GA-EP45T-EXTREME

LGA775 socket motherboard for Intel® Core™ processor family/
Intel® Pentium® processor family/Intel® Celeron® processor family

User's Manual

Rev. 1001

12ME-EP45TEXT-1001R

Declaration of Conformity

We, Manufacturer/Importer
(full address)

G.B.T. Technology Trading GMbH
Bullenkoppel 16, 22047 Hamburg, Germany

declare that the product
(description of the apparatus, system, installation to which it refers)

Motherboard
GA-EP45T-EXTREME
is in conformity with
(reference to the specification under which conformity is declared)
in accordance with 89/336 EEC-EMC Directive

☐ **EN 55011**	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) high frequency equipment	☒ **EN 61000-3-2**	Disturbances in supply systems caused
		☒ **EN 61000-3-3**	Disturbances in supply systems caused by household appliances and similar electrical equipment "Voltage fluctuations"
☐ **EN 55013**	Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment	☒ **EN 55024**	Information Technology equipment-Immunity characteristics-Limits and methods of measurement
☐ **EN 55014-1**	Limits and methods of measurement of radio disturbance characteristics of household electrical appliances, portable tools and similar electrical apparatus	☐ **EN 50082-1**	Generic immunity standard Part 1: Residual, commercial and light industry
		☐ **EN 50082-2**	Generic immunity standard Part 2: Industrial environment
☐ **EN 55015**	Limits and methods of measurement of radio disturbance characteristics of fluorescent lamps and luminaries	☐ **EN 55014-2**	Immunity requirements for household appliances tools and similar apparatus
☐ **EN 55020**	Immunity from radio interference of broadcast receivers and associated equipment	☐ **EN 50091- 2**	EMC requirements for uninterruptible power systems (UPS)
☒ **EN 55022**	Limits and methods of measurement of radio disturbance characteristics of information technology equipment		
☐ **DIN VDE 0855** ☐ **part 10** ☐ **part 12**	Cabled distribution systems; Equipment for receiving and/or distribution from sound and television signals		

☒ **CE marking** CE (EC conformity marking)

The manufacturer also declares the conformity of above mentioned product with the actual required safety standards in accordance with LVD 2006/95/EC

☐ **EN 60065**	Safety requirements for mains operated electronic and related apparatus for household and similar general use	☒ **EN 60950**	Safety for information technology equipment including electrical business equipment
☐ **EN 60335**	Safety of household and similar electrical appliances	☐ **EN 50091-1**	General and Safety requirements for uninterruptible power systems (UPS)

Manufacturer/Importer

(Stamp)

Date : Jun. 20, 2008

Signature : Timmy Huang

Name : Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

FC

Responsible Party Name: G.B.T. INC. (U.S.A.)

Address: 17358 Railroad Street
City of Industry, CA 91748

Phone/Fax No: (818) 854-9338/ (818) 854-9339

hereby declares that the product

Product Name: Motherboard

Model Number: GA-EP45T-EXTREME

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109 (a),Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful and (2) this device must accept any inference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: Jun. 20, 2008

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Documentation Classifications

In order to assist in the use of this product, GIGABYTE provides the following types of documentations:

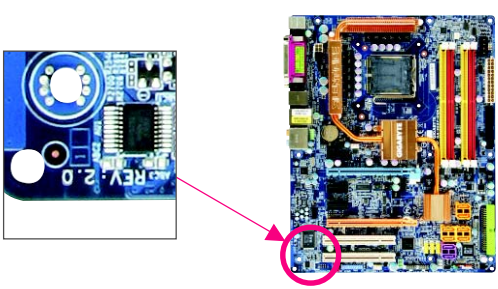
- For quick set-up of the product, read the Quick Installation Guide included with the product.
- For detailed product information, carefully read the User's Manual.
- For instructions on how to use GIGABYTE's unique features, read or download the information on/from the Support\Motherboard\Technology Guide page on our website.

For product-related information, check on our website at:
http://www.gigabyte.com.tw

Identifying Your Motherboard Revision

The revision number on your motherboard looks like this: "REV: X.X." For example, "REV: 1.0" means the revision of the motherboard is 1.0. Check your motherboard revision before updating motherboard BIOS, drivers, or when looking for technical information.

Example:



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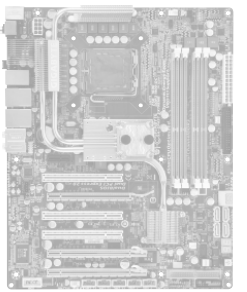
Box Contents

- ☑ GA-EP45T-EXTREME motherboard
- ☑ Motherboard driver disk
- ☑ User's Manual
- ☑ Quick Installation Guide
- ☑ Intel® LGA775 CPU Installation Guide
- ☑ One IDE cable and one floppy disk drive cable
- ☑ Four SATA 3Gb/s cables
- ☑ One SATA bracket
- ☑ I/O shield
- ☑ One 2-port IEEE 1394a bracket
- ☑ One Hybrid Silent-Pipe module kit

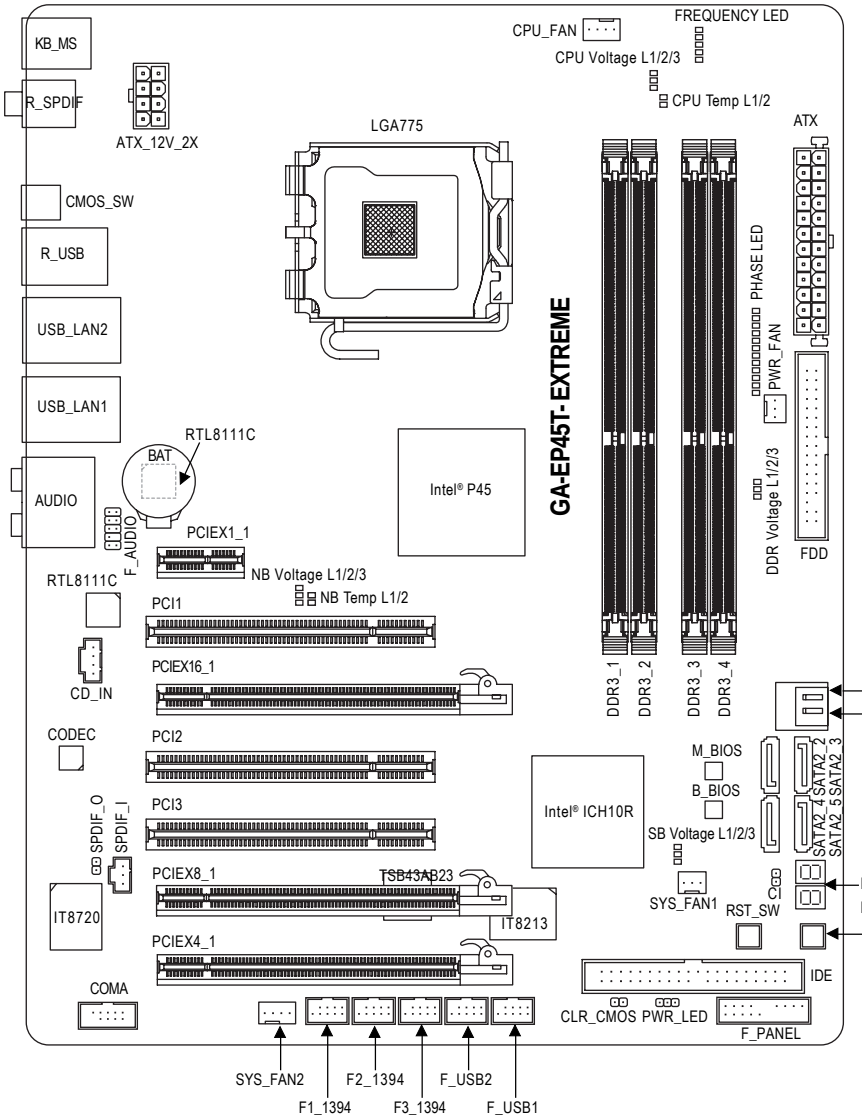


- The box contents above are for reference only and the actual items shall depend on product package you obtain. The box contents are subject to change without notice.
- The motherboard image is for reference only.

Optional Items

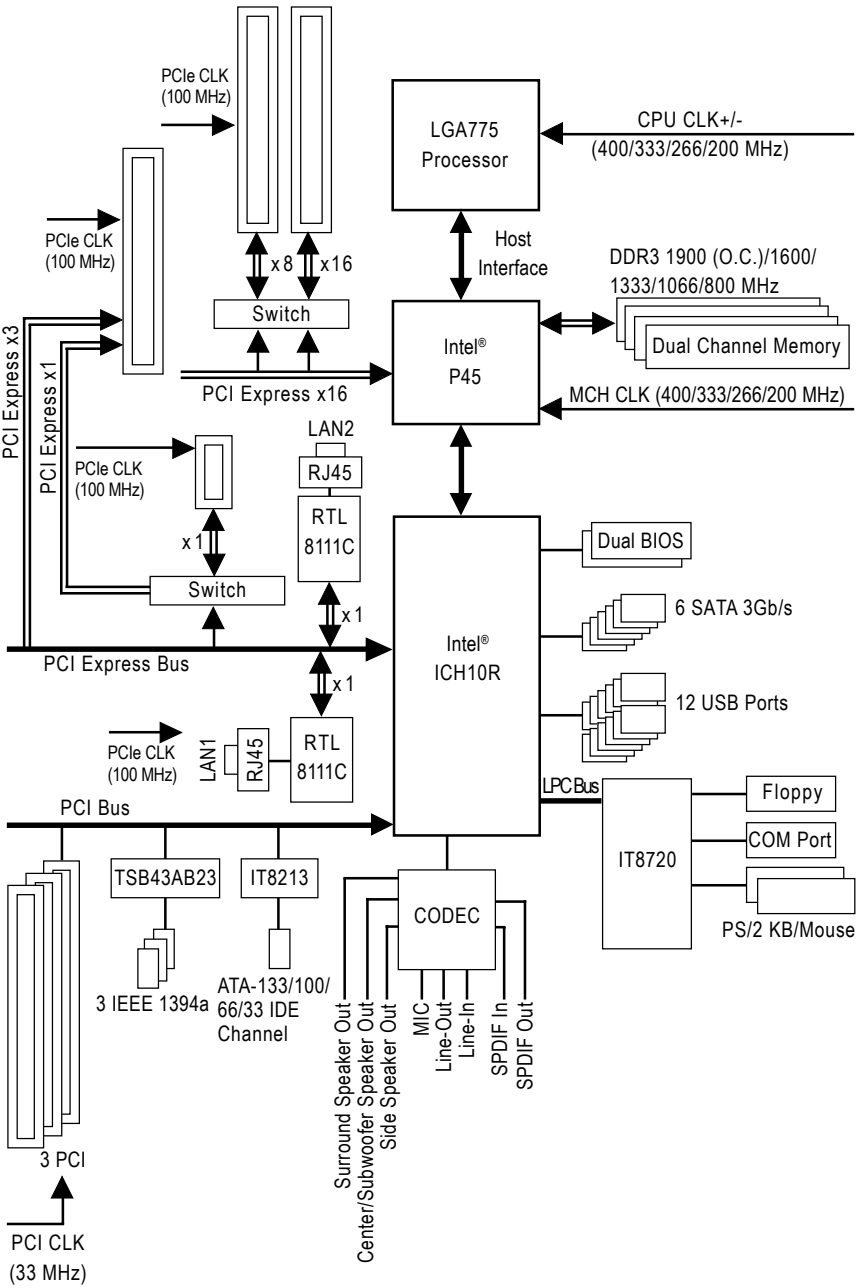
- ☐ 2-port USB 2.0 bracket (Part No. 12CR1-1UB030-51R)
- ☐ 2-port IEEE 1394a bracket (Part No. 12CF1-1IE008-01R)
- ☐ 2-port SATA power cable (Part No. 12CF1-2SERPW-01R)
- ☐ S/PDIF in cable (Part No. 12CR1-1SPDIN-01R)
- ☐ COM port cable (Part No. 12CF1-1CM001-32R)

GA-EP45T-EXTREME Motherboard Layout



(Note) For error code information, please refer to Chapter 5.

Block Diagram



Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

1-2 Product Specifications

CPU	◆ Support for an Intel® Core™ 2 Extreme processor/ Intel® Core™ 2 Quad processor/Intel® Core™ 2 Duo processor/ Intel® Pentium® Dual-Core processor/Intel® Celeron® processor in the LGA 775 package (Go to GIGABYTE's website for the latest CPU support list.) ◆ L2 cache varies with CPU
Front Side Bus	◆ 1600/1333/1066/800 MHz FSB
Chipset	◆ North Bridge: Intel® P45 Express Chipset ◆ South Bridge: Intel® ICH10R
Memory	◆ 4 x 1.5V DDR3 DIMM sockets supporting up to 16 GB of system memory (Note 1) ◆ Dual channel memory architecture ◆ Support for DDR3 1900 (O.C.)/1600/1333/1066/800 MHz memory modules (Go to GIGABYTE's website for the latest memory support list.)
Audio	◆ Realtek ALC889A codec ◆ High Definition Audio ◆ 2/4/5.1/7.1-channel ◆ Support for Dolby® Home Theater (Note 2) ◆ Support for S/PDIF In/Out ◆ Support for CD In
LAN	◆ 2 x Realtek 8111C chips (10/100/1000 Mbit) ◆ Support for Teaming
Expansion Slots	◆ 1 x PCI Express x16 slot (Note 3) ◆ 1 x PCI Express x8 slot (The PCIEX16_1 and PCIEX8_1 slots support ATI CrossFireX™ technology and conform to PCI Express 2.0 standard.) ◆ 1 x PCI Express x4 slot (Note 4) ◆ 1 x PCI Express x1 slot ◆ 3 x PCI slots
Storage Interface	◆ South Bridge: - 6 x SATA 3Gb/s connectors supporting up to 6 SA TA 3Gb/s devices - Support for SATA RAID 0, RAID 1, RAID 5, and RAID 10 ◆ iTE IT8213 chip: - 1 x IDE connector supporting ATA-133/100/66/33 and up to 2 IDE devices ◆ iTE IT8720 chip: - 1 x floppy disk drive connector supporting up to 1 floppy disk drive
IEEE 1394	◆ T.I. TSB43AB23 chip ◆ Up to 3 IEEE 1394a ports (via the IEEE 1394a brackets connected to the internal IEEE 1394a headers)

USB	◆ Integrated in the South Bridge ◆ Up to 12 USB 2.0/1.1 ports (8 on the back panel, 4 via the USB brackets connected to the internal USB headers)
Internal Connectors	◆ 1 x 24-pin ATX main power connector ◆ 1 x 8-pin ATX 12V power connector ◆ 1 x floppy disk drive connector ◆ 1 x IDE connector ◆ 6 x SATA 3Gb/s connectors ◆ 1 x CPU fan header ◆ 2 x system fan headers ◆ 1 x power fan header ◆ 1 x front panel header ◆ 1 x front panel audio header ◆ 1 x CD In connector ◆ 1 x S/PDIF In header ◆ 1 x S/PDIF Out header ◆ 2 x USB 2.0/1.1 headers ◆ 3 x IEEE 1394a headers ◆ 1 x serial port header ◆ 1 x power LED header ◆ 1 x chassis intrusion header ◆ 1 x power switch ◆ 1 x reset switch
Back Panel Connectors	◆ 1 x PS/2 keyboard port ◆ 1 x PS/2 mouse port ◆ 1 x coaxial S/PDIF Out connector ◆ 1 x optical S/PDIF Out connector ◆ 1 x clearing CMOS switch ◆ 8 x USB 2.0/1.1 ports ◆ 2 x RJ-45 ports ◆ 6 x audio jacks (Center/Subwoofer Speaker Out/Rear Speaker Out/Side Speaker Out/Line In/Line Out/Microphone)
I/O Controller	◆ iTE IT8720 chip
Hardware Monitor	◆ System voltage detection ◆ CPU/System/North Bridge temperature detection ◆ CPU/System/Power fan speed detection ◆ CPU overheating warning ◆ CPU/System/Power fan fail warning ◆ CPU/System fan speed control (Note 5)

BIOS	◆ 2 x 8 Mbit flash ◆ Use of licensed AWARD BIOS ◆ Support for DualBIOS™ ◆ PnP 1.0a, DMI 2.0, SM BIOS 2.4, ACPI 1.0b
Unique Features	◆ Support for @BIOS ◆ Support for Q-Flash ◆ Support for Virtual Dual BIOS ◆ Support for Download Center ◆ Support for Xpress Install ◆ Support for Xpress Recovery2 ◆ Support for EasyTune (Note 6) ◆ Support for Dynamic Energy Saver Advanced ◆ Support for Time Repair ◆ Support for Q-Share
Bundled Software	◆ Norton Internet Security (OEM version)
Operating System	◆ Support for Microsoft® Windows® Vista/XP
Form Factor	◆ ATX Form Factor; 30.5cm x 24.4cm

(Note 1) Due to Windows Vista/XP 32-bit operating system limitation, when more than 4 GB of physical memory is installed, the actual memory size displayed will be less than 4 GB.

(Note 2) For Windows Vista/XP 32-bit operating system only.

(Note 3) If you are installing one PCI Express graphics card, be sure to install it in the PCIEX16_1 slot for optimum performance. When both of the PCIEX16_1 and PCIEX8_1 slots are installed with expansion cards, the PCIEX16_1 will operate at x8 mode.

(Note 4) The PCI Express x4 slot shares bandwidth with the PCI Express x1 slot. When it is populated with a PCI Express x4 card, the PCI Express x1 slot become unavailable.

(Note 5) Whether the CPU/system fan speed control function is supported will depend on the CPU/ system cooler you install.

(Note 6) Available functions in EasyTune may differ by motherboard model.

1-3 Installing the CPU and CPU Cooler

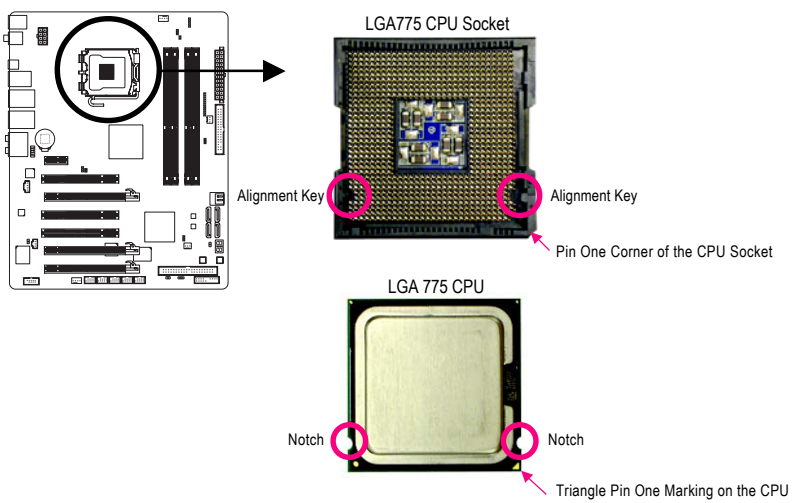
CAUTION

Read the following guidelines before you begin to install the CPU:

- Make sure that the motherboard supports the CPU.
  (Go to GIGABYTE's website for the latest CPU support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

1-3-1 Installing the CPU

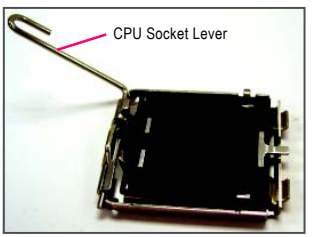
A. Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.



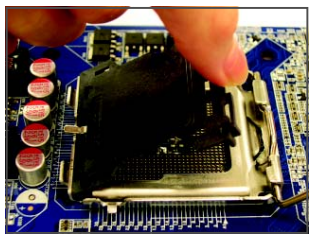
B. Follow the steps below to correctly install the CPU into the motherboard CPU socket.

CAUTION

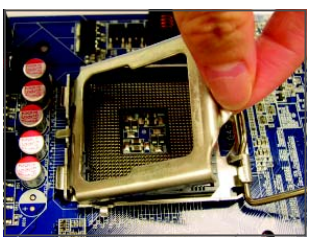
Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the CPU.



Step 1:
Completely raise the CPU socket lever.



Step 2:
Remove the protective socket cover.



Step 3:
Lift the metal load plate on the CPU socket.

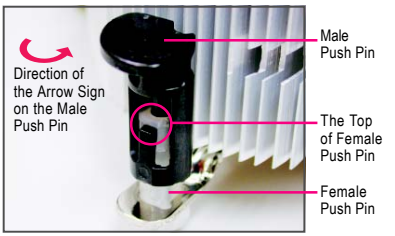
Step 4:
Hold the CPU with your thumb and index fingers. Align the CPU pin one marking (triangle) with the pin one corner of the CPU socket (or you may align the CPU notches with the socket alignment keys) and gently insert the CPU into position.

Step 5:
Once the CPU is properly inserted, replace the load plate and push the CPU socket lever back into its locked position.

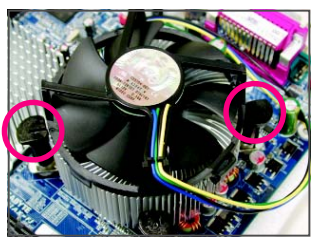
1-3-2 Installing the CPU Cooler

Follow the steps below to correctly install the CPU cooler on the motherboard. (The following procedure uses Intel® boxed cooler as the example cooler.)

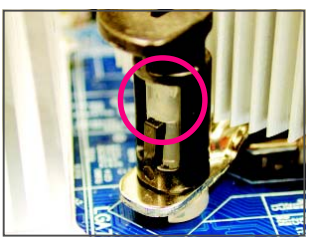
Step 1:
Apply an even and thin layer of thermal grease on the surface of the installed CPU.



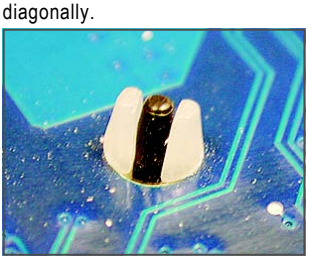
Step 2:
Before installing the cooler, note the direction of the arrow sign on the male push pin. (Turning the push pin along the direction of arrow is to remove the cooler, on the contrary, is to install.)



Step 3:
Place the cooler atop the CPU, aligning the four push pins through the pin holes on the motherboard. Push down on the push pins diagonally.



Step 4:
You should hear a "click" when pushing down each push pin. Check that the Male and Female push pins are joined closely. (Refer to your CPU cooler installation manual for instructions on installing the cooler.)



Step 5:
After the installation, check the back of the motherboard. If the push pin is inserted as the picture above, the installation is complete.

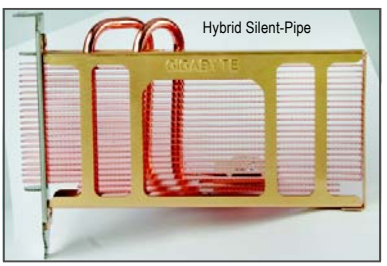
Step 6:
Finally, attach the power connector of the CPU cooler to the CPU fan header (CPU_FAN) on the motherboard.

NOTE Use extreme care when removing the CPU cooler because the thermal grease/tape between the CPU cooler and CPU may adhere to the CPU. Inadequately removing the CPU cooler may damage the CPU.

1-4 Installing the Hybrid Silent-Pipe Module

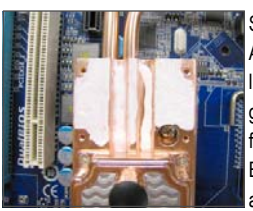
Read the following guideline before you begin to install the Hybrid Silent-Pipe module:

NOTE If you want to connect the front audio module from your chassis to the F_AUDIO connector on the motherboard, be sure to connect it before installing the Hybrid Silent-Pipe module to avoid interference.



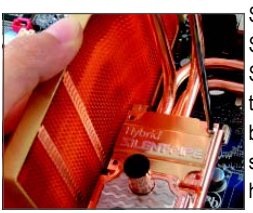
Tools needed:
1. A Philip's screwdriver
2. Thermal grease
3. Screws included with the motherboard

Follow the steps below to install the Hybrid Silent-Pipe module:



Step 1:
Apply an even thin layer of thermal grease on the surface of the North Bridge heatsink base and it grooves.

Step 2:
Position the heatpipe underneath the heatsink of the Hybrid Silent-Pipe module into the tunnel of the North Bridge heasink base.



Step 3:
Secure the Hybrid Silent-Pipe heatsink to the heatsink base by the included screws.(Use one hand to hold the top of the fins to avoid shaking.)

Step 4:
The picture on the left shows that four screws are fastened to the heatsink and heatsink base.

Step 5:
Secure the Hybrid Silent-Pipe bracket to the chassis back panel with a screw to complete the installation.

(Note) The components received may vary in appearance from the products illustrated.

1-5 Installing the Memory

CAUTION

Read the following guidelines before you begin to install the memory:

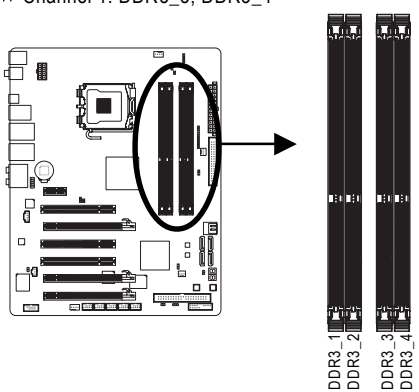
- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
  (Go to GIGABYTE's website for the latest memory support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

1-5-1 Dual Channel Memory Configuration

This motherboard provides four DDR3 memory sockets and supports Dual Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Dual Channel memory mode will double the original memory bandwidth.

