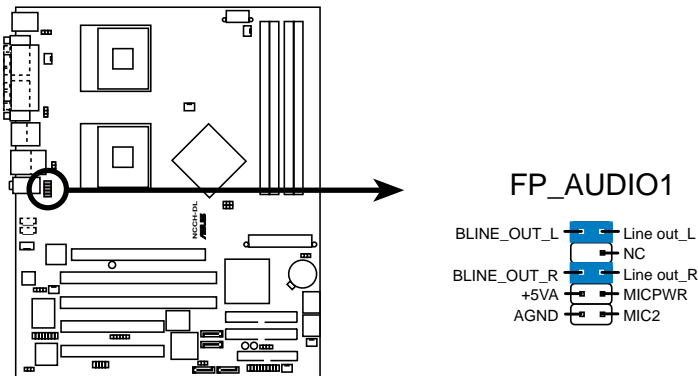
This connector supplies power to the hard disk activity LED. The read or write activities of any device connected to the primary or secondary IDE connector cause this LED to light up.



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

This is an interface for the Intel front panel audio cable that allow convenient connection and control of audio devices.

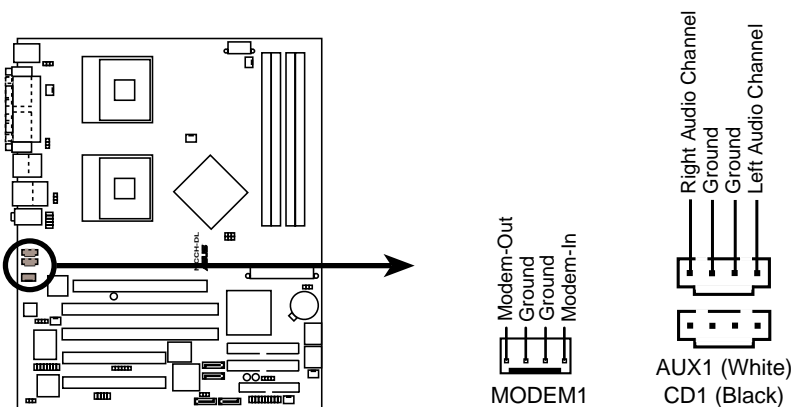
By default, the pins labeled LINE OUT_R/BLINE_OUT_R and the pins LINE OUT_L/BLINE_OUT_L are shorted with jumper caps. Remove the caps only when you are connecting the front panel audio cable.



NCCH-DL Front panel audio connector

12. Internal audio connectors (4-pin CD1, AUX1, MODEM1)

These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card. The MODEM connector allows the onboard audio to interface with a voice modem card with a similar connector. It also allows the sharing of mono_in (such as a phone) and a mono_out (such as a speaker) between the audio and a voice modem card.



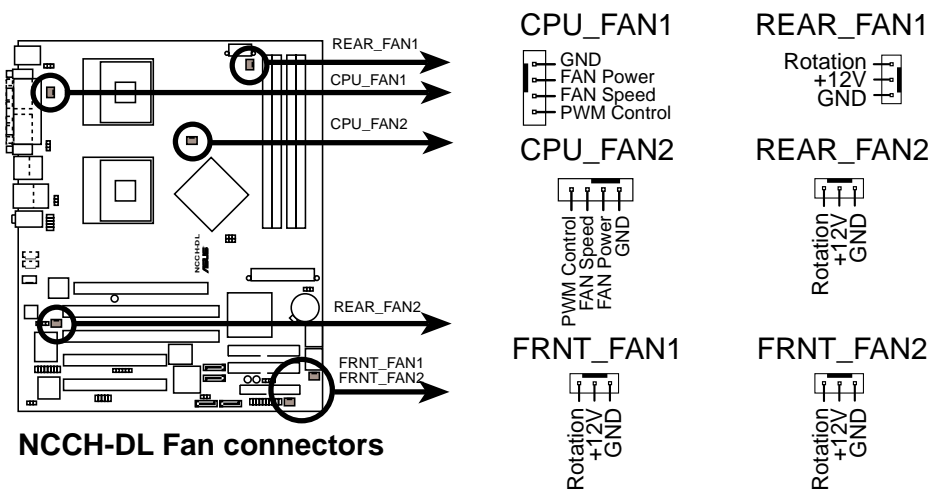
NCCH-DL Internal audio connectors

13. CPU and system fan connectors (4-pin CPU_FAN1/2, 3-pin REAR_FAN1/2, 3-pin FRNT_FAN1/2)

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



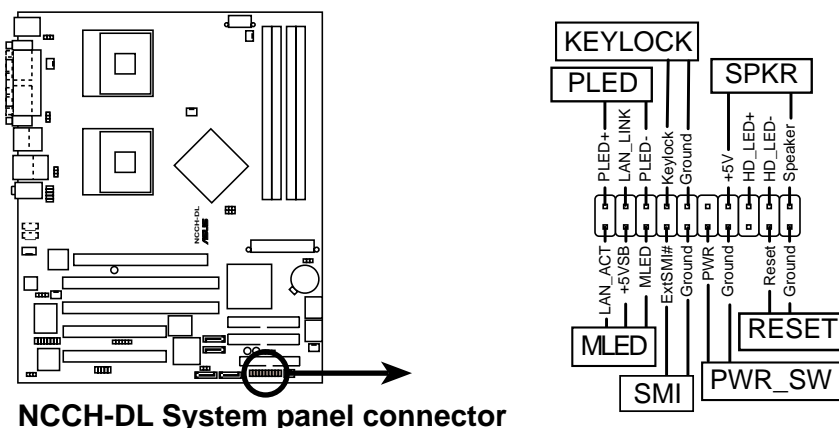
The CPU fan connectors support either a 3-pin or a 4-pin fan cable plug. Both connectors are slotted to ensure connection in correct orientation.



Do not forget to connect the fan cables to the fan connectors. Lack of sufficient air flow within the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!

14. System panel connector (20-pin PANEL1)

This connector accommodates several system front panel functions.



- **System Power LED (3-pin PLED)**

This lead connects to the system power LED. The LED lights up when you turn on the system power, and blinks when the system is in sleep mode.
- **Message LED (2-pin MLED)**

This lead connects to the message LED cable on the front panel and indicates the booting status. The LED blinks when the system is in the boot process until the operating system is loaded.
- **System warning speaker (4-pin SPEAKER)**

This lead connects to the case-mounted speaker and allows you to hear system beeps and warnings.
- **Hard disk activity (2-pin HD_LED)**

This lead connects the HDD LED cable. The read or write activities of the device connected to the any of IDE connectors cause the IDE LED to light up.
- **Power switch / Soft-off switch (2-pin PWR_SW)**

This lead connects a switch that controls the system power. Pressing the power switch turns the system between ON and SLEEP, or ON and SOFT OFF, depending on the BIOS or OS settings. Pressing the power switch while in the ON mode for more than 4 seconds turns the system OFF.
- **Reset switch (2-pin RESET)**

This lead connects to the chassis-mounted reset switch for rebooting the system without turning off the system power.
- **System Management Interrupt (2-pin SMI)**

This lead connects to the chassis-mounted suspend switch. This feature allows you to manually put the system into suspend mode, or “green” mode, where system activity is instantly decreased to save power and to expand the life of certain system components.

Chapter 3

This chapter describes the power up sequence and gives information on the BIOS beep codes.

Powering up

Chapter summary

- 3.1 Starting up for the first time 3-1**
- 3.2 Vocal POST Messages 3-2**
- 3.3 Powering off the computer 3-4**

3.1 Starting up for the first time

1. After making all the connections, replace the system case cover.
2. Be sure that all switches are off.
3. Connect the power cord to the power connector at the back of the system chassis.
4. Connect the power cord to a power outlet that is equipped with a surge protector.
5. Turn on the devices in the following order:
 - a. Monitor
 - b. External SCSI devices (starting with the last device on the chain)
 - c. System power
6. After applying power, the power LED on the system front panel case lights up. For SSI-type power supplies, the system LED lights up when you press the power switch. If your monitor complies with “green” standards or if it has a “power standby” feature, the monitor LED may light up or switch between orange and green after the system LED turns on. The system then runs the power-on tests. While the tests are running, the BIOS beeps (see BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

Phoenix-Award BIOS beep codes

No. of Beeps	Description
2	Parity error
3	Main memory read/write test error
4	Motherboard timer not operational
6	Keyboard controller BAT test error
7	General exception error
8	Display memory error
10	CMOS shutdown register read/write error

7. At power on, hold down <Delete> to enter BIOS Setup. Follow the instructions in Chapter 4.

3.2 Vocal POST Messages

This motherboard includes the Winbond speech controller to support a special feature called the ASUS POST Reporter™. This feature gives you vocal POST messages and alerts to inform 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.

Following is a list of the default POST messages and their corresponding actions, if any.

POST message	Action
No CPU installed	<ul style="list-style-type: none">• Install an Intel® Xeon™ Processor into the CPU socket.
System failed CPU test	<ul style="list-style-type: none">• Check the CPU if properly installed.• Call ASUS technical support for assistance. See the “ASUS contact information.”
System failed memory test	<ul style="list-style-type: none">• Install 184-pin unbuffered ECC or non-ECC PC3200/2700/2100 DIMMs into the DIMM sockets.• Check if the DIMMs on the sockets are properly installed.• Make sure that the DIMMs are not defective.• Refer to section “2.4 System memory” for instruction on installing a DIMM.
System failed VGA test	<ul style="list-style-type: none">• Install a PCI VGA card into one of the PCI slots, or a +0.8V/1.5V AGP card into the AGP slot.• Make sure that your VGA/AGP card is not defective.
System failed due to CPU over-clocking	<ul style="list-style-type: none">• Check your CPU settings in BIOS and make sure you only set to the recommended settings.

POST message	Action
No keyboard detected	<ul style="list-style-type: none"> • Check your keyboard if 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 floppy disk detected	<ul style="list-style-type: none"> • Make sure you have connected a floppy disk to the floppy disk connector on the motherboard. • See section “2.7 Connectors.”
No IDE hard disk detected	<ul style="list-style-type: none"> • Make sure you have connected an IDE hard disk drive to the one of the IDE connectors on the motherboard. • See section “2.7 Connectors.”
CPU temperature too high	<ul style="list-style-type: none"> • Check CPU fan if working properly.
CPU fan failed	<ul style="list-style-type: none"> • Check the CPU fan and make sure it turns on after you applied power to the system. • Make sure that your CPU fan supports the fan speed detection function.
CPU voltage out of range	<ul style="list-style-type: none"> • Check your power supply and make sure it is not defective. • Call ASUS technical support for assistance. See the “ASUS contact information.”
System completed Power-On Self Test	<ul style="list-style-type: none"> • No action required
Computer now booting to operating system	<ul style="list-style-type: none"> • No action required

3.3 Powering off the computer

3.3.1 Using the OS shut down function

If you are using Windows® 2000 Professional or Windows® 2000 Server:

1. Click the **Start** button then click **Shut Down...**
2. Make sure that the **Shut down** option button is selected, then click the **OK** button to shut down the computer.
3. The power supply should turn off after Windows® shuts down.

If you are using Windows® XP or Windows® Server 2003:

1. Click the **Start** button then select **Turn Off Computer**.
2. Click the **Turn Off** button to shut down the computer.
3. The power supply should turn off after Windows® shuts down.

3.3.2 Using the dual function power switch

While the system is ON, pressing the power switch for less than 4 seconds puts the system to sleep mode or to soft-off mode, depending on the BIOS setting. Pressing the power switch for more than 4 seconds lets the system enter the soft-off mode regardless of the BIOS setting. See section “4.5 Power Menu” in Chapter 4.

Chapter 4

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

BIOS setup

Chapter summary

4.1	Managing and updating your BIOS	4-1
4.2	BIOS Setup program	4-7
4.3	Main menu	4-10
4.4	Advanced menu	4-16
4.5	Power menu	4-30
4.6	Boot menu	4-36
4.7	Exit menu	4-41

4.1 Managing and updating your BIOS



-
- The **original BIOS file** for this motherboard is in the support CD.
 - Copy the original BIOS to a **bootable floppy disk** in case you need to restore the BIOS in the future.
-

4.1.1 Creating a bootable floppy disk

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

DOS environment

Insert a 1.44 MB floppy disk into the drive. At the DOS prompt, type:

format a: /s, then press the <Enter> key

Windows® XP environment

- a. Insert a new 1.44 MB floppy disk in the floppy disk drive.
 - b. From the Windows desktop, click **Start > My Computer**.
 - c. In the **My Computer** window, click the **3 1/2 Floppy** icon.
 - d. From the Menu bar, click **File > Format**.
 - e. Select "**Create an MS-DOS Startup Disk**" in the **Format Options** field, then click **Start**.
2. Copy the original (or the latest) motherboard BIOS to the bootable floppy disk.

4.1.2 AwardBIOS Flash Utility

Updating the BIOS

To update the BIOS using this utility.

