



# ConRoe945PL-GLAN

## User Manual

Version 1.0

Published May 2006

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- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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## Chapter 1 Introduction

Thank you for purchasing ASRock **ConRoe945PL-GLAN** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.



Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website <http://www.asrock.com>

### 1.1 Package Contents

ASRock **ConRoe945PL-GLAN** Motherboard

(ATX Form Factor: 12.0-in x 7.5-in, 30.5 cm x 19.1 cm)

ASRock **ConRoe945PL-GLAN** Quick Installation Guide

ASRock **ConRoe945PL-GLAN** Support CD

(including *LGA 775 CPU Installation Live Demo*)

One 80-conductor Ultra ATA 66/100 IDE Ribbon Cable

One Ribbon Cable for a 3.5-in Floppy Drive

One Serial ATA (SATA) Data Cables (Optional)

One Serial ATA (SATA) HDD Power Cables (Optional)

One HDMI\_SPDIF Cable (Optional)

One HD 8CH I/O Panel Shield

## 1.2 Specifications

<b>Platform</b>	- ATX Form Factor: 12.0-in x 7.5-in, 30.5 cm x 19.1 cm
<b>CPU</b>	- LGA 775 for Intel® Dual Core Pentium® D / Pentium® 4 / Celeron® D, supporting Core™ 2 Duo Desktop (Conroe), Presler and Cedar Mill processors (in 775-land LGA package) - FSB 800/533 MHz - Supports Hyper-Threading Technology (see <b>CAUTION 1</b> ) - Supports Untied Overclocking Technology (see <b>CAUTION 2</b> ) - Supports EM64T CPU
<b>Chipset</b>	- Northbridge: Intel® 945PL - Southbridge: Intel® ICH7
<b>Memory</b>	- Dual Channel DDRII Memory Technology (see <b>CAUTION 3</b> ) - 2 x DDRII DIMM slots - Support DDRII533 - Max. capacity: 2GB
<b>Hybrid Booster</b>	- CPU Frequency Stepless Control (see <b>CAUTION 4</b> ) - ASRock U-COP (see <b>CAUTION 5</b> ) - Boot Failure Guard (B.F.G.)
<b>Expansion Slot</b>	- 3 x PCI slots - 1 x PCI Express x16 slot - 1 x PCI Express x1 slot
<b>Audio</b>	- Realtek ALC888 7.1 channel CODEC with High Definition Audio
<b>LAN</b>	- Gigabit LAN 10/100/1000 Mb/s - PCIE x 1 Realtek RTL8111B - Supports Wake-On-LAN
<b>Rear Panel I/O</b>	HD 8CH I/O - 1 x PS/2 Mouse Port - 1 x PS/2 Keyboard Port - 1 x COM Port - 1 x Parallel Port (ECP/EPP Support) - 4 x Ready-to-Use USB 2.0 Ports - 1 x RJ-45 LAN Port - HD Audio Jack: Side Speaker/Rear Speaker/Central/Bass/Line in/Front Speaker/Microphone (see <b>CAUTION 6</b> )

<b>Connector</b>	<ul style="list-style-type: none"> <li>- 4 x SATAII 3.0Gb/s connectors (No Support for RAID and “Hot Plug” functions) (see <b>CAUTION 7</b>)</li> <li>- 1 x ATA100 IDE connector (supports 2 x IDE devices)</li> <li>- 1 x Floppy connector</li> <li>- 1 x IR header</li> <li>- 1 x Game header</li> <li>- 1 x HDMI_SPDIF header</li> <li>- CPU/Chassis FAN connector</li> <li>- 20 pin ATX power connector</li> <li>- 4 pin 12V power connector</li> <li>- CD in header</li> <li>- Front panel audio connector</li> <li>- 2 x USB 2.0 headers (support 4 USB 2.0 ports) (see <b>CAUTION 8</b>)</li> </ul>
<b>BIOS Feature</b>	<ul style="list-style-type: none"> <li>- 4Mb AMI BIOS</li> <li>- AMI Legal BIOS</li> <li>- Supports “Plug and Play”</li> <li>- ACPI 1.1 Compliance Wake Up Events</li> <li>- Supports jumperfree</li> <li>- AMBIOS 2.3.1 Support</li> </ul>
<b>Support CD</b>	- Drivers, Utilities, AntiVirus Software (Trial Version)
<b>Hardware Monitor</b>	<ul style="list-style-type: none"> <li>- CPU Temperature Sensing</li> <li>- Chassis Temperature Sensing</li> <li>- CPU Fan Tachometer</li> <li>- Chassis Fan Tachometer</li> <li>- CPU Quiet Fan</li> <li>- Voltage Monitoring: +12V, +5V, +3.3V, Vcore</li> </ul>
<b>OS</b>	- Microsoft® Windows® 2000/XP/XP 64-bit/Vista™ compliant (see <b>CAUTION 9</b> )
<b>Certifications</b>	- FCC, CE, WHQL

## **CAUTION!**

1. About the setting of "Hyper Threading Technology", please check page 29.
2. This motherboard supports Untied Overclocking Technology. Please read "Untied Overclocking Technology" on page 25 for details.
3. This motherboard supports Dual Channel Memory Technology. Before you implement Dual Channel Memory Technology, make sure to read the installation guide of memory modules on page 16 for proper installation.
4. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause the instability of the system or damage the CPU.
5. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system.
6. For microphone input, this motherboard supports both stereo and mono modes. For audio output, this motherboard supports 2-channel, 4-channel, 6-channel, and 8-channel modes. Please check the table on page 11 for proper connection.
7. Before installing SATAII hard disk to SATAII connector, please read the "SATAII Hard Disk Setup Guide" on page 24 to adjust your SATAII hard disk drive to SATAII mode. You can also connect SATA hard disk to SATAII connector directly.
8. Power Management for USB 2.0 works fine under Microsoft® Windows® Vista™ / XP 64-bit / XP SP1 or SP2 / 2000 SP4.
9. Microsoft® Windows® Vista™ driver is not ready yet. We will update it to our website in the future. Please visit our website for Microsoft® Windows® Vista™ driver and related information.  
ASRock website <http://www.asrock.com>



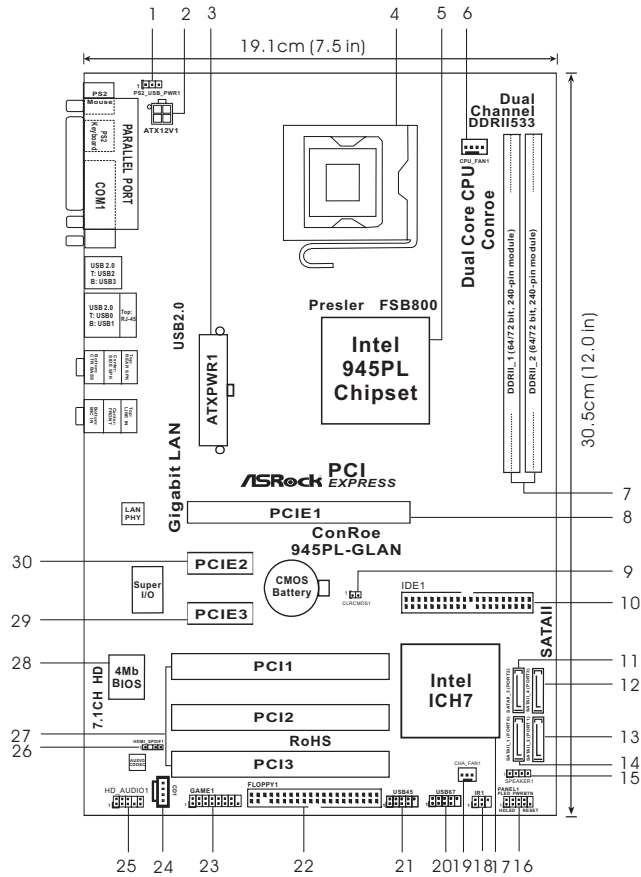
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### 1.3 Minimum Hardware Requirement Table for Windows® Vista™ Premium and Basic Logo