The four DDR3 memory sockets are divided into two channels and each channel has two memory sockets as following:

- Channel 0: DDR3_1, DDR3_2
- Channel 1: DDR3_3, DDR3_4



Dual Channel Memory Configurations Table

	DDR3_1	DDR3_2	DDR3_3	DDR3_4
Two Modules	DS/SS	- -	DS/SS	- -
	- -	DS/SS	- -	DS/SS
Four Modules	DS/SS	DS/SS	DS/SS	DS/SS

(SS=Single-Sided, DS=Double-Sided, "- -"=No Memory)

Due to chipset limitation, read the following guidelines before installing the memory in Dual Channel mode.

1. Dual Channel mode cannot be enabled if only one DDR3 memory module is installed.
2. When enabling Dual Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used and installed in the same colored DDR3 sockets for optimum performance.

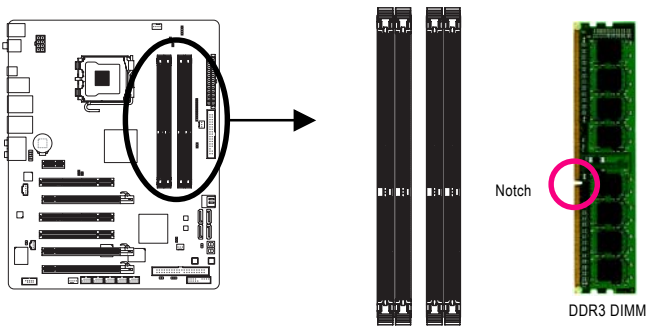
NOTE

When memory modules of different capacity and chips are installed, a message which says memory is operating in Flex Memory Mode will appear during the POST. Intel ® Flex Memory Technology offers greater flexibility to upgrade by allowing different memory sizes to be populated and remain in Dual Channel mode/performance.

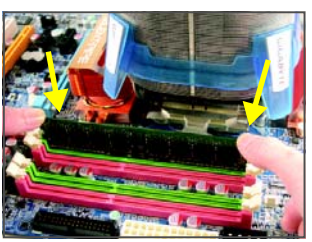
1-5-2 Installing a Memory

CAUTION

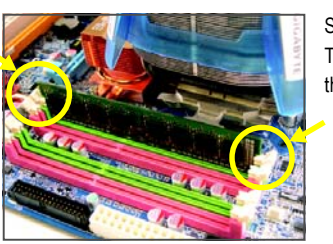
Before installing a memory module , make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module. DDR3 and DDR2 DIMMs are not compatible to each other or DDR DIMMs. Be sure to install DDR3 DIMMs on this motherboard.



A DDR3 memory module has a notch, so it can only fit in one direction. Follow the steps below to correctly install your memory modules in the memory sockets.



Step 1:
Note the orientation of the memory module. Spread the retaining clips at both ends of the memory socket. Place the memory module on the socket. As indicated in the picture on the left, place your fingers on the top edge of the memory, push down on the memory and insert it vertically into the memory socket.



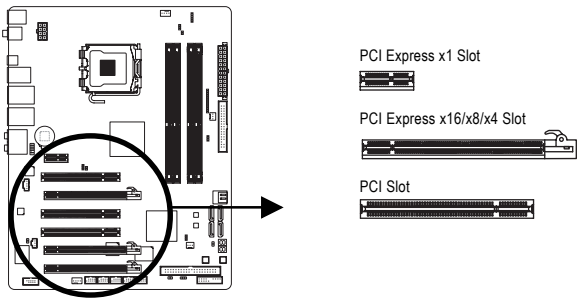
Step 2:
The clips at both ends of the socket will snap into place when the memory module is securely inserted.

1-6 Installing an Expansion Card

CAUTION

Read the following guidelines before you begin to install an expansion card:

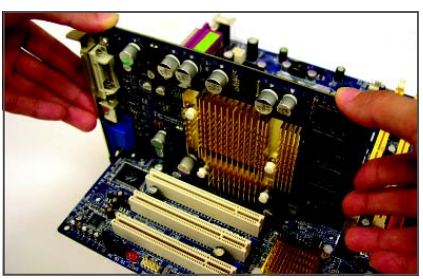
- Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.
- Always turn off the computer and unplug the power cord from the power outlet before installing an expansion card to prevent hardware damage.



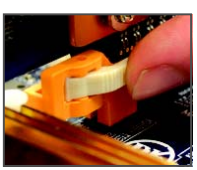
Follow the steps below to correctly install your expansion card in the expansion slot.

1. Locate an expansion slot that supports your card. Remove the metal slot cover from the chassis back panel.
2. Align the card with the slot, and press down on the card until it is fully seated in the slot.
3. Make sure the metal contacts on the card are completely inserted into the slot.
4. Secure the card's metal bracket to the chassis back panel with a screw.
5. After installing all expansion cards, replace the chassis cover(s).
6. Turn on your computer. If necessary, go to BIOS Setup to make any required BIOS changes for your expansion card(s).
7. Install the driver provided with the expansion card in your operating system.

Example: Installing and Removing a PCI Express x16 Graphics Card:



- Installing a Graphics Card:
  Gently push down on the top edge of the card until it is fully inserted into the PCI Express slot. Make sure the card is securely seated in the slot and does not rock.



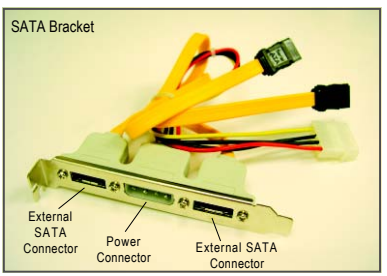
- Removing the Card:
  Press the white latch at the end of the PCI Express slot to release the card and then pull the card straight up from the slot.

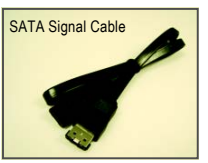
1-7 Installing the SATA Bracket

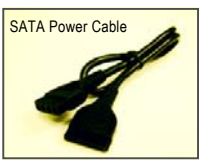
The SATA bracket allows you to connect external SA TA device(s) to your system by expanding the internal SATA port(s) to the chassis back panel.

CAUTION

- Turn off your system and the power switch on the power supply before installing or removing the SATA bracket and SATA power cable to prevent damage to hardware.
- Insert the SATA signal cable and SATA power cable securely into the corresponding connectors when installing.



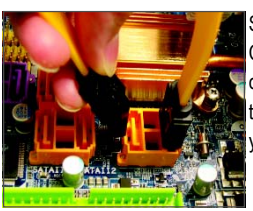




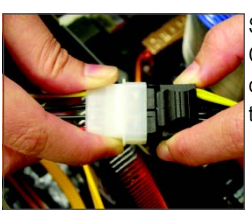
The SATA bracket includes one SA TA bracket, one SATA signal cable, and one SA TA power cable.

Follow the steps below to install the SA TA bracket:

Step 1:
Locate one free PCI slot and secure the SATA bracket to the chassis back panel with a screw.



Step 2:
Connect the SA TA cable from the bracket to the SA TA port on your motherboard.

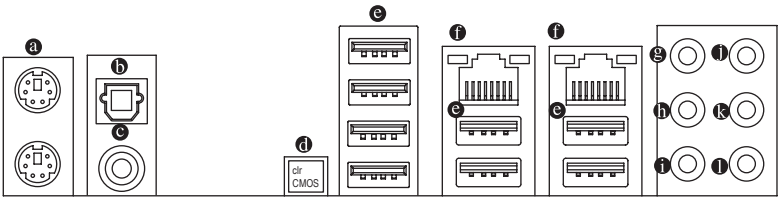


Step 3:
Connect the power cable from the bracket to the power supply.

Step 4:
Plug one end of the SATA signal cable into the external SATA connector on the bracket. Then attach the SATA power cable to the power connector on the bracket.

Step 5:
Connect the other ends of the SA TA signal cable and SA TA power cable to your SATA device. For SA TA device in external enclosure, you only need to connect the SATA signal cable. Before connecting the SATA signal cable, make sure to turn off the power of the external enclosure.

1-8 Back Panel Connectors



a PS/2 Keyboard and PS/2 Mouse Port

Use the upper port (green) to connect a PS/2 mouse and the lower port (purple) to connect a PS/2 keyboard.

b Optical S/PDIF Out Connector

This connector provides digital audio out to an external audio system that supports digital optical audio. Before using this feature, ensure that your audio system provides a n optical digital audio in connector.

c Coaxial S/PDIF Out Connector

This connector provides digital audio out to an external audio system that supports digital coaxial audio. Before using this feature, ensure that your audio system provides a coaxial digital audio in connector.

d Clearing CMOS Switch

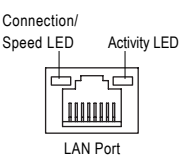
Press the clearing CMOS switch to clear CMOS values.

e USB Port

The USB port supports the USB 2.0/1.1 specification. Use this port for USB devices such as an USB keyboard/mouse, USB printer, USB flash drive and etc.

f RJ-45 LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.



Connection/Speed LED:

State	Description
Orange	1 Gbps data rate
Green	100 Mbps data rate
Off	10 Mbps data rate

Activity LED:

State	Description
Blinking	Data transmission or receiving is occurring
Off	No data transmission or receiving is occurring

CAUTION

- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

⓽ **Center/Subwoofer Speaker Out Jack (Orange)**

Use this audio jack to connect center/subwoofer speakers in a 5.1/7.1-channel audio configuration.

⓾ **Rear Speaker Out Jack (Black)**

Use this audio jack to connect rear speakers in a 4/5.1/7.1-channel audio configuration.

⓫ **Side Speaker Out Jack (Gray)**

Use this audio jack to connect side speakers in a 7.1-channel audio configuration.

⓬ **Line In Jack (Blue)**

The default line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc.

⓭ **Line Out Jack (Green)**

The default line out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

⓮ **Mic In Jack (Pink)**

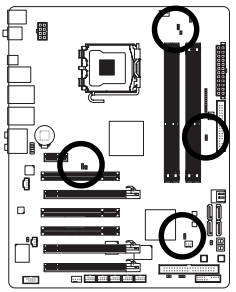
The default Mic in jack. Microphones must be connected to this jack.

NOTE In addition to the default speakers settings, the ⓽~⓮ audio jacks can be reconfigured to perform different functions via the audio software. Only microphones still MUST be connected to the default Mic in jack (⓮). Refer to the instructions on setting up a 2/4/5.1/7.1-channel audio configuration in Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio."

1-9 Onboard LEDs and Switches

Overvoltage LEDs

This motherboard contains 4 sets of overvoltage LEDs which indicate the overvoltage level of the CPU, memory, North Bridge, and South Bridge.



CPU (CPU Voltage)
Off: Normal condition
L1: Level 1 (Slight, green)
L2: Level 2 (Moderate, yellow)
L3: Level 3 (High, red)

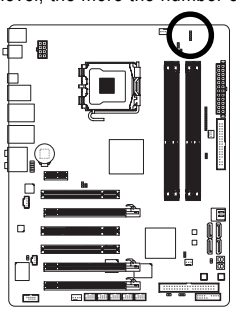
Memory (DDR Voltage)
Off: Normal condition
L1: Level 1 (Slight, green)
L2: Level 2 (Moderate, yellow)
L3: Level 3 (High, red)

North Bridge (NB Voltage)
Off: Normal condition
L1: Level 1 (Slight, green)
L2: Level 2 (Moderate, yellow)
L3: Level 3 (High, red)

South Bridge (SB Voltage)
Off: Normal condition
L1: Level 1 (Slight, green)
L2: Level 2 (Moderate, yellow)
L3: Level 3 (High, red)

Overclock LEDs

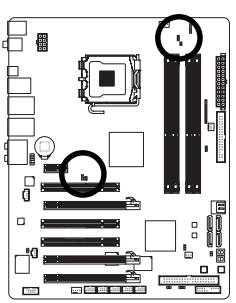
The onboard CPU overclock LEDs indicate on which level the CPU is overclocked. The higher the overclock level, the more the number of lighted LEDs.



CPU (FREQUENCY LED)
Off: Normal condition
F_LED1~F_LED5 : Blue

Temperature Indicator LEDs

The two sets of temperature indicator LEDs indicate the temperature level of the CPU and North Bridge. The LEDs are off when the temperature is below 60°C; the green LED lights up when the temperature is between 61~80°C; the red LED is illuminated when the temperature exceeds 80°C.

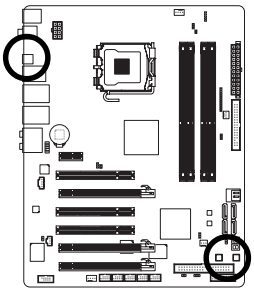


CPU (CPU Temp)
Off: Below 60°C
L1: 61~ 80°C (green)
L2: Over 80°C (red)

North Bridge (NB Temp)
Off: Below 60°C
L1: 61~ 80°C (green)
L2: Over 80°C (red)

Quick Switches

This motherboard has 3 quick switches: power switch, reset switch and clearing CMOS switch, allowing users to quickly turn on/off or reset the system or clear the CMOS values.

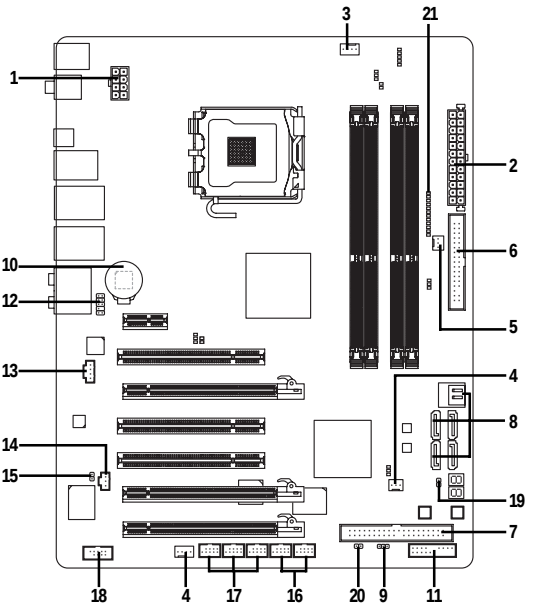


PW_SW: Power switch

RST_SW: Reset switch

CMOS_SW: Clearing CMOS switch

1-10 Internal Connectors



1)	ATX_12V_2X	12)	F_AUDIO
2)	ATX	13)	CD_IN
3)	CPU_FAN	14)	SPDIF_I
4)	SYS_FAN1/SYS_FAN2	15)	SPDIF_O
5)	PWR_FAN	16)	F_USB1/F_USB2
6)	FDD	17)	F1_1394/F2_1394/F3_1394
7)	IDE	18)	COMA
8)	SATA2_0/1/2/3/4/5	19)	CI
9)	PWR_LED	20)	CLR_CMOS
10)	BAT	21)	PHASE_LED
11)	F_PANEL		

CAUTION

Read the following guidelines before connecting external devices:

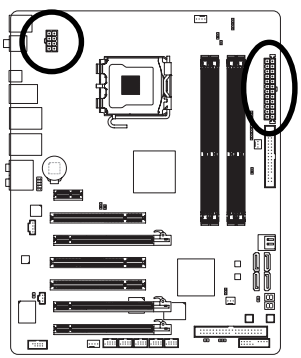
- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

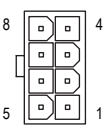
1/2) ATX_12V_2X/ATX (2x4 12V Power Connector and 2x12 Main Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation. The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start.

NOTE

- Use of a power supply providing a 2x4 12V power connector is recommended by the CPU manufacturer when using an Intel Extreme Edition CPU (130W).
- To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.
- The power connectors are compatible with power supplies with 2x2 12V and 2x10 power connectors. When using a power supply providing a 2x4 12V and a 2x12 power connector, remove the protective covers from the 12V power connector and the main power connector on the motherboard. Do not insert the power supply cable s into pins under the protective covers when using a power supply providing a 2x2 12V and a 2x10 power connector.

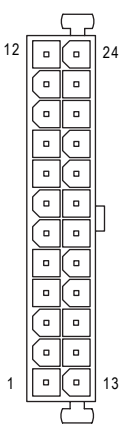




ATX_12V_2X

ATX_12V_2X:

Pin No.	Definition
1	GND (Only for 2x4 pin 12V)
2	GND (Only for 2x4 pin 12V)
3	GND
4	GND
5	+12V (Only for 2x4 pin 12V)
6	+12V (Only for 2x4 pin 12V)
7	+12V
8	+12V



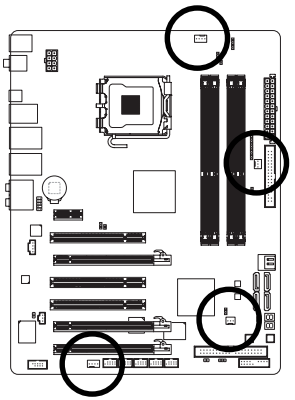
ATX

ATX :

Pin No.	Definition	Pin No.	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON(soft On/Off)
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power Good	20	-5V
9	5V SB(stand by +5V)	21	+5V
10	+12V	22	+5V
11	+12V (Only for 2x12 pin ATX)	23	+5V (Only for 2x12 pin ATX)
12	3.3V (Only for 2x12 pin ATX)	24	GND (Only for 2x12 pin ATX)

3/4/5) CPU_FAN/SYS_FAN1/SYS_FAN2/PWR_FAN (Fan Headers)

The motherboard has a 4-pin CPU fan header (CPU_FAN), a 3-pin (SYS_FAN1) and a 4-pin (SYS_FAN2) system fan headers, and a 3-pin power fan header (PWR_FAN). Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The motherboard supports CPU fan speed control, which requires the use of a CPU fan with fan speed control design . For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.



CPU_FAN:

Pin No.	Definition
1	GND
2	+12V / Speed Control
3	Sense
4	Speed Control

SYS_FAN2:

Pin No.	Definition
1	GND
2	Speed Control
3	Sense
4	+5V

SYS_FAN1/PWR_FAN:

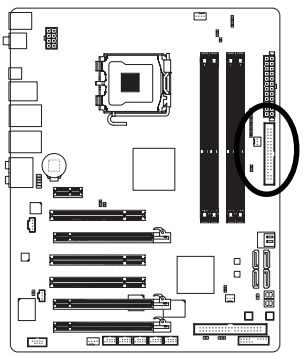
Pin No.	Definition
1	GND
2	+12V
3	Sense

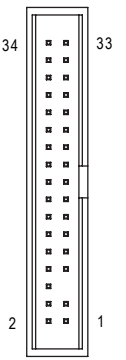
CAUTION

- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

6) FDD (Floppy Disk Drive Connector)

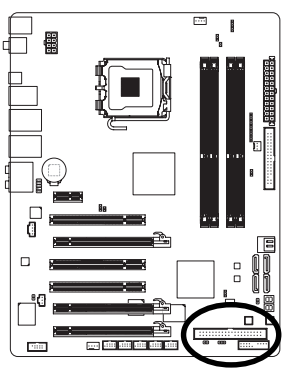
This connector is used to connect a floppy disk drive. The types of floppy disk drives supported are: 360 KB, 720 KB, 1.2 MB, 1.44 MB, and 2.88 MB. Before connecting a floppy disk drive, be sure to locate pin 1 of the connector and the floppy disk drive cable. The pin 1 of the cable is typically designated by a stripe of different color.

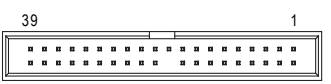




7) IDE (IDE Connector)

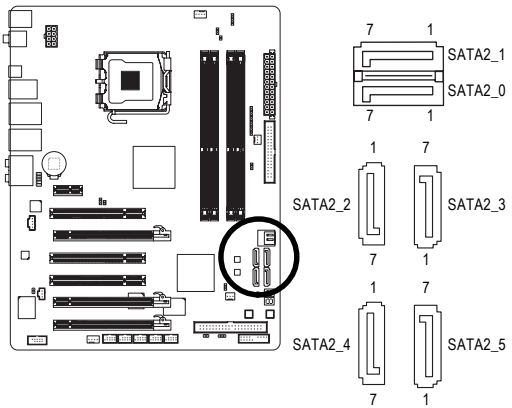
The IDE connector supports up to two IDE devices such as hard drives and optical drives. Before attaching the IDE cable, locate the foolproof groove on the connector. If you wish to connect two IDE devices, remember to set the jumpers and the cabling according to the role of the IDE devices (for example, master or slave). (For information about configuring master/slave settings for the IDE devices, read the instructions from the device manufacturers.)



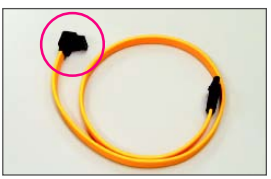


8) SATA2_0/1/2/3/4/5 (SATA 3Gb/s Connectors)

The SATA connectors conform to SATA 3Gb/s standard and are compatible with SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device. The ICH10R controller supports RAID 0, RAID 1, RAID 5 and RAID 10. Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array.



Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



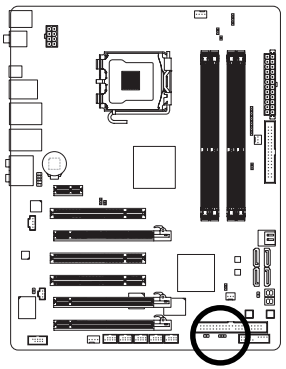
Please connect the L-shaped end of the SATA 3Gb/s cable to your SATA hard drive.

NOTE

- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are to be used, the total number of hard drives must be an even number.
- A RAID 5 configuration requires at least three hard drives. (The total number of hard drives does not have to be an even number.)
- A RAID 10 configuration requires at least four hard drives and the total number of hard drives must be an even number.

9) PWR_LED (System Power LED Header)

This header can be used to connect a system power LED on the chassis to indicate system power status. The LED is on when the system is operating. The LED keeps blinking when the system is in S1 sleep state. The LED is off when the system is in S3/S4 sleep state or powered off (S5).



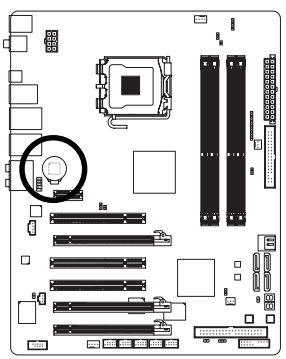
1

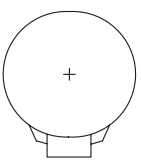
Pin No.	Definition
1	MPD+
2	MPD-
3	MPD-

System Status	LED
S0	On
S1	Blinking
S3/S4/S5	Off

10) BAT (BATTERY)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.





You may clear the CMOS values by removing the battery:

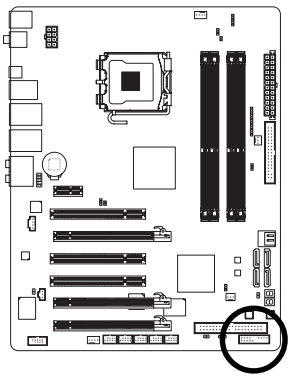
1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4. Plug in the power cord and restart your computer.

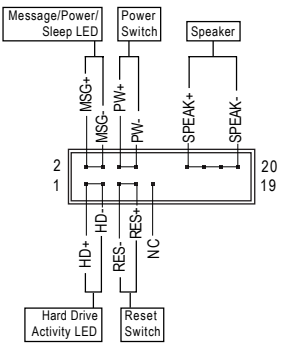
CAUTION

- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up).
- Used batteries must be handled in accordance with local environmental regulations.

11) F_PANEL (Front Panel Header)

Connect the power switch, reset switch, speaker and system status indicator on the chassis front panel to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.





- MSG (Message/Power/Sleep LED, Yellow):

System Status	LED
S0	On
S1	Blinking
S3/S4/S5	Off

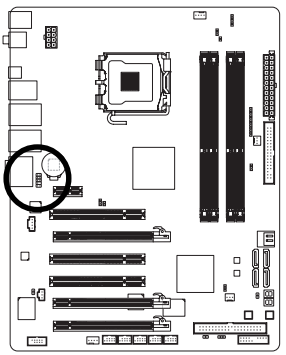
Connects to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1 sleep state. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

- PW (Power Switch, Red):
  Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management Setup," for more information).
- SPEAK (Speaker, Orange):
  Connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup. If a problem is detected, the BIOS may issue beeps in different patterns to indicate the problem. Refer to Chapter 5, "Troubleshooting," for information about beep codes.
- HD (Hard Drive Activity LED, Blue)
  Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.
- RES (Reset Switch, Green):
  Connects to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.
- NC (Purple):
  No connection

NOTE The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

12) F_AUDIO (Front Panel Audio Header)

The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.



For HD Front Panel Audio:

Pin No.	Definition
1	MIC2_L
2	GND
3	MIC2_R
4	-ACZ_DET
5	LINE2_R
6	GND
7	FAUDIO_JD
8	No Pin
9	LINE2_L
10	GND

For AC'97 Front Panel Audio:

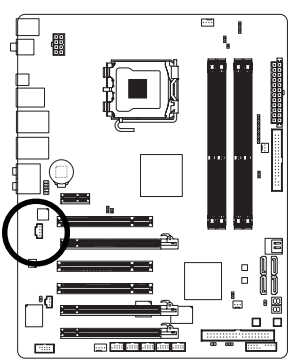
Pin No.	Definition
1	MIC
2	GND
3	MIC Power
4	NC
5	Line Out (R)
6	NC
7	NC
8	No Pin
9	Line Out (L)
10	NC

NOTE

- The front panel audio header supports HD audio by default. If your chassis provides an AC'97 front panel audio module, refer to the instructions on how to activate AC'97 functioninality via the audio software in Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio."
- When using an AC'97 front panel audio module, you can use either the front or the back panel audio connectors, but not both at the same time.
- Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer.

