



User's Manual

**Intel i865-G mainboard
for Intel Socket 478 processor**

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*Manual Revision 1.1
November 12, 2003*

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Section 1 INTRODUCTION

Package Contents

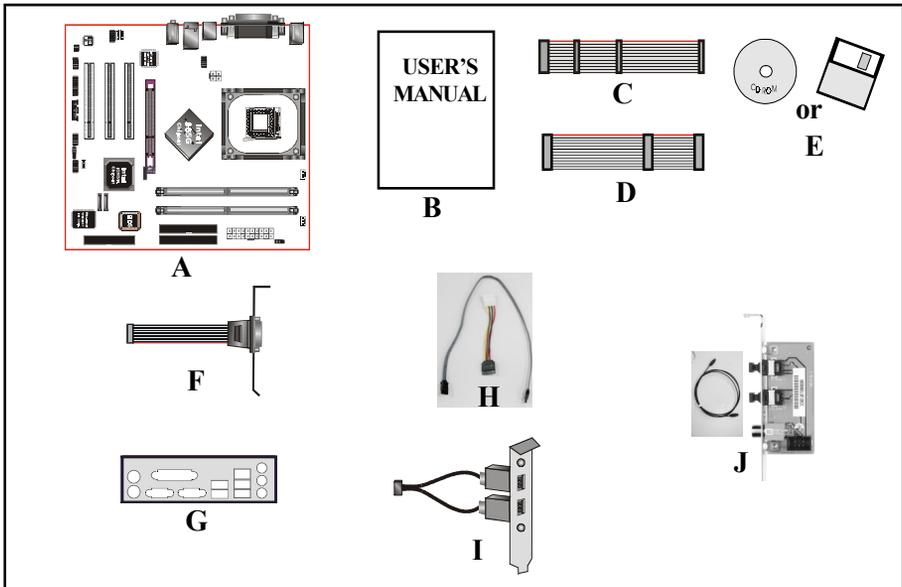
Contents

- A. Mainboard
- B. User's manual
- C. Floppy drive cable
- D. HDD drive cable
- E. CD or diskette (drivers and utilities)
- F. Game port cable
- G. I/O Shield
- H. S-ATA data and power cable

Other Optional Items

- I. Extra USB2.0 port cable
- J. S/PDIF Module

If you need the other optional item, please contact your dealer for assistance.



Introduction

Intel® Pentium® 4 processors

The Intel Pentium 4 processor, Intel's most advanced, most powerful processor for desktop PCs and entry-level workstations, is based on Intel NetBurst™ microarchitecture. The Pentium 4 processor is designed to deliver performance across applications and usages where end-users can truly appreciate and experience the performance. These applications include Internet audio and streaming video, image processing, video content creation, speech, 3D, CAD, games, multimedia, and multi-tasking user environments. The Pentium 4 processor delivers this world-class performance for consumer enthusiasts and business professional desktop PC users as well as for entry-level workstation users.

Intel adds support for Hyper-Threading Technology to the Pentium 4 processor family. HT Technology allows a single, physical Pentium 4 processor to function as two logical processor for next generation multi threaded application.

For more information about all the new features the Pentium 4 delivers check out the Intel website at <http://www.intel.com>

Chipset Components

This board is designed with Intel® 865G (Springdale-G) chipset. The Intel® 865G chipset consists of the Graphic Memory Controller Hub (GMCH) and the I/O Controller Hub (ICH5/R).

◆ **Graphic Memory Controller Hub (GMCH)**

The GMCH provides the interconnect between the AGP, DDR SDRAM and the system logic. It integrates:

- Supports for single processor with a data transfer rate of 400/533/800MHz.
- Supports dual channel of 266/333/400 DDR SDRAM up to 2GB.
- 8X/4X 1.5V AGP interface (Only support 1.5V on AGP interface).
- Downstream hub link for access to the ICH5/R.

◆ **I/O Controller Hub (ICH5/R)**

The I/O controller Hub provides the I/O subsystem with access to the rest of the system. Additionally, it integrates many I/O functions:

- Upstream hub link for access to the GMCH
- 2-Channel Ultra ATA/100 Bus Master IDE controller
- USB controller
- SMBus controller
- LPC / Flash BIOS interface
- PCI 2.3 interface
- Integrated System Management Controller

Accelerated Graphics Port (AGP)

The AGP slot on the board is compliant with the new AGP 3.0 specification. This new specification enhances the functionality of the original AGP specification by allowing 8X data transfers (8 data samples per clock) resulting in maximum bandwidth of 2.1GB/s. In addition, it defines 1.5 volt power supply operation. Complying with this specification, this board supports external AGP-8X/4X cards with Fast Write Transactions. Only 1.5V AGP cards are supported.

Ultra ATA/66/100

The ICH5/R provides an Ultra ATA/66/100 Bus Master IDE controller. This controller supports Ultra ATA/66/100 protocols which are ideal to support demanding applications such as real-time video, multimedia, and a high performance operating system. A new IDE cable is required for Ultra ATA/66/100; this cable is an 80-pin conductor cable which is backward compatible with ATA/33 connectors.

Hardware Monitoring

Hardware monitoring enables you to monitor various aspects of the system operation and status. The features include CPU temperature, voltage and fan speed in RPMs.

LAN (Optional)

This mainboard is optionally mounted with a LAN chipset. It allows the mainboard to connect to a local area network by means of a network hub.

Introduction

Serial ATA

The evolutionary serial ATA interface replaces the standard parallel ATA physical storage interface. The serial ATA specification provides scalability and allows future enhancements to the computing platform. Serial technology overcomes performance limits of parallel interface architecture, meeting the escalating need for faster data throughput in servers and storage devices.

Serial ATA is completely software compatible with parallel ATA, requiring no modification to your operating system. The serial ATA interface cable requires lower voltages and uses smaller cable connectors, providing ease of installation. You can easily upgrade storage devices that are compatible with the serial ATA interface specification.

Mainboard Form-Factor

This board is designed with M-ATX form factor - the latest industry standard for chassis design. The M-ATX form factor is essentially a Baby-AT baseboard rotated 90 degrees within the chassis enclosure and a new mounting configuration for the power supply. With these changes the processor is relocated away from the expansion slots, allowing them all to hold full length add-in cards. M-ATX defines a double height aperture to the rear of the chassis which can be used to host a wide range of onboard I/O. Only the size and position of this aperture is defined, allowing PC manufacturers to add new I/O features (e.g.; TV input, TV output, joystick, modem, LAN, audio, etc.) to systems. This will help systems integrators differentiate their products in the marketplace, and better meet your needs.

- By integrating more I/O down onto the board and better positioning the hard drive and floppy connectors material cost of cables and add-in cards is reduced.
- By reducing the number of cables and components in the system, manufacturing time and inventory holding costs are reduced and reliability will increase.
- By using an optimized power supply, it's possible to reduce cooling costs and lower acoustical noise. An ATX power supply, which has a side-mounted fan, allows direct cooling of the processor and add-in cards making a secondary fan or active heatsink unnecessary in most system applications.

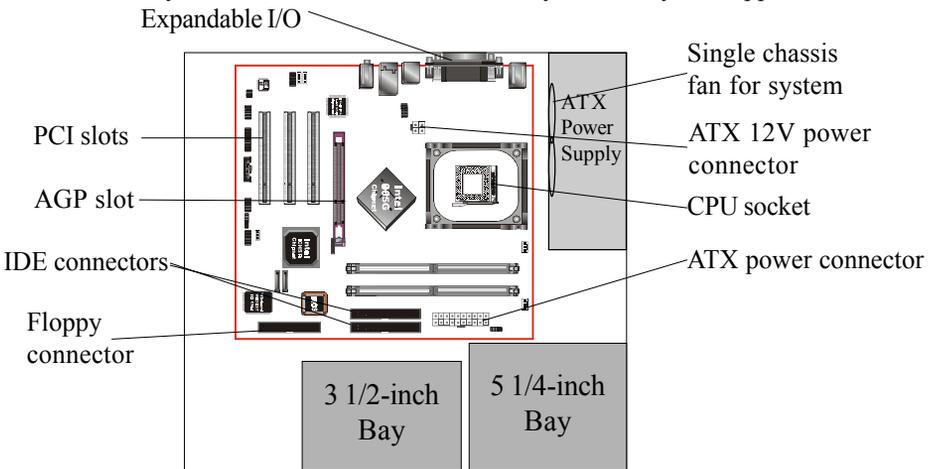


Figure 2: Summary of ATX chassis features

Introduction

I/O Shield Connector

The board is equipped with an I/O back panel (Figure 3). Ensure that your computer case has the appropriate I/O cutout.