For system integrators and users who purchase this motherboard and plan to submit Windows® Vista™ Premium and Basic logo, please follow the below table for minimum hardware requirement. Please adopt the CPU, memory, and VGA that we suggest.

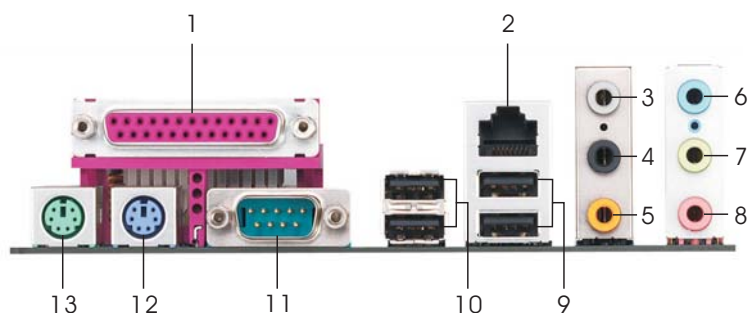
CPU	Celeron D 326
Memory	512MB Single Channel
VGA	DX9.0 with WDDM Driver
	with 128bit VGA memory (Premium)
	with 64bit VGA memory (Basic)

## 1.4 Motherboard Layout



- |  |  |
|--|--|
| 1 PS2_USB_PWR1 Jumper  | 16 System Panel Header (PANEL1)          |
| 2 ATX 12V Connector (ATX12V1)  | 17 South Bridge Controller               |
| 3 ATX Power Connector (ATXPWR1)  | 18 Infrared Module Header (IR1)          |
| 4 775-Pin CPU Socket   | 19 Chassis Fan Connector (CHA_FAN1)      |
| 5 North Bridge Controller  | 20 USB 2.0 Header (USB67, Blue)          |
| 6 CPU Fan Connector (CPU_FAN1)   | 21 USB 2.0 Header (USB45, Blue)          |
| 7 2 x 240-pin DDRII DIMM Slots<br>(Dual Channel: DDRII_1, DDRII_2; Yellow) | 22 Floppy Connector (FLOPPY1)            |
| 8 PCI Express x16 Slot (PCIE1)   | 23 Game Port Header (GAME1)              |
| 9 Clear CMOS Jumper (CLRCMOS1)   | 24 Internal Audio Connector: CD1 (Black) |
| 10 IDE1 Connector (IDE1, Blue)   | 25 Front Panel Audio Header (HD_AUDIO1)  |
| 11 SATAII Connector (SATAII_3 (PORT2); Orange)                             | 26 HDMI_SPDIF Header (HDMI_SPDIF1)       |
| 12 SATAII Connector (SATAII_4 (PORT3); Orange)                             | 27 PCI Slots (PCI1-3)                    |
| 13 SATAII Connector (SATAII_2 (PORT1); Red)                                | 28 BIOS FWH Chip                         |
| 14 SATAII Connector (SATAII_1 (PORT0); Red)                                | 29 PCI Express x1 Slot (PCIE3)           |
| 15 Chassis Speaker Header (SPEAKER 1)                                      | 30 PCI Express x1 Slot (PCIE2)           |

## 1.5 HD 8CH I/O Panel




- |                           |                                |
|---------------------------|--------------------------------|
| 1 Parallel Port           | 8 Microphone (Pink)            |
| 2 RJ-45 Port              | 9 USB 2.0 Ports (USB01)        |
| 3 Side Speaker (Gray)     | 10 USB 2.0 Ports (USB23)       |
| 4 Rear Speaker (Black)    | 11 Serial Port: COM1           |
| 5 Central / Bass (Orange) | 12 PS/2 Keyboard Port (Purple) |
| 6 Line In (Light Blue)    | 13 PS/2 Mouse Port (Green)     |
| *7 Front Speaker (Lime)   |                                |

\* If you use 2-channel speaker, please connect the speaker's plug into "Front Speaker Jack". See the table below for connection details in accordance with the type of speaker you use.

**TABLE for Audio Output Connection**

Audio Output Channels	Front Speaker (No. 7)	Rear Speaker (No. 4)	Central / Bass (No. 5)	Side Speaker (No. 3)
2	V	--	--	--
4	V	V	--	--
6	V	V	V	--
8	V	V	V	V

\* To enable Multi-Streaming function, you need to connect a front panel audio cable to the front panel audio header. After restarting your computer, you will find "Mixer" tool on your system. Please select "Mixer ToolBox" , click "Enable playback multi-streaming", and click

"ok". Choose "2CH", "4CH", "6CH", or "8CH" and then you are allowed to select "Realtek HDA Primary output" to use Rear Speaker, Central/Bass, and Front Speaker, or select "Realtek HDA Audio 2nd output" to use front panel audio.

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## Chapter 2 Installation

**ConRoe945PL-GLAN** is an ATX form factor (12.0" x 7.5", 30.5 x 19.1 cm) motherboard. 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 physical injuries to you and damages to motherboard components.

### 2.1 Screw Holes

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



Do not over-tighten the screws! Doing so may damage the motherboard.

### 2.2 Pre-installation Precautions

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

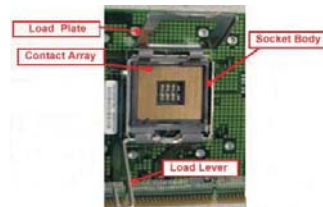
1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, **NEVER** place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.



Before you install or remove any component, ensure that the power 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.

## 2.3 CPU Installation

For the installation of Intel 775-LAND CPU, please follow the steps below.



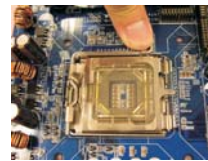
775-Pin Socket Overview



Before you insert the 775-LAND CPU into the socket, please check if the CPU surface is unclean or if there is any bent pin on the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.

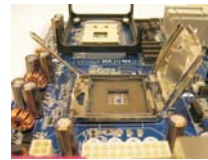
Step 1. Open the socket:

Step 1-1. Disengaging the lever by depressing down and out on the hook to clear retention tab.



Step 1-2. Rotate the load lever to fully open position at approximately 135 degrees.

Step 1-3. Rotate the load plate to fully open position at approximately 100 degrees.