13) CD_IN (CD In Connector, Black)

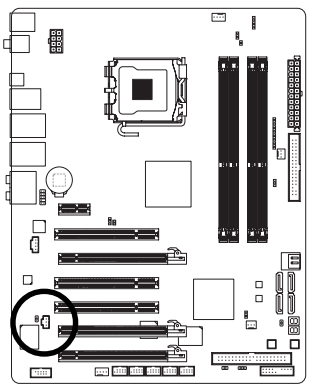
You may connect the audio cable that came with your optical drive to the header .

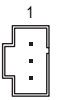


Pin No.	Definition
1	CD-L
2	GND
3	GND
4	CD-R

14) SPDIF_I (S/PDIF In Header, Red)

This header supports digital S/PDIF in and can connect to an audio device that supports digital audio out via an optional S/PDIF in cable. For purchasing the optional S/PDIF in cable, please contact the local dealer.

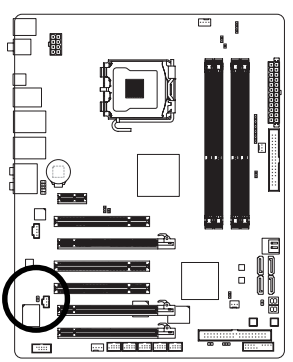




Pin No.	Definition
1	Power
2	SPDIFI
3	GND

15) SPDIF_O (S/PDIF Out Header)

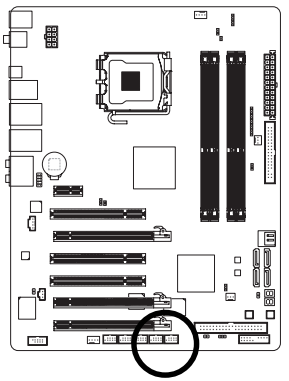
This header supports digital S/PDIF out and connects a S/PDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio cable for digital audio output from your motherboard to your graphics card if you wish to connect an HDMI display to the graphics card and have digital audio output from the HDMI display at the same time. For information about connecting the S/PDIF digital audio cable, carefully read the manual for your expansion card.

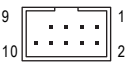


Pin No.	Definition
1	SPDIFO
2	GND

16) F_USB1/F_USB2 (USB Headers, Yellow)

The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.





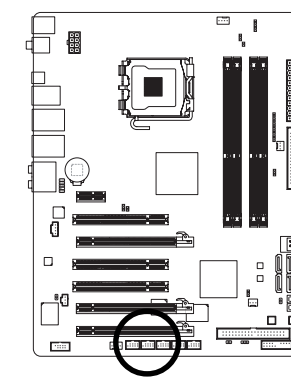
Pin No.	Definition
1	Power (5V)
2	Power (5V)
3	USB DX-
4	USB DY-
5	USB DX+
6	USB DY+
7	GND
8	GND
9	No Pin
10	NC

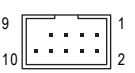
CAUTION

- Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB header.
- Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket.

17) F1_1394/F2_1394/F3_1394 (IEEE 1394a Headers, Gray)

The headers conform to IEEE 1394a specification. Each IEEE 1394a header can provide one IEEE 1394a port via an optional IEEE 1394a bracket. For purchasing the additional IEEE 1394a bracket(s), please contact the local dealer.





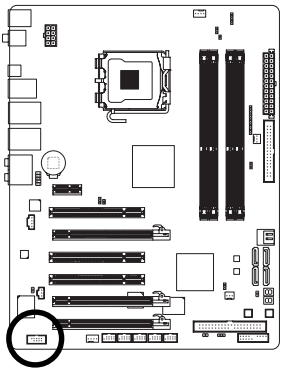
Pin No.	Definition
1	TPA+
2	TPA-
3	GND
4	GND
5	TPB+
6	TPB-
7	Power (12V)
8	Power (12V)
9	No Pin
10	GND

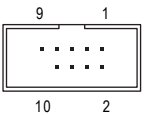
CAUTION

- Do not plug the USB bracket cable into the IEEE 1394a header.
- Prior to installing the IEEE 1394a bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the IEEE 1394a bracket.
- To connect an IEEE 1394a device, attach one end of the device cable to your computer and then attach the other end of the cable to the IEEE 1394a device. Ensure that the cable is securely connected.

18) COMA (Serial Port Header)

The COMA header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.

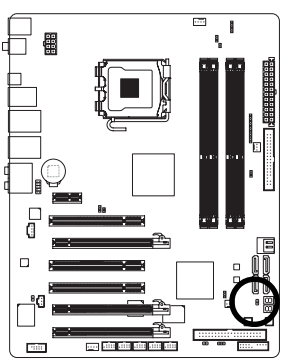




Pin No.	Definition
1	NDCD -
2	NSIN
3	NSOUT
4	NDTR -
5	GND
6	NDSR -
7	NRTS -
8	NCTS -
9	NRI -
10	No Pin

19) CI (Chassis Intrusion Header)

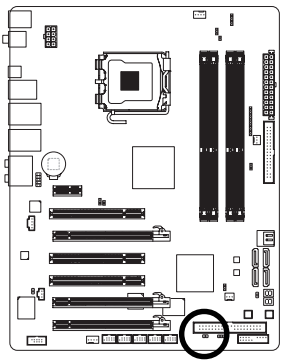
This motherboard provides a chassis detection feature that detects if the chassis cover has been removed. This function requires a chassis with chassis intrusion detection design.



Pin No.	Definition
1	Signal
2	GND

20) CLR_CMOS (Clearing CMOS Jumper)

Use this jumper to clear the CMOS values (e.g. date information and BIOS configurations) and reset the CMOS values to factory defaults. To clear the CMOS values, place a jumper cap on the two pins to temporarily short the two pins or use a metal object like a screwdriver to touch the two pins for a few seconds.



Open: Normal

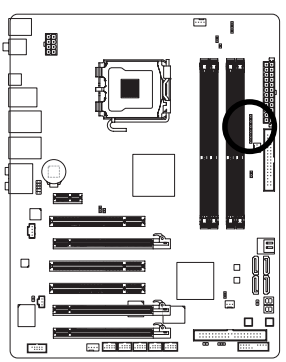
Short: Clear CMOS Values

CAUTION

- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After clearing the CMOS values and before turning on your computer, be sure to remove the jumper cap from the jumper. Failure to do so may cause damage to the motherboard.
- After system restart, go to BIOS Setup to load factory defaults (select **Load Optimized Defaults**) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

21) PHASE LED

The number of lighted LEDs indicates the CPU loading. The higher the CPU loading, the more the number of lighted LEDs.



Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-T est (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on. To see more advanced BIOS Setup menu options, you can press <Ctrl> + <F1> in the main menu of the BIOS Setup program.

To upgrade the BIOS, use either the GIGABYTE Q-Flash or @BIOS utility .

- Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system.
- @BIOS is a Windows-based utility that searches and downloads the latest version of BIOS from the Internet and updates the BIOS.

For instructions on using the Q-Flash and @BIOS utilities, refer to Chapter 4, "BIOS Update Utilities."

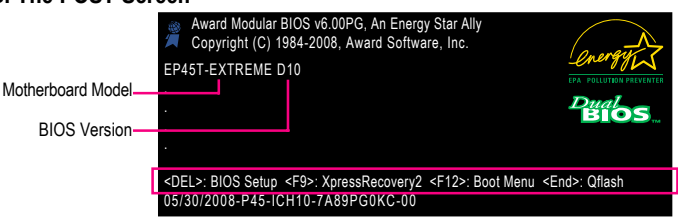
- Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- BIOS will emit a beep code during the POST. Refer to Chapter 5, "Troubleshooting," for the beep codes description.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 1 for how to clear the CMOS values.)

2-1 Startup Screen

The following screens may appear when the computer boots.

A. The LOGO Screen (Default)

B. The POST Screen



Function Keys:

<TAB>: POST Screen

Press the <Tab> key to show the BIOS POST screen. To show the BIOS POST screen at system startup, refer to the instructions on the **Full Screen LOGO Show** item on page 51.

<DEL>: BIOS Setup/Q-Flash

Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup.

<F9>: Xpress Recovery2

If you have ever entered Xpress Recovery2 to back up hard drive data using the driver disk, the <F9> key can be used for subsequent access to XpressRecovery2 during the POST. For more information, refer to Chapter 4, "Xpress Recovery2."

<F12>: Boot Menu

Boot Menu allows you to set the first boot device without entering BIOS Setup. In Boot Menu, use the up arrow key < ↑ > or the down arrow key< ↓ > to select the first boot device, then press <Enter> to accept. To exit Boot Menu, press <Esc>. The system will directly boot from the device configured in Boot Menu.

Note: The setting in Boot Menu is effective for one time only. After system restart, the device boot order will still be based on BIOS Setup settings. You can access Boot Menu again to change the first boot device setting as needed.

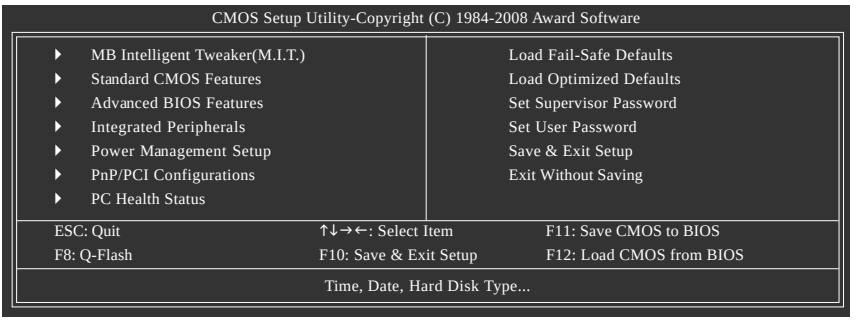
<End>: Q-Flash

Press the <End> key to access the Q-Flash utility directly without having to enter BIOS Setup first.

2-2 The Main Menu

Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter a sub-menu.

(Sample BIOS Version: D10)



BIOS Setup Program Function Keys

<↑><↓><←><→>	Move the selection bar to select an item
<Enter>	Execute command or enter the submenu
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu
<Page Up>	Increase the numeric value or make changes
<Page Down>	Decrease the numeric value or make changes
<F1>	Show descriptions of the function keys
<F2>	Move cursor to the Item Help block on the right (submenus only)
<F5>	Restore the previous BIOS settings for the current submenus
<F6>	Load the Fail-Safe BIOS default settings for the current submenus
<F7>	Load the Optimized BIOS default settings for the current submenus
<F8>	Access the Q-Flash utility
<F9>	Display system information
<F10>	Save all the changes and exit the BIOS Setup program
<F11>	Save CMOS to BIOS
<F12>	Load CMOS from BIOS

Main Menu Help

The onscreen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

Submenu Help

While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu. Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu.

NOTE

- If you do not find the settings you want in the Main Menu or a submenu, press <Ctrl>+<F1> to access more advanced options.
- When the system is not stable as usual, select the **Load Optimized Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.

- **The Functions of the <F11> and <F12> keys (For the Main Menu Only)**

  ▶ F11 : Save CMOS to BIOS

  This function allows you to save the current BIOS settings to a profile. You can create up to 8 profiles (Profile 1-8) and name each profile. First enter the profile name (to erase the default profile name, use the SPACE key) and then press <Enter> to complete.

  ▶ F12 : Load CMOS from BIOS

  If your system becomes unstable and you have loaded the BIOS default settings, you can use this function to load the BIOS settings from a profile created before, without the hassles of reconfiguring the BIOS settings. First select the profile you wish to load, then press <Enter> to complete.

- **MB Intelligent Tweaker(M.I.T.)**

  Use this menu to configure the clock, frequency and voltages of your CPU, memory, etc.

- **Standard CMOS Features**

  Use this menu to configure the system time and date, hard drive types, floppy disk drive types, and the type of errors that stop the system boot, etc.

- **Advanced BIOS Features**

  Use this menu to configure the device boot order, advanced features available on the CPU, and the primary display adapter.

- **Integrated Peripherals**

  Use this menu to configure all peripheral devices, such as IDE, SA TA, USB, integrated audio, and integrated LAN, etc.

- **Power Management Setup**

  Use this menu to configure all the power-saving functions.

- **PnP/PCI Configurations**

  Use this menu to configure the system's PCI & PnP resources.

- **PC Health Status**

  Use this menu to see information about autodetected system/CPU temperature, system voltage and fan speed, etc.

- **Load Fail-Safe Defaults**

  Fail-Safe defaults are factory settings for the most stable, minimal-performance system operations.

- **Load Optimized Defaults**

  Optimized defaults are factory settings for optimal-performance system operations.

- **Set Supervisor Password**

  Change, set, or disable password. It allows you to restrict access to the system and BIOS Setup. A supervisor password allows you to make changes in BIOS Setup.

- **Set User Password**

  Change, set, or disable password. It allows you to restrict access to the system and BIOS Setup. An user password only allows you to view the BIOS settings but not to make changes.

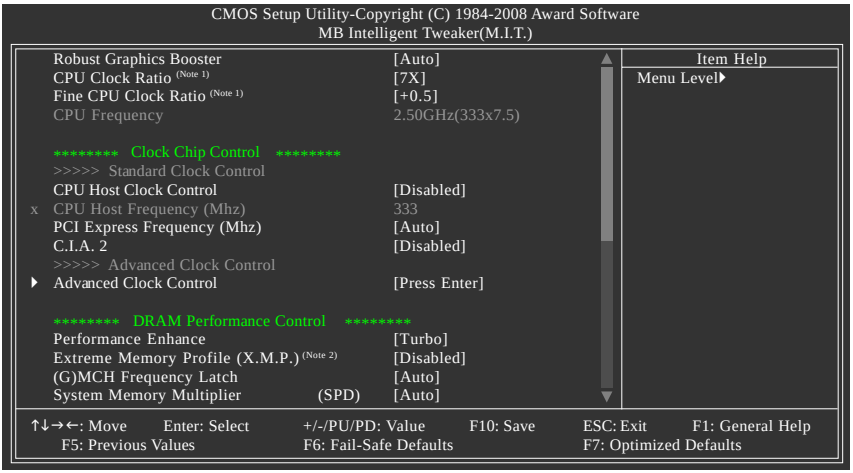
- **Save & Exit Setup**

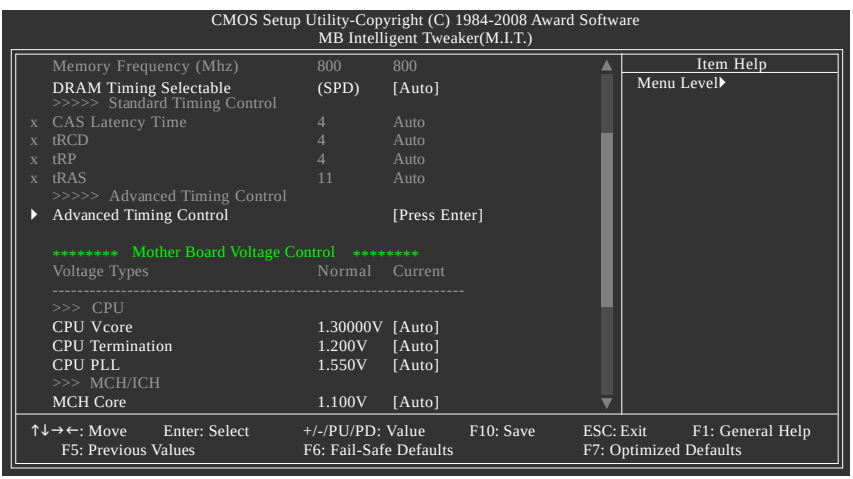
  Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.)

- **Exit Without Saving**

  Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.)

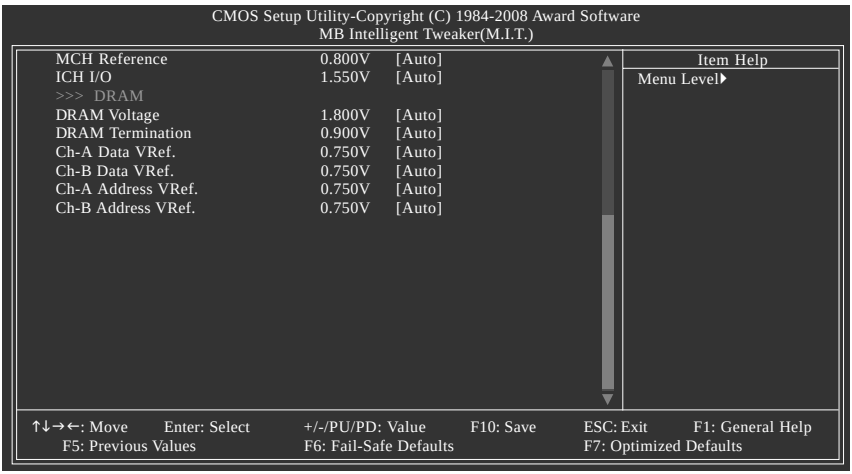
2-3 MB Intelligent Tweaker(M.I.T.)





(Note 1) This item appears only if you install a CPU that supports this feature.

(Note 2) This item appears only if you install a memory module that supports this feature.



CAUTION

Whether the system will work stably with the overclock/overvoltage settings you made is dependent on your overall system configurations. Incorrectly doing overclock/overvoltage may result in damage to CPU, chipset, or memory and reduce the useful life of these components. This page is for advanced users only and we recommend you not to alter the default settings to prevent system instability or other unexpected results. (Inadequately altering the settings may result in system's failure to boot. If this occurs, clear the CMOS values and reset the board to default values.)

☞ **Robust Graphics Booster**

Robust Graphics Booster (R.G.B.) helps to enhance the performance of the graphics chip and memory. **Auto** allows the BIOS to automatically set the R.G.B. mode based on system configurations. Options are: Auto (default), Fast, Turbo.

☞ **CPU Clock Ratio** (Note)

Allows you to alter the clock ratio for the installed CPU.
The item is present only if a CPU with unlocked clock ratio is installed.

☞ **Fine CPU Clock Ratio** (Note)

Allows you to increase the CPU clock ratio set in the **CPU Clock Ratio** item above by 0.5.

☞ **CPU Frequency**

Displays the current operating CPU frequency.

********** Clock Chip Control **********

>>>>> Standard Clock Control

☞ **CPU Host Clock Control**

Enables or disables the control of CPU host clock. **Enabled** will allow the **CPU Host Frequency** item below to be configurable. Note: If your system fails to boot after overclocking, please wait for 20 seconds to allow for automated system reboot, or clear the CMOS values to reset the board to default values. (Default: Disabled)

(Note) This item appears only if you install a CPU that supports this feature.

☞ **CPU Host Frequency (Mhz)**

Allows you to manually set the CPU host frequency. The adjustable range is from 100 MHz to 1200 MHz. This item is configurable only if the **CPU Host Clock Control** option is enabled.

For an 800 MHz FSB CPU, set this item to 200 MHz.

For a 1066 MHz FSB CPU, set this item to 266 MHz.

For a 1333 MHz FSB CPU, set this item to 333 MHz.

For a 1600 MHz FSB CPU, set this item to 400 MHz.

Important It is highly recommended that the CPU frequency be set in accordance with the CPU specifications.

☞ **PCI Express Frequency (Mhz)**

Allows you to manually set the PCIe clock frequency. The adjustable range is from 90 MHz to 150 MHz. **Auto** sets the PCIe clock frequency to standard 100 MHz. (Default: Auto)

☞ **C.I.A.2**

CPU Intelligent Accelerator 2 (C.I.A.2) is designed to automatically adjust CPU computing power to maximize system performance. C.I.A.2 allows your system bus to be changed dynamically based on CPU loading through the use of 5 preset states.

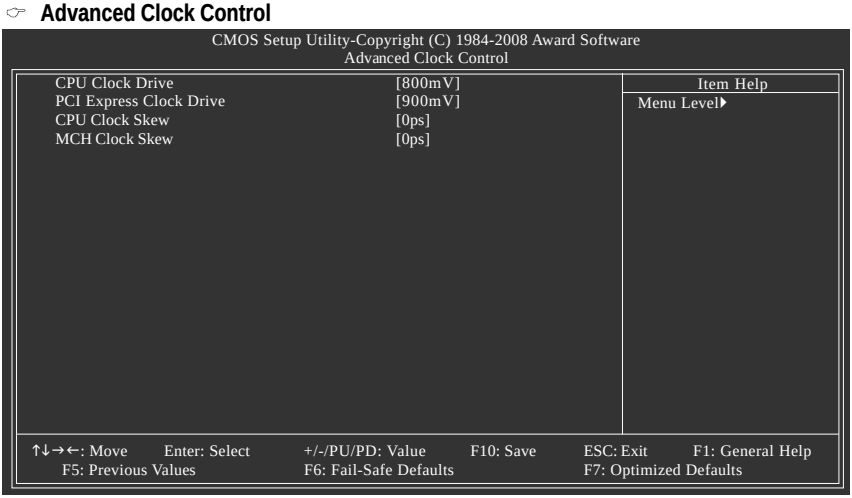
Note: System stability varies, depending on your system hardware components.

- Disabled — Disables the use of C.I.A.2. (Default)
- Cruise — Increases CPU frequency by 5% or 7% depending on CPU loading.
- Sports — Increases CPU frequency by 7% or 9% depending on CPU loading.
- Racing — Increases CPU frequency by 9% or 11% depending on CPU loading.
- Turbo — Increases CPU frequency by 15% or 17% depending on CPU loading.
- Full Thrust — Increases CPU frequency by 17% or 19% depending on CPU loading.

Warning: Before using C.I.A.2, please first verify the overclocking capability of your CPU. As stability is highly dependent on system components, when system instability occurs after overclocking, lower the overclocking ratio.

>>>>> Advanced Clock Control

☞ **Advanced Clock Control**



☞ **CPU Clock Drive**

Allows you to adjust the amplitude of the CPU and North Bridge clock.
Options are: 700mV, 800mV (default), 900mV, 1000mV.

☞ **PCI Express Clock Drive**

Allows you to adjust the amplitude of the PCI Express and North Bridge clock.
Options are: 700mV, 800mV, 900mV (default), 1000mV.

☞ **CPU Clock Skew**

Allows you to set the CPU clock prior to the North Bridge clock.
Options are: 0ps~750ps. (Default: 0ps)

☞ **MCH Clock Skew**

Allows you to set the North Bridge clock prior to the CPU clock.
Options are: 0ps~750ps. (Default: 0ps)

********** DRAM Performance Control **********

☞ **Performance Enhance**

Allows the system to operate at three different performance levels.

- ⏩ Standard — Lets the system operate at its basic performance level.
- ⏩ Turbo — Lets the system operate at its good performance level. (Default)
- ⏩ Extreme — Lets the system operate at its best performance level.

☞ **Extreme Memory Profile (X.M.P.)** (Note)

Allows the BIOS to read the SPD data on XMP memory module(s) to enhance memory performance when enabled.

- ⏩ Disabled — Disables this function. (Default)
- ⏩ Profile1 — Uses Profile 1 settings.
- ⏩ Profile2 — Uses Profile 2 settings.

☞ **(G)MCH Frequency Latch**

Allows you to fix the chipset frequency at system bootup. Options for adjusting memory multiplier below may differ according to the fixed frequency. Options are: Auto (default), 200MHz, 266MHz, 333MHz, 400MHz.

☞ **System Memory Multiplier (SPD)**

Allows you to set the system memory multiplier. Options are dependent on CPU FSB and the **(G)MCH Frequency Latch** settings. **Auto** sets memory multiplier according to memory SPD data. (Default: Auto)

☞ **Memory Frequency (Mhz)**

The first memory frequency value is the normal operating frequency of the memory being used; the second is the memory frequency that is automatically adjusted according to the **CPU Host Frequency (Mhz)** and **System Memory Multiplier** settings.

☞ **DRAM Timing Selectable (SPD)**

Manual allows all DRAM Timing items below to be configurable.
Options are: Auto (default), Manual.

(Note) This item appears only if you install a memory module that supports this feature.

>>>>> Standard Timing Control

☞ **CAS Latency Time**

Options are: Auto (default), 4~11.

☞ **tRCD**

Options are: Auto (default), 1~15.

☞ **tRP**

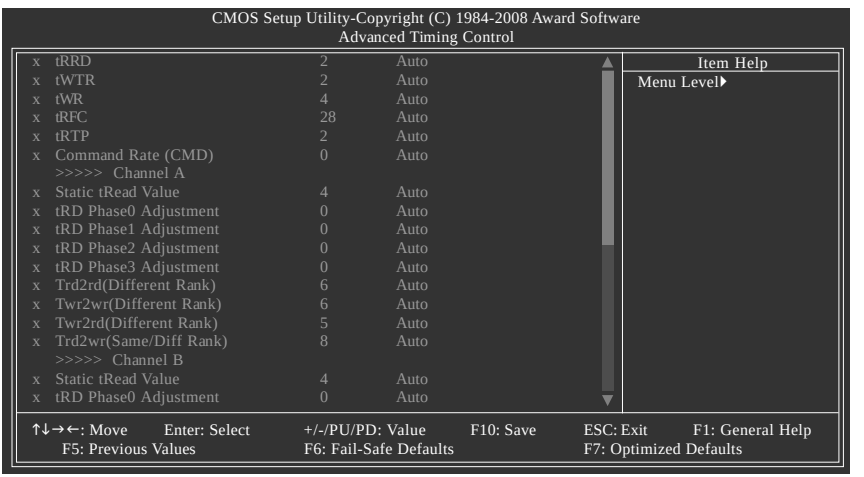
Options are: Auto (default), 1~15.