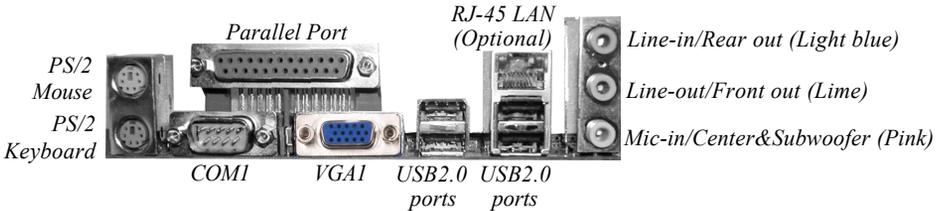


Figure 3: I/O ports

Power-On/Off (Remote)

This board has a 20-pin ATX and a 4-pin ATX12V power supply connector (Figure 4). For power supplies that support the **Remote On/Off** feature, this should be connected to the mainboard front panel PW_ON connector for the computer power On/Off button.

The board has been designed with “Soft Off” function. You can turn off the system in two ways: by pressing the front panel power On/Off button or using the "Soft Off" function (incorporated in the mainboard’s onboard circuit controller) that can be controlled by an operating system such as Windows®XP/ME/2000/98/95.

Note: For maintaining the DDR SDRAM power during STR (ACPI S3) function, it is strongly recommended to use power supplies that have a +5VSB current of ($> =$) 2A. Please check the 5VSB’s specification that has been printed on the power supply’s outer case.

Note: The board requires a minimum of 250 Watt power supply to operate. Your system configuration (amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement but to ensure that adequate power is provided, use a 300 Watt (or greater) power supply. Also your power supply must support 4-pin ATX 12V connector.

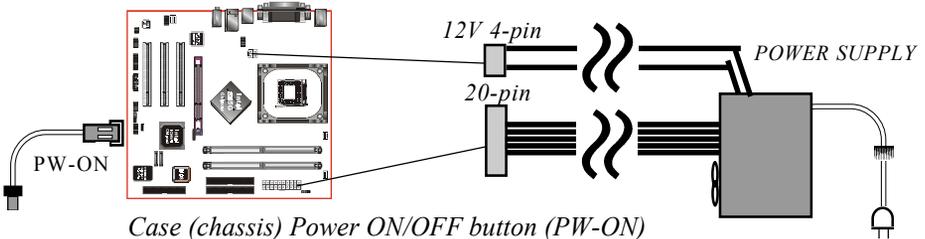


Figure 4: Simple ATX power ON/OFF controller

System Block Diagram

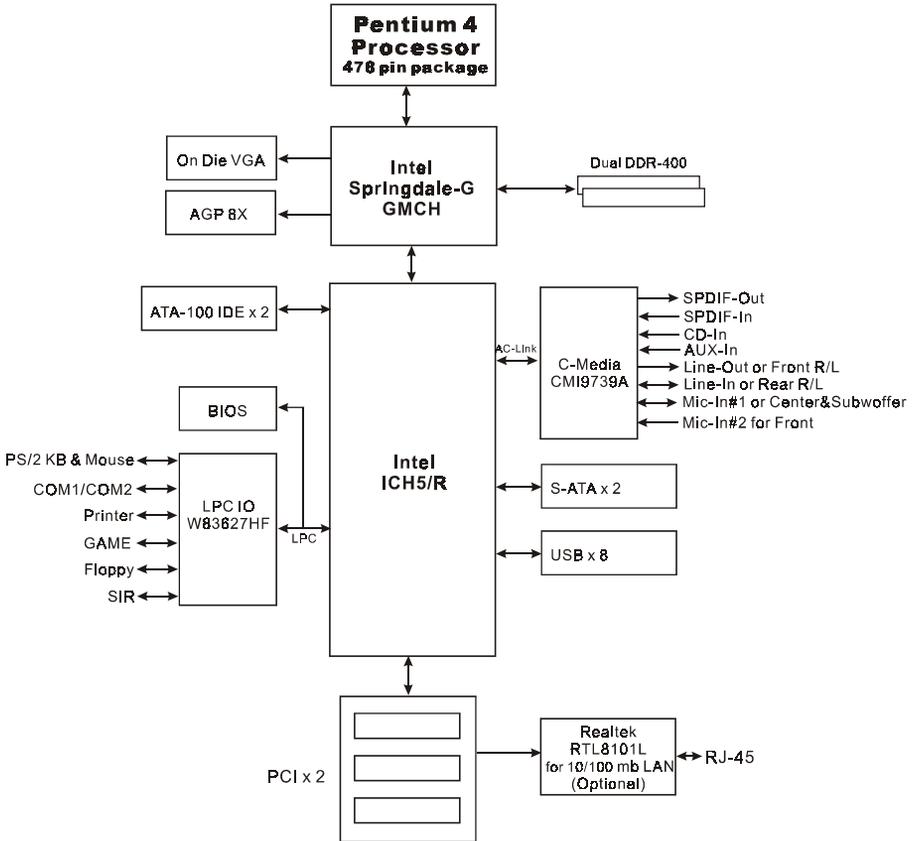


Figure 5: System Block Diagram

Section 2

FEATURES

Mainboard Features

● **Processor**

- ◆ Socket 478 Intel® Pentium® 4 and Celeron processors from 1.7GHz up to 3.2+GHz
- ◆ Supports the following System Bus and Memory combination:
 - FSB400 / DDR266 (PC2100)
 - FSB533 / DDR266/333 (PC2100/PC2700)
 - FSB800/DDR333 (PC2700)*
 - FSB800/DDR400 (PC3200)

* When configured to FSB800/DDR333, adaptive synchronization aligns to the closest FSB to memory clock ratio, setting memory channel to 320MHz.

- ◆ Supports Hyper-Threading Technology

To enable the Hyper-Threading Technology function on your computer system requires ALL of the following platform components:

- ☞ **CPU:** An Intel® Pentium® 4 Processor with HT Technology.
- ☞ **Chipset:** An Intel® Chipset that supports HT Technology.
- ☞ **BIOS:** A BIOS that supports HT Technology and has it enabled.
- ☞ **OS:** An operating system that supports HT Technology.

Performance will vary depending on the specific hardware and software you use. See <<http://www.intel.com/info/hyperthreading>> for information including details on which processor support HT Technology.

● **Chipset**

- ◆ Intel 865G Chipset (865G + ICH5/R)
 - Built-in Intel Extreme Graphics

● **Main Memory**

- ◆ **Two** 184-pin DDR DIMM sockets for PC2100/2700/3200 (DDR266/333/400) DIMMs

Features

- ◆ Supports 128-bit dual channel memory architecture
- ◆ Supports up to 2GB memory size

● BIOS

- ◆ Flash EEPROM with Award BIOS
 - ACPI v2.0 compliant
 - S3 (Suspend to DRAM) sleep-state support
 - SMBIOS (System Management BIOS) v2.2 compliant
 - Supports Power failure recovery
 - Able to wake the computer from specific states by LAN, Power switch, PME#, RTC alarm, USB, PS2 K/B, PS2 Mouse, Modem Ring-in COM#1...

● Onboard PCI Devices

- ◆ LAN --> Integrates 10/100Mbps Fast Ethernet controller with onboard (Optional) [Realtek RTL8101L LAN Chipset](#)
- ◆ S-ATA --> 2 S-ATA Port for up to 150MB/sec transfer rate
- ◆ IDE --> 2 ordinary IDE Port with PIO/Ultra DMA-33/66/100 for up to 4 devices

● Legacy IO Controller

- ◆ [Winbond W83627HF](#) LPC IO controller with floppy, printer, game, serial and SIR interface

● Audio

- ◆ Six channel audio with analog and digital output using [Cmedia CMI9739A](#) AC'97 CODEC
 - AC'97 v2.2 compliant
 - In 2-CH mode, supports Line-In (Light blue), Line-Out (Lime) and Mic-In (Pink) at rear panel
 - In 6-CH mode, supports Rear speaker-out (Light blue), Front speaker-out (Lime) and Center&Subwoofer speaker-out (Pink) at rear panel
 - Supports CD-In, Aux-In and S/PDIF-in/out interface
 - Supports Line-out and Mic-In for front panel

● Peripheral Interfaces

☞ At Rear Panel

- ◆ PS/2 keyboard and mouse ports
- ◆ **One** Parallel (printer) port
- ◆ **One** Serial port
- ◆ **One** VGA port
- ◆ **One** RJ45 LAN connector (Optional)
- ◆ **Four** USB2.0 ports
- ◆ **Three** Audio jacks

☞ Onboard connector and pin-header

- ◆ **One** floppy drive connector
- ◆ **Two** IDE connectors
- ◆ **Four** extra USB2.0 ports
- ◆ **One** CD-IN and **One** AuX-IN connector
- ◆ **One** S/PDIF in/out connector
- ◆ **One** IR connector
- ◆ **One** Front Panel Audio connector
- ◆ **One** Game port connector
- ◆ **One** COM2 connector
- ◆ **Two** S-ATA connectors
- ◆ **Two** Fan connectors

● Front Panel Controller

- ◆ Supports Reset & Soft-Off switches
- ◆ Supports HDD & Power LEDs
- ◆ Supports PC speaker