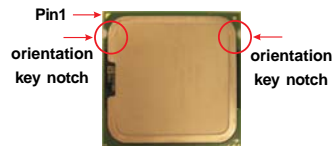


Step 2. Insert the 775-LAND CPU:

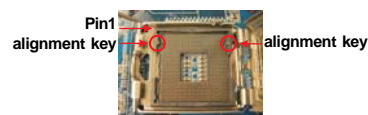
Step 2-1. Hold the CPU by the edges where are marked with black lines.



Step 2-2. Orient the CPU with IHS (Integrated Heat Sink) up. Locate Pin1 and the two orientation key notches.



775-LAND CPU



775-Pin Socket



For proper inserting, please ensure to match the two orientation key notches of the CPU with the two alignment keys of the socket.

Step 2-3. Carefully place the CPU into the socket by using a purely vertical motion.

Step 2-4. Verify that the CPU is within the socket and properly mated to the orient keys.



Step 3. Remove PnP Cap (Pick and Place Cap):

Use your left hand index finger and thumb to support the load plate edge, engage PnP cap with right hand thumb and peel the cap from the socket while pressing on center of PnP cap to assist in removal.



1. It is recommended to use the cap tab to handle and avoid kicking off the PnP cap.
2. This cap must be placed if returning the motherboard for after service.

Step 4. Close the socket:

Step 4-1. Rotate the load plate onto the IHS.

Step 4-2. While pressing down lightly on load plate, engage the load lever.

Step 4-3. Secure load lever with load plate tab under retention tab of load lever.



## 2.4 Installation of CPU Fan and Heatsink

This motherboard is equipped with 775-Pin socket that supports Intel 775-LAND CPU. Please adopt the type of heatsink and cooling fan compliant with Intel 775-LAND CPU to dissipate heat. Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation. Ensure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU\_FAN connector (CPU\_FAN1, see page 10, No. 6).

**For proper installation, please kindly refer to the instruction manuals of your CPU fan and heatsink.**

Below is an example to illustrate the installation of the heatsink for 775-LAND CPU.

- Step 1. Apply thermal interface material onto center of IHS on the socket surface.



- Step 2. Place the heatsink onto the socket. Ensure fan cables are oriented on side closest to the CPU fan connector on the motherboard (CPU\_FAN1, see page 10, No. 6).



- Step 3. Align fasteners with the motherboard throughholes.

- Step 4. Rotate the fastener clockwise, then press down on fastener caps with thumb to install and lock. Repeat with remaining fasteners.



If you press down the fasteners without rotating them clockwise, the heatsink cannot be secured on the motherboard.

- Step 5. Connect fan header with the CPU fan connector on the motherboard.
- Step 6. Secure excess cable with tie-wrap to ensure cable does not interfere with fan operation or contact other components.

## 2.5 Installation of Memory Modules (DIMM)

This motherboard provides two 240-pin DDRII (Double Data Rate) DIMM slots, and supports Dual Channel Memory Technology. For dual channel configuration, you always need to install two **identical** (the same brand, speed, size and chip-type) memory modules in the DDRII DIMM slots to activate Dual Channel Memory Technology. Otherwise, it will operate at single channel mode.



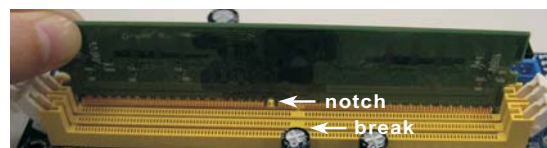
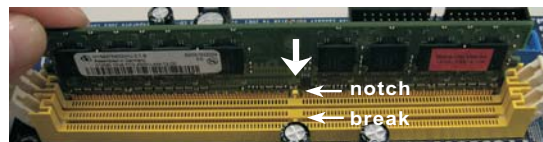
1. It is not allowed to install a DDR memory module into DDRII slot; otherwise, this motherboard and DIMM may be damaged.
2. If you install only one memory module or two non-identical memory modules, it is unable to activate the Dual Channel Memory Technology.

### Installing a DIMM



Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

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



The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

- Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.



---

## 2.6 Expansion Slots (PCI and PCI Express Slots)

There are 3 PCI slots and 3 PCI Express slots on this motherboard.

**PCI slots:** PCI slots are used to install expansion cards that have the 32-bit PCI interface.

**PCIe Slots:** PCIe1 (PCIe x16 slot) is used for PCI Express cards with x16 lane width graphics cards.

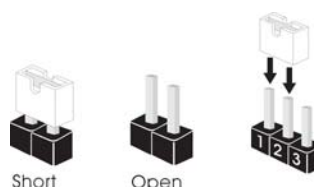
PCIe2 / PCIe3 (PCIe x1 slot) is used for PCI Express cards with x1 lane width graphics cards, such as Gigabit LAN card, SATA2 card, etc.

### Installing an expansion card

- Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 3. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 4. Fasten the card to the chassis with screws.

## 2.7 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is "Short". If no jumper cap is placed on pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when jumper cap is placed on these 2 pins.



Jumper	Setting	Description
PS2_USB_PWR1 (see p.10 No. 1)	<div> <div>1_2</div> <div></div> <div>+5V</div> </div> <div> <div>2_3</div> <div></div> <div>+5VSB</div> </div>	Short pin2, pin3 to enable +5VSB (standby) for PS/2 or USB wake up events.

Note: To select +5VSB, it requires 2 Amp and higher standby current provided by power supply.

### Clear CMOS

(CLRCMOS1, 2-pin jumper)

(see p.10 No. 9)



2-pin jumper

Note: CLRCMOS1 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short 2 pins on CLRCMOS1 for 5 seconds.

## 2.8 Onboard Headers and Connectors



Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

### FDD connector

(33-pin FLOPPY1)

(see p.10 No. 22)

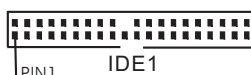


↑  
the red-striped side to Pin1

**Note:** Make sure the red-striped side of the cable is plugged into Pin1 side of the connector.

### Primary IDE connector (Blue)

(39-pin IDE1, see p.10 No. 10)



connect the blue end  
to the motherboard



connect the black end  
to the IDE devices

80-conductor ATA 66/100 cable

**Note:** Please refer to the instruction of your IDE device vendor for the details.

### Serial ATAII Connectors

(SATAII\_1 (PORT0):

see p.10, No. 14)

(SATAII\_2 (PORT1):

see p.10, No. 13)

(SATAII\_3 (PORT2):

see p.10, No. 11)

(SATAII\_4 (PORT3):

see p.10, No. 12)



These four Serial ATAII (SATAII) connectors support SATA data cables for internal storage devices. The current SATAII interface allows up to 3.0 Gb/s data transfer rate.

### Serial ATA (SATA)

Data Cable



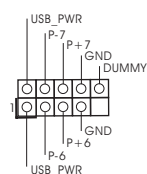
Either end of the SATA data cable can be connected to the SATA / SATAII hard disk or the SATAII connector on the motherboard.

### Serial ATA (SATA) Power Cable (Optional)



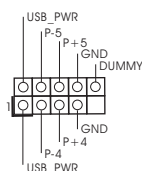
Please connect the black end of SATA power cable to the power connector on each drive. Then connect the white end of SATA power cable to the power connector of the power supply.