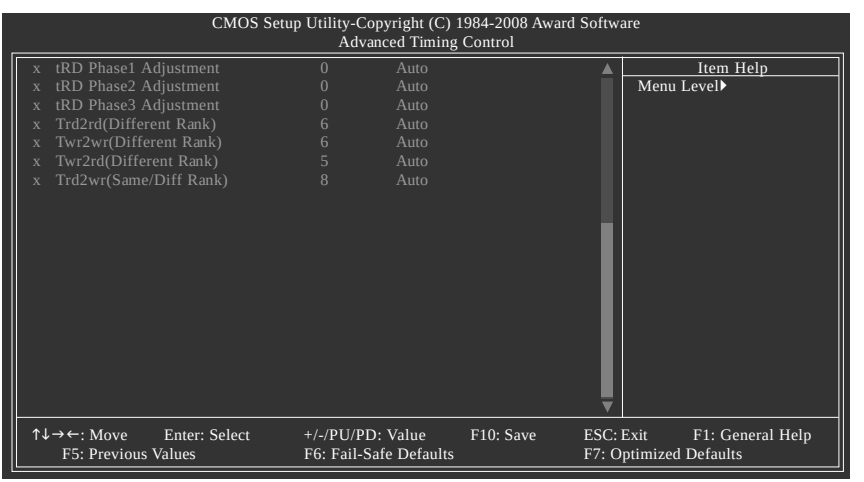
☞ **tRAS**

Options are: Auto (default), 1~63.

>>>>> Advanced Timing Control

☞ **Advanced Timing Control**





********** Advanced Timing Control **********

☞ **tRRD**
Options are: Auto (default), 1~15.

☞ **tWTR**
Options are: Auto (default), 1~31.

☞ **tWR**
Options are: Auto (default), 1~31.

☞ **tRFC**
Options are: Auto (default), 1~255.

☞ **tRTP**
Options are: Auto (default), 1~15.

☞ **Command Rate(CMD)**
Options are: Auto (default), 1~3.

>>>>> Channel A

☞ **Static tRead Value**
Options are: Auto (default), 1~15.

☞ **tRD Phase0 Adjustment**
Options are: Auto (default), 1-Advanced, 0-Normal.

☞ **tRD Phase1 Adjustment**
Options are: Auto (default), 1-Advanced, 0-Normal.

☞ **tRD Phase2 Adjustment**
Options are: Auto (default), 1-Advanced, 0-Normal.

☞ **tRD Phase3 Adjustment**
Options are: Auto (default), 1-Advanced, 0-Normal.

☞ **Trd2rd(Different Rank)**
Options are: Auto (default), 1~15.

☞ **Twr2wr(Different Rank)**
Options are: Auto (default), 1~15.

☞ **Twr2rd(Different Rank)**
Options are: Auto (default), 1~15.

☞ **Trd2wr(Same/Diff Rank)**
Options are: Auto (default), 1~15.

>>>>> Channel B

☞ **Static tRead Value**
Options are: Auto (default), 1~15.

☞ **tRD Phase0 Adjustment**
Options are: Auto (default), 1-Advanced, 0-Normal.

☞ **tRD Phase1 Adjustment**
Options are: Auto (default), 1-Advanced, 0-Normal.

☞ **tRD Phase2 Adjustment**
Options are: Auto (default), 1-Advanced, 0-Normal.

☞ **tRD Phase3 Adjustment**

Options are: Auto (default), 1-Advanced, 0-Normal.

☞ **Trd2rd(Different Rank)**

Options are: Auto (default), 1~15.

☞ **Twr2wr(Different Rank)**

Options are: Auto (default), 1~15.

☞ **Twr2rd(Different Rank)**

Options are: Auto (default), 1~15.

☞ **Trd2wr(Same/Diff Rank)**

Options are: Auto (default), 1~15.

********** Mother Board Voltage Control **********

>>> CPU

☞ **CPU Vcore**

The default is **Auto**.

☞ **CPU Termination**

The default is **Auto**.

☞ **CPU PLL**

The default is **Auto**.

>>> MCH/ICH

☞ **MCH Core**

The default is **Auto**.

☞ **MCH Reference**

The default is **Auto**.

☞ **ICH I/O**

The default is **Auto**.

>>> DRAM

☞ **DRAM Voltage**

The default is **Auto**.

☞ **DRAM Termination**

The default is **Auto**.

☞ **Ch-A Data VRef.**

The default is **Auto**.

☞ **Ch-B Data VRef.**

The default is **Auto**.

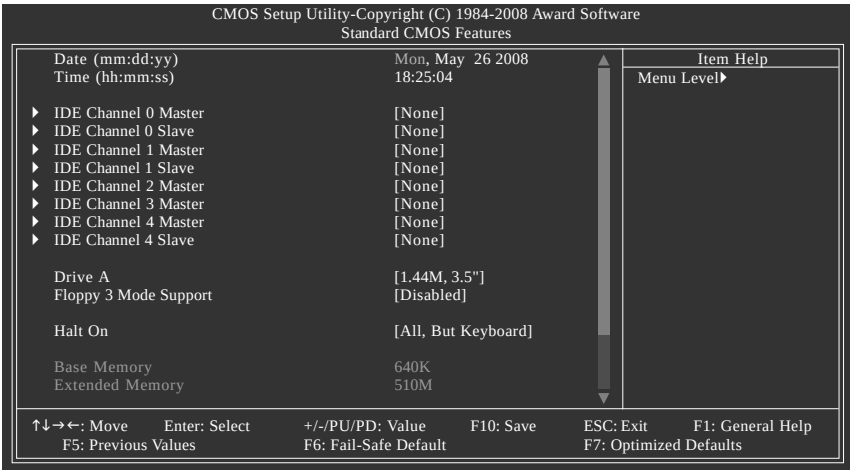
☞ **Ch-A Address VRef.**

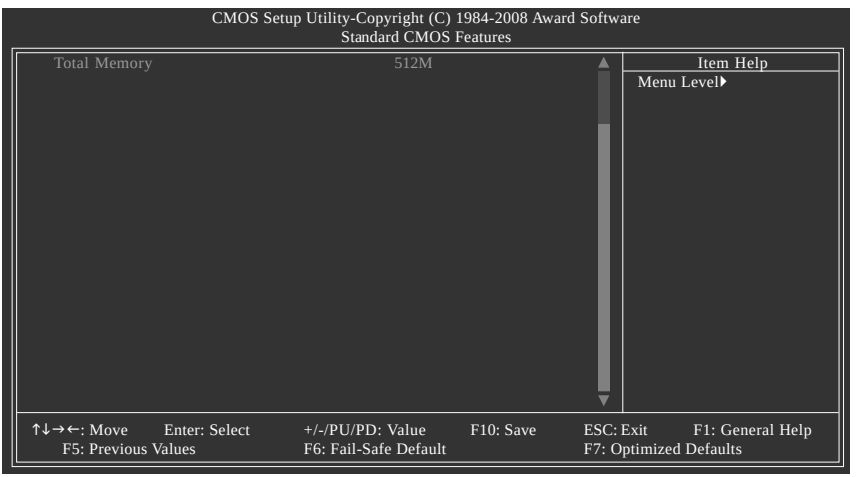
The default is **Auto**.

☞ **Ch-B Address VRef.**

The default is **Auto**.

2-4 Standard CMOS Features





☞ **Date**

Sets the system date. The date format is week (read-only), month, date and year. Select the desired field and use the up arrow or down arrow key to set the date.

☞ **Time**

Sets the system time. For example, 1 p.m. is 13:0:0. Select the desired field and use the up arrow or down arrow key to set the time.

☞ **IDE Channel 0/1 Master/Slave**

⏩ IDE HDD Auto-Detection

Press <Enter> to autodetect the parameters of the IDE/SA TA device on this channel.

⏩ IDE Channel 0/1 Master/Slave

Configure your IDE/SATA devices by using one of the three methods below:

- Auto — Lets BIOS automatically detect IDE/SATA devices during the POST. (Default)
- None — If no IDE/SATA devices are used, set this item to **None** so the system will skip the detection of the device during the POST for faster system startup.
- Manual — Allows you to manually enter the specifications of the hard drive when the hard drive access mode is set to **CHS**.

⏩ Access Mode — Sets the hard drive access mode. Options are: Auto (default), CHS, LBA, Large.

☞ **IDE Channel 2/3 Master, IDE Channel 4 Master/Slave**

⏩ IDE Auto-Detection

Press <Enter> to autodetect the parameters of the IDE/SA TA device on this channel.

⏩ Extended IDE Drive

Configure your IDE/SATA devices by using one of the two methods below:

- Auto — Lets BIOS automatically detect IDE/SATA devices during the POST. (Default)
- None — If no IDE/SATA devices are used, set this item to **None** so the system will skip the detection of the device during the POST for faster system startup.

⏩ Access Mode — Sets the hard drive access mode. Options are: Auto (default), Large.

The following fields display your hard drive specifications. If you wish to enter the parameters manually, refer to the information on the hard drive.

⏩ Capacity — Approximate capacity of the currently installed hard drive.
⏩ Cylinder — Number of cylinders.
⏩ Head — Number of heads.
⏩ Precomp — Write precompensation cylinder.
⏩ Landing Zone — Landing zone.
⏩ Sector — Number of sectors.

☞ **Drive A**

Allows you to selects the type of floppy disk drive installed in your system. If you do not install a floppy disk drive, set this item to **None**. Options are: None, 360K/5.25", 1.2M/5.25", 720K/3.5", 1.44M/3.5", 2.88M/3.5".

☞ **Floppy 3 Mode Support**

Allows you to specify whether the installed floppy disk drive is 3-mode floppy disk drive, a Japanese standard floppy disk drive. Options are: Disabled (default), Drive A.

☞ **Halt On**

Allows you to determine whether the system will stop for an error during the POST.

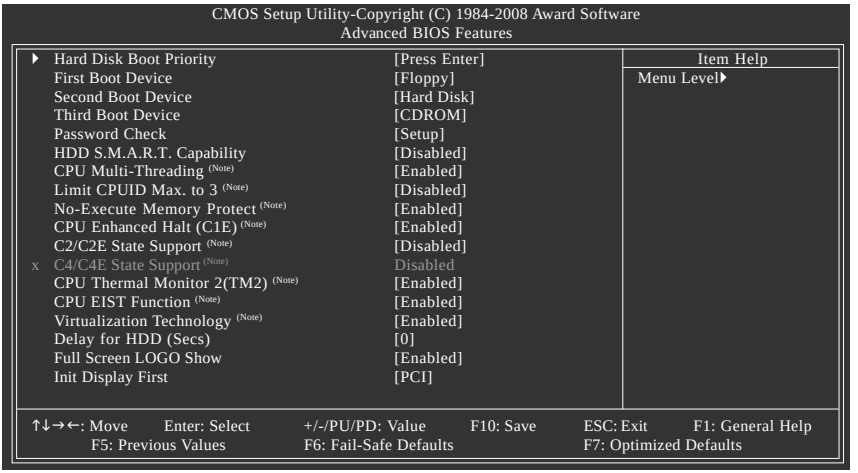
⏩ No Errors — The system boot will not stop for any error.
⏩ All Errors — Whenever the BIOS detects a non-fatal error the system boot will stop.
⏩ All, But Keyboard — The system boot will not stop for a keyboard error but stop for all other errors. (Default)
⏩ All, But Diskette — The system boot will not stop for a floppy disk drive error but stop for all other errors.
⏩ All, But Disk/Key — The system boot will not stop for a keyboard or a floppy disk drive error but it will stop for all other errors.

☞ **Memory**

These fields are read-only and are determined by the BIOS POST.

⏩ Base Memory — Also called conventional memory. Typically, 640 KB will be reserved for the MS-DOS operating system.
⏩ Extended Memory — The amount of extended memory.
⏩ Total Memory — The total amount of memory installed on the system.

2-5 Advanced BIOS Features



☞ **Hard Disk Boot Priority**

Specifies the sequence of loading the operating system from the installed hard drives. Use the up or down arrow key to select a hard drive, then press the plus key <+> (or <PageUp>) or the minus key <-> (or <PageDown>) to move it up or down on the list. Press <Esc> to exit this menu when finished.

☞ **First/Second/Third Boot Device**

Specifies the boot order from the available devices. Use the up or down arrow key to select a device and press <Enter> to accept. Options are: Floppy, LS120, Hard Disk, CDROM, ZIP, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, Legacy LAN, Disabled.

☞ **Password Check**

Specifies whether a password is required every time the system boots, or only when you enter BIOS Setup. After configuring this item, set the password(s) under the **Set Supervisor/User Password** item in the BIOS Main Menu.

- Setup — A password is only required for entering the BIOS Setup program. (Default)
- System — A password is required for booting the system and for entering the BIOS Setup program.

☞ **HDD S.M.A.R.T. Capability**

Enables or disables the S.M.A.R.T. (Self Monitoring and Reporting Technology) capability of your hard drive. This feature allows your system to report read/write errors of the hard drive and to issue warnings when a third party hardware monitor utility is installed. (Default: Disabled)

☞ **CPU Multi-Threading (Note)**

Allows you to determine whether to enable all CPU cores and multi-threading function when using an Intel® CPU that supports multi-core technology. This feature only works for operating systems that support multi-processor mode.

- Enabled — Enables all CPU cores and multi-threading capability. (Default)
- Disabled — Enables only one CPU core.

(Note) This item is present only if you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

☞ **Limit CPUID Max. to 3** (Note)

Allows you to determine whether to limit CPUID maximum value. Set this item to **Disabled** for Windows XP operating system; set this item to **Enabled** for legacy operating system such as Windows NT4.0. (Default: Disabled)

☞ **No-Execute Memory Protect** (Note)

Enables or disables Intel® Execute Disable Bit function. This function may enhance protection for the computer, reducing exposure to viruses and malicious buffer overflow attacks when working with its supporting software and system. (Default: Enabled)

☞ **CPU Enhanced Halt (C1E)** (Note)

Enables or disables Intel® CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. (Default: Enabled)

☞ **C2/C2E State Support** (Note)

Allows you to determine whether to let the CPU enter C2/C2E mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to descrease power consumption. (Default: Disabled)

☞ **C4/C4E State Support** (Note)

Allows you to determine whether to let the CPU enter C4/C4E mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to descrease power consumption. C4/C4E state is a more enhanced power-saving state than C2/C2E. This item is configurable only if the **C2/C2E State Support** option is enabled. (Default: Disabled)

☞ **CPU Thermal Monitor 2 (TM2)** (Note)

Enables or disables Intel® CPU Thermal Monitor (TM2) function, a CPU overheating protection function. When enabled, the CPU core frequency and voltage will be reduced when the CPU is overheated. (Default: Enabled)

☞ **CPU EIST Function** (Note)

Enables or disables Enhanced Intel SpeedStep Technology (EIST). Depending on CPU loading, Intel® EIST technology can dynamically and effectively lower the CPU voltage and core frequency to decrease average power consumption and heat production. (Default: Enabled)

☞ **Virtualization Technology** (Note)

Enables or disables Intel® Virtualization Technology. Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. (Default: Enabled)

☞ **Delay For HDD (Secs)**

Allows you to set a delay time for the BIOS to initialize the hard drive as the system boots up. The adjustable range is from 0 to 15 seconds. (Default: 0)

☞ **Full Screen LOGO Show**

Allows you to determine whether to display the GIGABYTE Logo at system startup. **Disabled** displays normal POST message. (Default: Enabled)

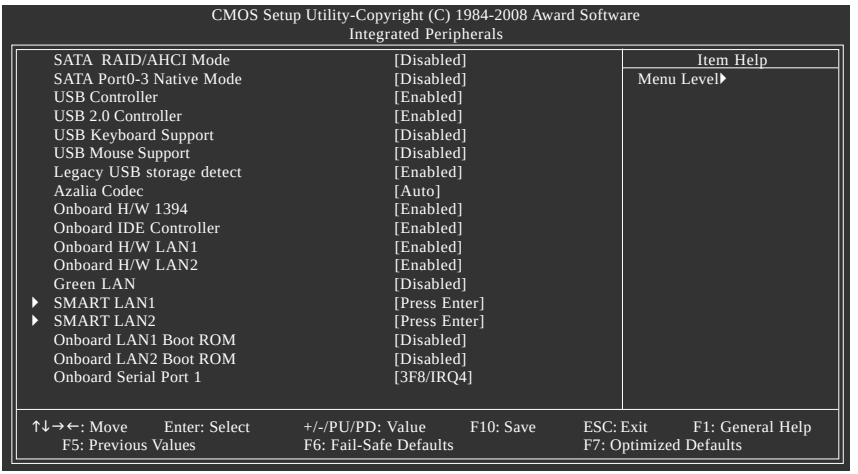
(Note) This item is present only if you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

☞ Init Display First

Specifies the first initiation of the monitor display from the installed PCI graphics card or PCI Express graphics card.

- ⏩ PCI — Sets the PCI graphics card as the first display. (Default)
- ⏩ PEG — Sets PCI Express graphics card on the PCI Express x16 slot as the first display.
- ⏩ PEG2 — Sets PCI Express graphics card on the PCI Express x8 slot as the first display.
- ⏩ PEG3 — Sets PCI Express graphics card on the PCI Express x4 slot as the first display.

2-6 Integrated Peripherals



☞ **SATA RAID/AHCI Mode**

Enables or disables RAID for the SATA controllers or configures the SATA controllers to AHCI mode.

- ⏩ Disabled — Disables RAID for the SATA controllers and configures the SATA controllers to PATA mode. (Default)
- ⏩ AHCI — Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug.
- ⏩ RAID — Enables RAID for the SATA controllers.

☞ **SATA Port0-3 Native Mode**

Specifies the operating mode of the integrated SATA controllers.

- ⏩ Disabled — Allows the SATA controllers to operate in Legacy IDE mode.
  In Legacy mode the SATA controllers use dedicated IRQs that cannot be shared with other device. Set this option to **Disabled** if you wish to install operating systems that do not support Native mode. (Default)
- ⏩ Enabled — Allows the SATA controllers to operate in Native IDE mode.
  Enable Native IDE mode if you wish to install operating systems that support Native mode.

☞ **USB Controller**

Enables or disables the integrated USB controller. (Default: Enabled)

Disabled will turn off all of the USB functionalities below.

☞ **USB 2.0 Controller**

Enables or disables the integrated USB 2.0 controller. (Default: Enabled)

☞ **USB Keyboard Support**

Allows USB keyboard to be used in MS-DOS. (Default: Disabled)

☞ **USB Mouse Support**

Allows USB mouse to be used in MS-DOS. (Default: Disabled)

☞ **Legacy USB storage detect**

Determines whether to detect USB storage devices, including USB flash drives and USB hard drives during the POST. (Default: Enabled)

☞ **Azalia Codec**

Enables or disables the onboard audio function. (Default: Auto)

If you wish to install a 3rd party add-in audio card instead of using the onboard audio, set this item to **Disabled**.

☞ **Onboard H/W 1394**

Enables or disables the onboard IEEE 1394 function. (Default: Enabled)

☞ **Onboard IDE Controller**

Enables or disables the integrated IDE controller. (Default: Enabled)

☞ **Onboard H/W LAN1 (LAN1 port)**

Enables or disables the onboard LAN function. (Default: Enabled)

If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to **Disabled**.

☞ **Onboard H/W LAN2 (LAN2 port)**

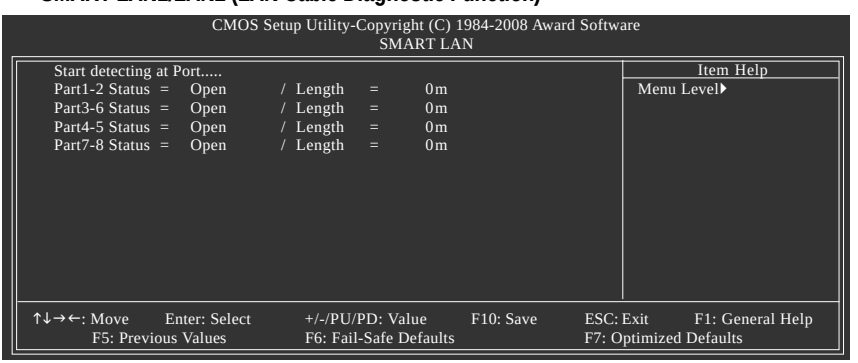
Enables or disables the onboard LAN function. (Default: Enabled)

If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to **Disabled**.

☞ **Green LAN**

When the onboard LAN function and **Green LAN** are enabed, the system will dynamically detects if LAN cable(s) is connected or not. If not, the corresponding LAN controller will be disabled automatically. (Default: Disabled)

☞ **SMART LAN1/LAN2 (LAN Cable Diagnostic Function)**



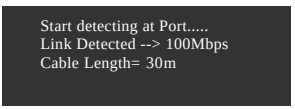
This motherboard incorporates cable diagnostic feature designed to detect the status of the attached LAN cable. This feature will detect cabling issue and report the approximate distance to the fault or short. Refer to the following information for diagnosing your LAN cable:

☞**When No LAN Cable Is Attached...**

If no LAN cable is attached to the motherboard, the **Status** fields of all four pairs of wires will show **Open** and the **Length** fields show **0m**, as shown in the figure above.

☞**When LAN Cable Is Functioning Normally...**

If no cable problem is detected on the LAN cable connected to a Gigabit hub or a 10/100 Mbps hub, the following message will appear:



- Link Detected Displays transmission speed
- Cable Length Displays the approximate length of the attached LAN cable.

Note: The Gigabit hub will only operate at a speed of 10/100 Mbps in MS-DOS mode; it will operate at a normal speed of 10/100/1000 Mbps in Windows mode or when the LAN Boot ROM is activated.

☞ **When a Cable Problem Occurs...**

If a cable problem occurs on a specified pair of wires, the **Status** field will show **Short** and then length shown will be the approximate distance to the fault or short.

Example: `Part1-2 Status = Short / Length = 2m`

Explanation: A fault or short might occur at about 2m on Part 1-2.

Note: Part 4-5 and Part 7-8 are not used in a 10/100 Mbps environment, so their **Status** fields will show **Open**, and the length shown is the approximate length of the attached LAN cable.

☞ **Onboard LAN1 Boot ROM (LAN1 port)**

Allows you to decide whether to activate the boot ROM integrated with the onboard LAN chip. (Default: Disabled)

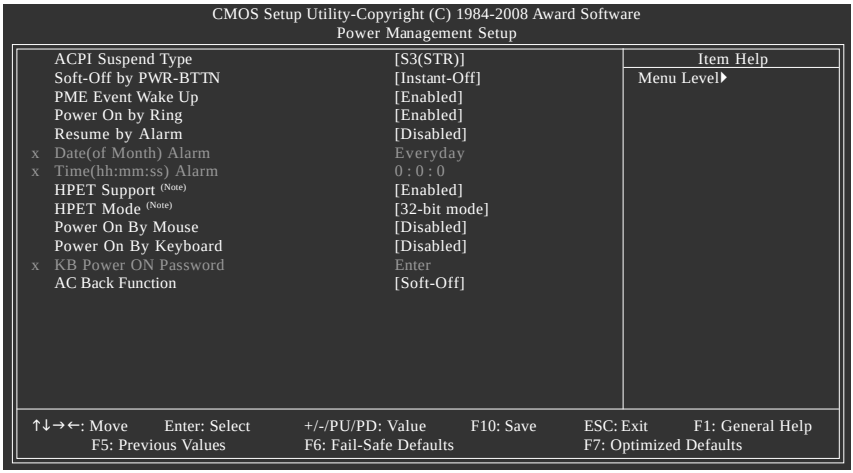
☞ **Onboard LAN2 Boot ROM (LAN2 port)**

Allows you to decide whether to activate the boot ROM integrated with the onboard LAN chip. (Default: Disabled)

☞ **Onboard Serial Port 1**

Enables or disables the first serial port and specifies its base I/O address and corresponding interrupt. Options are: Auto, 3F8/IRQ4 (default), 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Disabled.

2-7 Power Management Setup



☞ **ACPI Suspend Type**

Specifies the ACPI sleep state when the system enters suspend.

- S1(POS) Enables the system to enter the ACPI S1 (Power on Suspend) sleep state. In S1 sleep state, the system appears suspended and stays in a low power mode. The system can be resumed at any time.
- S3(STR) Enables the system to enter the ACPI S3 (Suspend to RAM) sleep state (default). In S3 sleep state, the system appears to be off and consumes less power than in the S1 state. When signaled by a wake-up device or event, the system resumes to its working state exactly where it was left off.

☞ **Soft-Off by PWR-BTTN**

Configures the way to turn off the computer in MS-DOS mode using the power button.

- Instant-Off Press the power button and then the system will be turned off instantly. (Default)
- Delay 4 Sec. Press and hold the power button for 4 seconds to turn off the system. If the power button is pressed for less than 4 seconds, the system will enter suspend mode.

☞ **PME Event Wake Up**

Allows the system to be awakened from an ACPI sleep state by a wake-up signal from a PCI or PCIe device. Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead. (Default: Enabled)

☞ **Power On by Ring**

Allows the system to be awakened from an ACPI sleep state by a wake-up signal from a modem that supports wake-up function. (Default: Enabled)

(Note) Supported on Windows® Vista® operating system only.

☞ **Resume by Alarm**

Determines whether to power on the system at a desired time. (Default: Disabled)
If enabled, set the date and time as following:

⏩ Date(of Month) Alarm: Turn on the system at a specific time on each day or on a specific day in a month.

⏩ Time(hh: mm: ss) Alarm: Set the time at which the system will be powered on automatically.

Note: When using this function, avoid inadequate shutdown from the operating system or removal of the AC power, or the settings may not be effective.