1. Download the latest BIOS file from the ASUS web site. Rename the file to ***.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 (awdf flash.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 **awdf flash** then press <Enter>. The Award BIOS Flash Utility screen appears.

```
AwardBIOS Flash Utility for ASUS V1.05
(C) Phoenix Technologies Ltd. All Rights Reserved
For Canterwood - NCCH-DL          DATE: 06/01/2004
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 V1.05
(C) Phoenix Technologies Ltd. All Rights Reserved

For Canterwood - NCCH-DL          DATE: 06/01/2004
Flash Type - SST 49LF004A/B /3.3V

File Name to Program : 1001.bin

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

7. The utility prompts you to save the current BIOS file. Press <Y> to save the current BIOS file to the floppy disk, or <N> to continue.



If you wish to save the current BIOS file, make sure that the floppy disk has enough disk space to save the file. See the next section for details on saving the current BIOS file.

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

```
AwardBIOS Flash Utility for ASUS V1.05
(C) Phoenix Technologies Ltd. All Rights Reserved

For Canterwood - NCCH-DL          DATE: 06/01/2004
Flash Type - SST 49LF004A/B /3.3V

File Name to Program : 1001.bin

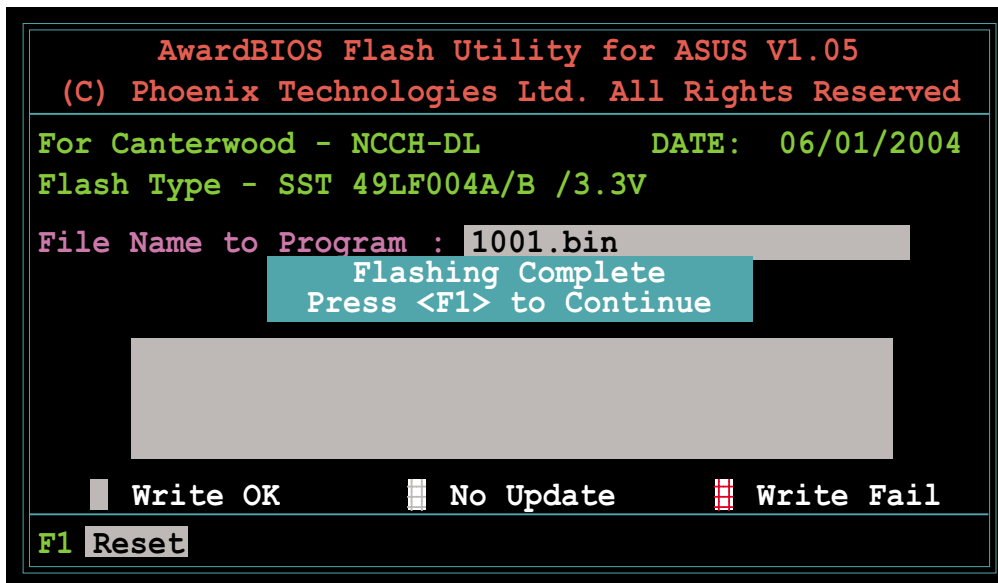
Save current BIOS as :

Message:
```



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. Press <F1> to restart the system.

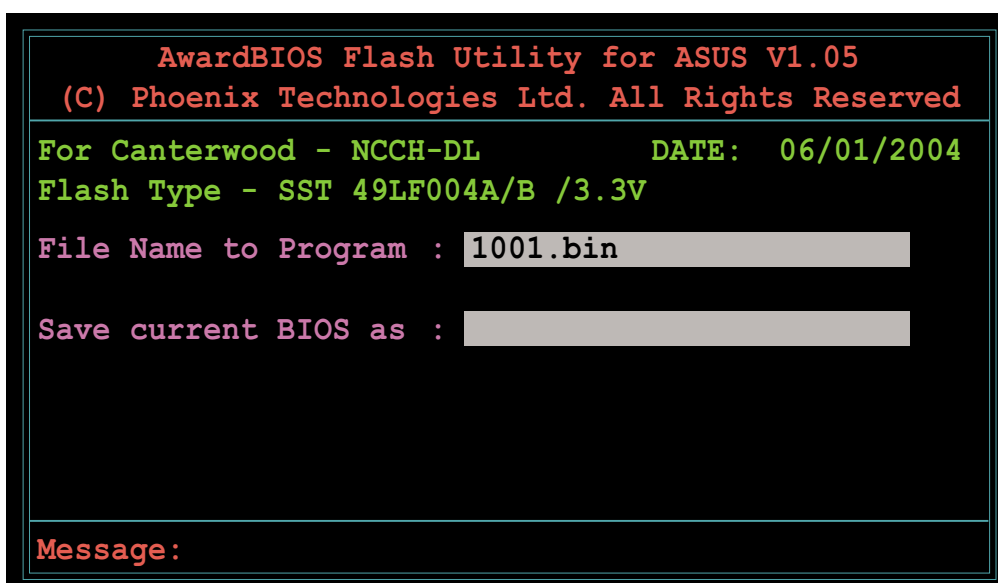


Saving the current BIOS file

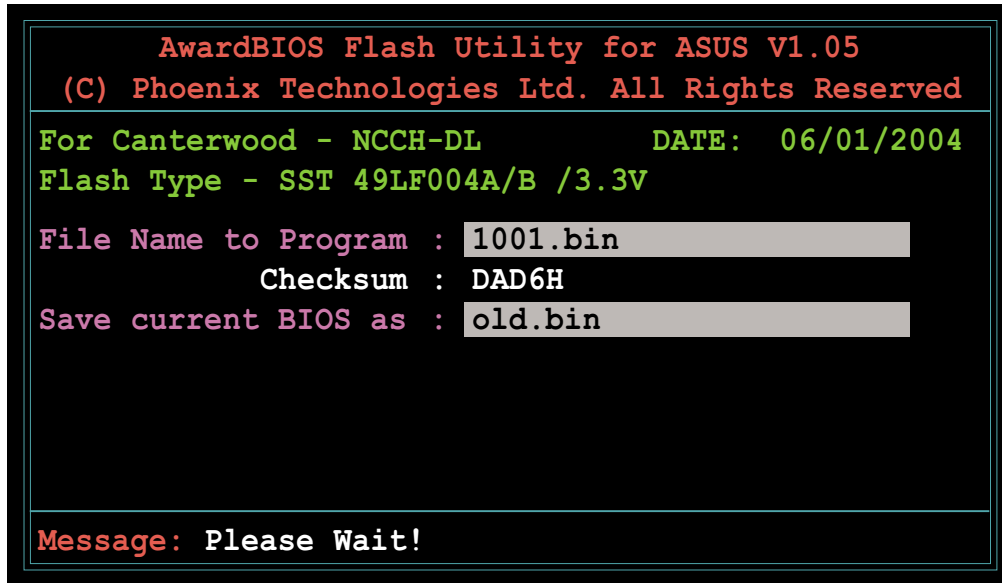
The AwardBIOS Flash utility allows you to save your original or current BIOS to a floppy disk before you update. You can load the saved BIOS file if the new BIOS file gets corrupted during the flashing process.

To save the current BIOS file:

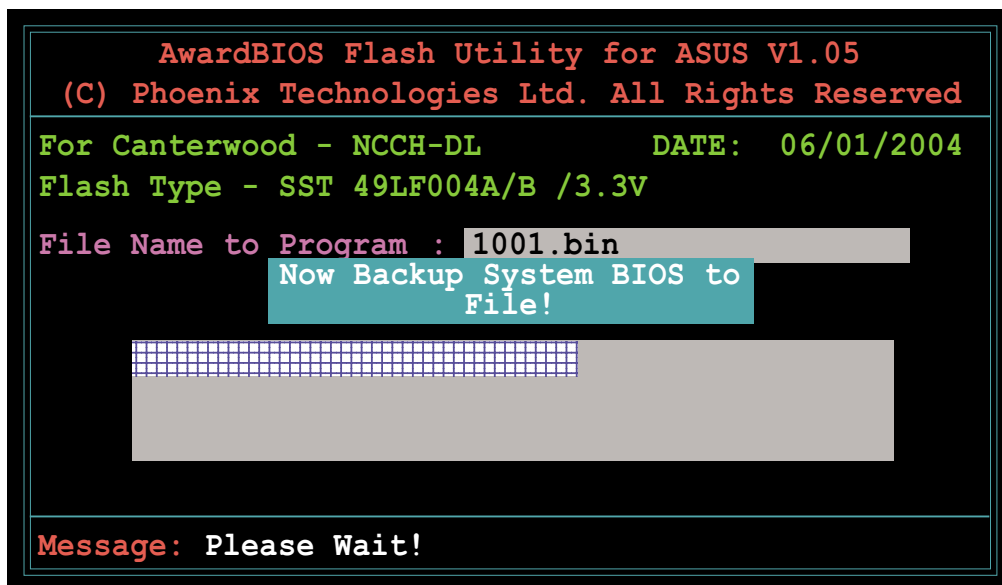
1. Follow steps 1 to 6 of the previous section.
2. Press <Y> when the utility prompts you to save the current BIOS file. The following screen appears.



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



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



4.1.3 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 and rename the same to P5AD2.ROM.
2. Save the BIOS file to a floppy disk, then restart the system.
3. Press <Alt> + <F2> during POST to display the following.

```
EZFlash starting BIOS update
Checking for floppy...
```

4. Insert the floppy disk that contains the BIOS file to the floppy disk drive. When the correct BIOS file is found, EZ Flash performs the BIOS update process and automatically reboots the system when done.



A “Floppy not found!” error message appears if there is no floppy disk in the drive. A “NCCH-DL.ROM not found!” error message appears if the correct BIOS file is not found in the floppy disk. Make sure that you rename the BIOS file to NCCH-DL.ROM.