### USB 2.0 Headers (9-pin USB67) (see p.10 No. 20)

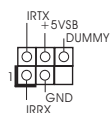


Besides four default USB 2.0 ports on the I/O panel, there are two USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

### (9-pin USB45) (see p.10 No. 21)

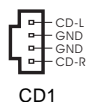


### Infrared Module Header (5-pin IR1) (see p.10 No. 18)



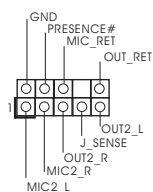
This header supports an optional wireless transmitting and receiving infrared module.

### Internal Audio Connectors (4-pin CD1) (CD1: see p.10 No. 24)



This connector allows you to receive stereo audio input from sound sources such as a CD-ROM, DVD-ROM, TV tuner card, or MPEG card.


### Front Panel Audio Header (9-pin HD\_AUDIO1) (see p.10 No. 25)



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

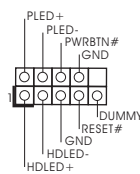


1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instruction in our manual and chassis manual to install your system.

2. If you use AC'97 audio panel, please install it to the front panel audio header as below:
- Connect Mic\_IN (MIC) to MIC2\_L.
  - Connect Audio\_R (RIN) to OUT2\_R and Audio\_L (LIN) to OUT2\_L.
  - MIC\_RET and OUT\_RET are for HD audio panel only. You don't need to connect them for AC'97 audio panel.
  - Enter BIOS Setup Utility. Enter Advanced Settings, and then select Chipset Configuration. Set the Front Panel Control option from [Auto] to [Enabled].
  - Enter Windows system. Click the icon on the lower right hand taskbar to enter Realtek HD Audio Manager. Click "Audio I/O", select "Connector Settings" , choose "Disable front panel jack detection", and save the change by clicking "OK".

#### System Panel Header

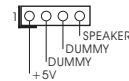
(9-pin PANEL1)  
(see p.10 No. 16)



This header accommodates several system front panel functions.

#### Chassis Speaker Header

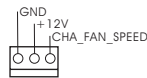
(4-pin SPEAKER 1)  
(see p.10 No. 15)



Please connect the chassis speaker to this header.

#### Chassis Fan Connector

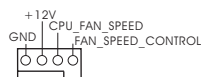
(3-pin CHA\_FAN1)  
(see p.10 No. 19)



Please connect a chassis fan cable to this connector and match the black wire to the ground pin.

#### CPU Fan Connector

(4-pin CPU\_FAN1)  
(see p.10 No. 6)



Please connect a CPU fan cable to this connector and match the black wire to the ground pin.

#### ATX Power Connector

(20-pin ATXPWR1)  
(see p.10 No. 3)



Please connect an ATX power supply to this connector.

#### ATX 12V Connector

(4-pin ATX12V1)  
(see p.10 No. 2)

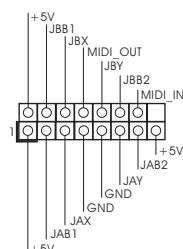


Please connect an ATX 12V power supply to this connector.

### Game Port Header

(15-pin GAME1)

(see p.10 No. 23)



Connect a Game cable to this header if the Game port bracket is installed.

### HDMI\_SPDIF Header

(3-pin HDMI\_SPDIF1)

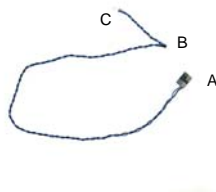
(see p.10 No. 26)



HDMI\_SPDIF header, providing SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/ projector/LCD devices. Please connect the HDMI\_SPDIF connector of HDMI VGA card to this header.

### HDMI\_SPDIF Cable

(Optional)

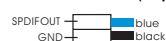


Please connect the black end (A) of HDMI\_SPDIF cable to the HDMI\_SPDIF header on the motherboard. Then connect the white end (B or C) of HDMI\_SPDIF cable to the HDMI\_SPDIF connector of HDMI VGA card.

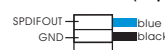
#### A. black end



#### B. white end (2-pin)



#### C. white end (3-pin)



## 2.9 HDMI\_SPDIF Header Connection Guide

HDMI (High-Definition Multi-media Interface) is an all-digital audio/video specification, which provides an interface between any compatible digital audio/video source, such as a set-top box, DVD player, A/V receiver and a compatible digital audio or video monitor, such as a digital television (DTV). A complete HDMI system requires a HDMI VGA card and a HDMI ready motherboard with a HDMI\_SPDIF header. This motherboard is equipped with a HDMI\_SPDIF header, which provides SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/projector/LCD devices. To use HDMI function on this motherboard, please carefully follow the below steps.

Step 1. Install the HDMI VGA card to the PCI Express Graphics slot on this motherboard. For the proper installation of HDMI VGA card, please refer to the installation guide on page 17.

Step 2. Connect the black end (A) of HDMI\_SPDIF cable to the HDMI\_SPDIF header (HDMI\_SPDIF1, yellow, see page 10, No. 26) on the motherboard.



Make sure to correctly connect the HDMI\_SPDIF cable to the motherboard and the HDMI VGA card according to the same pin definition. For the pin definition of HDMI\_SPDIF header and HDMI\_SPDIF cable connectors, please refer to page 22. For the pin definition of HDMI\_SPDIF connectors on HDMI VGA card, please refer to the user manual of HDMI VGA card vendor. Incorrect connection may cause permanent damage to this motherboard and the HDMI VGA card.

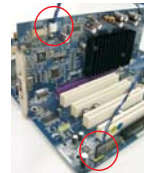
Step 3. Connect the white end (B or C) of HDMI\_SPDIF cable to the HDMI\_SPDIF connector of HDMI VGA card. (There are two white ends (2-pin and 3-pin) on HDMI\_SPDIF cable. Please choose the appropriate white end according to the HDMI\_SPDIF connector of the HDMI VGA card you install.



white end  
(2-pin) (B)



white end  
(3-pin) (C)



Please do not connect the white end of HDMI\_SPDIF cable to the wrong connector of HDMI VGA card or other VGA card. Otherwise, the motherboard and the VGA card may be damaged. For example, this picture shows the wrong example of connecting HDMI\_SPDIF cable to the fan connector of PCI Express VGA card. Please refer to the VGA card user manual for connector usage in advance.



Step 4. Connect the HDMI output connector on HDMI VGA card to HDMI device, such as HDTV. Please refer to the user manual of HDTV and HDMI VGA card vendor for detailed connection procedures.

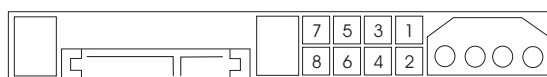


Step 5. Install HDMI VGA card driver to your system.

## 2.10 SATAII Hard Disk Setup Guide

Before installing SATAII hard disk to your computer, please carefully read below SATAII hard disk setup guide. Some default setting of SATAII hard disks may not be at SATAII mode, which operate with the best performance. In order to enable SATAII function, please follow the below instruction with different vendors to correctly adjust your SATAII hard disk to SATAII mode in advance; otherwise, your SATAII hard disk may fail to run at SATAII mode.

### Western Digital



If pin 5 and pin 6 are shorted, SATA 1.5Gb/s will be enabled.