☞ **HPET Support** (Note)

Enables or disables High Precision Event Timer (HPET) for Windows® Vista® operating system. (Default: Enabled)

☞ **HPET Mode** (Note)

Allows you to select the HPET mode for your Windows ® Vista® operating system. Select **32-bit** mode when you install 32-bit Windows ® Vista®; select **64-bit** mode when you install 64-bit Windows® Vista®. (Default: 32-bit mode)

☞ **Power On By Mouse**

Allows the system to be turned on by a PS/2 mouse wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

⏩ Disabled Disables this function. (Default)

⏩ Double Click Double click on left button on the PS/2 mouse to turn on the system.

☞ **Power On By Keyboard**

Allows the system to be turned on by a PS/2 keyboard wake-up event.

Note: you need an ATX power supply providing at least 1A on the +5VSB lead.

⏩ Disabled Disables this function. (Default)

⏩ Password Set a password with 1~5 characters to turn on the system.

⏩ Keyboard 98 Press POWER button on the Windows 98 keyboard to turn on the system.

☞ **KB Power ON Password**

Set the password when **Power On by Keyboard** is set to **Password**. Press <Enter> on this item and set a password with up to 5 characters and then press <Enter> to accept. To turn on the system, enter the password and press <Enter>.

Note: To cancel the password, press <Enter> on this item. When prompted for the password, press <Enter> again without entering the password to clear the password settings.

☞ **AC Back Function**

Determines the state of the system after the return of power from an AC power loss.

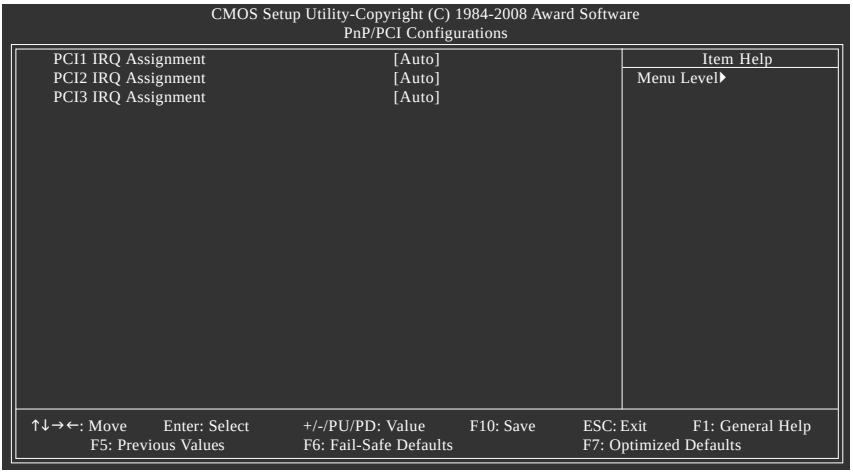
⏩ Soft-Off The system stays off upon the return of the AC power. (Default)

⏩ Full-On The system is turned on upon the return of the AC power.

⏩ Memory The system returns to its last known awake state upon the return of the AC power.

(Note) Supported on Windows® Vista® operating system only.

2-8 PnP/PCI Configurations



☞ **PCI1 IRQ Assignment**

- Auto — BIOS auto-assigns IRQ to the first PCI slot. (Default)
- 3,4,5,7,9,10,11,12,14,15 — Assigns IRQ 3,4,5,7,9,10,11,12,14,15 to the first PCI slot.

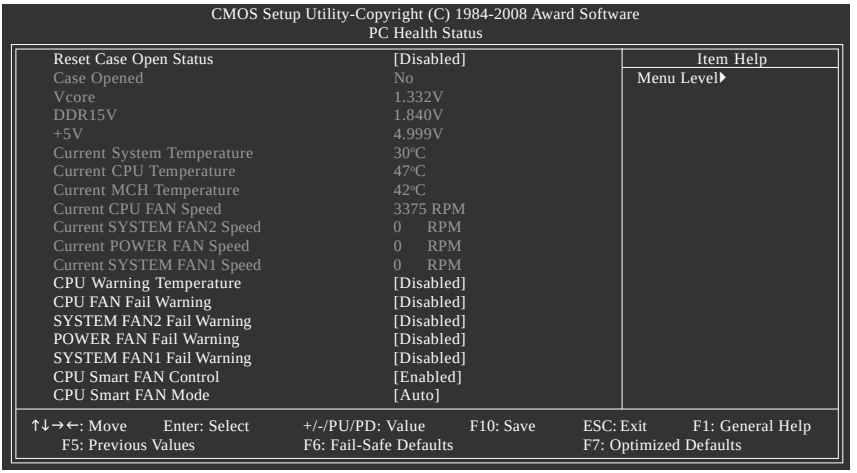
☞ **PCI2 IRQ Assignment**

- Auto — BIOS auto-assigns IRQ to the second PCI slot. (Default)
- 3,4,5,7,9,10,11,12,14,15 — Assigns IRQ 3,4,5,7,9,10,11,12,14,15 to the second PCI slot.

☞ **PCI3 IRQ Assignment**

- Auto — BIOS auto-assigns IRQ to the third PCI slot. (Default)
- 3,4,5,7,9,10,11,12,14,15 — Assigns IRQ 3,4,5,7,9,10,11,12,14,15 to the third PCI slot.

2-9 PC Health Status



☞ **Reset Case Open Status**

Keeps or clears the record of previous chassis intrusion status. **Enabled** clears the record of previous chassis intrusion status and the **Case Opened** field will show "No" at next boot. (Default: Disabled)

☞ **Case Opened**

Displays the detection status of the chassis intrusion detection device attached to the motherboard CI header. If the system chassis cover is removed, this field will show "Y es", otherwise it will show "No". To clear the chassis intrusion status record, set **Reset Case Open Status** to **Enabled**, save the settings to CMOS, and then restart your system.

☞ **Current Voltage(V) Vcore/DDR15V/+5V**

Displays the current system voltages.

☞ **Current System/CPU/MCH Temperature**

Displays current system/CPU/North Bridge temperature.

☞ **Current CPU/SYSTEM/POWER FAN Speed (RPM)**

Displays current CPU/system/power fan speed.

☞ **CPU Warning Temperature**

Sets the warning threshold for CPU temperature. When CPU temperature exceeds the threshold, BIOS will emit warning sound. Options are: Disabled (default), 60 °C/140°F, 70°C/158°F, 80°C/176°F, 90°C/194°F.

☞ **CPU/SYSTEM/POWER FAN Fail Warning**

Allows the system to emit warning sound if the CPU/system/power fan is not connected or fails. Check the fan condition or fan connection when this occurs. (Default: Disabled)

☞ **CPU Smart FAN Control**

Enables or disables the CPU fan speed control function. **Enabled** allows the CPU fan to run at different speed according to the CPU temperature. You can adjust the fan speed with EasyT une based on system requirements. If disabled, CPU fan runs at full speed. (Default: Enabled)

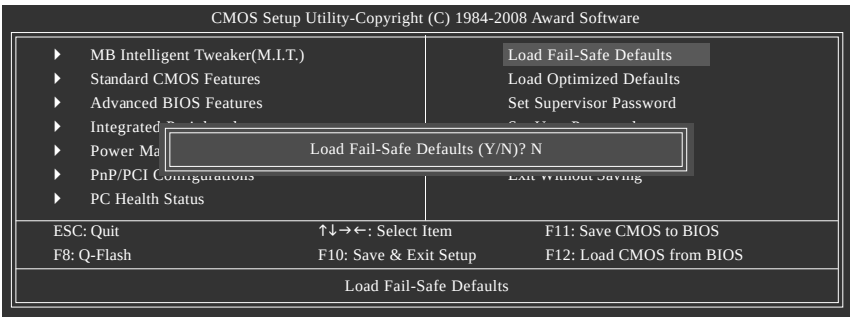
☞ **CPU Smart FAN Mode**

Specifies how to control CPU fan speed. This item is configurable only if **CPU Smart FAN Control** is set to **Enabled**.

- Auto — Lets BIOS autodetect the type of CPU fan installed and sets the optimal CPU fan control mode. (Default)
- Voltage — Sets Voltage mode for a 3-pin CPU fan.
- PWM — Sets PWM mode for a 4-pin CPU fan.

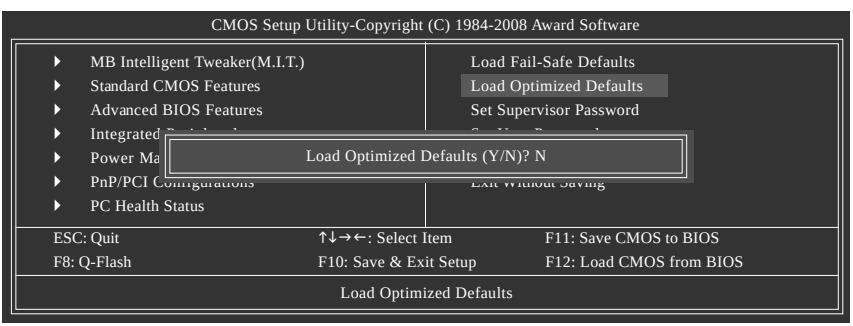
Note: The **Voltage** mode can be set for a 3-pin CPU fan or a 4-pin CPU fan. However , for a 4-pin CPU fan that is not designed following Intel PWM fan specifications, selecting PWM mode may not effectively reduce the fan speed.

2-10 Load Fail-Safe Defaults



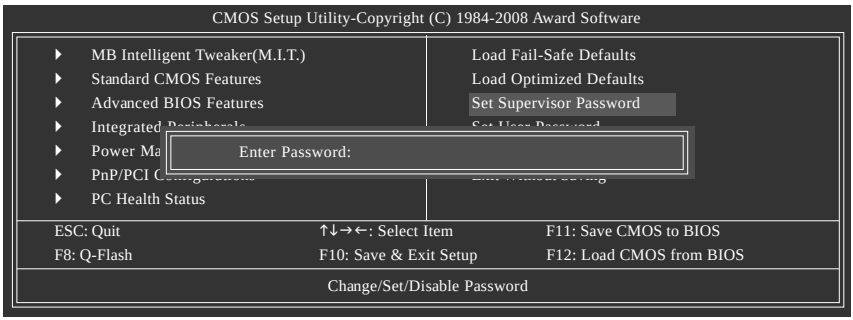
Press <Enter> on this item and then press the <Y> key to load the safest BIOS default settings.
In case system instability occurs, you may try to load Fail-Safe defaults, which are the safest and most stable BIOS settings for the motherboard.

2-11 Load Optimized Defaults



Press <Enter> on this item and then press the <Y> key to load the optimal BIOS default settings. The BIOS defaults settings helps the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.

2-12 Set Supervisor/User Password



Press <Enter> on this item and type the password with up to 8 characters and then press <Enter>. You will be requested to confirm the password. Type the password again and press <Enter>.

The BIOS Setup program allows you to specify two separate passwords:

☞ **Supervisor Password**

When a system password is set and the **Password Check** item in **Advanced BIOS Features** is set to **Setup**, you must enter the supervisor password for entering BIOS Setup and making BIOS changes.

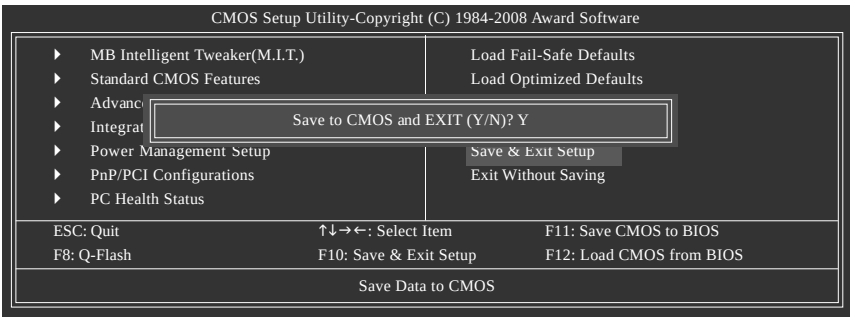
When the **Password Check** item is set to **System**, you must enter the supervisor password (or user password) at system startup and when entering BIOS Setup.

☞ **User Password**

When the **Password Check** item is set to **System**, you must enter the supervisor password (or user password) at system startup to continue system boot. In BIOS Setup, you must enter the supervisor password if you wish to make changes to BIOS settings. The user password only allows you to view the BIOS settings but not to make changes.

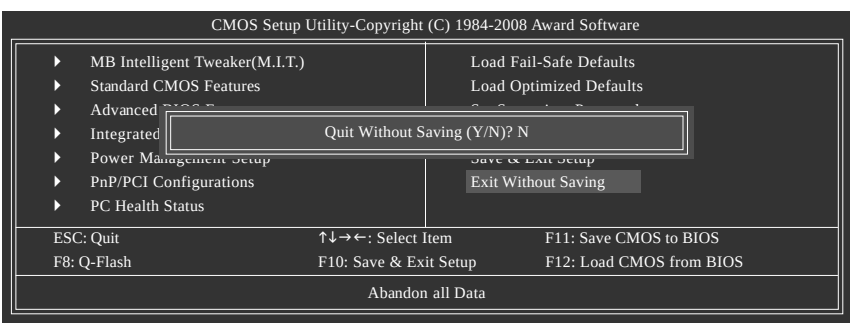
To clear the password, press <Enter> on the password item and when requested for the password, press <Enter> again. The message "PASSWORD DISABLED" will appear, indicating the password has been cancelled.

2-13 Save & Exit Setup



Press <Enter> on this item and press the <Y> key. This saves the changes to the CMOS and exits the BIOS Setup program. Press <N> or <Esc> to return to the BIOS Setup Main Menu.

2-14 Exit Without Saving



Press <Enter> on this item and press the <Y> key. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Press <N> or <Esc> to return to the BIOS Setup Main Menu.

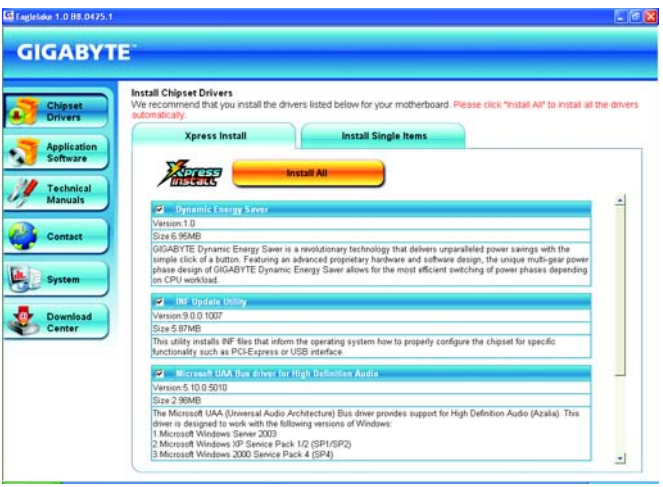
Chapter 3 Drivers Installation

NOTE

- Before installing the drivers, first install the operating system. (The following instructions use Windows XP as the example operating system.)
- After installing the operating system, insert the motherboard driver disk into your optional drive. The driver Autorun screen is automatically displayed which looks like that shown in the screen shot below. (If the driver Autorun screen does not appear automatically, go to My Computer, double-click the optical drive and execute the **Run**.exe program.)

3-1 Installing Chipset Drivers

After inserting the driver disk, "Xpress Install" will automatically scan your system and then list all the drivers that are recommended to install. Y ou can click the **Install All** button and "Xpress Install" will install all the recommended drivers. Or click **Install Single Items** to manually select the drivers you wish to install.

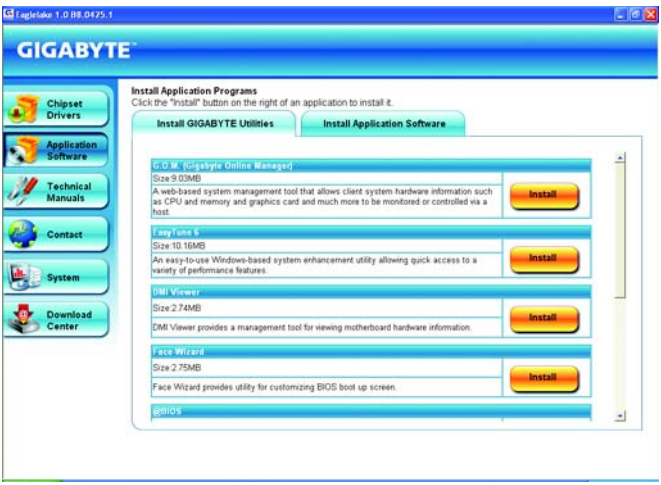


NOTE

- Please ignore the popup dialog box(es) (e.g. the **Found New Hardware Wizard**) displayed when "Xpress Install" is installing the drivers. Failure to do so may affect the driver installation.
- Some device drivers will restart your system automatically during the driver installation. After the system restart, "Xpress Install" will continue to install other drivers.
- After the drivers are installed, follow the onscreen instructions to restart your system. You can install other applications included in the motherboard driver disk.
- For USB 2.0 driver support under the Windows XP operating system, please install the Windows XP Service Pack 1 or later. After installing the SP1 (or later), if a question mark still exists in **Universal Serial Bus Controller** in **Device Manager**, please remove the question mark (by right-clicking your mouse and select **Uninstall**) and restart the system. (The system will then autodetect and install the USB 2.0 driver.)

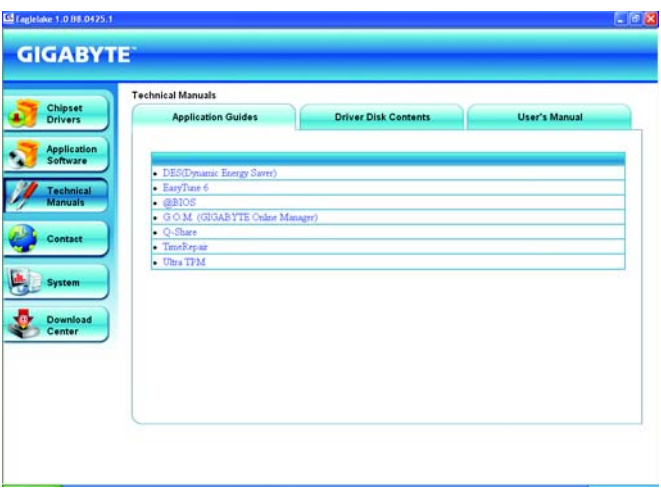
3-2 Application Software

This page displays all the utilities and applications that GIGABYTE develops and some free software. You can click the **Install** button on the right of an item to install it.



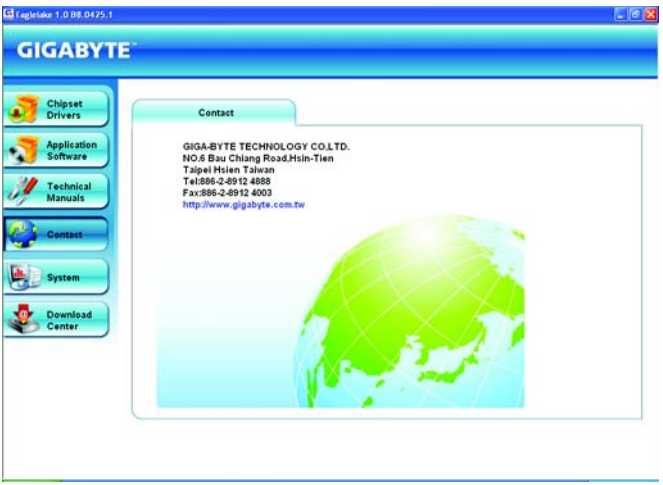
3-3 Technical Manuals

This page provides GIGABYTE's application guides, content descriptions for this driver disk, and the motherboard manuals.



3-4 Contact

Click the URL on this page to link to the GIGABYTE Web site. Or read the last page of th is manual to check the contact information for GIGABYTE Taiwan headquarter or worldwide branch of fices.

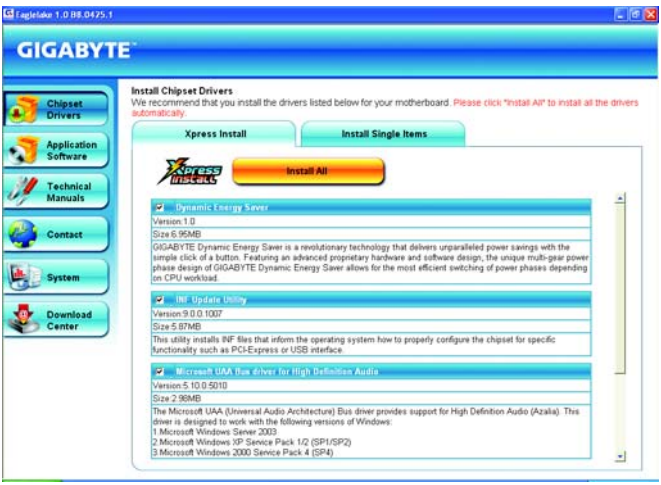


3-5 System

This page provides the basic system information.

3-6 Download Center

To update the BIOS, drivers, or applications, click the **Download Center** button to link to the GIGABYTE Web site. The latest version of the BIOS, drivers, or applications will be displayed.



Chapter 4 Unique Features

4-1 Xpress Recovery2

Xpress Recovery2 is a utility that allows you to quickly compress and back up your system data and perform restoration of it. Supporting NTFS, FAT32, and FAT16 file systems, Xpress Recovery2 can back up data on PATA and SATA hard drives and restore it.

Before You Begin:

- Xpress Recovery2 will check the first physical hard drive* for the operating system. Xpress Recovery2 can only back up/restore the first physical hard drive that has the operating system installed.
- As Xpress Recovery2 will save the backup file at the end of the hard drive, make sure to leave enough unallocated space in advanced (10 GB or more is recommended; actual size requirements vary, depending on the amount of data).
- It is recommended to back up your system soon after the operating system and drivers are installed.
- The amount of data and hard drive access speed may affect the speed at which the data is backed up/restored.
- It takes longer to back up a hard drive than to restore it.

System Requirements:

- Intel® platform
- At least 64 MB of system memory
- VESA compatible graphics card
- Windows® XP with SP1 or later

- Xpress Recovery and Xpress Recovery2 are different utilities. For example, a backup file created with Xpress Recovery cannot be restored using Xpress Recovery2.
- USB hard drives are not supported.
- Hard drives in RAID/AHCI mode are not supported.

"*" Xpress Recovery2 checks the first physical hard drive in the following sequence: The first PATA IDE connector, the second PATA IDE connector, the first SATA connector, the second SATA connector and so forth. For example, when hard drives are attached to the first IDE and the first SATA connectors, the hard drive on the first IDE connector is the first physical drive. When hard drives are attached to the first and second SATA connectors, the hard drive on the first SATA connector is the first physical drive.

Installation and Configuration

(The following procedure uses Windows XP as the example operating system.)

A. Installing Windows XP and Partitioning the Hard Drive

1. Set CD-ROM drive as the first boot device under "Advanced BIOS Features" in the BIOS Setup program. Save the changes and exit.
2. When partitioning your hard drive (Figure 1), make sure to leave unallocated space for Xpress Recovery2 (10 GB or more is recommended; actual size requirements vary, depending on the amount of data) (Figure 2).

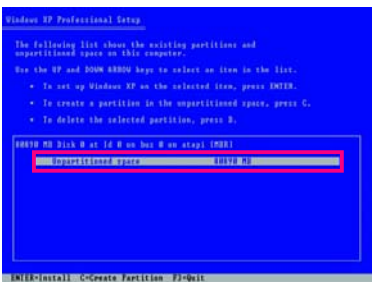


Figure 1

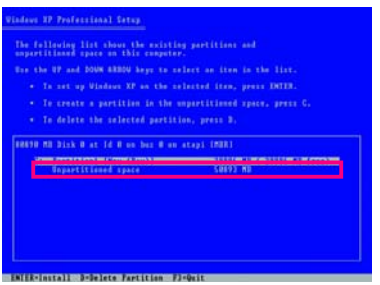


Figure 2

3. Select a file system (for example, NTFS) and begin the installation of the operating system (Figure 3).

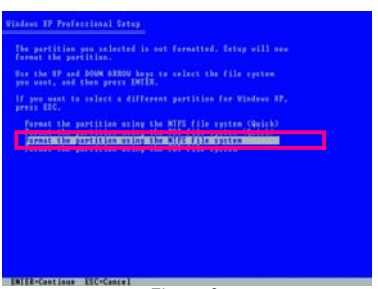


Figure 3

4. After the operating system is installed, right-click the **My Computer** icon on your desktop and select **Manage** (Figure 4). Go to **Computer Management** to check disk allocation. Xpress Recovery2 will save the backup file to the unallocated space (black stripe along the top)(Figure 5). Please note that if there is no enough unallocated space, Xpress Recovery2 cannot save the backup file.

Figure 4

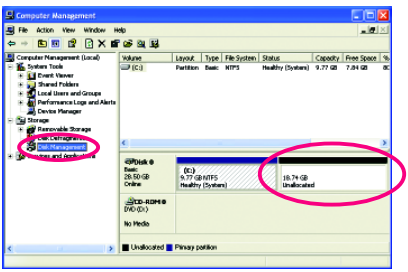


Figure 5

5. If your hard drive is not properly partitioned before you install the operating system, you may create new partitions using free space on your hard drive (Figure 6, 7). However, if **Disk Management** shows the hard drive only contains the System partition without any unallocated space, you will not be able to create new partitions or use Xpress Recovery2. If this occurs, reinstall the operating system and re-partition your hard drive.

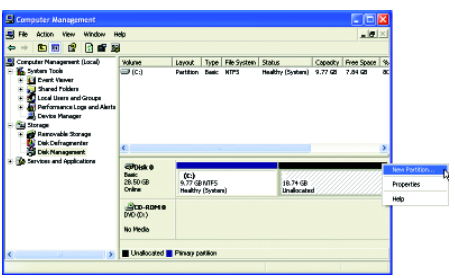


Figure 6

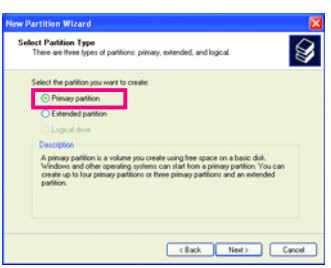


Figure 7

In the New Partition Wizard, you MUST select **Primary partition**. This will reserve unallocated space for Xpress Recovery2 to use.