```
EZFlash starting BIOS update
Checking for floppy...
Floppy found!
Reading file "NCCH-DL.rom". Completed.
Start erasing.....|
Start programming...|
Flashed successfully. Rebooting.
```



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

4.2 BIOS Setup program

This motherboard includes a Flash ROM that you can update using the provided utility described in section “4.1 Managing and updating your BIOS.”

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

Even if you are not prompted to use the Setup program, you may want to change the configuration of your computer in the future. For example, you may want to enable the security password feature or make changes to 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 Flash ROM.

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

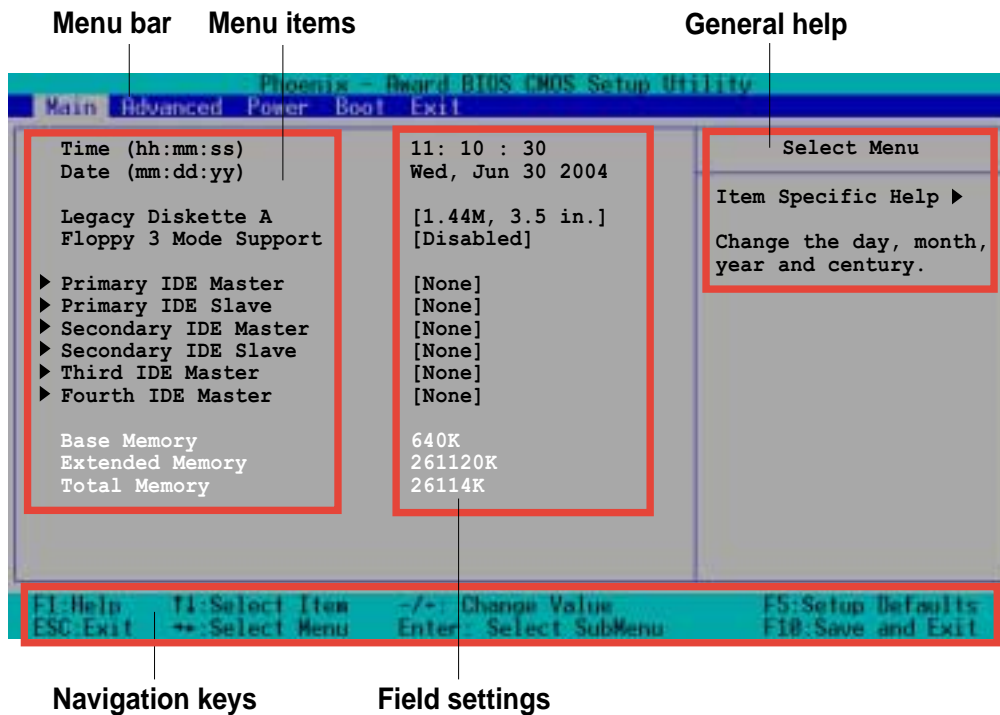
If you wish to enter Setup after POST, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.



Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purposes only, and may not exactly match what you see on your screen.

4.2.1 BIOS menu screen



4.2.2 Menu bar

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

- Main** For changing the basic system configuration settings
- Advanced** For changing the advanced system settings
- Power** For changing the power configuration settings
- Boot** For changing the system boot configuration settings
- Exit** For selecting the exit options and loading default settings

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

4.2.3 Navigation keys

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



The navigation keys differ from one screen to another.

4.2.4 General help

On the right side of the menu screen is a brief description of the selected item.

4.2.5 Sub-menu

An item with a sub-menu on any menu screen is distinguished by a solid triangle before the item. To display the sub-menu, select the item and press Enter.

4.2.6 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press **Up/Down arrow keys** or **PageUp/PageDown keys** to display the other items on the screen.

4.2.7 Pop-up window

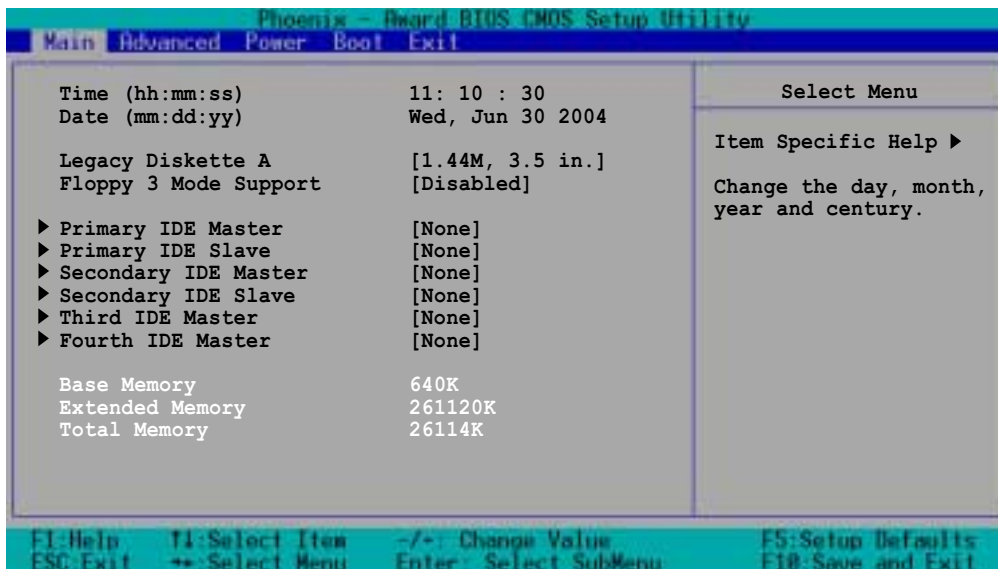
Select an item in the menu, then press Enter to display a pop-up window with the configuration options for that item.

4.3 Main menu

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



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



Time (hh:mm:ss)

Sets the system to the time that you specify (usually the current time). The format is hour:minute:second. Valid values for hour, minute, and second are Hour: (00 to 23), Minute: (00 to 59), Second: (00 to 59). Use the <Tab> key to move between the hour, minute, and second fields.

Date (mm:dd:yy)

Sets the system to the date that you specify (usually the current date). The format is month:day:year. Valid values for month, day, and year are Month: (Jan to Dec), Day: (1 to 31), Year: (1999 to 2099). Use the <Tab> key to move between the month, day, and year fields.

Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive installed. Configuration options: [None] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

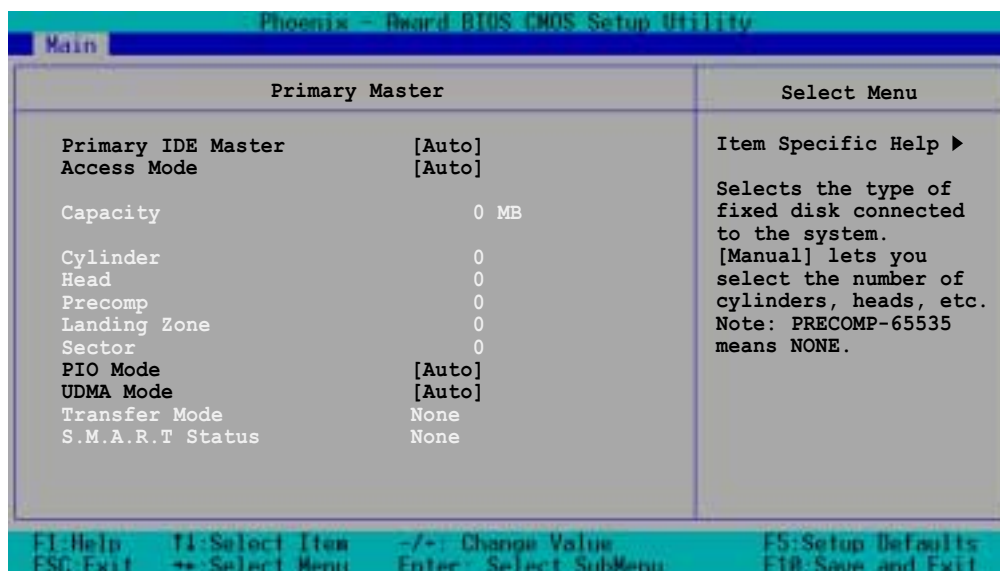
Floppy 3 Mode Support [Disabled]

This is required to support older Japanese floppy drives. The Floppy 3 Mode feature allows reading and writing of 1.2MB (as opposed to 1.44MB) on a 3.5-inch floppy disk. Configuration options: [Disabled] [Enabled]

Base/Extended/Total Memory [xxxK]

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

4.3.1 Primary IDE Master



Primary IDE Master [Auto]

Select [Auto] to automatically detect an IDE drive. If automatic detection is successful, the setup BIOS automatically fills in the correct values for the remaining fields on this sub-menu.

If automatic detection fails, this may be because the IDE drive is too old or too new. If the drive was already formatted on a previous system, the BIOS may detect incorrect parameters. In these cases, select [Manual] to manually enter the IDE drive parameters. Refer to the section “Manually detecting an IDE drive.”

If no drive is installed or if you are removing a drive and not replacing it, 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 drive. Configuration options: [CHS] [LBA] [Large] [Auto]