On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 5 and pin 6.

### SAMSUNG



If pin 3 and pin 4 are shorted, SATA 1.5Gb/s will be enabled.

On the other hand, if you want to enable SATAII 3.0Gb/s, please remove the jumpers from pin 3 and pin 4.

### HITACHI

Please use the Feature Tool, a DOS-bootable tool, for changing various ATA features. Please visit HITACHI's website for details:

<http://www.hitachigst.com/hdd/support/download.htm>



The above examples are just for your reference. For different SATAII hard disk products of different vendors, the jumper pin setting methods may not be the same. Please visit the vendors' website for the updates.



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## **2.11 Serial ATA (SATA) / Serial ATAII (SATAII) Hard Disks Installation**

This motherboard adopts Intel® ICH7 south bridge chipset that supports Serial ATA (SATA) / Serial ATAII (SATAII) hard disks. You may install SATA / SATAII hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA / SATAII hard disks.

STEP 1: Install the SATA / SATAII hard disks into the drive bays of your chassis.

STEP 2: Connect the SATA power cable to the SATA / SATAII hard disk.

STEP 3: Connect one end of the SATA data cable to the motherboard's SATAII connector.

STEP 4: Connect the other end of the SATA data cable to the SATA / SATAII hard disk.

## **2.12 Driver Installation Guide**

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from up to bottom side to install those required drivers. Therefore, the drivers you install can work properly.

## **2.13 Untied Overclocking Technology**

This motherboard supports Untied Overclocking Technology, which means during overclocking, FSB enjoys better margin due to fixed PCI / PCIE bus. You may set "CPU Host Frequency" option of BIOS setup to [Auto], which will show you the actual CPU host frequency in the following item. Therefore, CPU FSB is untied during overclocking, but PCI / PCIE bus is in the fixed mode so that FSB can operate under a more stable overclocking environment.

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## Chapter 3 BIOS SETUP UTILITY

### 3.1 Introduction

This section explains how to use the BIOS SETUP UTILITY to configure your system. The BIOS FWH chip on the motherboard stores the BIOS SETUP UTILITY. You may run the BIOS SETUP UTILITY when you start up the computer. Please press <F2> during the Power-On-Self-Test (POST) to enter the BIOS SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the BIOS SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.



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

#### 3.1.1 BIOS Menu Bar

The top of the screen has a menu bar with the following selections:

<b>Main</b>	To set up the system time/date information
<b>Advanced</b>	To set up the advanced BIOS features
<b>H/W Monitor</b>	To display current hardware status
<b>Boot</b>	To set up the default system device to locate and load the Operating System
<b>Security</b>	To set up the security features
<b>Exit</b>	To exit the current screen or the BIOS SETUP UTILITY

Use <←> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

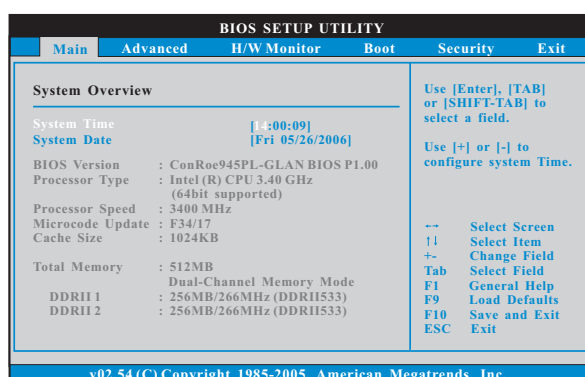
### 3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the BIOS SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

### 3.2 Main Screen

When you enter the BIOS SETUP UTILITY, the Main screen will appear and display the system overview



#### System Time [Hour:Minute:Second]

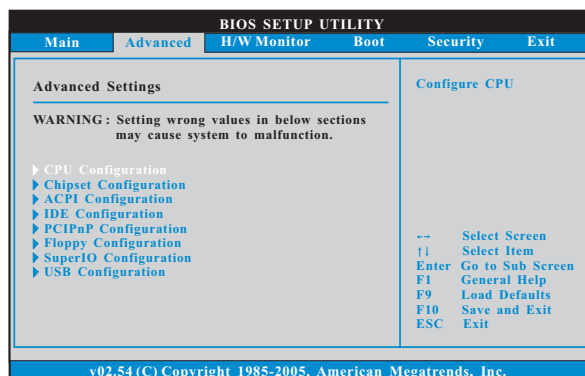
Use this item to specify the system time.

#### System Date [Day Month/Date/Year]

Use this item to specify the system date.

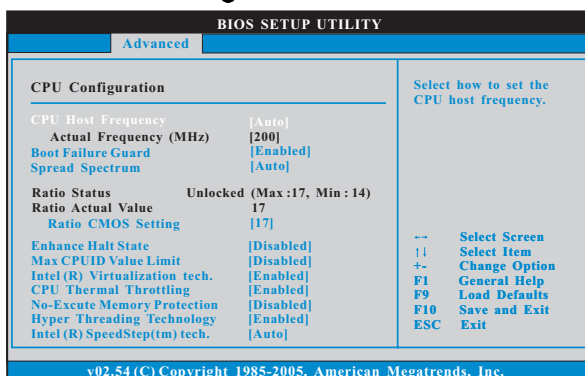
### 3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, ACPI Configuration, IDE Configuration, PCIPnP Configuration, Floppy Configuration, SuperIO Configuration, and USB Configuration.



Setting wrong values in this section may cause the system to malfunction.

### 3.3.1 CPU Configuration



#### CPU Host Frequency

While entering setup, BIOS auto detects the present CPU host frequency of this motherboard. The actual CPU host frequency will show in the following item.

#### Boot Failure Guard

Enable or disable the feature of Boot Failure Guard.

#### Spread Spectrum

This item should always be [Auto] for better system stability.

#### Ratio Status

This is a read-only item, which displays whether the ratio status of this motherboard is "Locked" or "Unlocked". If it shows "Unlocked", you will find an item **Ratio CMOS Setting** appears to allow you changing the ratio value of this motherboard.

---

**Ratio Actual Value**

This is a read-only item, which displays the ratio actual value of this motherboard.

**Ratio CMOS Setting**

If the ratio status is unlocked, you will find this item appear to allow you changing the ratio value of this motherboard.

**Enhance Halt State**

All processors support the Halt State (C1). The C1 state is supported through the native processor instructions HLT and MWAIT and requires no hardware support from the chipset. In the C1 power state, the processor maintains the context of the system caches.

**Max CPUID Value Limit**

For Prescott CPU only, some OSes (ex. NT4.0) cannot handle the function with disable. This should be enabled in order to boot legacy OSes that cannot support CPUs with extended CPUID functions.

**Intel (R) Virtualization tech.**

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel (R) Virtualization Technology.

**CPU Thermal Throttling**

You may select [Enabled] to enable P4 CPU internal thermal control mechanism to keep the CPU from overheated.

**No-Excute Memory Protection**

No-Execution (NX) Memory Protection Technology is an enhancement to the IA-32 Intel Architecture. An IA-32 processor with "No Execute (NX) Memory Protection" can prevent data pages from being used by malicious software to execute code. This option will be hidden if the current CPU does not support No-Excute Memory Protection.