B. Accessing Xpress Recovery2

1. Boot from the motherboard driver disk to access Xpress Recovery2 for the first time. When you see the following message: `Press any key to startup Xpress Recovery2` (Figure 8), press any key to enter Xpress Recovery2.

Figure 8

2. After you use the backup function in Xpress Recovery2 for the first time, Xpress Recovery2 will stay permanent in your hard drive. If you wish to enter Xpress Recovery2 later, simply press <F9> during the POST (Figure 9).

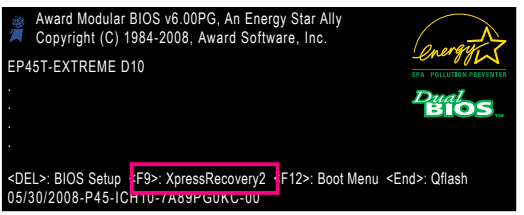


Figure 9

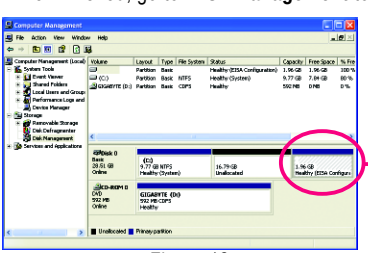
C. Using the Backup Function in Xpress Recovery2

1. Select **BACKUP** to start backing up your hard drive data (Figure 10).
2. Xpress Recovery2 will then begin to search the first physical hard drive as the target drive and detect whether this hard drive contains the Windows operating system. When the Windows operating system is detected, Xpress Recovery 2 will begin the backup process (Figure 11).

Figure 10

Figure 11

3. When finished, go to **Disk Management** to check disk allocation.



Xpress Recovery2 will automatically create a new partition to store the backup image file.

Figure 12

D. Using the Restore Function in Xpress Recovery2

Select **RESTORE** to restore the backup to your hard drive in case the system breaks down. The **RESTORE** option will not be present if no backup is created before (Figure 13, 14).

Figure 13

Figure 14

E. Removing the Backup

1. If you wish to remove the backup file, select **REMOVE** (Figure 15).
2. After the backup file is removed, no backup image file will be present in **Disk Management** and hard drive space will be freed up (Figure 16).

Figure 15

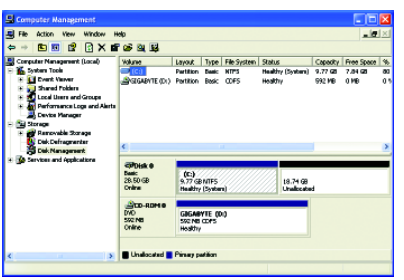


Figure 16

F. Exiting Xpress Recovery2

Select **REBOOT** to exit Xpress Recovery2.

Figure 17

4-2 BIOS Update Utilities

GIGABYTE motherboards provide two unique BIOS update tools, Q-Flash ™ and @BIOS™. GIGABYTE Q-Flash and @BIOS are easy-to-use and allow you to update the BIOS without the need to enter MS-DOS mode. Additionally, this motherboard features the DualBIOS ™ design, which enhances protection for the safety and stability of your computer by adding one more physical BIOS chip.

What is DualBIOS™?

Motherboards that support DualBIOS have two BIOS onboard, a main BIOS and a backup BIOS. Normally, the system works on the main BIOS. However, if the main BIOS is corrupted or damaged, the backup BIOS will take over on the next system boot and copy the BIOS file to the main BIOS to ensure normal system operation. For the sake of system safety, users cannot update the backup BIOS manually.

What is Q-Flash™?

With Q-Flash you can update the system BIOS without having to enter operating systems like MS-DOS or Window first. Embedded in the BIOS, the Q-Flash tool frees you from the hassles of going through complicated BIOS flashing process.

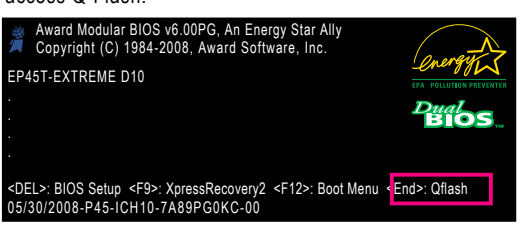
What is @BIOS™?

@BIOS allows you to update the system BIOS while in the Windows environment. @BIOS will download the latest BIOS file from the nearest @BIOS server site and update the BIOS.

4-2-1 Updating the BIOS with the Q-Flash Utility

A. Before You Begin:

1. From GIGABYTE's website, download the latest compressed BIOS update file that matches your motherboard model.
2. Extract the file and save the new BIOS file (e.g. EP45TEX.f1) to your floppy disk, USB flash drive, or hard drive. Note: The USB flash drive or hard drive must use F AT32/16/12 file system.
3. Restart the system. During the POST , press the <End> key to enter Q-Flash. Note: Y ou can access Q-Flash by either pressing the <End> key during the POST or pressing the <F8> key in BIOS Setup. However, if the BIOS update file is saved to a hard drive in RAID/AHCI mode or a hard drive attached to an independent IDE/SA TA controller, use the <End> key during the POST to access Q-Flash.



CAUTION

Because BIOS flashing is potentially risky, please do it with caution. Inadequate BIOS flashing may result in system malfunction.

B. Updating the BIOS

When updating the BIOS, choose the location where the BIOS file is saved. The follow procedure assumes that you save the BIOS file to a floppy disk.

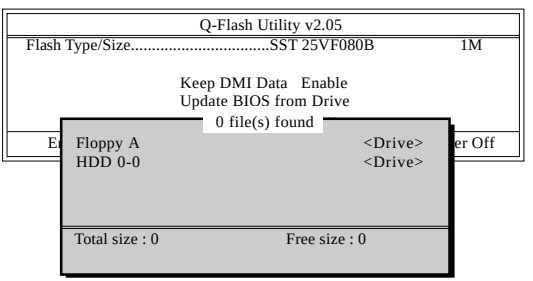
Step 1:

1. Insert the floppy disk containing the BIOS file into the floppy disk drive. In the main menu of Q-Flash, use the up or down arrow key to select **Update BIOS from Drive** and press <Enter>.

NOTE

- The **Save Main BIOS to Drive** option allows you to save the current BIOS file.
- Q-Flash only supports USB flash drive or hard drives using F AT32/16/12 file system.
- If the BIOS update file is saved to a hard drive in RAID/AHCI mode or a hard drive attached to an independent IDE/SATA controller, use the <End> key during the POST to access Q-Flash.

2. Select **Floppy A** and press <Enter>.



3. Select the BIOS update file and press <Enter>.

CAUTION

Make sure the BIOS update file matches your motherboard model.

Step 2:

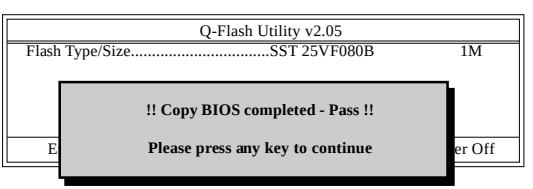
The process of the system reading the BIOS file from the floppy disk is displayed on the screen. When the message "Are you sure to update BIOS?" appears, press <Enter> to begin the BIOS update. The monitor will display the update process.

CAUTION

- Do not turn off or restart the system when the system is reading/updating the BIOS.
- Do not remove the floppy disk , USB flash drive, or hard drive when the system is updating the BIOS.

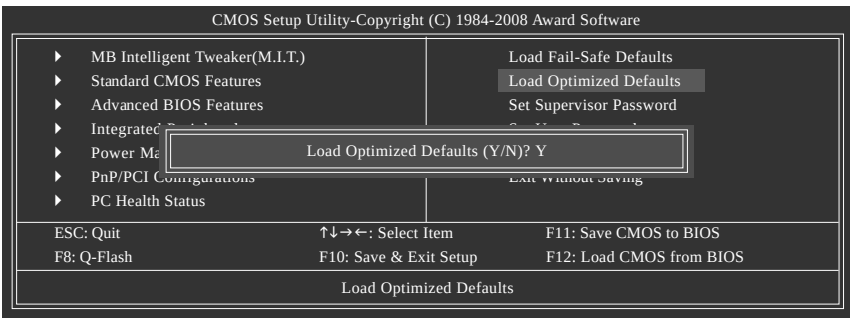
Step 3:

When the update process is complete, press any key to return to the main menu.



Step 4:
Press <Esc> and then <Enter> to exit Q-Flash and reboot the system. As the system boots, you should see the new BIOS version is present on the POST screen.

Step 5:
During the POST, press <Delete> to enter BIOS Setup. Select **Load Optimized Defaults** and press <Enter> to load BIOS defaults. System will re-detect all peripherals devices after a BIOS update, so we recommend that you reload BIOS defaults.



Press <Y> to load BIOS defaults

Step 6:
Select **Save & Exit Setup** and then press <Y> to save settings to CMOS and exit BIOS Setup. The procedure is complete after the system restarts.

4-2-2 Updating the BIOS with the @BIOS Utility

A. Before You Begin:

1. In Windows, close all applications and TSR (Terminate and Stay Resident) programs. This helps prevent unexpected failures when performing a BIOS update.
2. During the BIOS update process, ensure the Internet connection is stable and do NOT interrupt the Internet connection (for example, avoid a power loss or switching off the Internet). Failure to do so may result in a corrupted BIOS or a system that is unable to start.
3. Do not use the G.O.M. (GIGABYTE Online Management) function when using @BIOS.
4. GIGABYTE product warranty does not cover any BIOS damage or system failure resulting from an inadequate BIOS flashing.

B. Using @BIOS:

1. **Update the BIOS Using the Internet Update Function:**

   Click **Update BIOS from GIGABYTE Server**, select the @BIOS server site closest to your location and then download the BIOS file that matches your motherboard model. Follow the on-screen instructions to complete.

   NOTE If the BIOS update file for your motherboard is not present on the @BIOS server site, please manually download the BIOS update file from GIGABYTE's website and follow the instructions in "Update the BIOS without Using the Internet Update Function" below.

2. **Update the BIOS without Using the Internet Update Function:**

   Click **Update BIOS from File**, then select the location where you save the BIOS update file obtained from the Internet or through other source. Follow the on-screen instructions to complete.

3. **Save Current BIOS to File:**

   Click **Save Current BIOS** to save the current BIOS file.

C. After Updating the BIOS:

After updating the BIOS, restart your system. As the system boots, press <Delete> to enter the BIOS Setup program. Select **Load Optimized Defaults** and press <Enter> to load BIOS defaults.

NOTE Make sure that the BIOS file to be flashed matches your motherboard model. Updating the BIOS with an incorrect BIOS file could cause your system not to boot.

4-3 EasyTune 6

GIGABYTE's EasyTune 6 is a simple and easy-to-use interface that allows users to fine-tune their system settings or do overclock/overvoltage in Windows environment. The user-friendly EasyTune 6 interface also includes tabbed pages for CPU and memory information, lettings users read their system-related information without the need to install additional software.

The EasyTune 6 Interface

Tabs Information

Tab	Function
CPU	The **CPU** tab provides information on the installed CPU and motherboard.
Memory	The **Memory** tab provides information on the installed memory module(s). You can select memory module on a specific slot to see its information.
Tuner	The **Tuner** tab allows you to change system clock settings and voltages. • **Easy mode** allows you to adjust the CPU FSB only. • **Advanced mode** allows you to individually change system clock settings and voltages settings using the sliders. • **Save** allows you to save the current settings to a new profile (.txt file). • **Load** allows you to load previous settings from a profile. After making changes, be sure to click **Go** for these changes to take effect or click **Default** to restore to default values.
Graphics	The **Graphics** tab allows you to change the core clock and memory clock for your ATI or NVIDIA graphics card.
Smart	The **Smart** tab allows you to specify a C.I.A.2 level and a Smart Fan mode. **Smart Fan Advance Mode** allows the CPU fan speed to be changed linearly based on the CPU temperature thresholds you set.
HW Monitor	The **HW Monitor** tab allows you to monitor hardware temperature, voltage and fan speed and set temperature/fan speed alarm. You can choose the alert sound from the buzzer or use your own sound file (.wav file).

NOTE Available functions in EasyTune 6 may differ by motherboard model. Grayed-out area(s) indicates that the item is not configurable or the function is not supported.

CAUTION Incorrectly doing overclock/overvoltage may result in damage to the hardware components such as CPU, chipset, and memory and reduce the useful life of these components. Before you do the overclock/overvoltage, make sure that you fully know each function of EasyTune 6, or system instability or other unexpected results may occur.

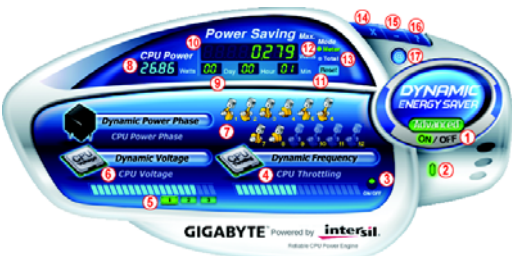
4-4 Dynamic Energy Saver Advanced

GIGABYTE Dynamic Energy Saver Advanced (Note 1) is a revolutionary technology that delivers unparalleled power savings with a click of the button. Featuring an advanced proprietary hardware and software design, GIGABYTE Dynamic Energy Saver Advanced is able to provide exceptional power savings and enhanced power efficiency without sacrificing computing performance.

The Dynamic Energy Saver Advanced Interface

A. Meter Mode

In Meter Mode, GIGABYTE Dynamic Energy Saver Advanced shows how much power they have saved in a set period of time.



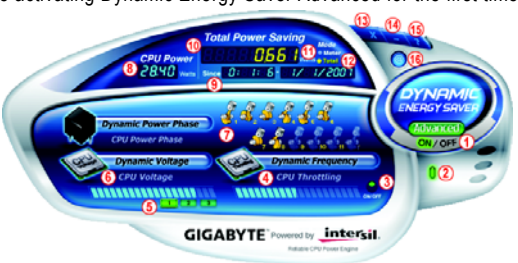
Meter Mode - Button Information Table

	Button Description
1	Dynamic Energy Saver On/Off Switch (Default: Off)
2	Motherboard Phase LED On/Off Switch (Default: On)
3	Dynamic CPU Frequency Function On/Off Switch (Default: Off) (Note 2)
4	CPU Throttling Display
5	3-Level CPU Voltage Switch (Default:1) (Note 3)
6	CPU Voltage Display
7	Dynamic Power Phase Status
8	Current CPU Power Consumption
9	Meter Time
10	Power Saving (Calculate power savings based on time)
11	Meter/Timer Reset Switch
12	Meter Mode Switch
13	Total Mode Switch
14	Close (Application will enter Stealth Mode)
15	Minimize (Application will continue to run in taskbar)
16	INFO/Help
17	Live Utility Update (Check for the latest utility version)

- The above data is for reference only. Actual performance may vary depending on motherboard model.
- CPU Power and Power Scores are for reference only. Actual results may vary based on testing method.

B. Total Mode

In Total Mode, users are able to see how much total power savings they have accumulated in a set period of time since activating Dynamic Energy Saver Advanced for the first time (Note 4).



Total Mode - Button Information Table

	Button Description
1	Dynamic Energy Saver On/Off Switch (Default: Off)
2	Motherboard Phase LED On/Off Switch (Default: On)
3	Dynamic CPU Frequency Function On/Off Switch (Default: Off)
4	CPU Throttling Display
5	3-Level CPU Voltage Switch (Default:1) (Note 3)
6	CPU Voltage Display
7	Dynamic Power Phase Status
8	Current CPU Power Consumption
9	Time/Date Dynamic Energy Saver Enabled
10	Total Power Savings (Total power saving with Dynamic Energy Saver enabled) (Note 5)
11	Dynamic Energy Saver Meter Mode Switch
12	Dynamic Energy Saver Total Mode Switch
13	Close (Application will enter Stealth Mode)
14	Minimize (Application will continue to run in taskbar)
15	INFO/Help
16	Live Utility Update (Check for the latest utility version)

C. Stealth Mode

In Stealth Mode, the system continues to work with the user-defined power saving settings, even after the system is restarted. Re-enter the application only if you want to make any changes or completely close the application.

(Note 1) Before using the DES function, make sure the **CPU Enhanced Halt (C1E)** and **CPU EIST Function** items in the BIOS Setup program are set to **Enabled**.
(Note 2) Maximize system power saving with Dynamic Frequency Function; system performance may be affected.
(Note 3) 1: Normal Power Saving (default); 2: Advanced Power Saving; 3: Extreme Power Saving.
(Note 4) The total amount of power saved will be recorded until re-activated when only the Dynamic Power Saver is under the enable status, and power savings meter is unable to reset to zero.
(Note 5) Dynamic Energy Saver Meter will automatically reset when the total power saving reaches 99999999 Watts.

4-5 Q-Share

Q-Share is an easy and convenient data sharing tool. You are able to connect your computer to another computer simply using Q-Share without making complicated settings.

Directions for using Q-Share

After installing Q-Share from the motherboard driver disk, go to Start>All Programs>GIGABYTE> Q-Share.exe to launch the Q-Share tool. Find the **Q-Share** icon in your system tray and right-click on this icon to configure the data sharing settings.

Figure 1. Data Sharing Disabled

Figure 2. Data Sharing Enabled

Options Descriptions

Option	Description
Connect ...	Displays the computers with data sharing enabled
Enable Incoming Folder ...	Enables data sharing
Disable Incoming Folder ...	Disables data sharing
Open Incoming Folder : C:\Q-ShareFolder	Accesses the shared data folder
Change Incoming Folder : C:\Q-ShareFolder	Changes the data folder to be shared (Note)
Update Q-Share ...	Updates Q-Share online
About Q-Share ...	Displays the current Q-Share version
Exit...	Exits Q-Share

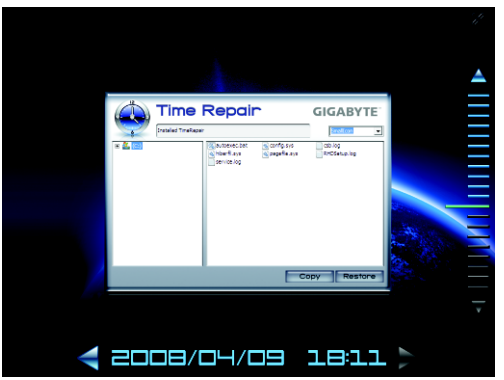
(Note) This option is available only when data sharing is NOT enabled.

4-6 Time Repair

Based on the Microsoft Volume Shadow Copy Services technology, Time Repair allows you to quickly back up and restore your system data in the Windows Vista operating system. Time Repair supports NTFS file system and can restore system data on P ATA and SATA hard drives.

System Restore

Choose a system restore point using the navigation bar on the right or at the bottom of the screen to view the system data backed up at dif ferent time. You can choose file(s)/directory(ies) and click the **Copy** button to restore the file(s)/directory(ies) or click **Restore** to restore the entire system.



Preference Screen:

Button	Function
ON	Automatically creates system restore points
OFF	DO NOT automatically create system restore points
SCHEDULE	Sets a regular interval for creating system restore points
CAPACITY	Sets the percentage of hard drive space used for saving shadow copies
TRIGGER	Creates a system restore point upon the first boot up of the day
?	Displays the Time Repair help file

NOTE

- The hard drive used must have more than 1 GB of capacity and over 300 MB of available space.
- Each storage volume can accommodate 64 shadow copies. When this limit is reached, the oldest shadow copy will be deleted and unable to be restored. Shadow copies are read-only so you cannot edit the contents of a shadow copy.

4-7 Teaming

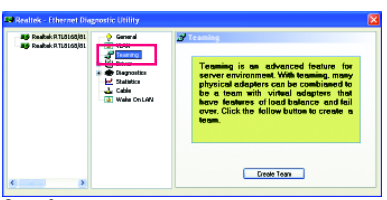
Dual LAN with Teaming functionality enabled on this motherboard allows two single connections to act as one single connection for twice the transmission bandwidth, making data transmission more effective and improving the quality of transmission of distant image(s). Fault tolerance on the dual LAN network prevents network downtime by transferring the workload from a failed port to a working port.

NOTE The speed of transmission is subject to the actual network environment or status even with Teaming enabled.

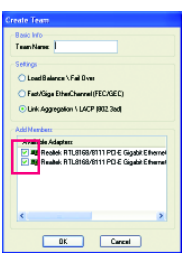
A. Enabling Teaming Functionality in Windows XP:

Step 1:
Insert the motherboard driver disk and select **Application Software, Install Application Software**. Click **Install** under **Realtek Ethernet Teaming Utility** for installation. Restart your system when completed.

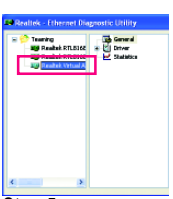
Step 2:
The **Realtek Ethernet Diagnostic Utility** icon appears in the system tray after the system restarts. Double-click the icon to access the utility.

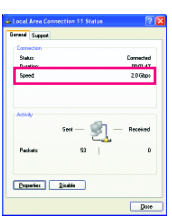


Step 3:
Choose **Teaming** and click the **Create Team** button.



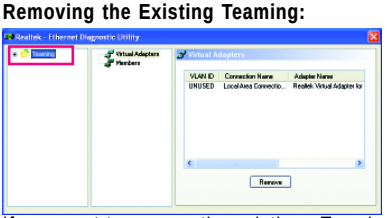
Step 4:
Give a name for the Team, e.g. Teaming, and set up the Teaming mode based on your hub's specifications. Select the check boxes for the two available adapters and click **OK**.





Step 5:
After you complete the setup, you will see the third virtual network interface. Go to **Local Area Connection Status** and you will see the connection speed is 2.0 Gbps.

Removing the Existing Teaming:



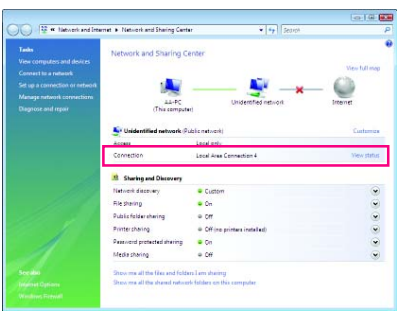
If you want to remove the existing Teaming, click the item you created, and then click the **Remove** button.

B. Enabling Teaming Functionality in Windows Vista:

Step 1:
Insert the motherboard driver disk and select **Application Software, Install Application Software**. Click **Install** under **Realtek Ethernet Teaming Utility** for installation. Restart your system when completed.

Step 2:
Click the **Start** icon. Point to **All Programs**, **Realtek Teaming and VLAN**, **Realtek Teaming and VLAN Utility** to access the utility.

Step 3:
Select the two adapters and set up the Teaming mode based on your hub's specifications. Then click the **Teaming** button. (Two dialog boxes will appear during the setup process, click **OK** to continue). When the **Create Virtual Adapter For Teaming Complete** dialog box appears, click **OK** to complete.



Step 4:
After the Teaming is created, you will see only one connection in **Network and Sharing Center**.

Step 5:
Click **View status** in **Network and Sharing Center** and you will see the connection speed is 2.0 Gbps.

Removing the Existing Teaming:

If you want to remove the existing Teaming, access the **Realtek Vlan & Teaming Utility** and click the **Remove** button.

Chapter 5 Appendix

5-1 Configuring SATA Hard Drive(s)

To configure SATA hard drive(s), follow the steps below:

A. Install SATA hard drive(s) in your computer.
B. Configure SATA controller mode in BIOS Setup.
C. Configure a RAID array in RAID BIOS. (Note 1)
D. Make a floppy disk containing the SATA RAID/AHCI driver. (Note 2)
E. Install the SATA RAID/AHCI driver and operating system. (Note 2)

Before you begin

Please prepare:

- At least two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID, you may prepare only one hard drive.
- An empty formatted floppy disk.
- Windows Vista/XP setup disk.
- Motherboard driver disk.

5-1-1 Configuring the Onboard SATA Controller

A. Installing SATA hard drive(s) in your computer

Attach one end of the SATA signal cable to the rear of the SATA hard drive and the other end to available SATA port on the motherboard. Then connect the power connector from your power supply to the hard drive.

(Note 1) Skip this step if you do not want to create RAID array on the SATA controller.
(Note 2) Required when the SATA controller is set to AHCI or RAID mode.

B. Configuring SATA controller mode in BIOS Setup

Make sure to configure the SATA controller mode correctly in system BIOS Setup .

Step 1:

Turn on your computer and press <Delete> to enter BIOS Setup during the POST (Power-On Self-Test). To create RAID, set **SATA RAID/AHCI Mode** under the **Integrated Peripherals** menu to **RAID** (Figure 1)(**Disabled** by default). If you do not want to create RAID, set this item to **Disabled** or **AHCI**.