● Expansion Slots

- ◆ **One** AGP slot supporting 1.5v **4X/8X** AGP card
 - AGP v3.0 compliant

Features

- ◆ **Three** PCI slots with Bus Master support
 - PCI v2.3 compliant

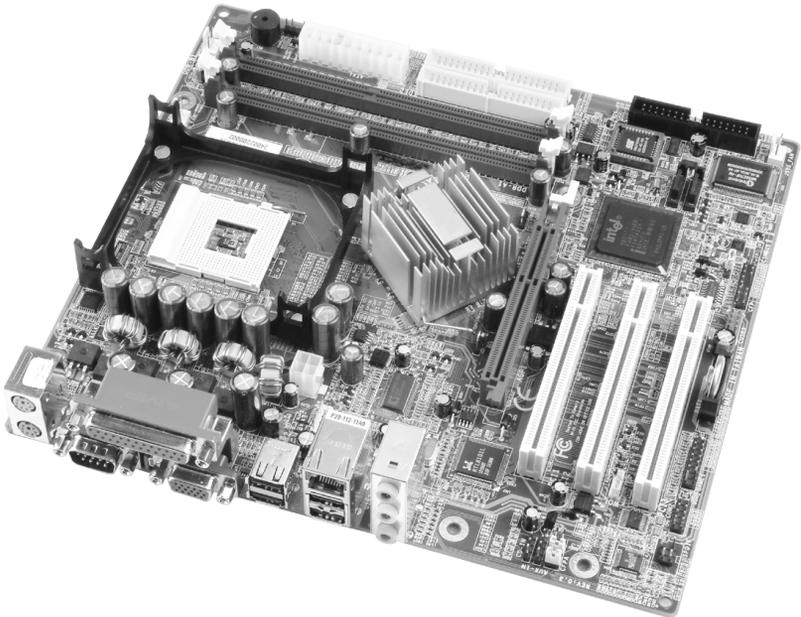
● **Other Features**

- ◆ Magic Health – a H/W monitoring software utility, for voltages, temperatures and fan-speeds sensing
- ◆ EZ Boot – An easy way let end-user can choose to boot from hard drive, CD-ROM, floppy, ...
- ◆ Supports exclusive KBPO (Keyboard Power On) function
- ◆ Excellent Overclocking capabilities through
 - subtle frequency tuning on FSB
 - Supports complete Asynchronous FSB/Memory and Asynchronous FSB/AGP, PCI scheme for overclocking

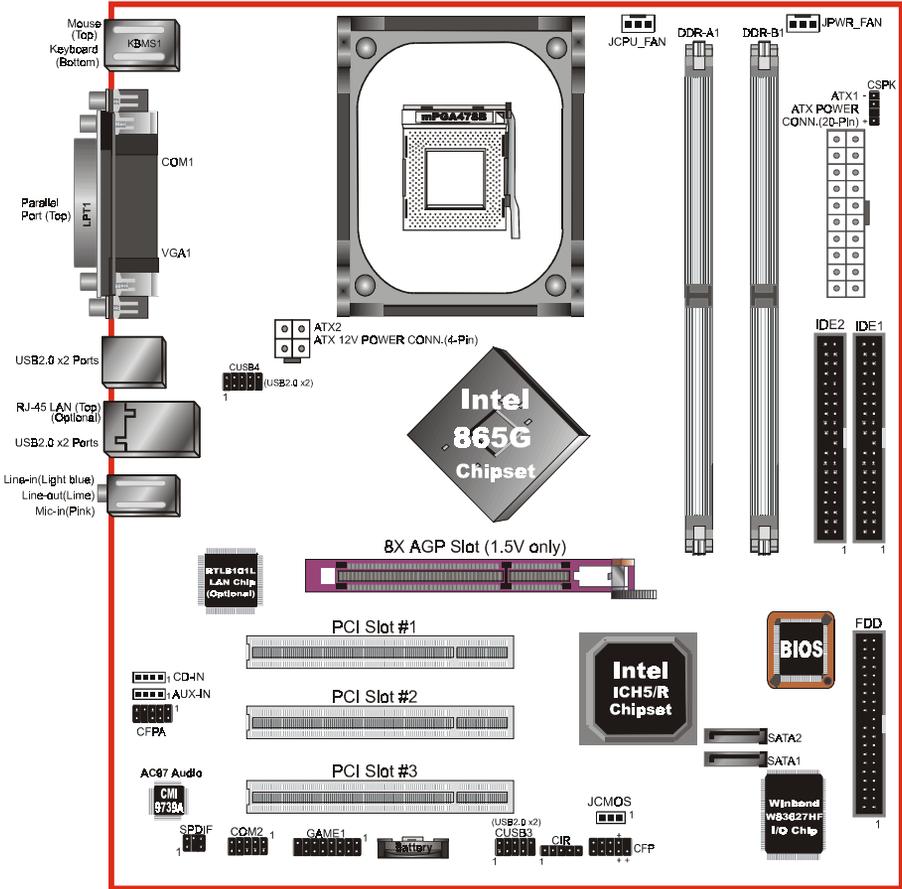
● **Form Factor**

- ◆ 245mm x 220 mm Micro ATX size

Section 3 INSTALLATION



Mainboard Layout



Easy Installation Procedure

The following must be completed before powering on your new system:

- 3-1. CPU Installation**
- 3-2. Jumper Settings**
- 3-3. System Memory Configuration**
- 3-4. Expansion Slots**
- 3-5. Device Connectors**

3-1 CPU Installation

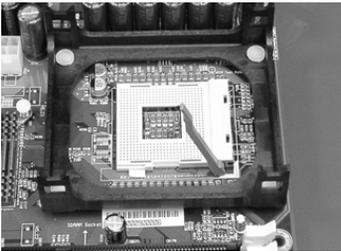


Figure 1

Step 1

Open the socket by raising the actuation lever.

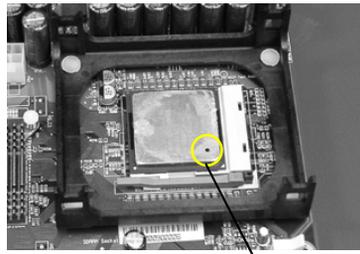


Figure 2

Pin 1

Step 2

Align pin 1 on the CPU with pin 1 on the CPU socket as shown in the illustration above. The CPU is keyed to prevent incorrect insertion. Don't force the processor into the socket. If it does not go in easily, check for mis-orientation and reinsert the CPU.

Make sure the processor is fully inserted into the socket.

Installation

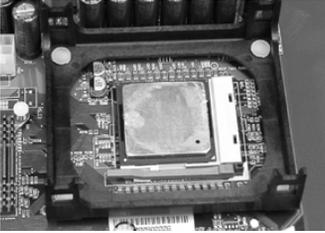


Figure 3

Step 3

Close the socket by lowering and locking the actuation lever.



Figure 4

Step 4

Apply thermal compound to the top of the CPU and install the heatsink as shown.

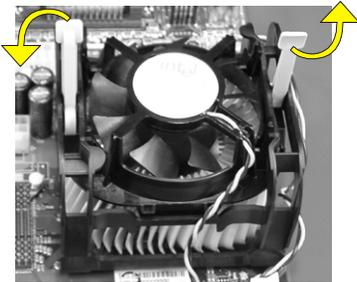


Figure 5

Step 5

Install the cooling fan assembly. Press the two clips in the direction of the arrows shown in Figure 5 to secure the assembly to the CPU socket.

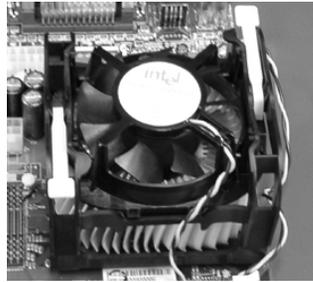


Figure 6

Step 6

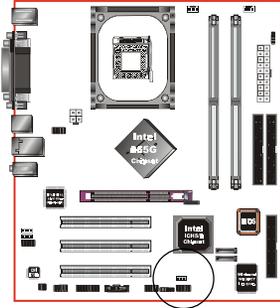
Plug the CPU fan into the CPU fan connector.

The installation is complete.

NOTES:

- Damage to Intel Pentium™ 4 processors might result if installed with incorrect CPU fan and heatsink assemblies. Use Intel's design thermal solution shown in the illustrations above: an active heatsink; an extruded aluminum heatsink base; and a fan attached to the top of the fin array.
- Apply heatsink thermal compound or paste to the CPU to avoid CPU overheating and damage.
- In accordance with Intel Corp. specifications, do not install a CPU over 50 times to avoid bending the pins and damaging the CPU.

3-2 Jumper Settings



JCMOS: Clear CMOS data Jumper

If the CMOS data becomes corrupted or you forgot the supervisor or user password, clear the CMOS data to reconfigure the system back to the default values stored in the ROM BIOS.



Settings:

- 1-2: Normal (Default)
- 2-3: Clear CMOS

To CMOS Clear data, please follow the steps below.