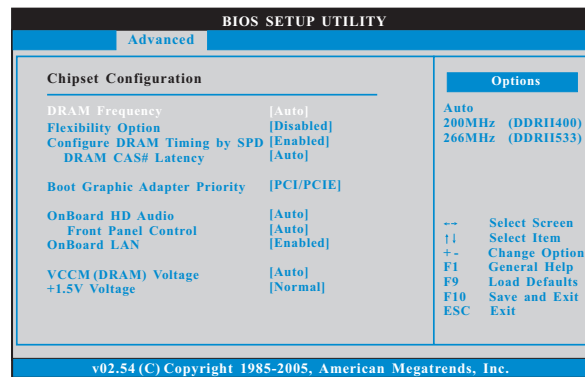
**Hyper Threading Technology**

To enable this feature, it requires a computer system with an Intel Pentium®4 processor that supports Hyper-Threading technology and an operating system that includes optimization for this technology, such as Microsoft® Windows® XP. Set to [Enabled] if using Microsoft® Windows® XP, or Linux kernel version 2.4.18 or higher. This option will be hidden if the installed CPU does not support Hyper-Threading technology.

**Intel (R) SpeedStep(tm) tech.**

Intel (R) SpeedStep(tm) tech. is Intel's new power saving technology. Processor can switch between multiple frequency and voltage points to enable power savings. If you select [Auto], you need to set the "Power Schemes" as "Portable/Laptop" to enable this function.

### 3.3.2 Chipset Configuration



#### DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically. You may also select other value as operating frequency: [200MHz (DDRII 400)], [266MHz (DDRII 533)].

#### Flexibility Option

The default value of this option is [Disabled]. It will allow better tolerance for memory compatibility when it is set to [Enabled].

#### Configure DRAM Timing by SPD

Select [Enabled] will configure the following items by the contents in the SPD (Serial Presence Detect) device. If you select [Disabled], you will find the items "DRAM RAS# to CAS# Delay", "DRAM RAS# Precharge", and "DRAM RAS# Activate to Precharge" appear to allow you adjusting them.

#### DRAM CAS# Latency

Use this item to adjust the means of memory accessing. Configuration options are [6], [5], [4], [3], and [Auto].

#### DRAM RAS# to CAS# Delay

This controls the latency between the DRAM active command and the read / write command. Configuration options: [2 DRAM Clocks], [3 DRAM Clocks], [4 DRAM Clocks], [5 DRAM Clocks], and [6 DRAM Clocks].

#### DRAM RAS# Precharge

This controls the idle clocks after a precharge command is issued. Configuration options: [2 DRAM Clocks], [3 DRAM Clocks], [4 DRAM Clocks], [5 DRAM Clocks], and [6 DRAM Clocks].

---

**DRAM RAS# Activate to Precharge**

This controls the number of DRAM clocks for TRAS. Configuration options: [4 DRAM Clocks], [5 DRAM Clocks], [6 DRAM Clocks], [7 DRAM Clocks], [8 DRAM Clocks], [9 DRAM Clocks], [10 DRAM Clocks], [11 DRAM Clocks], [12 DRAM Clocks], [13 DRAM Clocks], [14 DRAM Clocks], and [15 DRAM Clocks].

**Boot Graphic Adapter Priority**

This allows you to select [PCI/PCIE] or [PCIE/PCI] as the boot graphic adapter priority. The default value is [PCI/PCIE].

**OnBoard HD Audio**

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

**Front Panel Control**

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio Front Panel.

**OnBoard LAN**

This allows you to enable or disable the "OnBoard LAN" feature.

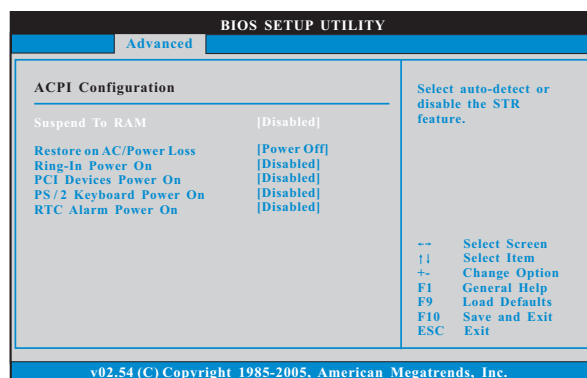
**VCCM (DRAM) Voltage**

Use this to select VCCM (DRAM) Voltage. Configuration options: [High], [Middle], [Low], and [Auto]. The default value of this feature is [Auto].

**+1.5V Voltage**

Configuration options: [High] and [Normal]. The default value of this feature is [Normal].

### 3.3.3 ACPI Configuration



#### Suspend to RAM

This field allows you to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the system supports it.

#### Restore on AC/Power Loss

This allows you to set the power state after an unexpected AC/Power loss. If [Power Off] is selected, the AC/Power remains off when the power recovers. If [Power On] is selected, the AC/Power resumes and the system starts to boot up when the power recovers.

#### Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

#### PCI Devices Power On

Use this item to enable or disable PCI devices to turn on the system from the power-soft-off mode.

#### PS/2 Keyboard Power On

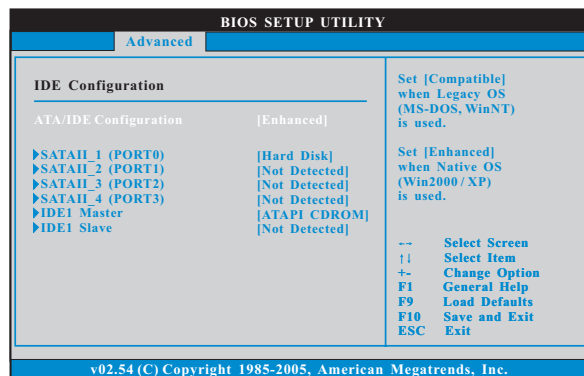
Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

#### RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.



### 3.3.4 IDE Configuration



#### ATA/IDE Configuration

Please select **[Compatible]** when you install legacy OS (Windows NT). If native OS (Windows 2000 / XP) is installed, please select **[Enhanced]**.

When **[Compatible]** is selected

#### Combined Option

It allows you to select between **[SATA 1, SATA 2, SATA 3, SATA 4]**, **[SATA 1, SATA 3, IDE 1]**, and **[IDE 1, SATA 2, SATA 4]**. If it is set to **[SATA 1, SATA 3, IDE 1]**, then SATAII\_2 (PORT1), SATAII\_4 (PORT3) will not work. Likewise, if it is set to **[IDE 1, SATA 2, SATA 4]**, then SATAII\_1 (PORT0), SATAII\_3 (PORT2) will not work.

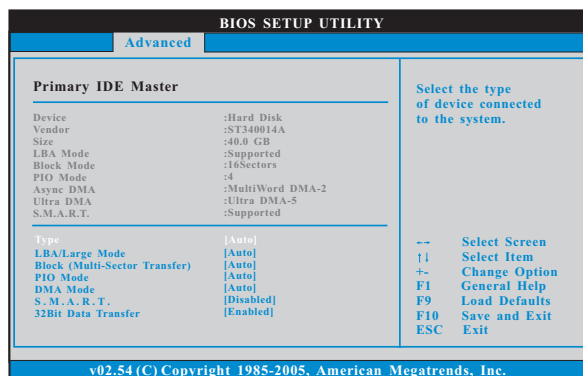


Because Intel® ICH7 south bridge only supports four IDE devices under legacy OS (Windows NT), you have to choose **[SATA 1, SATA 2, SATA 3, SATA 4]**, **[SATA 1, SATA 3, IDE 1]**, or **[IDE 1, SATA 2, SATA 4]** when the installed device is used with legacy OS.