Most of the IDE drive information items are grayed out when the items **Primary IDE Master** and **Access Mode** are set to [Auto].

If you wish to manually configure the IDE drive items, set the Primary IDE Master to [Manual], and the Access Mode to [CHS].

PIO Mode [Auto]

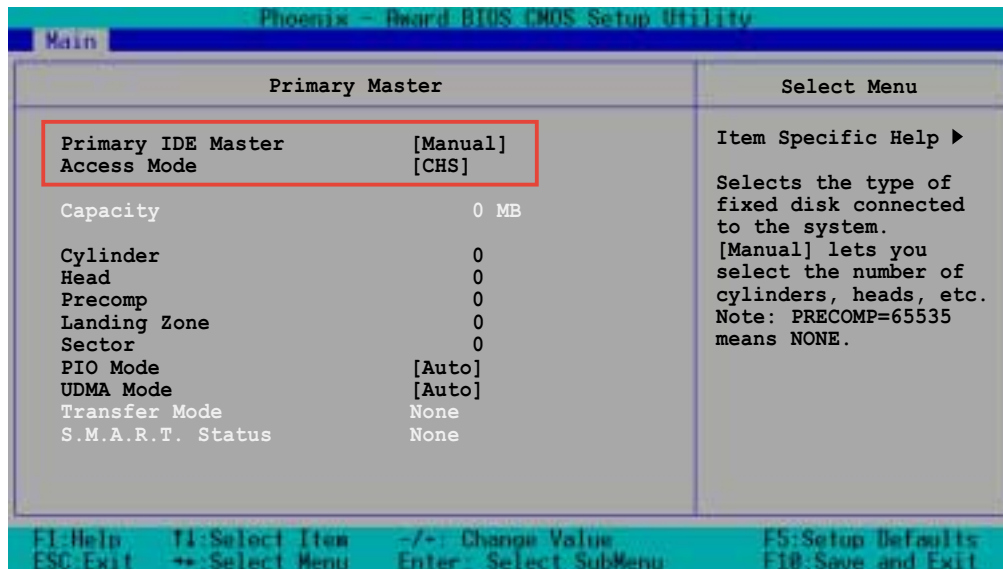
Sets the PIO mode for the IDE drive. The settings Mode 0 to 4 allow successive increase in performance. Configuration options: [Auto] [Mode 0] [Mode 1] [Mode 2] [Mode 3] [Mode 4]

UDMA Mode [Auto]

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

Manually detecting an IDE drive

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



Before attempting to manually configure an IDE drive, make sure that you have the correct configuration information supplied by the drive manufacturer. Incorrect settings may cause the system to fail to recognize the installed IDE drive!

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

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

Capacity [xxxxx MB]

Displays the auto-detected hard disk capacity. The value is not user-configurable.

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, on the motherboard.

Landing Zone

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

Sector

Shows the number of sectors per track.

Transfer Mode

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



After entering the IDE hard disk drive information, use a disk utility, such as FDISK, to partition and format new IDE 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 drive to "Active."

4.3.2 Primary IDE Slave

When configuring a drive as **Primary IDE Slave**, refer to section "4.3.1 Primary IDE Master" for the menu item descriptions.

4.3.3 Secondary IDE Master

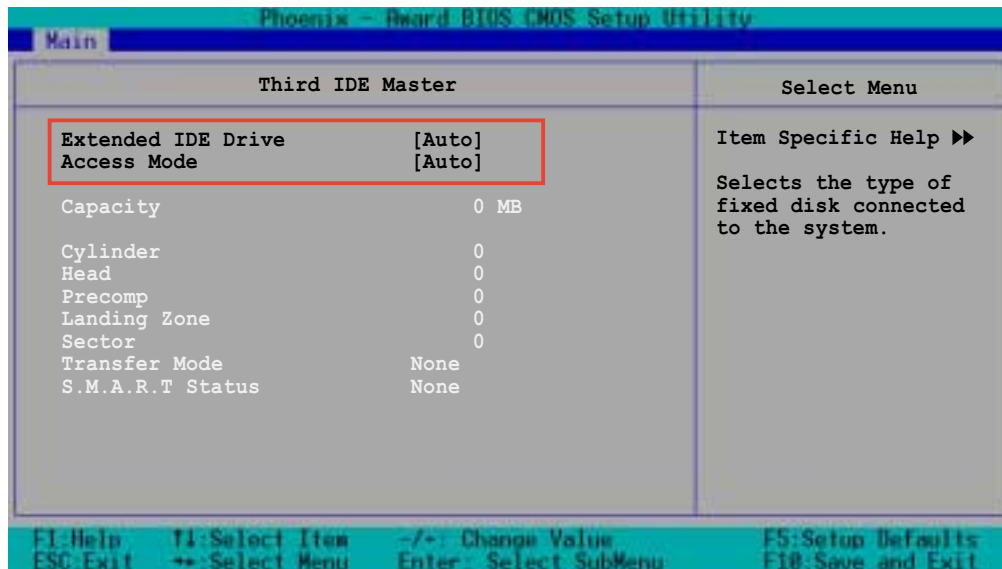
When configuring a drive as **Secondary IDE Master**, refer to section "4.3.1 Primary IDE Master" for the menu item descriptions.

4.3.4 Secondary IDE Slave

When configuring a drive as **Secondary IDE Slave**, refer to section "4.3.1 Primary IDE Master" for the menu item descriptions.

4.3.5 Third IDE Master

When configuring a drive as **Third IDE Master**, refer to section “4.3.1 Primary IDE Master” for the menu item descriptions which are not discussed in this section.



Extended IDE Drive [Auto]

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]

Configuration options: [Large] [Auto]

4.3.6 Fourth IDE Master

When configuring a drive as **Fourth IDE Master**, refer to section “4.3.1 Primary IDE Master” and section “4.3.5 Third IDE Master” for the menu item descriptions.



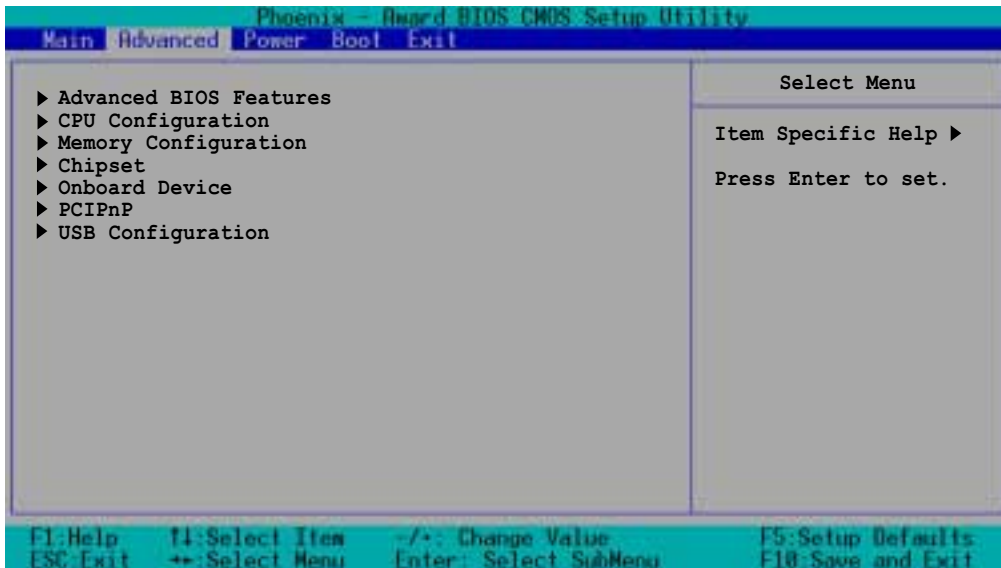
The items **Third IDE Master** and **Fourth IDE Master** appear only if you set the **On-Chip Serial ATA** item in SATA Configuration menu to either [Auto] or [Enhanced Mode]. See page 4-25 for information.

4.4 Advanced menu

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

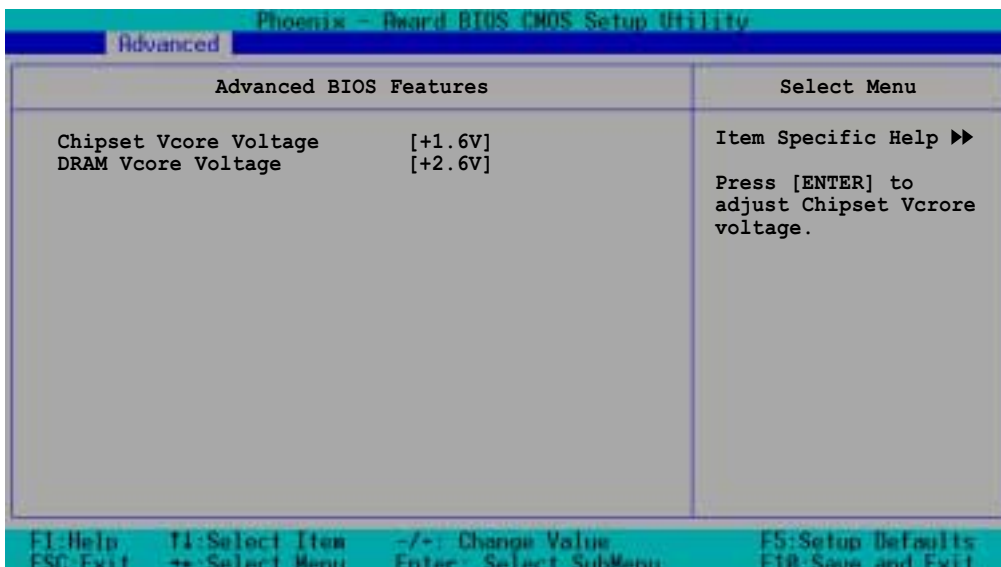


Take caution when changing the settings of the Advanced menu items. Incorrect field values may cause the system to malfunction!



4.4.1 Advanced BIOS Features

This menu shows the chipset and DRAM Vcore voltage settings. Select an item then press Enter to display a pop-up menu with the configuration options.





Setting to very high Vcore voltages may cause the system to become unstable!

Chipset Vcore Voltage [+1.6V]

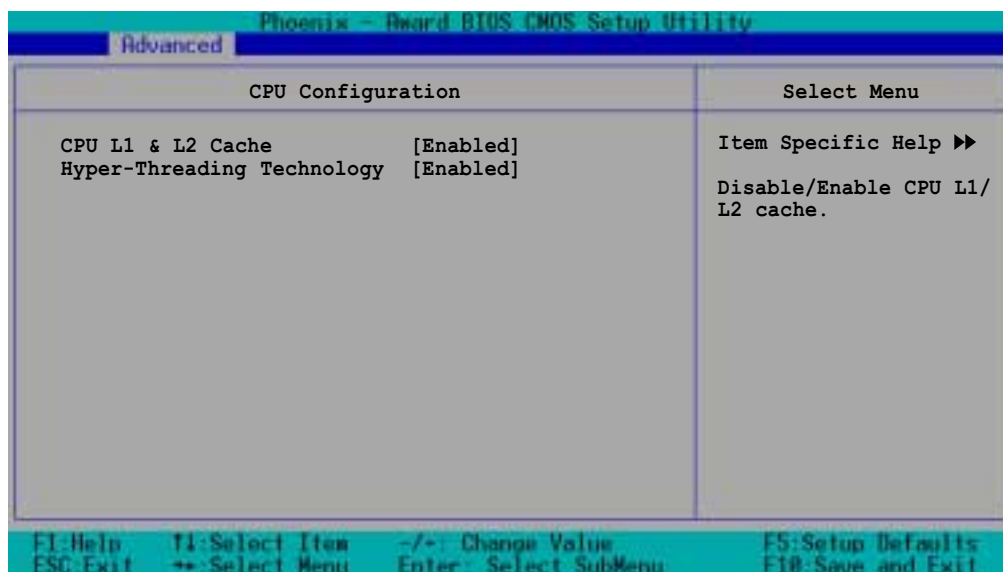
Allows adjustment of the chipset Vcore voltage. Configuration options: [+1.5V] [+1.6V] [+1.7V] [+1.8V]

DRAM Vcore Voltage [+2.6V]

Allows adjustment of the DRAM Vcore voltage. Configuration options: [+2.8V] [+2.7V] [+2.6V]

4.4.2 CPU Configuration

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



CPU L1 & L2 Cache [Enabled]

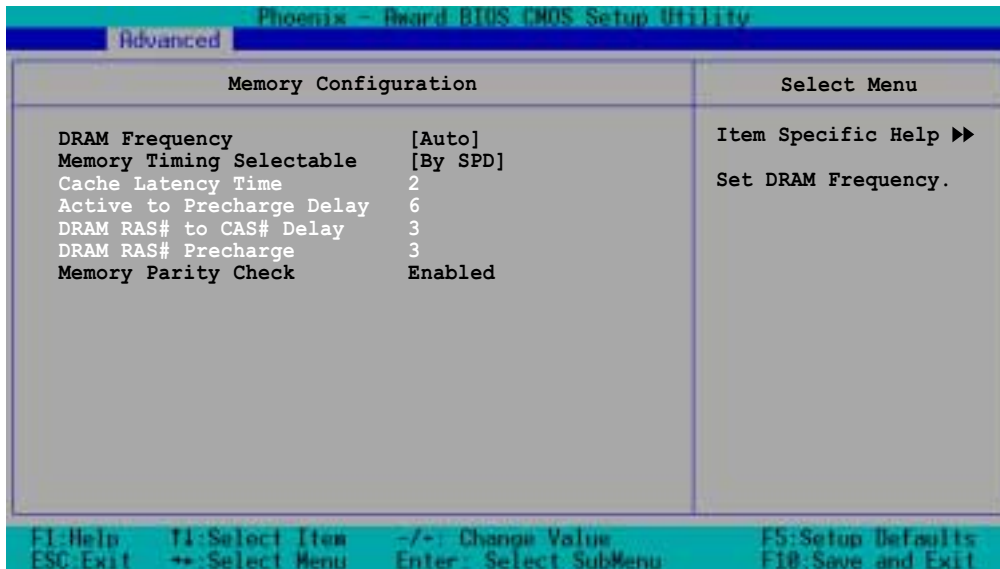
Allows you to enable or disable the CPU L1 and L2 cache. Configuration options: [Disabled] [Enabled]

Hyper-Threading Technology [Enabled]

Allows you to enable or disable the CPU Hyper-Threading Technology feature. Set this item to [Enabled] if you are using an operating system that is optimized for Hyper-Threading Technology, such as Windows XP or Linux kernel later than version 2.4. Otherwise, set this item to [Disabled]. Configuration options: [Disabled] [Enabled]