1. Turn off the system.
 2. Change the jumper from “1-2” to “2-3” position for a few seconds.
 3. Replace the jumper on to the “1-2” position.
 4. Turn on the system and hold down the key to enter BIOS setup.
-

Installation

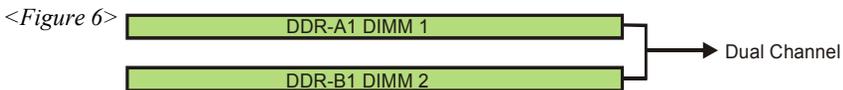
3-3 System Memory Configuration

Memory Layout

The mainboard accommodates two PC2100/PC2700/PC3200 184-pin DIMMs (Dual In-line Memory Modules):

- Supports up to 2.0GB of 266/333/400MHz DDR SDRAM.
- Supports two 64-bit wide DDR data channels.
- Available bandwidth up to 3.2GB/s (DDR400) for single-channel mode and 6.4GB/s (DDR400) in dual-channel mode.
- Supports non ECC DIMMs.
- Registered DIMMs not supported.
- Supports 128-Mb, 256-Mb, 512Mb DDR technologies.
- Supports only x8, x16, DDR devices with four banks.
- SPD (Serial Presence Detect) scheme for DIMM detection support.
- Supports configurations defined in the JEDEC DDR1 DIMM specification only.

Figure 6 and Table 1 show several possible memory configurations.



<Table 1>

	1 DIMM (64-bit)		2 DIMM (128-bit)
DIMM#1	SS/DS		SS/DS
DIMM#2		SS/DS	SS/DS

* SS: Single-Sided DIMM, DS: Double-Sided DIMM

NOTES:

- When FSB is 400MHz, only DDR266 is support.
- When FSB is 533MHz, DDR266/333 are support.
- When FSB is 800MHz, the supports DDR333/400 (With DDR333, adaptive synchronization aligns to the closest FSB to memory clock ratio, setting memory channel to 320MHz)
- For one DIMM memory configuration, the DIMM can be located on any of DIMM#1 to DIMM#2 in 64-bit mode.
- For two DIMMs memory configuration, it is recommended to mount the DIMMs on slots of the same color to enable 128-bit mode. Only in keeping those DIMMs in same type and same size are preferred.
- Using non-compliant memory with higher bus speeds (overclocking) may severely compromise the integrity of the system.

Installation

DIMM Module Installation

Figure 8 displays the notch on the DDR DIMM memory module.

DIMMs have 184 pins and one notch that matches with the DDR DIMM socket. DIMM modules are installed by placing the chip firmly into the socket and pressing straight down as shown in figure 9 until the white clips close and the module fits tightly into the DIMM socket (figure 10).

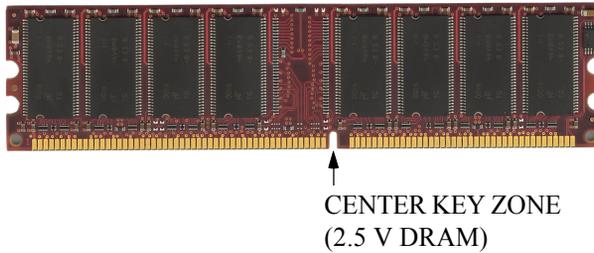


Figure 8 - DIMM notch

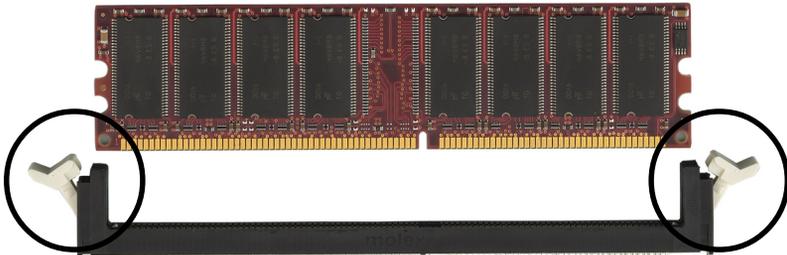


Figure 9 - DIMM module clips before installation

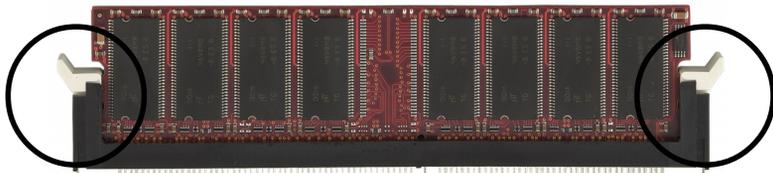
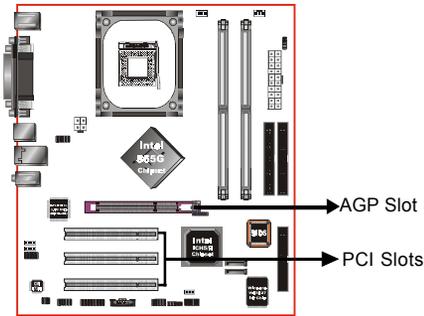


Figure 10 - DIMM module clip after installation

To remove the DIMM module press down the white clips and the module will be ejected from the socket.

3-4 Expansion Slots



AGP Slot

The mainboard is equipped with an AGP slot. Make sure you install a card that supports the 1.5V specification.

PCI Slots

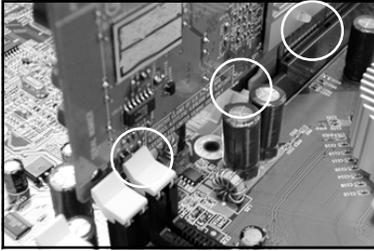
The mainboard is equipped with 3 PCI slots.

Installing an Expansion Card

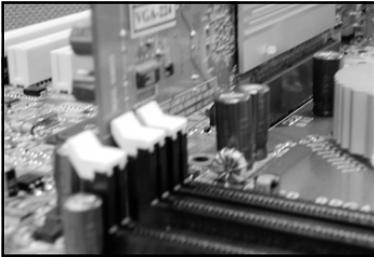
The steps below assume that the mainboard is already installed in the system chassis.

1. Make sure the PC and all other peripheral devices connected to its has been powered down.
2. Disconnect all power cords and cables.
3. Remove the system unit cover.
4. Remove the bracket of the slot that you intend to use. (You need to remove the screw in order to remove the bracket.)
5. Align the card above the slot then press it down firmly until it is completely seated in the slot.
6. Secure the card to the chassis with the screw you removed in step 4.
7. Replace the system unit cover.
8. Power on the PC.
9. Enter the BIOS step program to make the necessary settings.
10. Save the settings and restart the PC.
11. Install the software drivers of the expansion cards, if necessary.

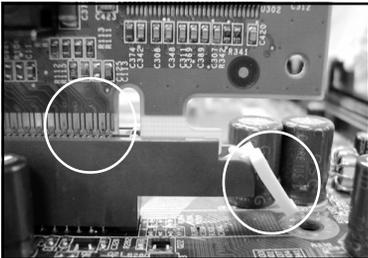
AGP Card Installation Caution



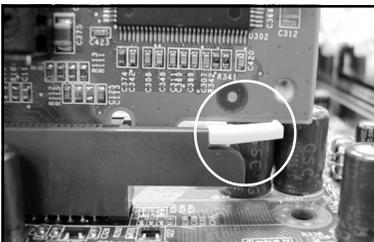
1. AGP card component is blocked by DIMM socket lock.
2. AGP slot clicker is not locked.
3. AGP card edge connector is not inserted properly.



1. AGP card component is not blocked by DIMM socket lock.
2. AGP slot clicker is locked.
3. AGP card edge connector is inserted properly.



1. AGP slot clicker is not locked.
2. AGP card edge connector is not inserted properly.



1. AGP slot clicker is locked.
2. AGP card edge connector is inserted properly.



3-5 Connectors

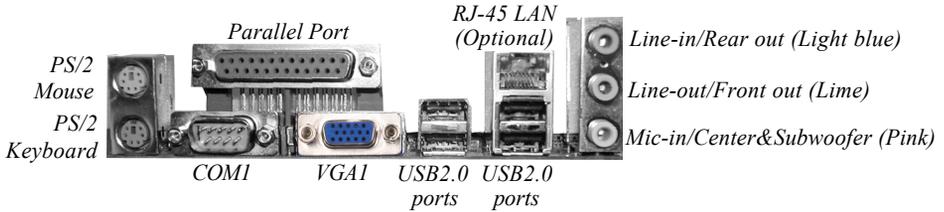
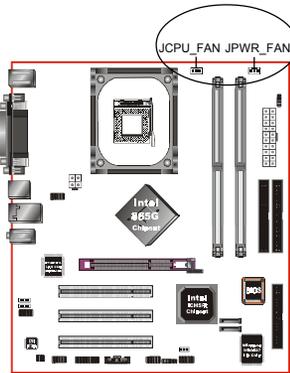


Figure 11 - I/O Ports



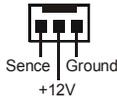
JCPU_FAN/JPWR_FAN:

CPU/Power Fan Power Connectors

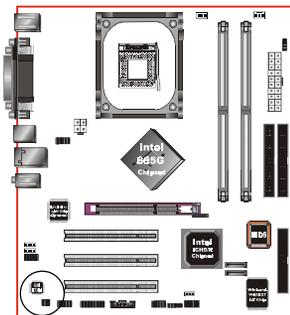
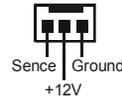
JCPU_FAN: The CPU must be kept cool by using a heatsink with fan assembly.