	[SATA 1, SATA 2, SATA 3, SATA 4]	[SATA 1, SATA 3, IDE 1]	[IDE 1, SATA 2, SATA 4]
Master	SATAII_1 (PORT0), SATAII_2 (PORT1)	SATAII_1 (PORT0)	SATAII_2 (PORT1)
Slave	SATAII_3 (PORT2), SATAII_4 (PORT3)	SATAII_3 (PORT2)	SATAII_4 (PORT3)

#### IDE Device Configuration

You may set the IDE configuration for the device that you specify. We will use the "Primary IDE Master" as the example in the following instruction.



### TYPE

Use this item to configure the type of the IDE device that you specify. Configuration options: [Not Installed], [Auto], [CD/DVD], and [ARMD].

**[Not Installed]:** Select [Not Installed] to disable the use of IDE device.

**[Auto]:** Select [Auto] to automatically detect the hard disk drive.



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

**[CD/DVD]:** This is used for IDE CD/DVD drives.

**[ARMD]:** This is used for IDE ARMD (ATAPI Removable Media Device), such as MO.

### LBA/Large Mode

Use this item to select the LBA/Large mode for a hard disk > 512 MB under DOS and Windows; for Netware and UNIX user, select [Disabled] to disable the LBA/Large mode.

### Block (Multi-Sector Transfer)

The default value of this item is [Auto]. If this feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

### PIO Mode

Use this item to set the PIO mode to enhance hard disk performance by optimizing the hard disk timing.

### DMA Mode

DMA capability allows the improved transfer-speed and data-integrity for compatible IDE devices.

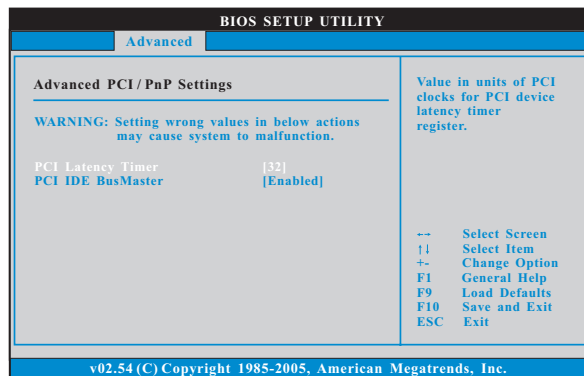
#### S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled], [Auto], [Enabled].

#### 32-Bit Data Transfer

Use this item to enable 32-bit access to maximize the IDE hard disk data transfer rate.

### 3.3.5 PCIPnP Configuration



#### PCI Latency Timer

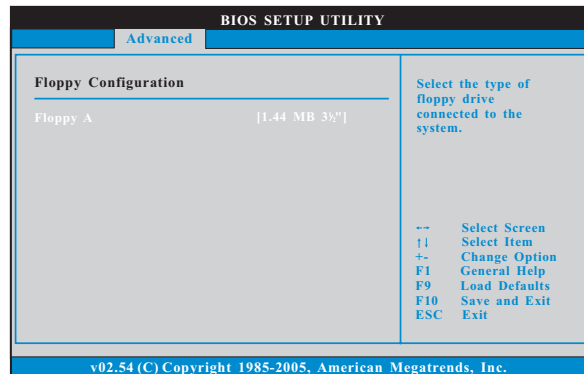
The default value is 32. It is recommended to keep the default value unless the installed PCI expansion cards' specifications require other settings.

#### PCI IDE BusMaster

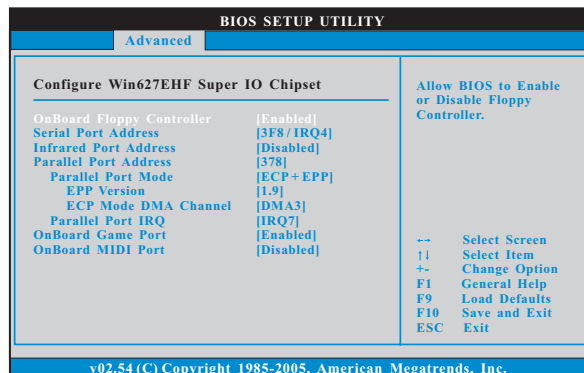
Use this item to enable or disable the PCI IDE BusMaster feature.

### 3.3.6 Floppy Configuration

In this section, you may configure the type of your floppy drive.



### 3.3.7 Super IO Configuration



#### OnBoard Floppy Controller

Use this item to enable or disable floppy drive controller.

#### Serial Port Address

Use this item to set the address for the onboard serial port or disable it.

Configuration options: [Disabled], [3F8 / IRQ4], [2F8 / IRQ3], [3E8 / IRQ4], [2E8 / IRQ3].

#### Infrared Port Address

Use this item to set the address for the onboard infrared port or disable it.

Configuration options: [Disabled], [2F8 / IRQ3], and [2E8 / IRQ3].

---

#### **Parallel Port Address**

Use this item to set the address for the onboard parallel port or disable it. Configuration options: [Disabled], [378], and [278].

#### **Parallel Port Mode**

Use this item to set the operation mode of the parallel port. The default value is [ECP+EPP]. If this option is set to [ECP+EPP], it will show the EPP version in the following item, "EPP Version". Configuration options: [Normal], [Bi-Directional], and [ECP+EPP].

#### **EPP Version**

Use this item to set the EPP version. Configuration options: [1.9] and [1.7].

#### **ECP Mode DMA Channel**

Use this item to set the ECP mode DMA channel. Configuration options: [DMA0], [DMA1], and [DMA3].

#### **Parallel Port IRQ**

Use this item to set the IRQ for the parallel port. Configuration options: [IRQ5] and [IRQ7].

#### **OnBoard Game Port**

Use this item to enable the Game Port or disable it.

#### **OnBoard MIDI Port**

Use this item to select the address for the MIDI Port or disable it. Configuration options: [Disabled], [300], and [330].

### 3.3.8 USB Configuration

BIOS SETUP UTILITY	
Advanced	
<b>USB Configuration</b>	
USB Controller	[Enabled]
USB 2.0 Support	[Enabled]
Legacy USB Support	[Disabled]
To enable or disable the onboard USB controllers.	
-- Select Screen	
↑↓ Select Item	
+/- Change Option	
F1 General Help	
F9 Load Defaults	
F10 Save and Exit	
ESC Exit	
v02.54 (C) Copyright 1985-2005, American Megatrends, Inc.	

#### USB Controller

Use this item to enable or disable the use of USB controller.

#### USB 2.0 Support

Use this item to enable or disable the USB 2.0 support.