4.4.3 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.



DRAM Frequency [Auto]

This item sets the DRAM operating frequency. Configuration options: [DDR266] [DDR333] [DDR400] [Auto]

Memory Timing Selectable [By SPD]

The DRAM clock are set according to the DRAM SPD (Serial Presence Detect). Select [By SPD] for automatic DRAM clock detection. Select [Manual] to allow setting the succeeding memory items to optimal timings. Configuration options: [Manual] [By SPD]



The items CAS Latency Time, Active to Precharge Delay, DRAM RAS# to CAS# Delay, and DRAM RAS# Precharge are configurable only when the Memory Timing Selectable item is set to [Manual].

CAS Latency Time [2]

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

Active to Precharge Delay [6]

This item controls the number of DRAM clocks used for DRAM parameters. Configuration options: [8] [7] [6] [5]

DRAM RAS# to CAS# Delay [3]

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

DRAM RAS# Precharge [3]

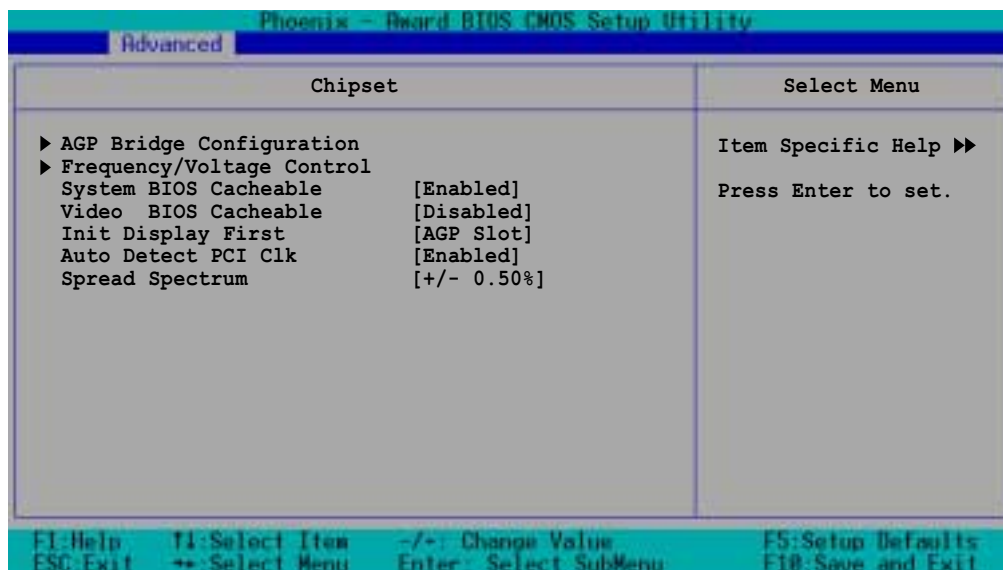
This item controls the idle clocks after issuing a precharge command to the DDR SDRAM. Configuration options: [4] [3] [2]

Memory Parity Check [Enabled]

Allows memory parity checking option ECC (Error-Correcting Code). Configuration options: [Disabled] [Enabled]

4.4.4 Chipset

This menu shows the chipset configuration 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.



System BIOS Cacheable [Enabled]

Allows you to enable or disable the cache function of the system BIOS. Configuration options: [Disabled] [Enabled]

Video BIOS Cacheable [Disabled]

Allows you to enable or disable the cache function of the video BIOS. Setting to [Enabled] improves the display speed by caching the display data. Configuration options: [Disabled] [Enabled]

Init Display First [AGP Slot]

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

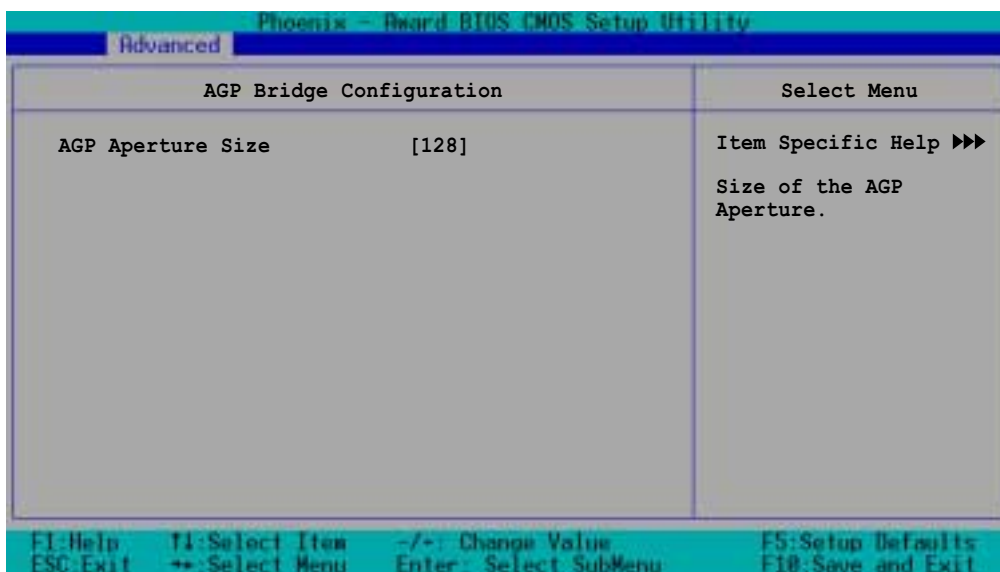
Auto Detect PCI Clk [Enabled]

Allows you to select the maximum PCI bus speed to be programmed.
Configuration options: [Enabled] [Disabled]

Spread Spectrum [- 0.50%]

Allows you to select the clock generator spread spectrum. Configuration options: [Disabled] [+/- 0.1%] [+/- 0.2%] [+/- 0.3%] [+/- 0.4%] [+/- 0.5%] [+/- 0.6%] [+/- 0.7%] [+/- 0.8%] [+/- 0.9%] [+/- 1.0%]

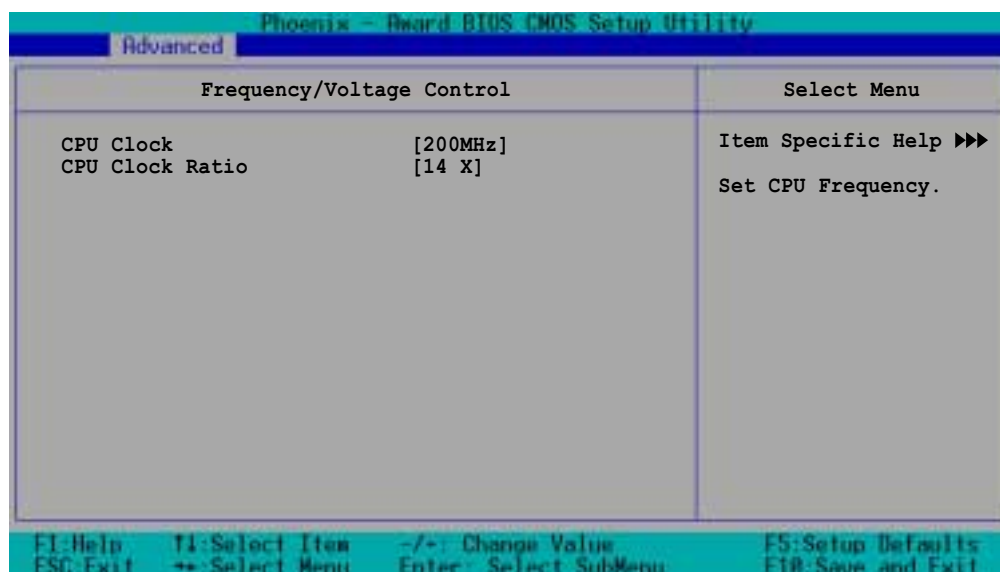
AGP Bridge Configuration



AGP Aperture Size [128]

Allows you to select the size of mapped memory for AGP graphic data.
Configuration options: [4] [8] [16] [32] [64] [128] [256]

Frequency/Voltage Control



Take caution when overclocking the CPU. Overclocking may cause the system to become unstable!

CPU Clock [200MHz]

Allows you to set the CPU frequency. Key-in a value within the specified range, then press Enter. Configuration options: [Min=200] [Max=233]



The minimum and maximum configuration values for the **CPU Clock** depend on the installed CPU. These values are detected by BIOS.

CPU Clock Ratio [18 X]

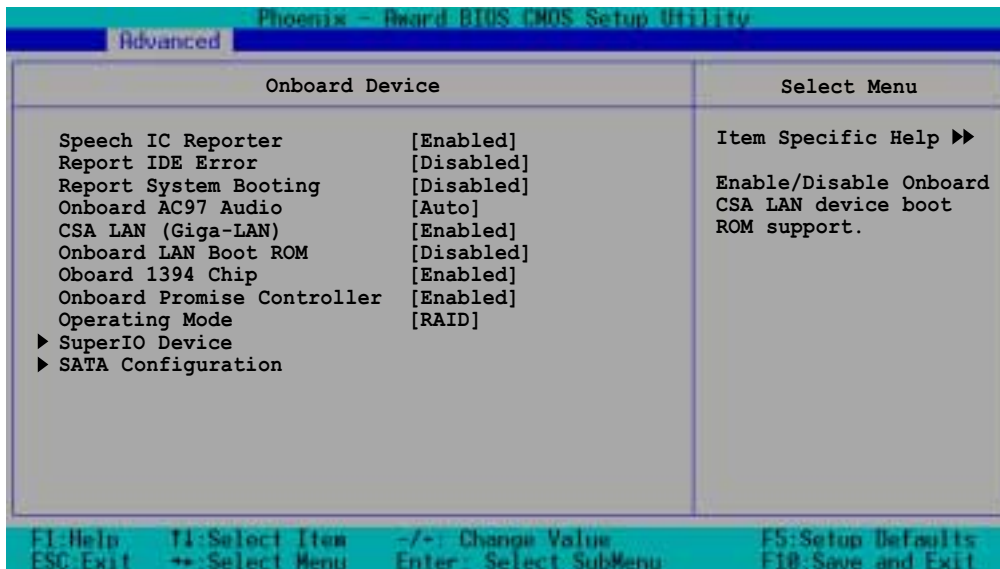
Sets the ratio between the CPU core clock and the Front Side Bus (FSB) frequency. Key-in a value within the specified range, then press Enter. Configuration options: [Min=12] [Max=18]



The minimum and maximum configuration values for the **CPU Clock Ratio** depend on the installed CPU. These values are detected by BIOS.

4.4.5 Onboard Device

This menu shows the onboard device configuration 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.



Speech IC Reporter [Enabled]

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

Report IDE Error [Disabled]

Allows you enable or disable reporting of IDE errors, if any.
Configuration options: [Disabled] [Enabled]

Report System Booting [Disabled]

Allows you enable or disable reporting of system boot errors, if any.
Configuration options: [Disabled] [Enabled]

Onboard AC97 Audio [Auto]

Allows you enable or disable the onboard AC97 audio controller.
Configuration options: [Auto] [Enabled]

CSA LAN (Giga-LAN) [Enabled]

Allows you enable or disable the onboard Gigabit LAN controller.
Configuration options: [Disabled] [Enabled]

Onboard LAN Boot ROM [Disabled]