JPWR_FAN: If you are installing an additional fan in the unit, connect to this fan connector.

JCPU_FAN

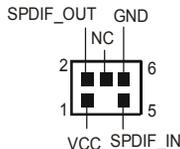


JPWR_FAN

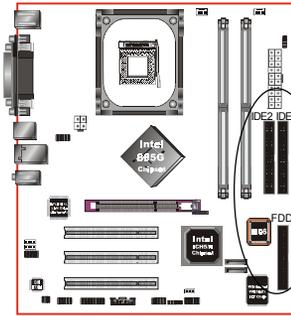


S/PDIF: Sony/Philips Digital InterFace connector

This connector is the digital link between the mainboard and your audio devices, such as CD player, sampler or DAT recorder. It allows the digital transmission of audio data in S/PDIF format.



Installation



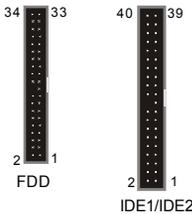
FDD:

Floppy Controller Connector

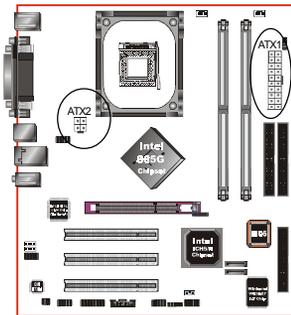
This mainboard is equipped with a floppy disk drive connector for connecting up to 2 floppy disk drives.

IDE1/IDE2: Ultra DMA-66/100 Primary/Secondary IDE Connector

This mainboard is equipped with 2 IDE disk connectors for connecting up to 4 ATA-100 IDE drives. It supports PIO and DMA mode operations for maximum data transfer rate of 100MB/sec per channel.



When use two IDE drives, one must be set to Master mode and the other one to Slave mode. Refer to your disk drive user's manual for information about selecting the proper drive switch settings.



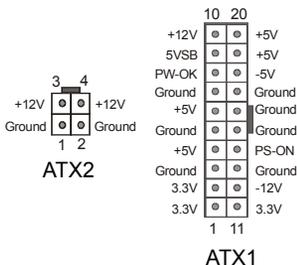
ATX1: 20-pin ATX Power Connector

ATX2: 4-pin ATX12V Power Connector

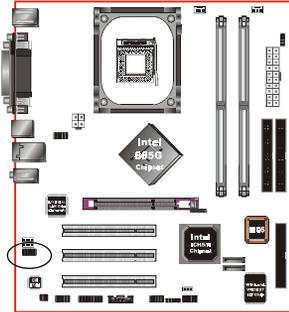
The mainboard is equipped with a standard 20-pin ATX main power connector and a 4-pin +12V power connector for connecting an ATX12V power supply. The plugs of the power cables are designed to fit in only one orientation. Find the proper orientation then insert the plugs into the connectors until they fit in place.

Caution:

The ATX1 and ATX2 Power Connector must be used simultaneously or else this system will not boot-up.

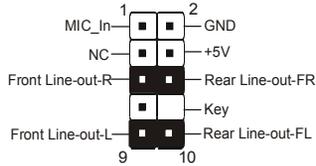


The board requires a minimum of 250 Watt power supply to operate. Your system configuration (amount of memory, add-in cards, peripherals, etc.) may exceed this minimum power requirement, power usage therefore to ensure that adequate power is provided, use a 300 Watt (or greater) power supply.



CFPA: Front Panel Audio Connector

When the jumpers are removed this connector can be used for front panel audio. The front panel line-out phone jack should have “normal close” switch. Without phone plug inserted, the rear panel audio is enabled. With phone plug inserted, the rear panel audio will be disabled.



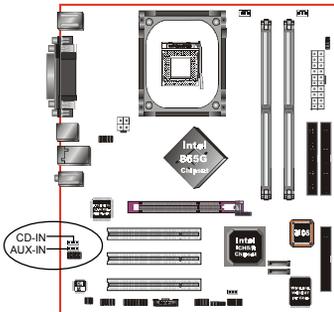
Settings

Pins (5-6) & (9-10) Short (default): Only the onboard rear panel audio jack can be used.

Pins (5-6) & (9-10) Open: Only front panel audio jack can be used.



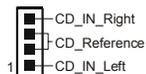
In 2-Channel audio mode, Mic-In is shared for both front panel and rear panel.
In 6-Channel audio mode, the Mic-In is dedicated for front panel use, and rear panel Mic-In function will switch to Center and Subwoofer support.



CD-IN/AUX-IN: CD Audio_IN Connector

The CD-IN and AUX-IN connectors are used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

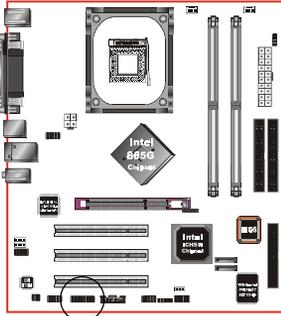
CD-IN



AUX-IN

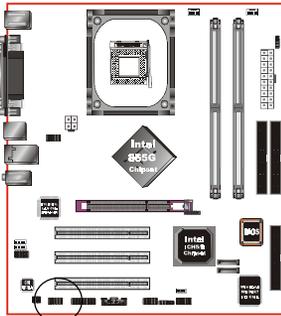


Installation



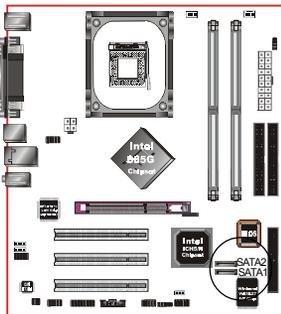
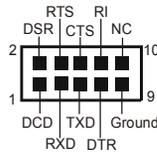
GAME1: Game/MIDI connector

This port works well with any application that is compatible with the standard PC joystick.



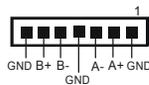
COM2: Serial Port Connector

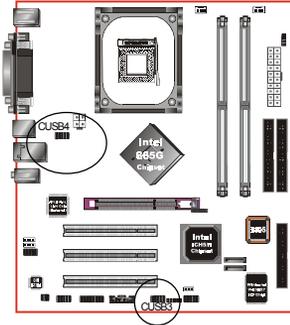
The serial ports can be used with modems, serial printers, remote display terminals, and other serial device.



SATA1 / SATA2: Serial ATA Connectors

These connectors enable you to connect two Serial ATA devices that conform to the Serial ATA specification.



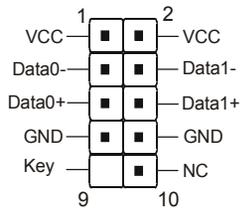


CUSB3/CUSB4: Four USB 2.0 ports

This mainboard includes 4 additional onboard USB ports, identified by 2 10-pin connector.

If you wish to use the additional USB ports, install the card-edge bracket to the system chassis then insert its cables to this 10-pin connector.

USB2.0 allows data transfer speed up to 480Mbps.

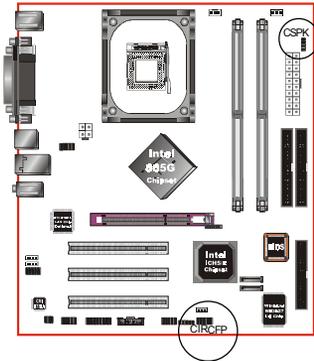


CAUTION!

Please make sure the USB cable has the same pin assignment. A different pin assignment may cause damage to the system.

If you need the USB cable, please contact our retailer.

Installation



CFP: Front Panel Connector

◆ HD_LED

This LED will light up whenever the hard drive is being accessed.

◆ PWR_LED

This connects to the power button of the system chassis

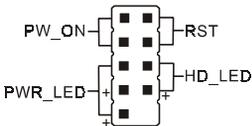
◆ RST

This switch allows you to reboot without having to power off the system thus prolonging the life of the power supply or system.

◆ PW_ON

This is connected to the power button on the case. Using the Soft-Off by Pwr-BTTN feature, you can choose either Instant Off (turns system off immediately), or 4 sec delay (push the button for 4 seconds before the system turns off). When the system is in 4 sec delay mode, suspend mode is enabled by pushing the button momentarily.

CFP



CIR

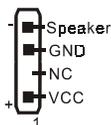


CIR: IR connector

Connect your IrDA cable to this IR connector.

- | | |
|---------|---------|
| 1. VCC | 4. GND |
| 2. NC | 5. IRTX |
| 3. IRRX | |

CSPK



CSPK: Speaker

Connect to the system's speaker for beeping

- | | |
|--------|------------|
| 1. VCC | 3. GND |
| 2. NC | 4. Speaker |

3-6 External Modem Ring-in Power ON and Keyboard Power ON Functions (KBPO)

Modem-Ring Power ON Function

The I/O chipset provides the two serial ports with the External Modem Ring-in Power ON function. Once you connect an external modem to COM1 or COM2, the mainboard enables you to turn on the system through remote and host dial-up control.