#### Legacy USB Support

Use this item to enable or disable the support to emulate legacy I/O devices such as mouse, keyboard,... etc. Or you may select [Auto] so that the system will start to auto-detect; if there is no USB device connected, "Auto" option will disable the legacy USB support.

## 3.4 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.

BIOS SETUP UTILITY					
Main	Advanced	H/W Monitor	Boot	Security	Exit
<b>Hardware Health Event Monitoring</b>			Target Fan Speed		
CPU Temperature : 37°C / 98°F			Fast		
M/B Temperature : 31°C / 87°F			Middle		
CPU Fan Speed : 3400 RPM			Slow		
Chassis Fan Speed : N/A					
Vcore : 1.629V					
+ 3.30V : 3.306V					
+ 5.00V : 5.067V					
+ 12.00V : 11.890V					
CPU Quiet Fan [Enabled]			-- Select Screen		
Target CPU Temperature (°C) [50]			↑↓ Select Item		
Tolerance (°C) [02]			F1 General Help		
Target Fan Speed [Fast]			F9 Load Defaults		
			F10 Save and Exit		
			ESC Exit		
v02.54 (C) Copyright 1985-2005, American Megatrends, Inc.					

### CPU Quiet Fan

This item allows you to identify the temperature of CPU fan. If you set this option as [Disabled], the CPU fan will operate in full speed. If you set this option as [Enabled], you will find the items "Target CPU Temperature ( °C)", "Tolerance ( °C)", and "Minimun Fan Speed" appear to allow you adjusting them. The default value is [Disabled].

#### Target CPU Temperature ( °C)

The target temperature will be between 45 °C and 65 °C. The default value is [50].

#### Tolerance ( °C)

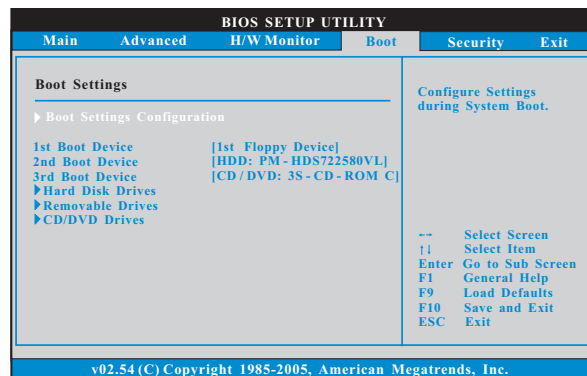
The default value of tolerance is [2], which means the error of the target CPU temperature will be within 2 °C.

#### Target Fan Speed

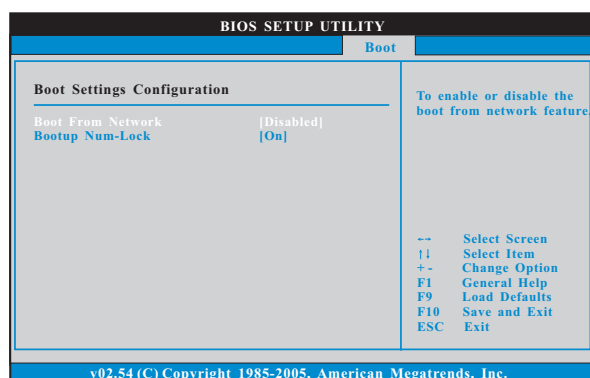
Use this option to set the target fan speed. You can freely adjust the target fan speed according to the target CPU temperature that you choose. The default value is [Fast]. Configuration options: [Fast], [Middle] and [Slow].

## 3.5 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



### 3.5.1 Boot Settings Configuration



#### Boot From Network

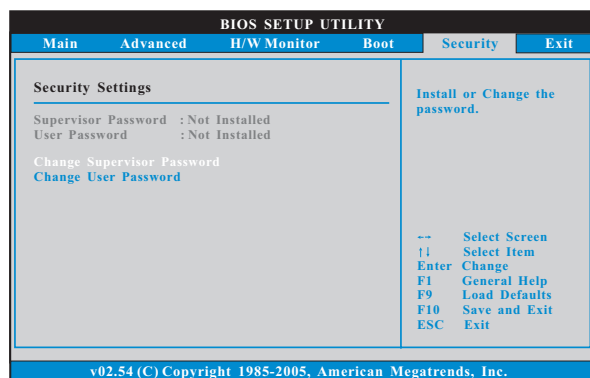
Use this item to enable or disable the Boot From Network feature.

#### Boot Up Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

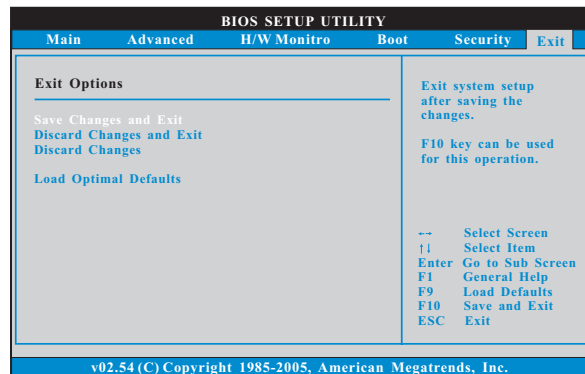
### 3.6 Security Screen

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.





### 3.7 Exit Screen



#### Save Changes and Exit

When you select this option, it will pop-out the following message, "Save configuration changes and exit setup?" Select [OK] to save the changes and exit the BIOS SETUP UTILITY.

#### Discard Changes and Exit

When you select this option, it will pop-out the following message, "Discard changes and exit setup?" Select [OK] to exit the BIOS SETUP UTILITY without saving any changes.

#### Discard Changes

When you select this option, it will pop-out the following message, "Discard changes?" Select [OK] to discard all changes.

#### Load Optimal Defaults

When you select this option, it will pop-out the following message, "Load optimal defaults?" Select [OK] to load the default values for all the setup configurations.

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## **Chapter 4 Software Support**

### **4.1 Install Operating System**

This motherboard supports various Microsoft® Windows® operating systems: 2000 / XP / XP 64-bit / Vista™. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

### **4.2 Support CD Information**

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

#### **4.2.1 Running The Support CD**

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASSETUP.EXE" from the BIN folder in the Support CD to display the menus.

#### **4.2.2 Drivers Menu**

The Drivers Menu shows the available devices drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

#### **4.2.3 Utilities Menu**

The Utilities Menu shows the applications software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

#### **4.2.4 "LGA 775 CPU Installation Live Demo" Program**

This motherboard is equipped with Intel LGA 775 socket, which is a new CPU socket interface that Intel has released. Since it has several tiny pins, which are easily to be damaged by improper handling, ASRock sincerely presents you a clear installation guide through this "LGA 775 CPU Installation Live Demo". We hope you may check this live demo program before you start the installation of LGA 775 CPU in order to reduce the risks of CPU and motherboard damages caused by any improper handling. To see this Live Demo, you can run Microsoft® Media Player® to play the file. You may find this Live Demo in the motherboard's Support CD through the following path:

**..\ Live Demo \ PC DIY \ LGA775INST\_English.dat**

#### **4.2.5 Contact Information**

If you need to contact ASRock or want to know more about ASRock, welcome to visit ASRock's website at <http://www.asrock.com>; or you may contact your dealer for further information.