Allows you to enable or disable the onboard LAN device boot ROM.
Configuration options: [Disabled] [Enabled]

Onboard 1394 [Enabled]

Allows you to enable or disable the onboard IEEE 1394 controller.
Configuration options: [Disabled] [Enabled]

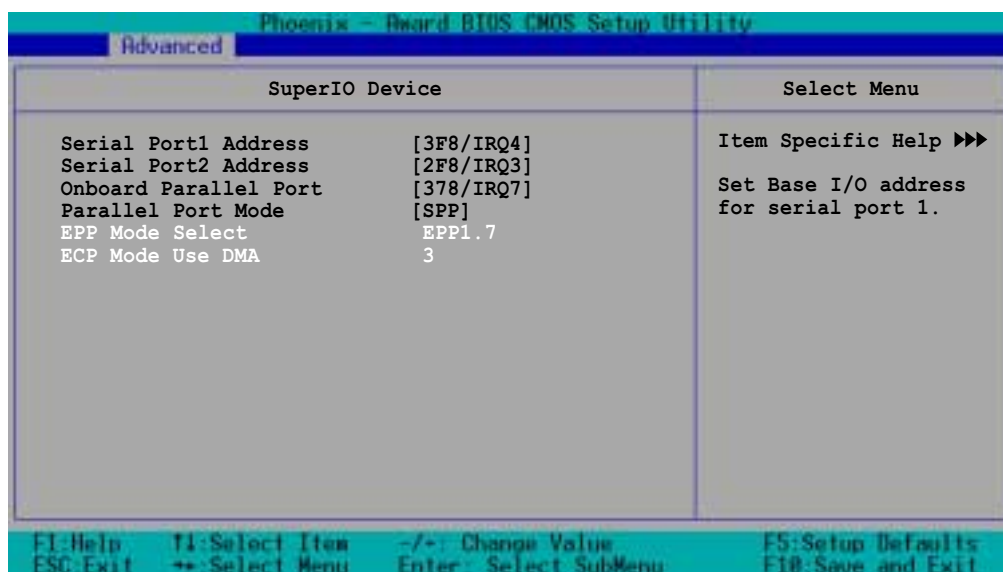
Onboard Promise Controller [Enabled]

Allows you to enable or disable the onboard Promise® RAID controller.

Operating Mode [IDE]

Allows you to set the RAID controller operating mode. This item is configurable only when the **Onboard Promise Controller** item is set to [Enabled]. Configuration options: [IDE] [RAID]

SuperIO Device



Serial Port 1 Address [3F8/IRQ4]

Serial Port 2 Address [2F8/IRQ3]

Allow you to select the serial port base addresses. 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/IRG5] [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 EPP mode. This item becomes configurable only if the **Parallel Port Mode** is set to [EPP] or [ECP+EPP]. Configuration options: [EPP 1.7] [EPP 1.9]

ECP Mode Use DMA [3]

Allows you to select the 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]

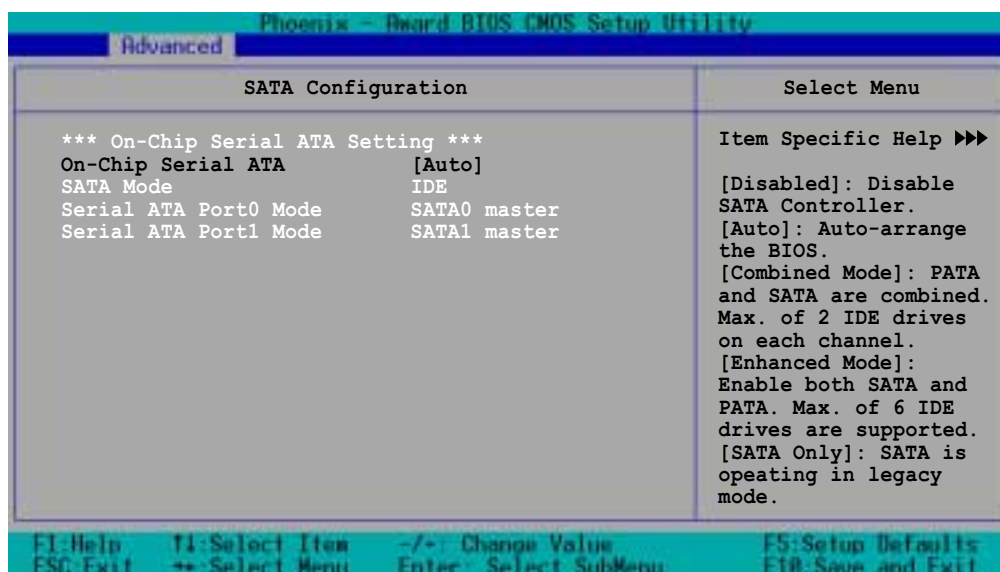
MIDI Port Address [330]

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

MIDI Port IRQ [10]

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

SATA Configuration



**On-Chip Serial ATA Setting



The items **SATA Mode**, **Serial ATA Port0 Mode**, and **Serial ATA Port1 Mode** are not configurable when the On-Chip Serial ATA item is set to [Disabled].

On-chip Serial ATA [Auto]

This item allows you to configure your serial ATA devices if present. Configuration options: [Disabled] [Auto] [Combined Mode] [Enhanced Mode] [SATA Only]



Setting the **On-chip Serial ATA** item to [Auto] or [Enhanced Mode] enables the items **Third IDE Master** and **Fourth IDE Master** in the Main menu. See page 4-14 for more information.

- Setting to **[Auto]** allows BIOS to automatically configure the SATA devices.
- Setting to **[Combined Mode]** allows you to install parallel ATA and serial ATA devices at the same time. You may install **two IDE devices on any of the parallel ATA channels**, and **one IDE device on each serial ATA channel** for a maximum of **four** devices.

- c. Setting to [**Enhanced Mode**] allows you to install Parallel ATA and Serial ATA devices at the same time, with a maximum of **six** IDE devices on each channel.



-
1. Use the [Enhanced Mode] option if you installed a native operating system like Winows 2000/XP.
 2. You may not use this option if you are using Linux RedHat 8 or 9 version operating system, as they do not support native mode.
-

- d. Setting to [**SATA Only**] allows you to install IDE devices on the Serial ATA channels only.
- e. Setting to [**Disabled**] disables the onboard SATA controller. The RAID feature is also disabled.

SATA Mode [IDE]

When this item is set to [IDE], SATA operates in IDE mode. When set to [RAID], SATA operates in RAID mode. The RAID feature allows configuration of the installed IDE devices into a disk array. Configuration options: [IDE] [RAID]

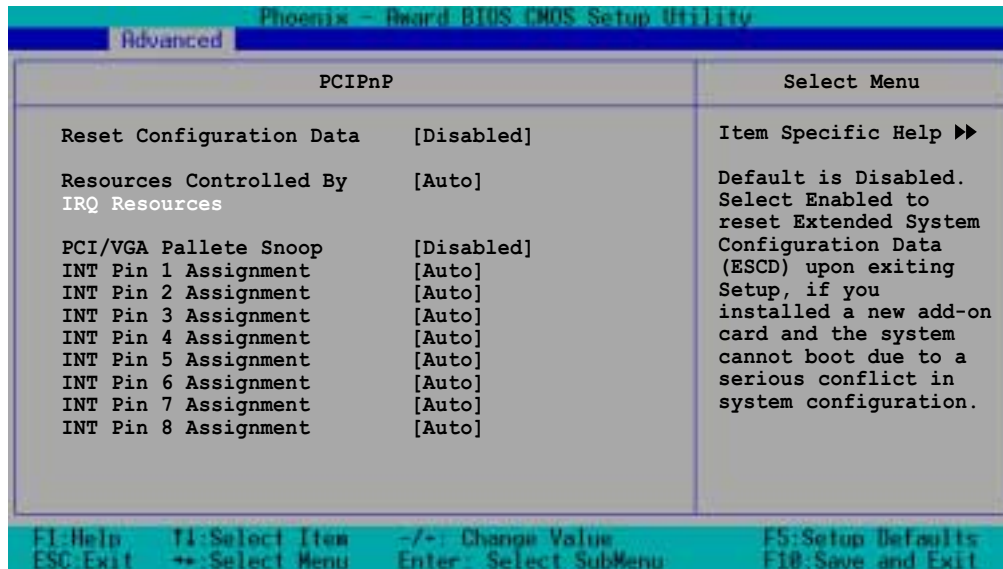
Serial ATA Port0 Mode [SATA0 Master]

Serial ATA Port1 Mode [SATA1 Master]

Allow you to set the SATA Port0 and Serial ATA Port1 modes. The options for these items vary depending on the setting of the **On-Chip Serial ATA** item. Configuration options: [Primary Master] [Primary Slave] [Secondary Master] [Secondary Slave] [SATA0 Master] [SATA1 Master]

4.4.6 PCIPnP

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



Reset Configuration Data [Disabled]

Allows you to enable or disabled resetting of the Extended System Configuration Data (ESCD) when you exit the Setup. The ESCD includes information on non-PnP devices. Set this item to [Enabled] if you installed an expansion card that conflicts with other devices and cause system boot failure. Configuration options: [Disabled] [Enabled]

Resources Controlled By [Auto]

When set to [Auto], allows BIOS to automatically configure of all boot and Plug and Play devices. When set to [Manual], you can assign the available IRQ Resources to the PCI 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 Pallete 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]