Keyboard Power ON Function

The mainboard features a keyboard power on function that enables you to turn on the power supply using a keypress. Follow these instructions to enable the Keyboard Power ON function .

Step : Use the Keyboard Power ON function (KBPO) to turn on the system by using a key press, password, or hot key combination etc. as set in the BIOS Power Management Setup menu (refer to the BIOS Power Management Setup for details). The BIOS default setting is keyboard Hot key (<Ctrl>+<F1>). To power off the system, use the Soft-OFF function under Windows XP/ME/2000/98. (refer to Windows online help).

NOTES:

- Intel ATX version 2.0 specification recommends a power supply that supplies ≥ 2.0 A in 5.0 VSB. However, this mainboard supports a 5.0 VSB standby power supply $\geq 2A$.
- We recommend you use the power supply with 2.0 A in 5.0 VSB, which supports PCI 2.3 specification for remote power-on and wake-up functions.

3-7 STR (Suspend To RAM) Function

This mainboard supports the STR (Suspend To RAM) power management scheme by maintaining the appropriate power states in the DDR SDRAM interface signals. The power source to the DDR SDRAM must be kept active during STR (ACPI S3). Advanced Configuration Power Interface (ACPI) provides many Energy Saving Features for operating systems that support Instant ON and QuickStart™ function.

1. To enable STR functionality to save system power :
 - a. Install ACPI certified add-on cards (such as AGP, LAN, and modem cards).
 - b. In BIOS under Power Management Setup (refer to Section 4), select “ACPI Suspend Type: S3(STR)” and “USB Port Wake Up Control” (if you have a USB mouse or keyboard device).
 - c. Install Windows® XP/2000/ME/98SE.
 - d. Restart the system.
 - e. Open the Control Panel Power Management application, and click the Advanced tab. In the Power buttons section, select “Stand By” from the drop-down lists.
2. To activate the STR function, click the START button and choose Shut Down. In the Shut Down Windows dialog box, select the Stand By option to enter STR mode.

The following lists the differences between STR power saving mode and Green (or Suspend) mode:

- a. STR is the most advanced Power Management mode.
- b. STR cuts all the power supplied to peripherals except to memory - max. power saving.
- c. STR saves and keeps all on-screen data including any executed applications to DDR SDRAM.
- d. In STR mode, you must push the power button (connected to the onboard PW-On of CFP pin), click your USB mouse buttons, or press your USB keyboard keys to wake up your system to the last display.

Section 4

BIOS SETUP

Main Menu

The ROM BIOS provides a built-in Setup program which allows user to modify the basic system configuration and hardware parameters. The modified data is stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will stay unchanged unless there is a configuration change in the system, such as hard drive replacement or a device is added.

It is possible for the CMOS battery to fail causing CMOS data loss. If this happens you will need install a new CMOS battery and reconfigure your BIOS settings.



The BIOS setup screen and description are for reference only, and may not exactly match what you see on your screen. The contents of BIOS are subject to change without notice. Please visit our website for updates.

To enter the Setup Program :

Power on the computer and press the key during the POST (Power On Self Test). The BIOS CMOS SETUP UTILITY opens. (Figure 1)

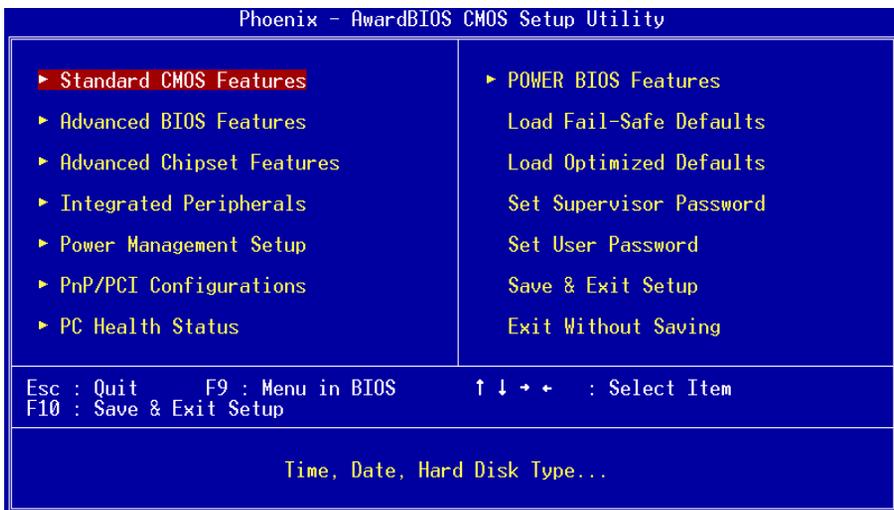


Figure 1: CMOS Setup Utility

BIOS

The main menu displays all the major selection items. Select the item you need to reconfigure. The selection is made by moving the cursor (press any direction (arrow key)) to the item and pressing the 'Enter' key. An on-line help message is displayed at the bottom of the screen as the cursor is moved to various items which provides a better understanding of each function. When a selection is made, the menu of the selected item will appear so that the user can modify associated configuration parameters.

4-1 Standard CMOS Setup

Choose "STANDARD CMOS FEATURES" in the CMOS SETUP UTILITY Menu (Figure 2). Standard CMOS Features Setup allows the user to configure system settings such as the current date and time, type of hard disk drive installed, floppy drive type, and display type. Memory size is auto-detected by the BIOS and displayed for your reference. When a field is highlighted (use direction keys to move the cursor and the <Enter> key to select), the entries in the field can be changed by pressing the <PgDn> or the <PgUp> key.

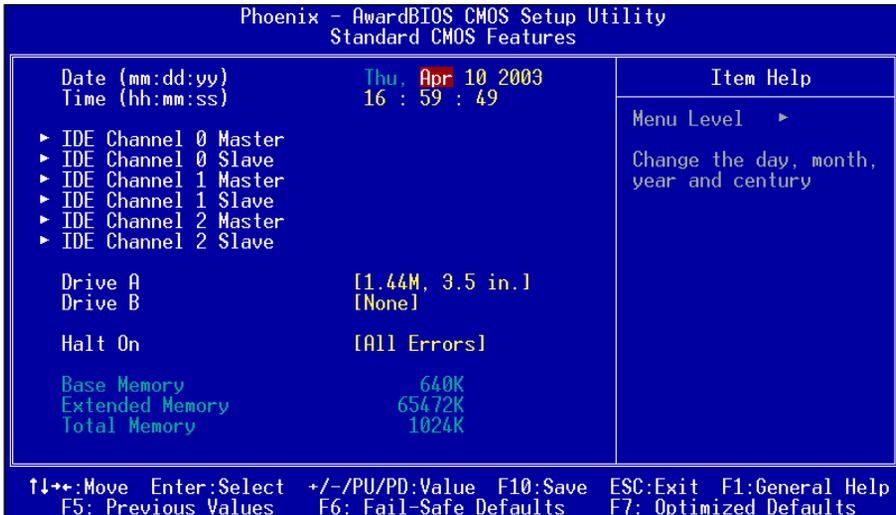


Figure 2: Standard CMOS Setup

Notes:

- If the hard disk Primary Master/Slave and Secondary Master/Slave are set to Auto, the hard disk size and model will be auto-detected.
- The “Halt On:” field is used to determine when the BIOS will halt the system if an error occurs.
- Floppy 3 Mode support is a mode used to support a special 3.5-inch drive used in Japan. This is a 3.5-inch disk that stores 1.2 MB. The default setting for this is disabled.

4-2 Advanced BIOS Features

Selecting the “ADVANCED BIOS FEATURES” option in the CMOS SETUP UTILITY menu allows users to change system related parameters in the displayed menu. This menu shows all of the manufacturer’s default values for the board.

Pressing the [F1] key displays a help message for the selected item.

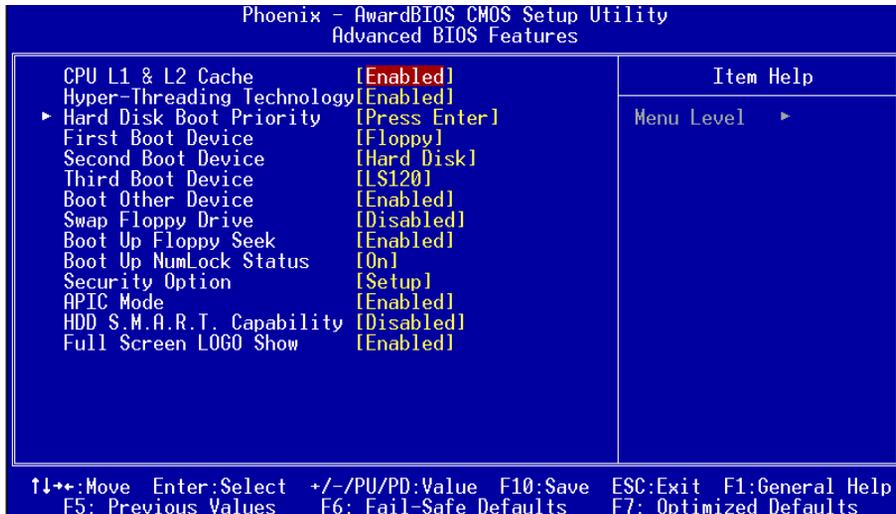


Figure 3: BIOS Features Setup

BIOS

CPU L1 & L2 Cache

This controls the status of the processor's internal Level One and Level Two cache. The default is Enabled.