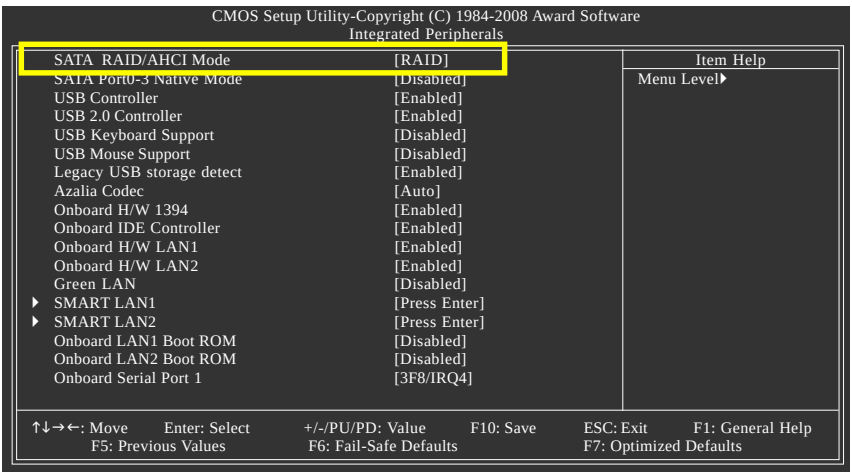


Figure 1

Step 2:

Save changes and exit BIOS Setup.

NOTE The BIOS Setup menus described in this section may differ from the exact settings for your motherboard. The actual BIOS Setup menu options you will see shall depend on the motherboard you have and the BIOS version.

C. Configuring a RAID array in RAID BIOS

Enter the RAID BIOS setup utility to configure a RAID array. Skip this step and proceed to the installation of Windows operating system for a non-RAID configuration.

Step 1:

After the POST memory test begins and before the operating system boot begins, look for a message which says "Press <Ctrl-I> to enter Configuration Utility" (Figure 2). Press <Ctrl> + <I> to enter the RAID Configuration Utility.

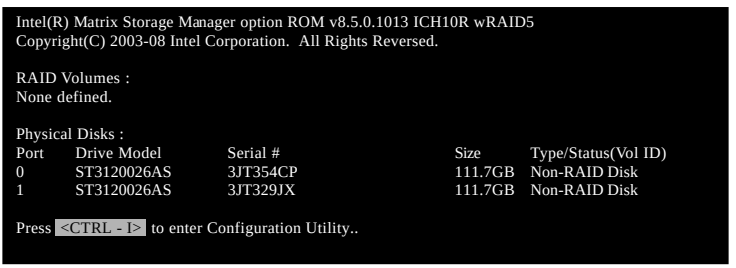


Figure 2

Step 2:

After you press <Ctrl> + <I>, the **MAIN MENU** screen will appear (Figure 3).

Create RAID Volume

If you want to create a RAID array , select **Create RAID Volume** in **MAIN MENU** and press <Enter>.

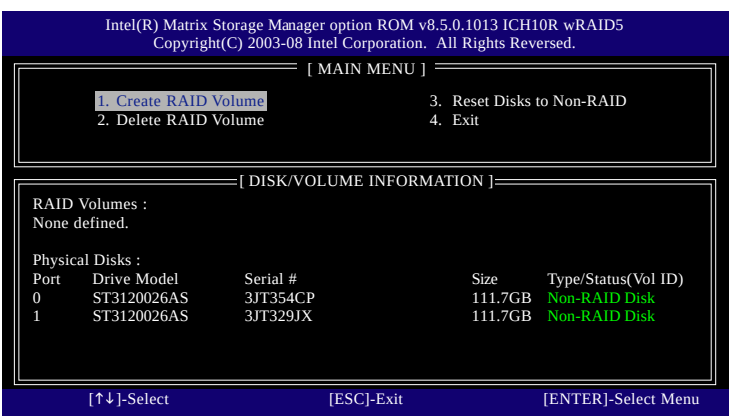


Figure 3

Step 3:

After entering the **CREATE VOLUME MENU** screen, enter a volume name with 1~16 letters (letters cannot be special characters) under the **Name** item and press <Enter>. Then, select a RAID level (Figure 4). There are four RAID levels supported: RAID 0, RAID 1, RAID 10 and RAID 5 (the selections available depend on the number of the hard drives being installed). Press <Enter> to proceed.

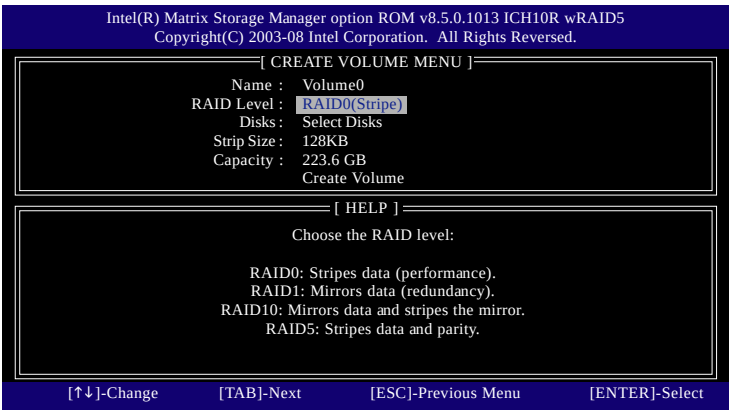


Figure 4

Step 4:

Under **Disks** item, select the hard drives to be included in the RAID array. If only two hard drives are installed, they will be automatically assigned to the array. Set the stripe block size (Figure 5) if necessary. The stripe block size can be set from 4 KB to 128 KB. Once you have selected the stripe block size, press <Enter>.

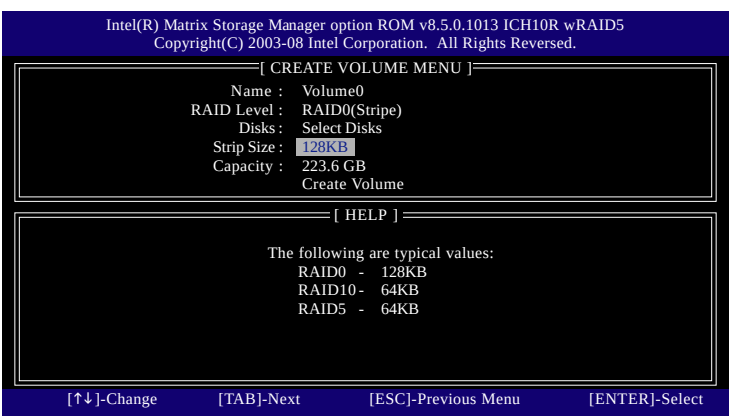


Figure 5

Step 5:

Enter the array capacity and press <Enter>. Finally press <Enter> on the **Create Volume** item to begin creating the RAID array. When prompted to confirm whether to create this volume, press <Y> to confirm or <N> to cancel (Figure 6).

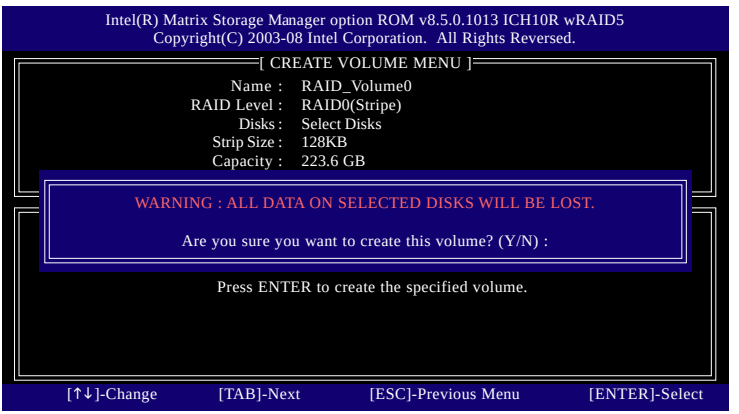


Figure 6

When completed, you can see detailed information about the RAID array in the **DISK/VOLUME INFORMATION** section, including the RAID level, stripe block size, array name, and array capacity , etc. (Figure 7)

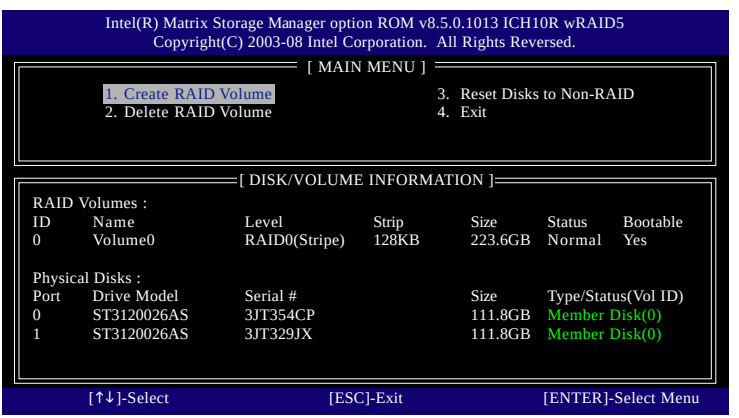


Figure 7

To exit the ICH10R RAID BIOS utility , press <Esc> or select **Exit** in **MAIN MENU**.

Now, you may proceed to create the SA TA RAID/AHCI driver diskette and the installation of the SA TA RAID/ACHI driver and operating system.

Delete RAID Volume

To delete a RAID array , select **Delete RAID Volume** in **MAIN MENU** and press <Enter>. In the **DELETE VOLUME MENU** section, use the up or down arrow key to select the array to be deleted and press <Delete>. When prompted to confirm your selection (Figure 8), press <Y> to confirm or <N> to abort.

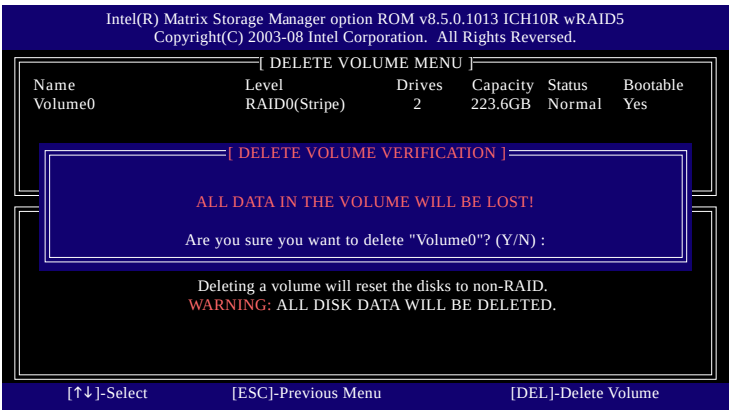


Figure 8

5-1-2 Making a SATA RAID/AHCI Driver Diskette (Required for AHCI and RAID Mode)

To successfully install operating system onto SATA hard drive(s) that is/are configured to RAID/AHCI mode, you need to install the SATA controller driver during the OS installation. Without the driver , the hard drive may not be recognized during the Windows setup process. First of all, copy the driver for the SATA controller from the motherboard driver disk to a floppy disk. For installing W indows Vista, you first have to copy the SATA controller driver from the motherboard driver disk to your USB flash drive and then extract it (see instructions on the next page). See the instructions below about how to copy the driver in MS-DOS mode(Note). Prepare a startup disk that has CD-ROM support and a blank formatted floppy disk.

Step 1: Insert the prepared startup disk and motherboard driver disk in your system. Boot from the startup disk. Once at the A:\> prompt, change to your optical drive (example: D:\>). At the D:\> prompt, type the following two commands. Press <Enter> after each command (Figure 1):

```
cd bootdrv
menu
```

Step 2: When the controller menu (Figure 2) appears, remove the startup disk and insert the blank formatted disk. Select the controller driver by pressing the corresponding letter from the menu. For example, from the menu in Figure 2, select **7) Intel Matrix Storage Manager 32 bit** for Windows 32-bit operating system or **8) Intel Matrix Storage Manager 64 bit** for Windows 64-bit.
Your system will then automatically zip and transfer this driver file to the floppy disk. Press <0> to exit when finished.

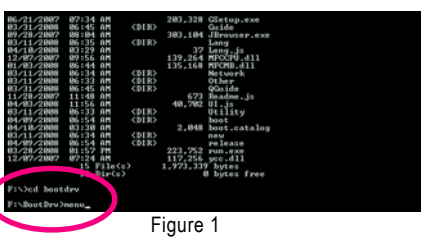


Figure 1

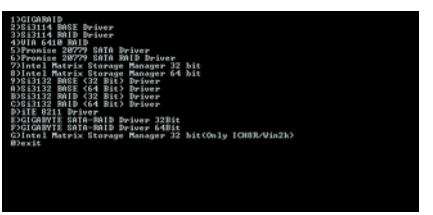


Figure 2

(Note) For users without a startup disk:
Use an alternative system and insert the motherboard driver disk. From your optical drive folder, double click the **MENU.exe** file in the **BootDrv** folder (Figure 3). A command prompt window will open similar to that in Figure 2.

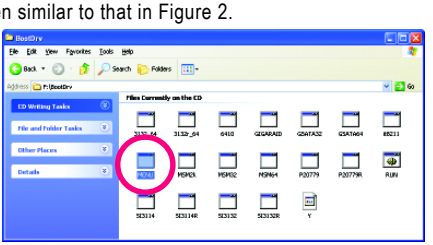


Figure 3

Copying the SATA RAID/AHCI driver from the motherboard driver disk to a USB flash drive

Step 1:

On an alternative system, copy the SATA RAID/AHCI driver to your USB flash drive from the motherboard driver disk. For example, to install the Windows Vista 32-bit operating system (Note) on the Intel ICH10R SATA controller, copy the **MSM32** file (Figure 4) located in the **BootDrv** folder in the motherboard driver disk to your USB flash drive.

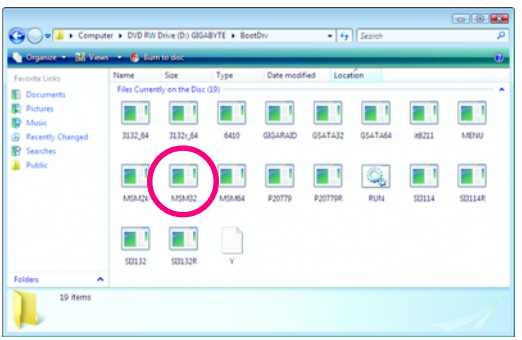


Figure 4

Step 2:

Double-click the **MSM32** file in the USB flash drive. When a screen similar to that in Figure 5 appears, type "yes" after the "Continue extraction?" message, and then press <Enter> to begin extracting the driver. After the driver is extracted, a screen similar to that in Figure 6 will appear.

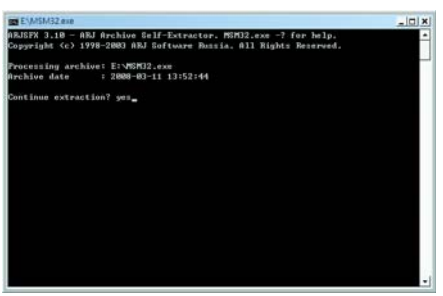


Figure 5

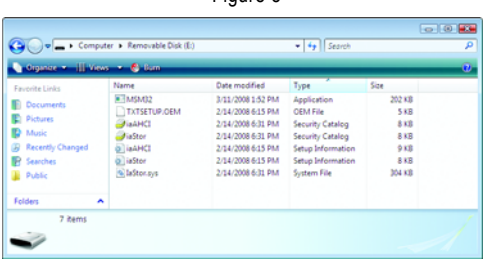


Figure 6

(Note) To install the Windows Vista 64-bit operating system, please copy the **MSM64** file.

5-1-3 Installing the SATA RAID/AHCI Driver and Operating System

Now that you have prepared the SA TA RAID/AHCI driver diskette and configured the required BIOS settings, you are ready to install Windows Vista/XP onto your hard drive(s). The following is an example of Windows XP and Vista installation.

A. Installing Windows XP

Step 1:

Restart your system to boot from the Windows XP setup disk and press <F6> as soon as you see the message "Press F6 if you need to install a 3rd party SCSI or RAID driver" (Figure 1). After pressing <F6>, there will be a few moments of some files being loaded before you see the next screen.

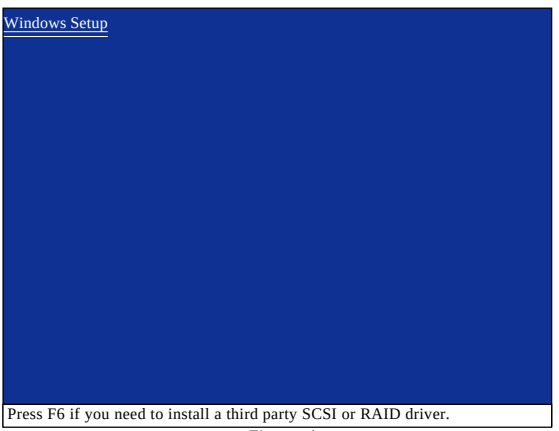


Figure 1

Step 2:

When a screen similar to that below appears, insert the floppy disk containing the SA TA RAID/AHCI driver and press <S> (Figure 2).

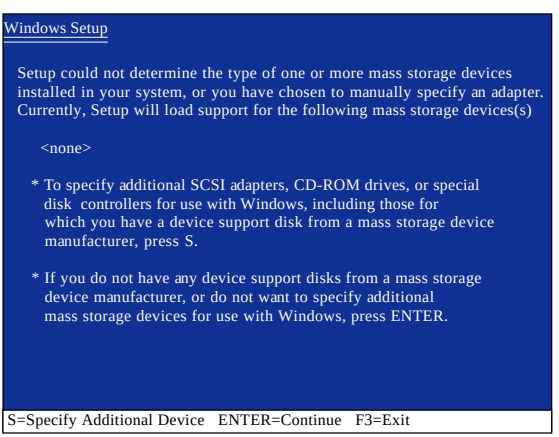


Figure 2

Step 3:

When Setup correctly recognizes the Intel ICH10R SA TA RAID/AHCI driver in the floppy disk, a controller menu similar to Figure 3 below will appear. Use the up or down arrow key to select one of the items displayed and press <Enter>. If you set the **SATA RAID/AHCI Mode** item in BIOS Setup to RAID mode, select **Intel(R) ICH8R/ICH9R/ICH10R SATA RAID Controller**. (Select **Intel(R) ICH10R SATA AHCI Controller** for AHCI mode.)

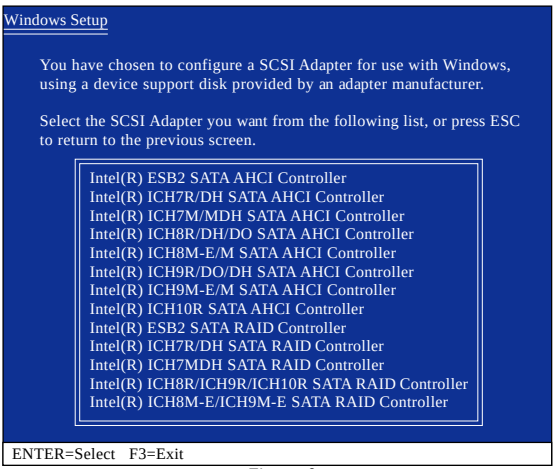


Figure 3

CAUTION

If a message appears saying one or some file(s) cannot be found, please check the floppy disk or copy the correct SA TA RAID/AHCI driver again from the motherboard driver disk.

When the screen as shown below appears, press <Enter> to continue the driver installation from the floppy disk. The driver installation will be finished in about one minute.

Figure 4

Step 4:

After the SATA RAID/AHCI driver installation is completed, you can proceed with the W indows XP installation.

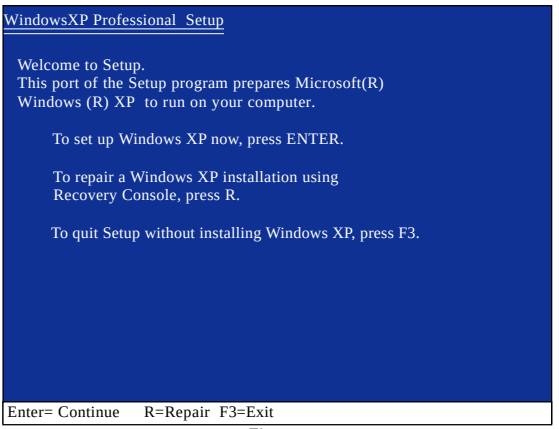


Figure 5

B. Installing Windows Vista

(The procedure below assumes that only one RAID array exists in your system.)

Step 1:

Restart your system to boot from the Windows Vista setup disk and perform standard OS installation steps. When a screen similar to that below appears, select **Load Driver**. (Figure 6).

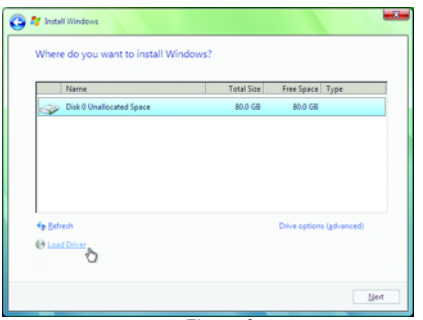


Figure 6

Step 2:

Specify the location where the driver is saved, such as your floppy disk or USB flash drive (Figure 7).

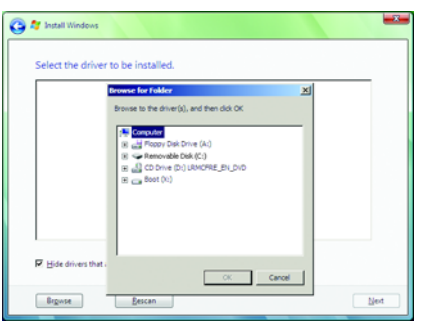


Figure 7

Step 3:

When a screen as shown in Figure 8 appears, select **Intel(R) ICH8R/ICH9R/ICH10R SATA RAID Controller** (Note) and press **Next**.

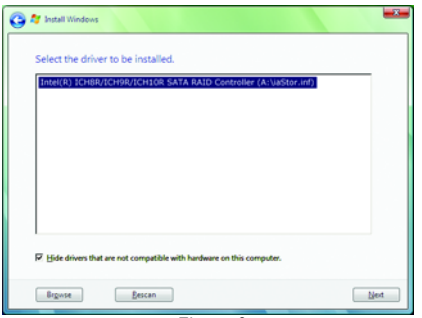


Figure 8

Step 4:

After the driver is loaded, select the RAID/AHCI drive(s) where you want to install the operating system and then press **Next** to continue the OS installation (Figure 9).

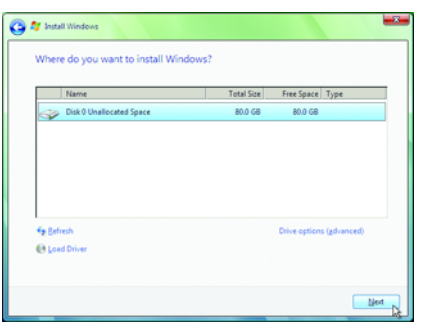


Figure 9

(Note) The item displayed in Figure 8 will be shown as **Intel(R) ICH10R SATA AHCI Controller** when the SATA controllers are set to AHCI mode.

5-2 Configuring Audio Input and Output

5-2-1 Configuring 2/4/5.1/7.1-Channel Audio

The motherboard provides six audio jacks on the back panel which support 2/4/5.1/7.1-channel audio. The picture to the right shows the default audio jack assignments.

The integrated HD (High Definition) audio provides jack retasking capability that allows the user to change the function for each jack through the audio driver. For example, in a 4-channel audio configuration, if a Rear speaker is plugged into the default Center/Subwoofer speaker out jack, you can retask the Center/Subwoofer speaker out jack to be Rear speaker out.

NOTE

- To install a microphone, connect your microphone to the Mic in jack and manually configure the jack for microphone functionality.
- If your front panel audio supports Intel HD Audio standard, you can have both the front and back panel audio connectors active simultaneously.

High Definition Audio (HD Audio)

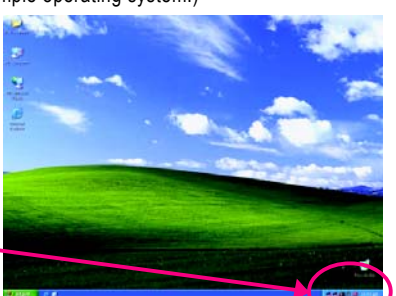
HD Audio includes multiple high quality digital-to-analog converters (DACs) that support 48KHz sampling rate. HD Audio features multistreaming capabilities that allow multiple audio streams (in and out) to be simultaneously processed. For example, users can listen to MP3 music, have an Internet chat, make a telephone call over the Internet, and etc. all at the same time.

A. Configuring Speakers:

(The following instructions use Windows XP as the example operating system.)

Step 1:

After installing the audio driver, the **Audio Manager** icon will appear in your system tray. Double-click the icon to access the Audio Control Panel.



CAUTION

Before installing the audio driver, make sure the "Microsoft UAA Bus driver for High Definition Audio" has been installed from the motherboard driver disk and your operating system has been updated with the latest Service Pack for Windows.

(Note) 2/4/5.1/7.1-Channel Audio Configurations:

Refer to the following for multi-channel speaker configurations.

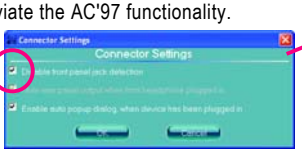
- 2-channel audio: Headphone or Line out.
- 4-channel audio: Front speaker out and Rear speaker out.
- 5.1-channel audio: Front speaker out, Rear speaker out, and Center/Subwoofer speaker out.
- 7.1-channel audio: Front speaker out, Rear speaker out, Center/Subwoofer speaker out, and Side speaker out.

Step 2:
Click the **Audio I/O** tab. In the speaker list on the left, select **2CH Speaker**, **4CH Speaker**, **6CH Speaker**, or **8CH Speaker** according to the type of speaker configuration you wish to set up.

Step 3:
Everytime you connect an audio device to an audio jack, the **Connected device** box appears. Select the device according to the type of device you connect. Then click **OK** to complete the configuration.