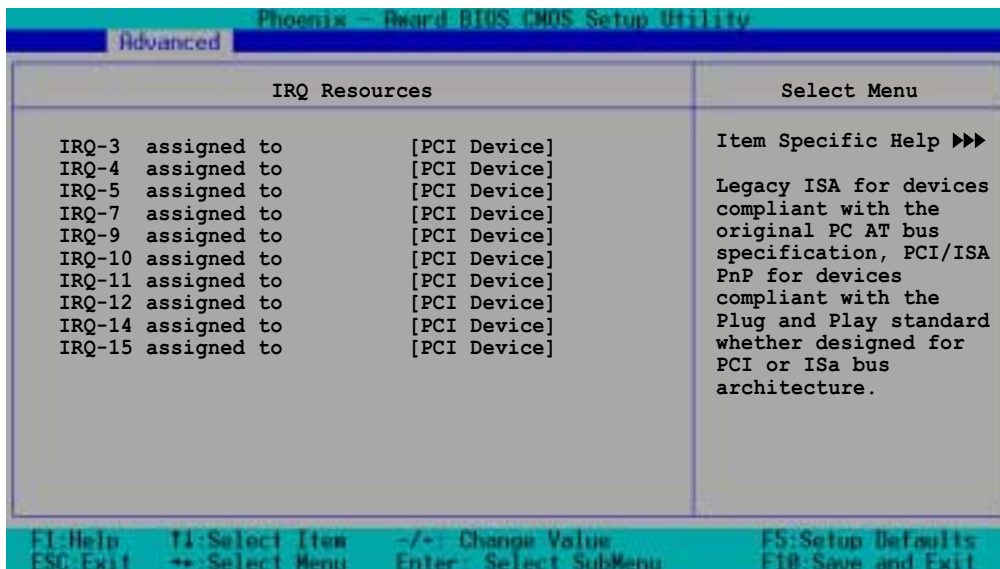
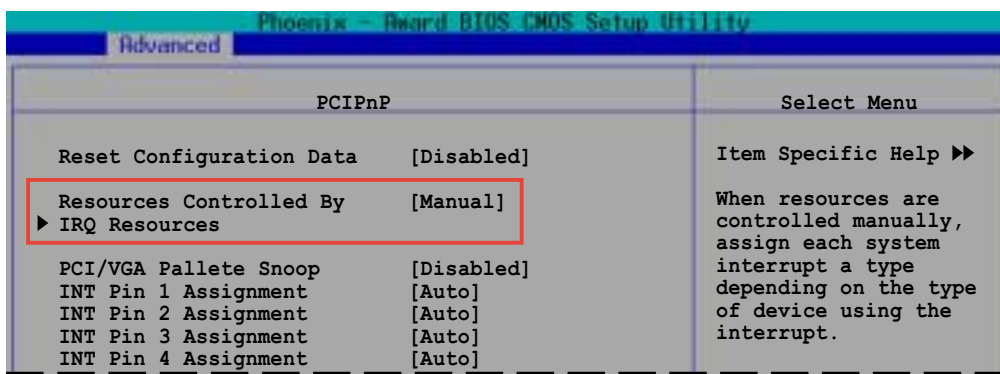
INT Pin 1~8 Assignment [Auto]

Allows you to select the appropriate interrupt to the specific devices to avoid conflict. Configuration options: [Auto] [3] [4] [5] [7] [9] [10] [11] [12] [14] [15]

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.

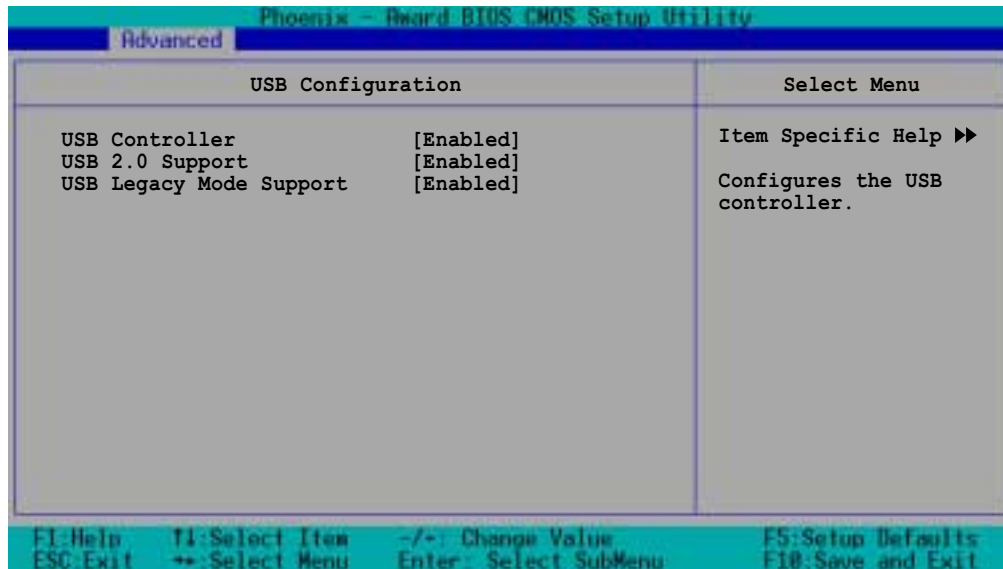


IRQ-xx assigned to [PCI device]

The IRQ Resources sub-menu is activated when the Resources Controlled by parameter is set to [Manual]. Select [PCI Device] to assign an IRQ address to a Plug and Play device. Setting to [Reserved] reserves the IRQ address. Configuration options: [PCI Device] [Reserved]

4.4.7 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.



USB Controller [Enabled]

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

USB 2.0 Support [Enabled]

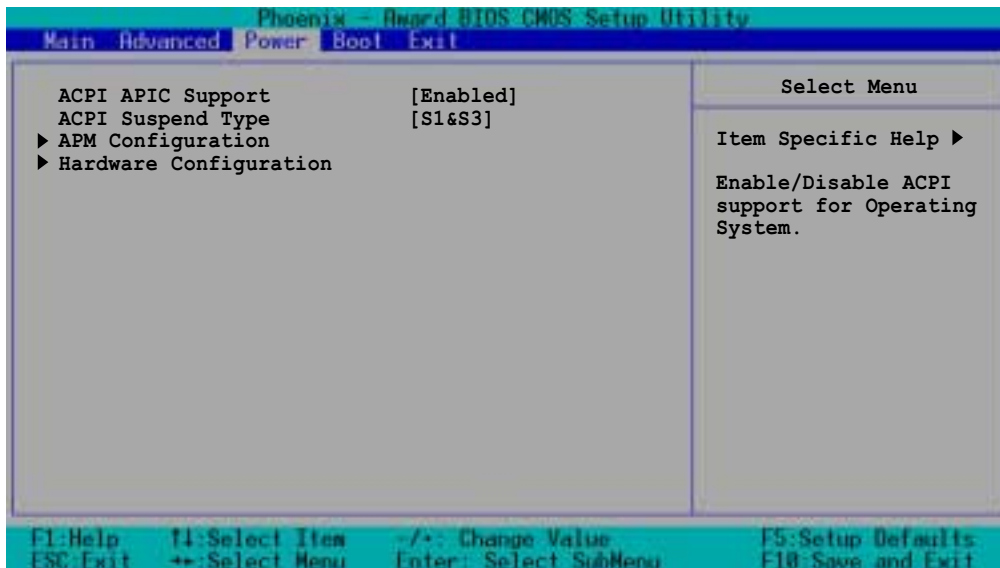
Allows you to enable or disable the EHCI controller. Setting this item to [Enabled] allows the built-in high speed USB support in the BIOS to turn on automatically when you install high speed USB devices. Configuration options: [Disabled] [Enabled]

USB Legacy Mode Support [Enabled]

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

4.5 Power menu

The Power menu items allow you to change the power management settings. Select an item then press Enter to display the configuration options.



ACPI APIC Support [Enabled]

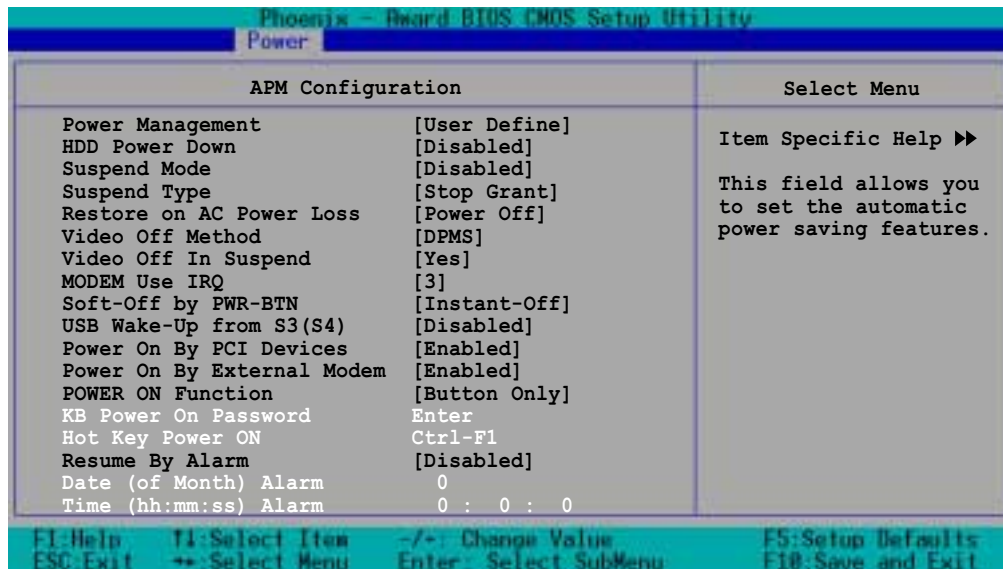
Allows you to enable or disable the ACPI feature on the operating system. Configuration options: [Disabled] [Enabled]

ACPI Suspend Type [S1&S3]

Allows you to select the ACPI state that you wish to use for system suspend. Configuration options: [S1(POS)] [S3(STR)] [S1&S3]

4.5.1 APM Configuration

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



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 IDE hard disk drives in the system after a period of inactivity as set in this field. This feature does not affect SCSI hard drives. Configuration options: [Disabled] [1 Min] ... [15 Min]

Suspend Mode [Disabled]

Sets the time period before the system goes into suspend mode. Configuration options: [Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [12 Min] [20 Min] [30 Min] [40 Min] [1 Hr]

Suspend Type [Stop Grant]

Allows you to select the suspend type. Configuration options: [Stop Grant] [PwrOn Suspend]

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 an 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]

Video Off Method [DPMS]

This item determines the video off features. The Display Power Management System (DPMS) feature allows the BIOS to control the video display card if it supports the DPMS feature. [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]

Video Off In Suspend [Yes]

This item determines when to activate the video off feature for monitor power management. Configuration options: [Yes] [No]

MODEM Use IRQ [3]

Allows you to select the IRQ assignment for the modem. Configuration options: [NA] [3] [4] [5] [7] [9] [10] [11]

Soft-Off by PWR-BTTN [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], press the power button for **more** than 4 seconds to power off the system. Configuration options: [Instant-Off] [Delay 4 Sec.]

USB Wake-Up from S3(S4) [Disabled]

Allows you to enable or disable system wake-up from S3 or S4 state through a USB keyboard/mouse event. Configuration options: [Disabled] [Enabled]

Power On By PCI Devices [Enabled]

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

Power On By External Modem [Enabled]

Allows you to enable or disable system power up when the external modem receives a call while in soft-off mode. Configuration options: [Disabled] [Enabled]

Power On Function [BUTTON ONLY]

Allows you to select a device to turn the system power on. Configuration options: [Password] [Hot Key] [Mouse Left] [Mouse Right] [Any KEY] [BUTTON ONLY] [PS/2 Mouse]

KB Power On Password [Enter]

Allows you to set a password to turn the system power on. Highlight this item then press enter to set a password.



To configure this item, you should set the **Power On Function** item to [Password].

Hot Key Power On [Ctrl-F1]