Options: Enables, Disabled.

Hyper-Threading Technology

Enables the CPU Hyper-Threading Technology.

Options: Enables, Disabled.

Note: It is recommend to enable Hyper-Threading Technology on system with Windows XP and Linux 2.4 and disabling it for legacy OS.

Hard Disk Boot Priority

This item allows you to select the hard disk boot priority.

First /Second/Third/Other Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

Options: Floppy, LS120, Hard Disk, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, Disabled.

Boot Other Device

When enabled, the system searches all other possible locations for an operating system if it fails to find one in the devices specified under the first, second, and third boot devices. The default is Enabled.

Options: Enabled, Disabled.

Swap Floppy Drive

This will swap your physical drive letters A & B if you are using two floppy disks.

Options: Enables, Disabled.

Boot Up Floppy Seek

If this item is enabled, it checks the size of the floppy disk drives at start-up time.

You don't need to enable this item unless you have a legacy diskette drive with 360K capacity. The default is Disabled.

Options: Enabled, Disabled.

Boot Up NumLock Status

This controls the state of the NumLock key when the system boots. The default is On.

On: The keypad acts as a 10-key pad.

Off: The keypad acts like cursor keys.

Security Option

This category allows you to limit access to the System and Setup, or just to Setup. The default is Setup.

System: The system will not boot and access to Setup will be denied unless the correct password is entered at the prompt.

Setup: The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.

APIC Mode

This item allows you to enable APIC (Advanced Programmable Interrupt Controller) functionality. APIC is an Intel chip that provides symmetric multiprocessing (SMP) for its Pentium systems.

Options: Enabled, Disabled.

HDD S.M.A.R.T. Capability

The S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) system is a diagnostics technology that monitors and predicts device performance. S.M.A.R.T. Software resides on both the disk drive and the host computer.

The disk drive software monitors the internal performance of the motors, media, heads, and electronics of the drive. The host software monitors the overall reliability status of the drive. If a device failure is predicted, the host software, through the Client WORKS S.M.A.R.T applet, warns the user of the impending condition and advises appropriate action to protect the data. The default is Disabled.

Options: Enabled, Disabled.

Full Screen LOGO Show

This item allows you determine Full Screen LOGO display during POST.

Options: Enabled, Disabled.

4-3 Advanced Chipset Features

Choose the “ADVANCED CHIPSET FEATURES” option in the CMOS SETUP UTILITY menu to display following menu.

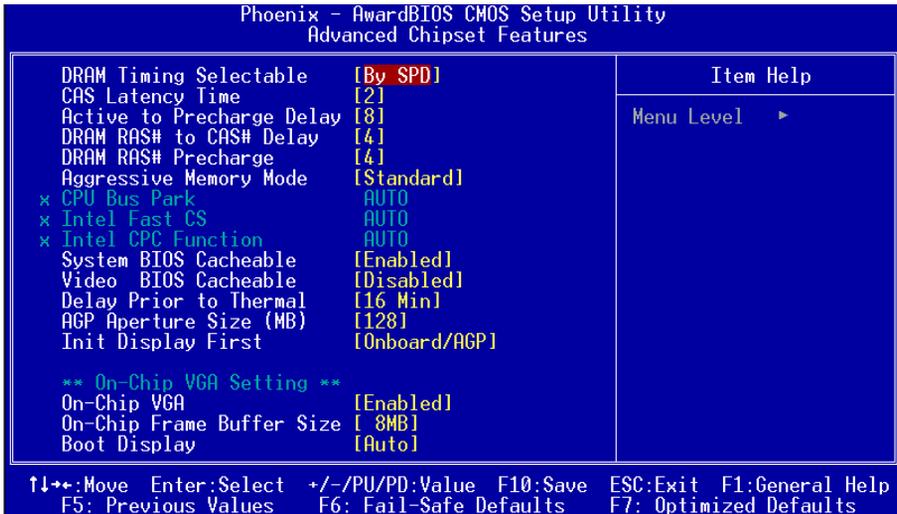


Figure 4: Chipset Features Setup

DRAM Timing Selectable

For setting DRAM Timing, select By SPD to follow Intel PC DDR SDRAM Serial Presence Detect Specification.

Options: Manual, By SPD.

CAS Latency Time

Enables you to select the CAS latency time. The value is set at the factory depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM and DRAM clock from DRAM Timing Selectable. The default is by DRAM SPD.

Options: 2, 2.5, 3.

Active to Precharge Delay

This item specifies the number of clock cycles needed after a bank active command before a precharge can occur (sets the minimum RAS pulse width.). The default is by DRAM SPD.

Options: 5, 6, 7, 8.

DRAM RAS# to CAS# Delay

This item sets the timing parameters for the system memory such as the CAS (Column Address Strobe) and RAS (Row Address Strobe). The default is by DRAM SPD.

Options: 2, 3, 4.

DRAM RAS# Precharge

This item refers to the number of cycles required to return data to its original location to close the bank or the number of cycles required to page memory before the next bank activate command can be issued. The default is by DRAM SPD.

Options: 2, 3, 4.

Aggressive Memory Mode (AMM)

Aggressive Memory Mode reduces delays within the chipset to improve DDR DRAM usage efficiency.

Options: Max, Turbo, Expert, Standard.



Performance upgrade using AMM will largely depend on hardware availability within the chipset.

CPU Bus Park

Options: Disabled, Enabled.

Intel Fast CS

Options: Auto, Disabled, Enabled.

Intel CPC Function

Options: Auto, Disabled, Enabled.

System BIOS Cacheable

This item allows the system to be cached in memory for faster execution.

Options: Disabled, Enabled.

Video BIOS Cacheable

This item allows the video to be cached in memory for faster execution.

Options: Disabled, Enabled.

Delay Prior to Thermal

Set this item to enable the CPU Thermal function to engage after the specified time.

The default is 16 minutes.

Options: 4, 8, 16, 32 minutes.

BIOS

AGP Aperture Size (MB)

This item defines the size of the aperture if you use an AGP graphics adapter. It refers to a section of the PCI memory address range used for graphics memory.
Options: 4, 8, 16, 32, 64, 128, 256 MB.

Init Display First

If two video cards are used (1 AGP and 1 PCI) this specifies which one will be the primary display adapter.
Options: PCI Slot, AGP.

**** On-Chip VGA Settings ****

On-Chip VGA

This item allows you to control the on-chip VGA.
Options: Enabled, Disabled.

On-Chip Frame Buffer Size

This item allows you to control the on-chip frame buffer size.
Options: 1MB, 8MB, 16MB.

Boot Display

This item allows you to select the boot display device.
Options: Auto, CRT, TV, EFP.

4-4 Integrated Peripherals

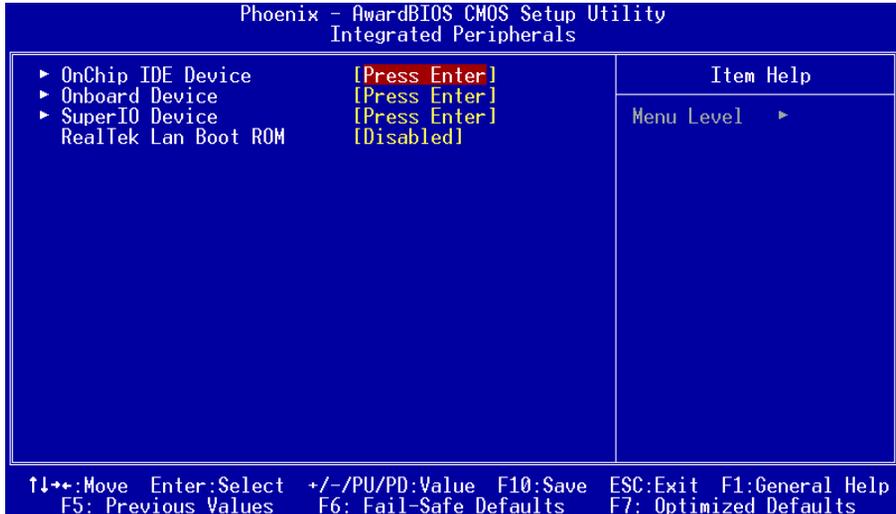


Figure 5: Integrated Peripherals

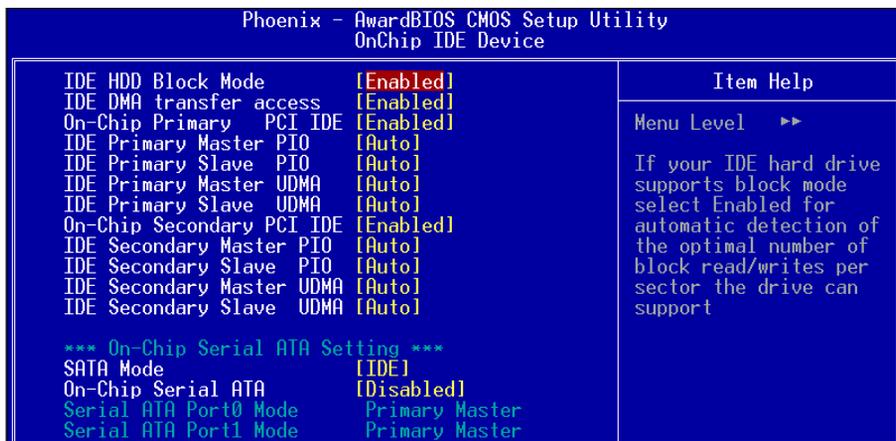
RealTek Lan Boot ROM (Optional)

Enable/disable the onboard LAN Boot ROM. The default is Disabled.