B. Configuring Sound Effect:
You may configure an audio environment on the **Sound Effect** tab.

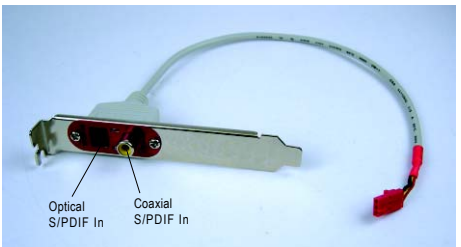
C. Configuring AC'97 Audio:
If you want to connect an AC'97 front panel audio module, click the tool icon on the **Audio I/O** tab On the **Global Connector Settings** box, select the **Disable front panel jack detection** check box. Click **OK** to activiate the AC'97 functionality.



NOTE When using an AC'97 front panel audio module, you can only have audio signals present on either the front or the back panel audio connections, but not both at the same time.

5-2-2 Installing the S/PDIF In Cable (Optional)

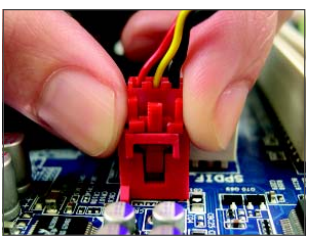
The S/PDIF in cable provides S/PDIF in functionality.



S/PDIF In:

The S/PDIF in jacks allow you to input digital audio signals to the computer for audio processing.

A. Installing the S/PDIF In Cable:



Step 1:
First, attach the connector at the end of the cable to the SPDIF_I header on your motherboard.

Step 2:
Secure the metal bracket to the chassis back panel with a screw.

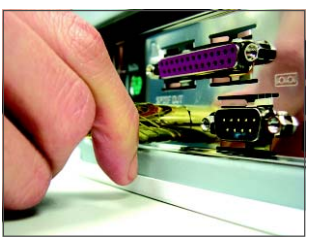
S/PDIF Out:

The S/PDIF out jacks can transmit audio signals to an external decoder for decoding to get the best audio quality.

B. Conneting a S/PDIF out Cable

S/PDIF Coaxial Cable

Connect a S/PDIF coaxial cable or a S/PDIF optical cable (either one) to an external decoder for transmitting the S/PDIF digital audio signals.



S/PDIF Optical Cable

C. Configuring S/PDIF out:

Click the tool icon in the **DIGITAL** section. In the **S/PDIF In/Out Settings** dialog box, select an output sampling rate and select (or disable) the output source. Click **OK** to complete the configuration.

(Note) The actual locations of the SPDIF In or Out connectors may differ by model.

5-2-3 Enabling the Dolby Home Theater Function

Before Dolby Home Theater is enabled, you get only 2-channel playback output (from the front speakers) when playing 2-channel stereo sources. You must play 4-, 5.1-, or 7.1-channel content to get 4-, 5.1-, or 7.1- channel audio effects. With Dolby Home Theater enabled, 2-channel stereo content will be transformed into multi-channel audio, creating a virtual surround sound environment (Note).

A. Windows XP

After installing the audio driver, at the center bottom of the Audio Control Panel, you should find the Dolby Home Theater control buttons as shown below:

Dolby Home Theater Control Buttons

1. : This button provides you with more controls over the onboard audio.
2. DOLBY HEADPHONE:
   Click this button to enable or disable the Dolby Headphone function. Enabling Dolby Headphone allows 2-channel stereo content to be heard as surround sound from any set of headphones.
3. DOLBY PRO LOGIC II:
   Click this button to enable or disable the Dolby Pro Logic II function.
   Enabling Dolby Pro Logic II allows 2-channel stereo content to be processed into 4- or 5.1- channel surround sound, depending on your speaker configurations.
4. DOLBY VIRTUAL SPEAKER:
   Click this button to enable or disable the Dolby Virtual Speaker function. Enabling Dolby Virtual Speaker allows 2-channel stereo content to be heard as surround sound from two speakers.
5. DOLBY DIGITAL LIVE:
   If your surround sound system is connected via an external decoder, click the **Audio I/O** tab in the Audio Control Panel. Either click **Dolby Digital 5.1** in the upper left list or click the **DOLBY DIGITAL LIVE** button at the center bottom of the Audio Control Panel. And click the **DOLBY PRO LOGIC II** button. The system will then simulate 5.1 channel surround sound playback from two-channel content.

B. Windows Vista

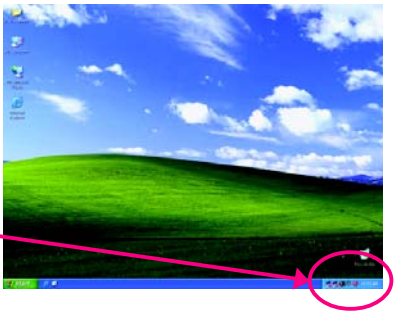
Install the **Dolby GUI Software** driver from the motherboard driver disk. Click the **Start** icon. Point to **All Programs**, **Dolby Control Center** to access the utility.
(The following illustration demonstrates a 7.1-speaker configuration as an example.)

1. Dolby Pro Logic IIx : Click **Dolby Pro Logic IIx**. The system will expand 2-channel audio for a 7.1-channel surround sound playback.
2. Natural Bass : Click **Natural Bass** to enable speaker bass effect.

(Note) When Dolby Digital Live is enabled, only digital audio output (S/PDIF) is working, and you will not hear any sound from analog speakers or headphone.

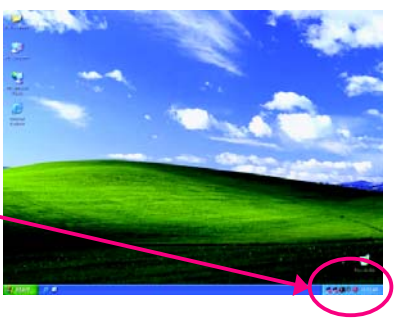
5-2-4 Configuring Microphone Recording

Step 1:
After installing the audio driver, the **Audio Manager** icon will appear in your system tray. Double-click the icon to access the Audio Control Panel.



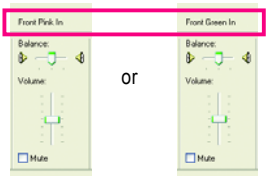
Step 2:
Connect your microphone to the Mic in jack (pink) on the back panel or the Mic in jack (pink) on the front panel. Then configure the jack for microphone functionality.
Note: The microphone functions on the front panel and back panel cannot be used at the same time.

Step 3:
Locate the **Volume** icon in your system tray and click it to open the volume control panel.



Step 4:

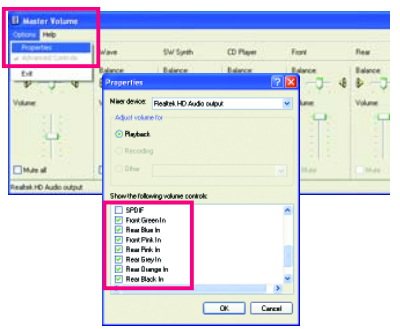
To hear the sound being recorded during the recording process when using the microphone function on the front panel, do not select the **Mute** check box under **Front Pink In** or **Front Green In** in **Master Volume**. It is recommended that you set the volume at a middle level.



To hear the sound being recorded during the recording process when using the microphone function on the back panel, do not select the **Mute** check box under **Rear Pink In** in **Master Volume**. It is recommended that you set the volume at its middle level.

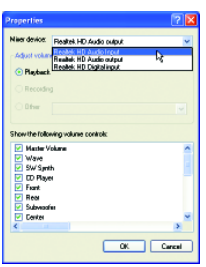
(Note)

If you cannot find the volume control options you need in **Master Volume**, go to the **Options** menu and then choose **Properties**. Select the volume control options you wish to show and click **OK** to complete.



Step 5:

Next, while in **Master Volume**, go to **Options** and click **Properties**. In the **Mixer device** list, select **Realtek HD Audio Input**. Then set the recording sound level properly. Do NOT mute the recording sound, or you will not hear any sound when playing back the recording you just made.



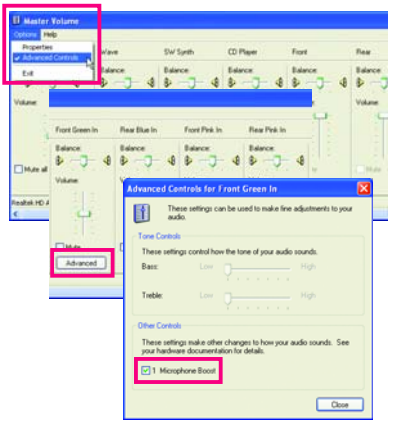
Select **Realtek HD Audio Input** in the **Mixer device** list

(Note)

Based on the audio specifications, to adjust the recording sound, use the **Recording** option to set the recording sound for your recording device(s) altogether.

Recording Control

Step 6:
To raise the recording and playing sound for the microphone, go to **Options** in **Master Volume** and select **Advanced Controls**. Click the **Advanced** button under a volume control option (e.g. Front Green In, Front Pink In). In the **Other Controls** field, select the **1 Microphone Boost** check box.



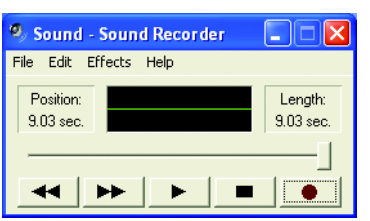
Step 7:
After completion, click **Start**, point to **All Programs**, point to **Accessories**, point to **Entertainment**, and then click **Sound Recorder** to begin the sound recording.

5-2-5 Using the Sound Recorder

Recording the Sound:

1. Make sure you have connected the audio input device (e.g. microphone) to the computer.
2. On the **File** menu, choose **New**.
3. To record a sound file, click the **Recording** button .
4. To stop the recording, click the **Stop** button .

Be sure to save the recording upon completion.



Playing the Sound:

1. On the **File** menu, choose **Open**.
2. In the **Open** dialog box, select the sound (.wav) file you wish to play.
3. To play a sound file, click the **Play** button .
4. To stop playing, click the **Stop** button .
5. You may use the **Fast Forward** button to move to the beginning of a file or the **Fast Backward** button to the end.

5-3 Troubleshooting

5-3-1 Frequently Asked Questions

To read more F AQs for your motherboard, please go to the Support\Motherboard\F AQ page on GIGABYTE's website.

Q: In the BIOS Setup program, why are some BIOS options missing?
A: Some advanced options are hidden in the BIOS Setup program. Press <Delete> to enter BIOS Setup during the POST. In the Main Menu, press <Ctrl>+<F1> to show the advanced options.

Q: Why is the light of my keyboard/optical mouse still on after the computer shuts down?
A: Some motherboard provides a small amount of standby power after the computer shuts down and that's why the light is still on.

Q: How do I clear the CMOS values?
A: If your motherboard has a clearing CMOS jumper, refer to the instructions on the CLR_CMOS jumper in Chapter 1 to short the jumper to clear the CMOS values. If your board doesn't have this jumper, refer to the instructions on the motherboard battery in Chapter 1. You can temporarily remove the battery from the battery holder to stop supplying power to the CMOS, which will clear the CMOS values after about one minute. Refer to the steps below:

Steps:

1. Turn off your computer and unplug the power cord.
2. Gently remove the battery from the battery holder and wait for one minute.
   (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.)
3. Replace the battery.
4. Plug in the power cord and restart your computer.
5. Press <Delete> to enter BIOS Setup. Select "Load Fail-Safe Defaults" (or "Load Optimized Defaults") to load BIOS default settings.
6. Saves changes and exit BIOS Setup (select "Save & Exit Setup") to restart your computer.

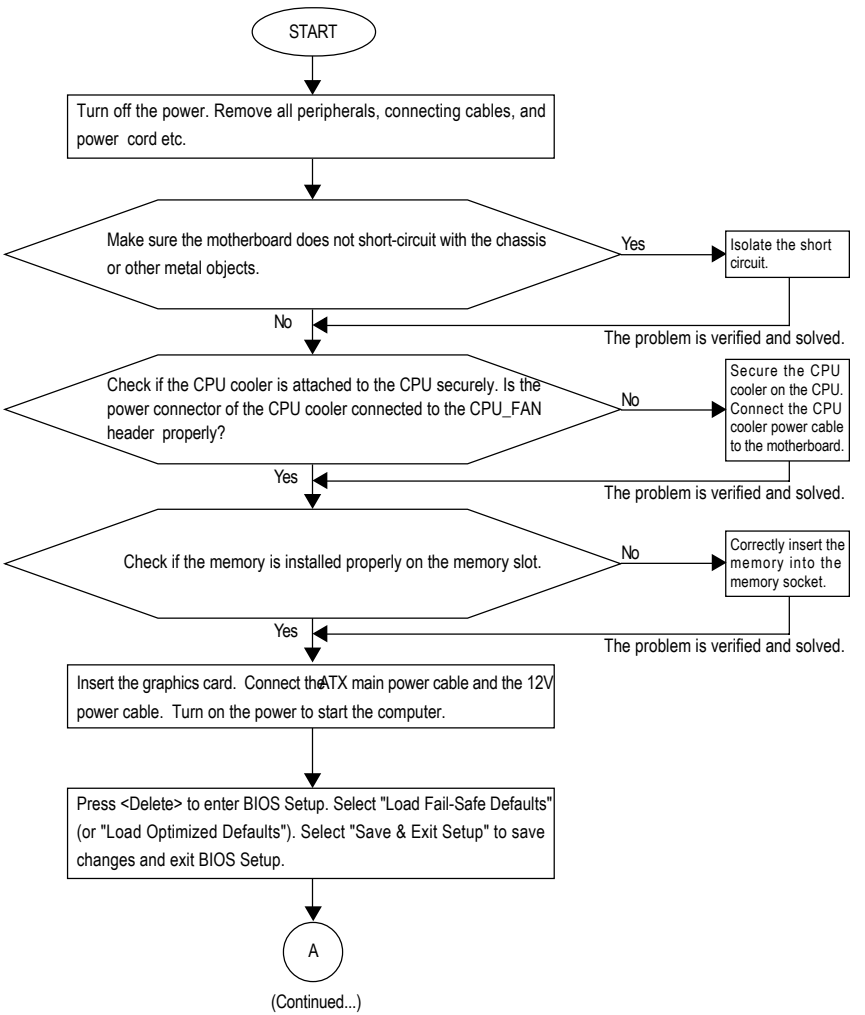
Q: Why do I still get a weak sound even though I have turned my speaker to the maximum volume?
A: Make sure your speaker is equipped with an internal amplifier. If not, try a speaker with power/ amplifier.

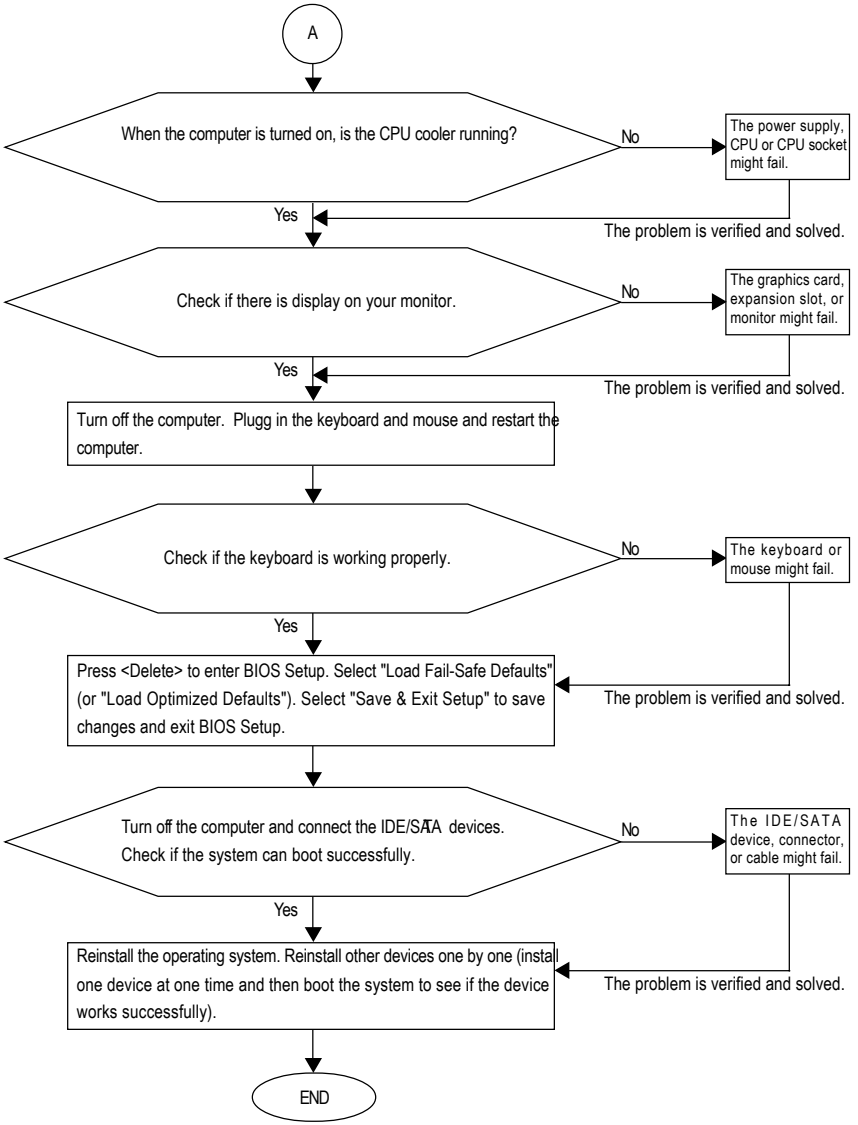
Q: What do the beeps emitted during the POST mean?
A: The following Award BIOS beep code descriptions may help you identify possible computer problems. (For reference only.)

1 short: System boots successfully
2 short: CMOS setting error
1 long, 1 short: Memory or motherboard error
1 long, 2 short: Monitor or graphics card error
1 long, 3 short: Keyboard error
1 long, 9 short: BIOS ROM error
Continuous long beeps: Graphics card not inserted properly
Continuous short beeps: Power error

5-3-2 Troubleshooting Procedure

If you encounter any troubles during system startup, follow the troubleshooting procedure below to solve the problem.





NOTE If the procedure above is unable to solve your problem, contact the place of purchase or local dealer for help. Or go to the Support\Technical Service Zone page to submit your question. Our customer service staff will reply you as soon as possible.

5-4 POST Error Code

POST (hex)	Description
CFh	Test CMOS R/W functionality
C0h	Early chipset initialization: - Disable shadow RAM - Program basic chipset registers
C1h	Detect memory - Auto-detection of DRAM size, type and ECC
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM
01h	Expand the Xgroup codes locating in physical address 1000:0
02h	DualBIOS init (optional)
03h	Initial Superio_Early_Init switch
05h	1. Blank out screen 2. Clear CMOS error flag
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips 2. Enable keyboard interface
0Ah	1. Disable PS/2 mouse interface (optional) 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional) 3. Reset keyboard Super I/O chips
0Eh	Test F000h segment shadow to see whether it is R/W -able or not. If test fails, keep beeping the speaker
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers
16h	Initial onboard clock generator if Early_Init_Onboard_Generator is defined See also POST 26h
18h	Detect CPU information including brand, SMI type and CPU level
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR
1Dh	Initial EARLY_PM_INIT switch
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead

POST (hex)	Description
24h	Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information
25h	Early PCI initialization: - Enumerate PCI bus number - Assign memory & I/O resource - Search for a valid VGA device & VGA BIOS, and put it into C000:0
26h	1. If Early_Init_Onboard_Generator is not defined Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots 2. Init onboard PWM 3. Init onboard H/W monitor devices
27h	Initialize INT 09 buffer
29h	1. Program CPU internal MTRR for 0-640K memory address 2. Initialize the APIC for Pentium class CPU 3. Program early chipset according to CMOS setup Example: onboard IDE controller 4. Measure CPU speed
2Bh	Invoke video BIOS
2Dh	1. Initialize double-byte language font (optional) 2. Put information on screen display, including Award title, CPU type, CPU speed, full screen logo
33h	Reset keyboard if Early_Reset_KB is defined e.g. Winbond 977 series Super I/O chips. See also POST 63h
35h	Test DMA Channel 0
37h	Test DMA Channel 1
39h	Test DMA page registers
3Ch	Test 8254
3Eh	Test 8259 interrupt mask bits for channel 1
40h	Test 8259 interrupt mask bits for channel 2
43h	Test 8259 functionality
47h	Initialize EISA slot
49h	1. Calculate total memory by testing the last double word of each 64K page 2. Program write allocation
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range 3. Initialize the APIC for P6 class CPU 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical
50h	Initialize USB Keyboard & Mouse
52h	Test all memory (clear all extended memory to 0)
53h	Clear password according to H/W jumper (optional)
55h	Display number of processors (multi-processor platform)

POST (hex)	Description
57h	1. Display PnP logo 2. Early ISA PnP initialization - Assign CSN to every ISA PnP device
59h	Initialize the combined Trend Anti-Virus code
5Dh	1. Initialize Init_Onboard_Super_IO 2. Initialize Init_Onbaord_AUDIO
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility
63h	Reset keyboard is Early_Reset_KB is not defined
65h	Initialize PS/2 Mouse
67h	Prepare memory size information for function call: INT 15h ax=E820h
69h	Turn on L2 cache
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table
6Dh	1. Assign resources to all ISA PnP devices 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO"
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM...
77h	Detect serial ports & parallel ports
7Ah	Detect & install co-processor
7Ch	Init HDD write protect
7Fh	1. Switch back to text mode if full screen logo is supported - If errors occur, report errors & wait for keys - If no errors occur or F1 key is pressed to continue: • Clear EPA or customization logo
82h	1. Call chipset power management hook 2. Recover the text fond used by EP A logo (not for full screen logo) 3. If password is set, ask for password
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. Switch screen back to text mode
87h	NET PC: Build SYSID structure
89h	1. Assign IRQs to PCI devices 2. Set up ACPI table at top of the memory
8Bh	1. Invoke all ISA adapter ROMs 2. Invoke all PCI ROMs (except VGA)
8Dh	1. Enable/Disable Parity Check according to CMOS setup 2. APM initialization

POST (hex)	Description
8Fh	Clear noise of IRQs
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache 2. Program daylight saving 3. Program boot up speed 4. Chipset final initialization 5. Power management final initialization 6. Clear screen & display summary table 7. Boot BIOS support (popup menu)
95h	Update keyboard LED & typematic rate
96h	1. Build MP table 2. Initialize power-saving (optional) 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table
FFh	Boot attempt (INT 19h)

Regulatory Statements

Regulatory Notices

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In addition to high-efficiency performance, all GIGABYTE motherboards fulfill European Union regulations for RoHS (Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment) and WEEE (Waste Electrical and Electronic Equipment) environmental directives, as well as most major worldwide safety requirements. To prevent releases of harmful substances into the environment and to maximize the use of our natural resources, GIGABYTE provides the following information on how you can responsibly recycle or reuse most of the materials in your "end of life" product.

Restriction of Hazardous Substances (RoHS) Directive Statement

GIGABYTE products have not intended to add and safe from hazardous substances (Cd, Pb, Hg, Cr+6, PBDE and PBB). The parts and components have been carefully selected to meet RoHS requirement. Moreover, we at GIGABYTE are continuing our efforts to develop products that do not use internationally banned toxic chemicals.

Waste Electrical & Electronic Equipment (WEEE) Directive Statement

GIGABYTE will fulfill the national laws as interpreted from the 2002/96/EC WEEE (Waste Electrical and Electronic Equipment) directive. The WEEE Directive specifies the treatment, collection, recycling and disposal of electric and electronic devices and their components. Under the Directive, used equipment must be marked, collected separately, and disposed of properly.

WEEE Symbol Statement

The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort.

Finally, we suggest that you practice other environmentally friendly actions by understanding and using the energy-saving features of this product (where applicable), recycling the inner and outer packaging (including shipping containers) this product was delivered in, and by disposing of or recycling used batteries properly. With your help, we can reduce the amount of natural resources needed to produce electrical and electronic equipment, minimize the use of landfills for the disposal of "end of life" products, and generally improve our quality of life by ensuring that potentially hazardous substances are not released into the environment and are disposed of properly.

China Restriction of Hazardous Substances Table

The following table is supplied in compliance with China's Restriction of Hazardous Substances (China RoHS) requirements:

关于符合中国《电子信息产品污染控制管理办法》的声明
Management Methods on Control of Pollution from Electronic Information Products
(China RoHS Declaration)

产品中有毒有害物质或元素的名称及含量
Hazardous Substances Table

部件名称(Parts)	有毒有害物质或元素(Hazardous Substances)					
	铅(Pb)	汞(Hg)	镉(Cd)	六价铬(Cr(VI))	多溴联苯(PBB)	多溴二苯醚(PBDE)
PCB板 PCB	○	○	○	○	○	○
结构件及风扇 Mechanical parts and Fan	×	○	○	○	○	○
芯片及其他主动零件 Chip and other Active components	×	○	○	○	○	○
连接器 Connectors	×	○	○	○	○	○
被动电子元器件 Passive Components	×	○	○	○	○	○
线材 Cables	○	○	○	○	○	○
焊接金属 Soldering metal	○	○	○	○	○	○
助焊剂，散热膏，标签及其他耗材 Flux, Solder Paste, Label and other Consumable Materials	○	○	○	○	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006标准规定的限量要求以下。
Indicates that this hazardous substance contained in all homogenous materials of this part is below the limit requirement SJ/T 11363-2006

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求。
Indicates that this hazardous substance contained in at least one of the homogenous materials of this part is above the limit requirement in SJ/T 11363-2006

对销售之日的所受售产品，本表显示我公司供应链的电子信息产品可能包含这些物质。注意：在所售产品中可能会也可能不会含有所有所列的部件。
This table shows where these substances may be found in the supply chain of our electronic information products, as of the date of the sale of the enclosed products. Note that some of the component types listed above may or may not be a part of the enclosed product.

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