Allows you to set a hot key combination to turn the system power on. Configuration options: [Ctrl-F1] ... [Ctrl-F12]



To configure this item, you should set the **Power On Function** item to [Hot Key].

Resume by Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is enabled, you can set the date and time of alarm using the two following items. Configuration options: [Disabled] [Enabled]

Date (of Month) Alarm [0]

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

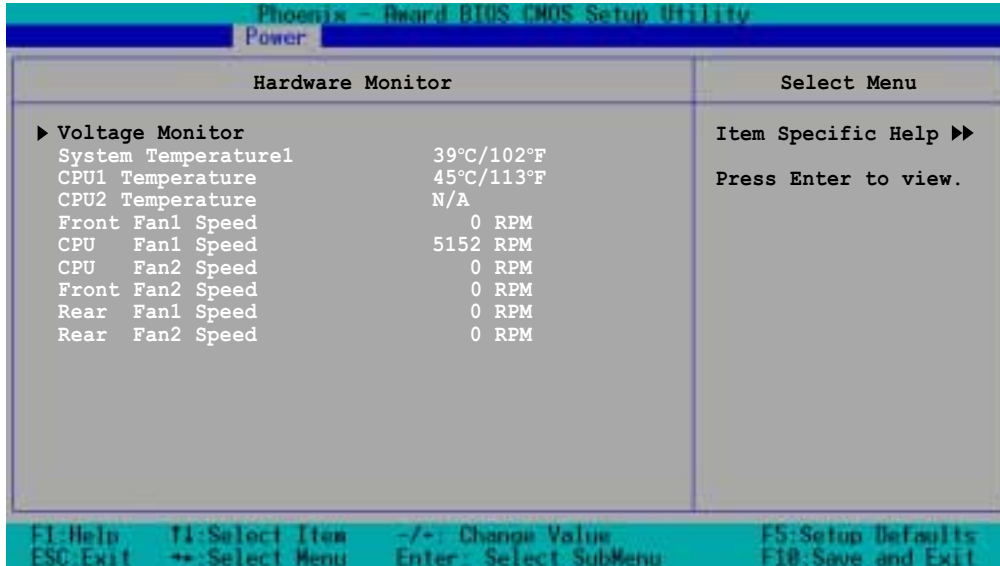
Time (hh:mm:ss) Alarm [0 : 0 : 0]

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.

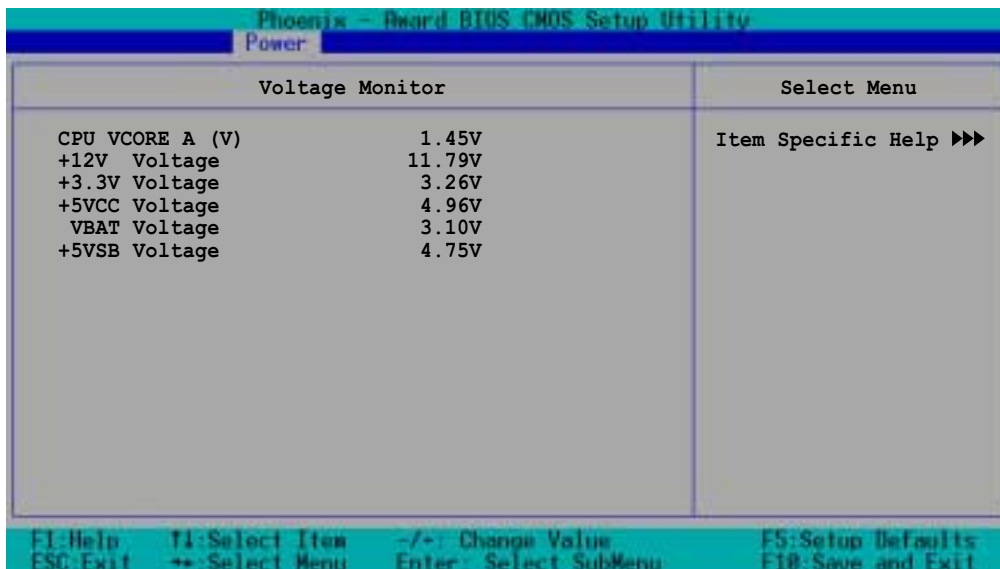
4.5.2 Hardware Monitor

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



The CPU temperatures and fan speeds are auto-detected.

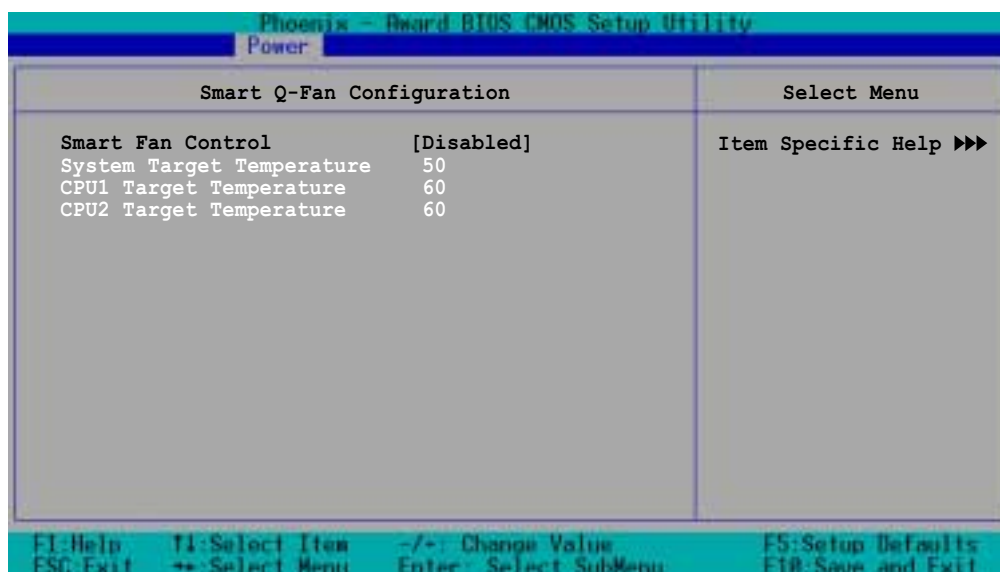
Voltage Monitor



CPU VCORE Voltage, +12V Voltage, +3.3V Voltage, +5VCC Voltage, VBAT Voltage, +5VSB Voltage

Auto-detected voltages through the onboard voltage regulators.

Smart Q-Fan Configuration



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].

2. 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 [60]

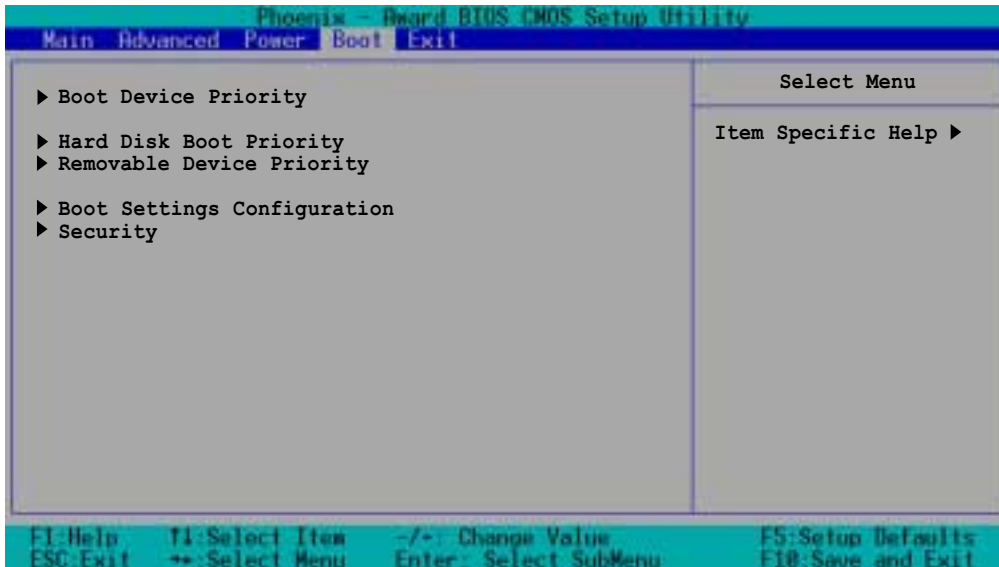
Allows you to set the target temperature for CPU1. Configuration options: [Min=30] [Max=60]

CPU2 Target Temperature [60]

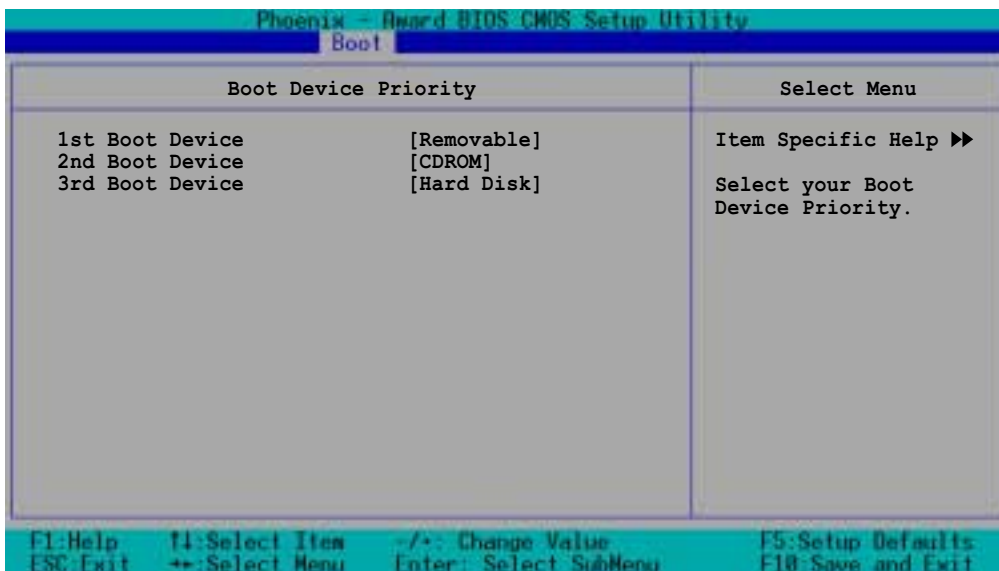
Allows you to set the target temperature for CPU1. Configuration options: [Min=30] [Max=60]

4.6 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.



4.6.1 Boot Device Priority



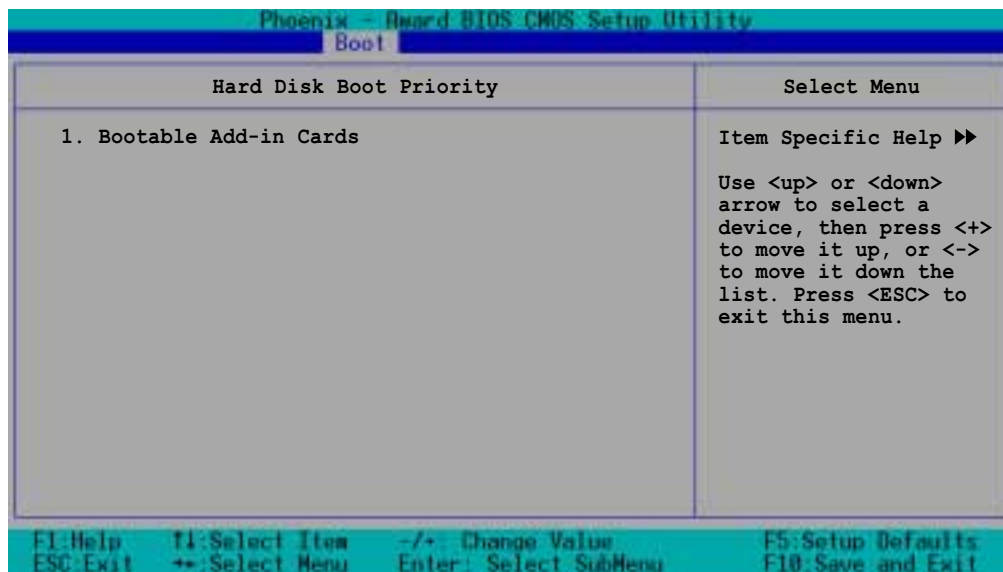
1st Boot Device [Removable]

2nd Boot Device [CDROM]

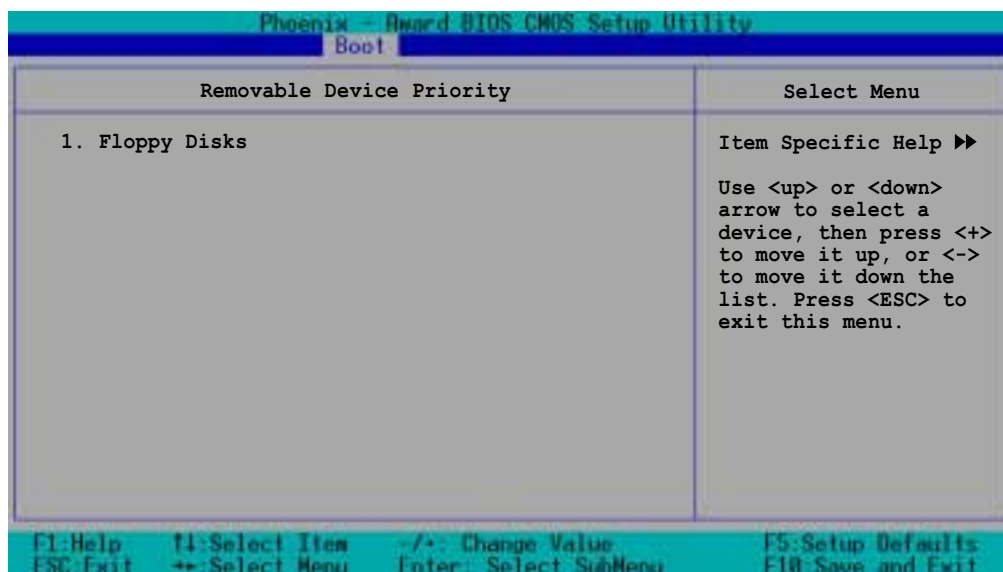
3rd Boot Device [Hard Disk]

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

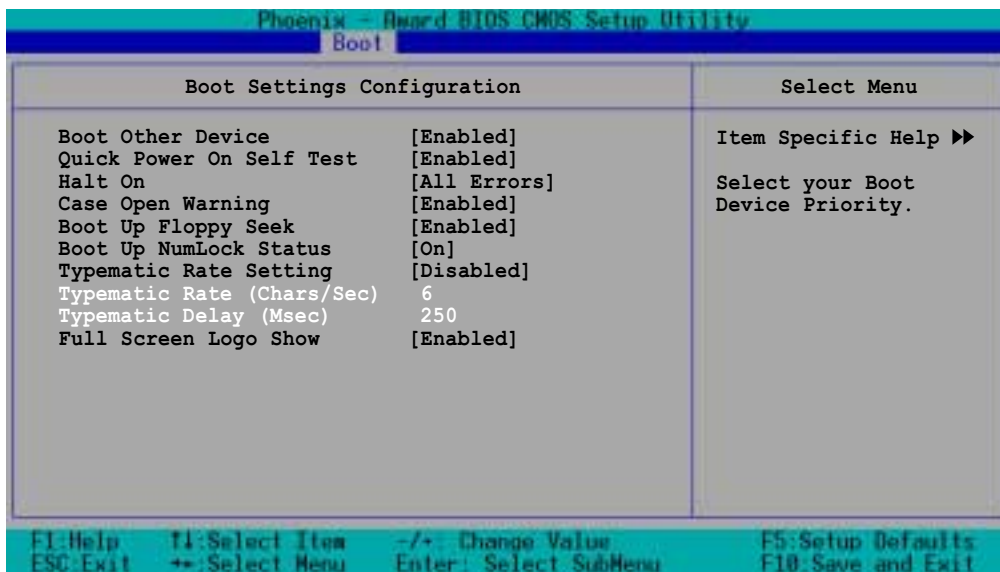
4.6.2 Hard Disk Boot Priority



4.6.3 Removable Device Priority



4.6.4 Boot Settings Configuration



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 retesting a second, third, and fourth time. Configuration options: [Disabled] [Enabled]

Halt On [All Errors]

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]

Case Open Warning [Enabled]

Allows you to enable or disable the case open status feature. Setting to [Enabled] clear the case open status. Configuration options: [Disabled] [Enabled]

Boot Up Floppy Seek [Enabled]

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]

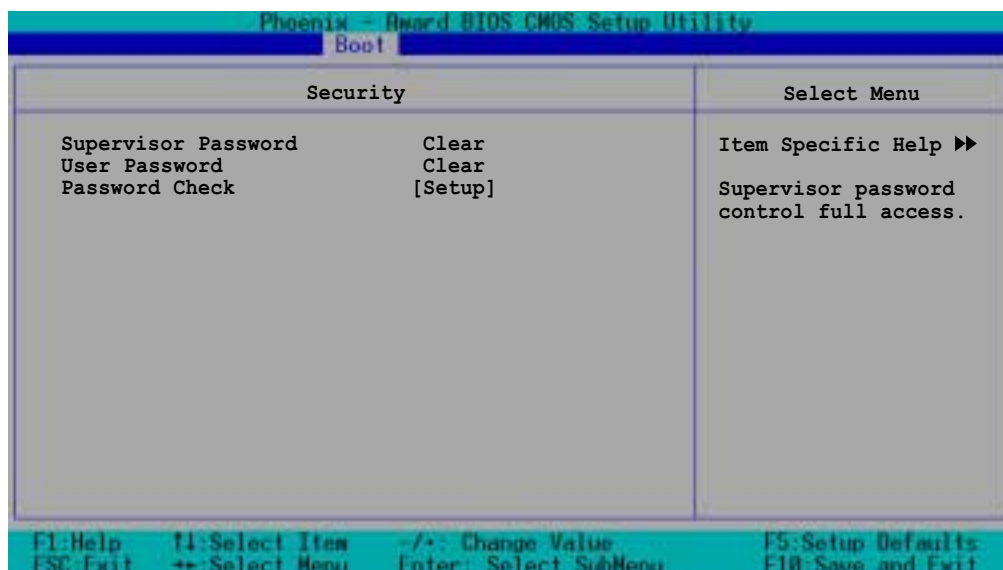
Full Screen Logo Show [Enabled]

Allows you to enable or disable the ASUS Mylogo2™ feature. Configuration options: [Disabled] [Enabled]



The ASUS MyLogo2 is automatically installed when you install ASUS Update from the support CD. You need to launch ASUS Update, then ASUS MyLogo2 to change the full screen logo.

4.6.5 Security



Supervisor Password [Clear]

User Password [Clear]

These fields allow you to set passwords.

To set a password:

1. Highlight an item then press <Enter>.
2. Type in a password using eight (8) alphanumeric 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. Highlight the password field, and press <Enter> twice. The following message appears:
“PASSWORD DISABLED!!! Press any key to continue...”
2. Press any key to return to the menu.

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 the password?

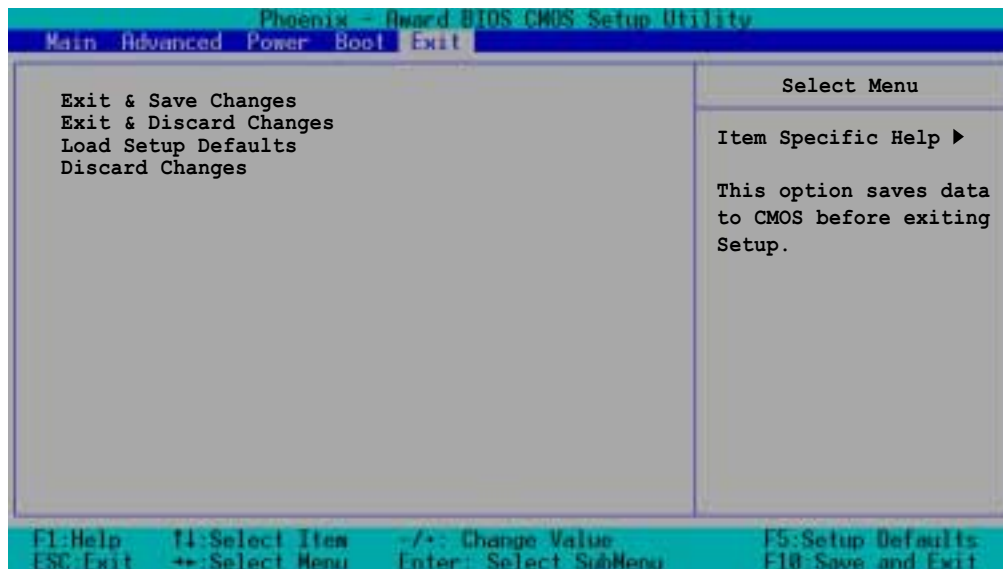
If you forget your password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. The RAM data containing the password information is powered by the onboard button cell battery. If you need to erase the CMOS RAM, refer to section “2.6 Jumpers” for instructions.

Password Check [Setup]

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]

4.7 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.



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

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

Appendix

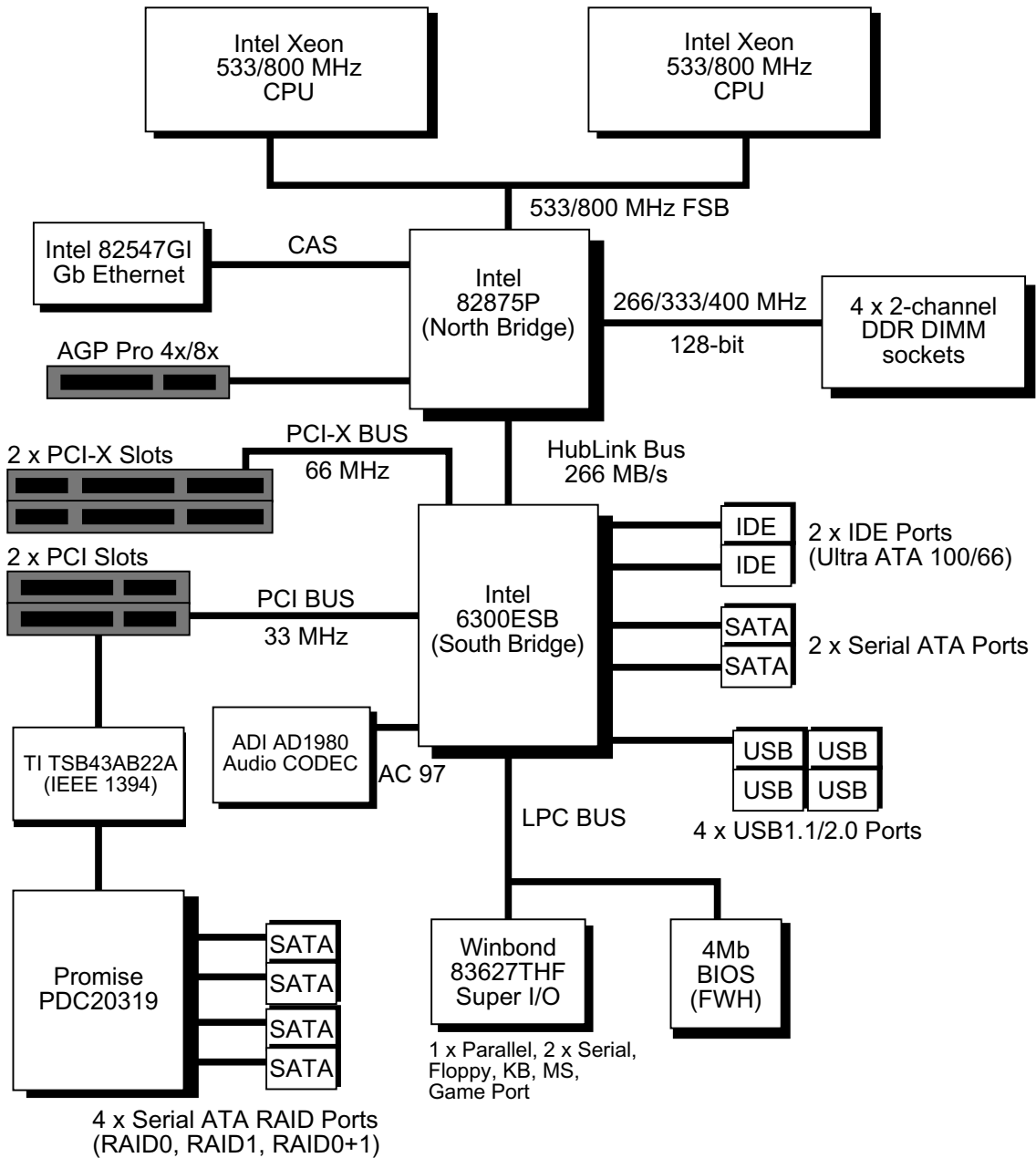
This appendix includes additional information that you may refer to when configuring the motherboard.

Reference information

Appnedix summary

A-1	Block diagram	A-1
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A.1 NCCH-DL block diagram



A series of 28 horizontal lines, evenly spaced, providing a template for text entry.