Options: Enabled, Disabled.

▶ OnChip IDE Device

Scroll to OnChip IDE Device and press <Enter>. The following screen appears:



BIOS

IDE HDD Block Mode

IDE Block Mode allows the controller to access blocks of sectors rather than a single sector at a time. The default is Enabled.

Options: Enabled, Disabled.

IDE DMA transfer access

Automatic data transfer between system memory and IDE device with minimum CPU intervention. This improves data throughput and frees CPU to perform other tasks.

Options: Enabled, Disabled.

On-Chip Primary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select “Enabled” (default) to activate each channel separately.

Options: Enabled, Disabled.

Note: If you do not use the onboard IDE connector, then you will need to set the Onboard Primary PCI IDE and Onboard Secondary PCI IDE to “Disabled”.

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 to 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

Options: Auto, Mode 0 ~ 4.

IDE Primary/Secondary Master/Slave UDMA

This allows you to select the mode of operation for the IDE drive. Ultra DMA-33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and your system software both support Ultra DMA-33/66/100, select Auto to enable UDMA mode by BIOS or you can manually disable it.

Options: Auto, Disabled.

*** On-Chip Serial ATA Setting ***

SATA Mode (ICH5R only)

This item allows you to select Serial ATA Mode. When RAID is enabled, Serial ATA ports 0 and 1 will default to "SATA0" and "SATA1".

Options: IDE, RAID.

Note: O/S driver for this RAID feature is available only for Windows XP, please check future updates for other O/S support.

On-Chip Serial ATA

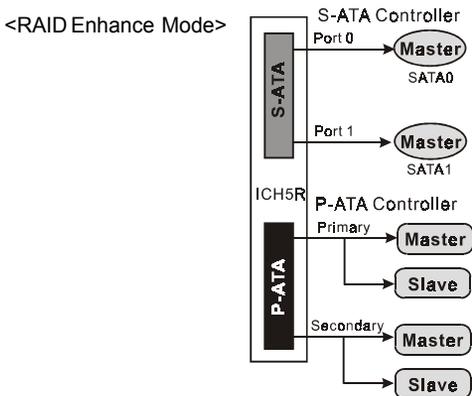
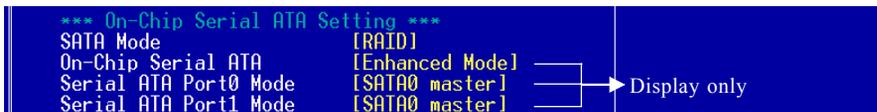
Applicable only when RAID function above is "Disabled". Assigning "Primary" will make Serial ATA IDE the Primary port and in effect disable the Parallel-ATA Primary port. Similarly, assigning "Secondary" will disable the Parallel-ATA Secondary port.

Options: Enhanced Mode, Disabled, For Primary, For Secondary.

Serial ATA Port 0 /1 Mode

Display Serial ATA Port 0/1 assignment to IDE device.

◆ The following screen shows SATA Mode "RAID".

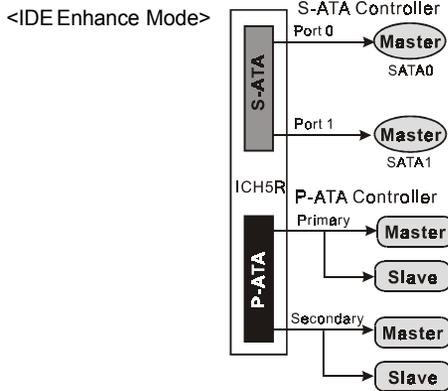


BIOS

- ◆ The following screen shows SATA Mode "IDE" and on-chip Serial ATA assigned to "Enhanced Mode".

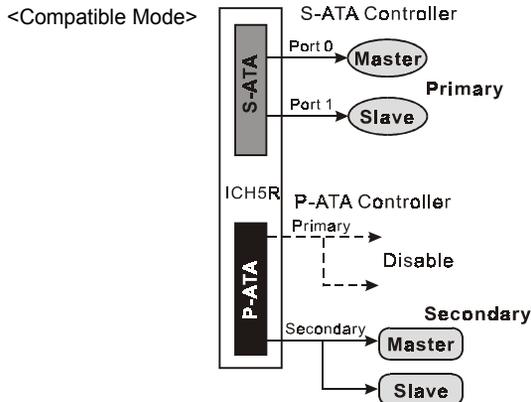
Note: Enhanced mode is available only for Windows2000 and XP.

```
*** On-Chip Serial ATA Setting ***
SATA Mode                [IDE]
On-Chip Serial ATA       [Enhanced Mode]
Serial ATA Port0 Mode    [SATA0 master]
Serial ATA Port1 Mode    [SATA0 master]
```



- ◆ The following screen shows SATA Mode "IDE" and on-chip Serial ATA assigned to "For Primary".

```
*** On-Chip Serial ATA Setting ***
SATA Mode                [IDE]
On-Chip Serial ATA       [For Primary]
Serial ATA Port0 Mode    [Primary Master]
Serial ATA Port1 Mode    [Primary Slave]
```

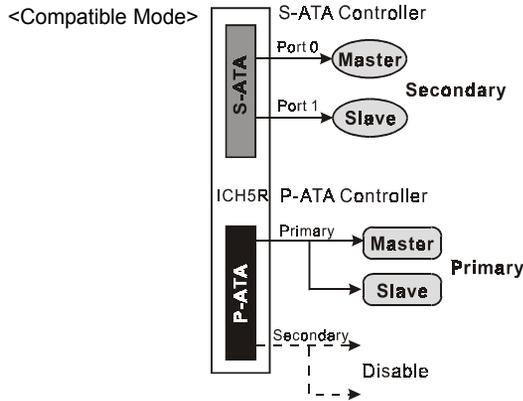


- ◆ The following screen shows SATA Mode "IDE" and on-chip Serial ATA assigned to "For Secondary".

```

*** On-Chip Serial ATA Setting ***
SATA Mode                [IDE]
On-Chip Serial ATA       [For Secondary]
Serial ATA Port0 Mode    [Secondary Master]
Serial ATA Port1 Mode    [Secondary Slave]
    
```

→ Display only



BIOS

► Onboard PCI Device Setup

Scroll to Onboard PCI Device Setup and press <Enter>. The following screen appears:

Phoenix - AwardBIOS CMOS Setup Utility		Item Help
Onboard Device		Menu Level ►►
USB Controller	[Enabled]	
USB 2.0 Controller	[Enabled]	
USB Keyboard Support	[Auto]	
USB Mouse Support	[Disabled]	
AC97 Audio	[Auto]	
Game Port Address	[201]	
Midi Port Address	[330]	
Midi Port IRQ	[10]	
Onboard LAN Device	[Enabled]	

USB Controller

Enables the USB controller.
Options: Disabled, Enabled.

USB 2.0 Controller

Enables the EHCI (USB2.0) controller.
Options: Disabled, Enabled.

USB Keyboard Support

Enable/Disable support for USB keyboard. The default is Auto detect.
Options: Auto, Enabled, Disabled.

USB Mouse Support

Enable/Disable support for USB mouse. The default is Disabled.
Options: Enabled, Disabled.

AC97 Audio

This item allows you disable the chipset on-chip support for AC97 Audio. The system default is Auto.
Options: Auto, Disabled.

Game Port Address

Select an address for the Game port.
Options: 201, 209, Disabled.

Midi Port Address

Select an address for the Midi port.
Options: 290, 300, 330, Disabled.

Midi Port IRQ

Select an interrupt for the Midi port.

Options: 5, 10.

Onboard LAN Device (Optional)

Enables the onboard LAN feature.

Options: Enabled, Disabled.

► **Onboard I/O Chip Setup**

Scroll to Onboard I/O Chip Setup and press <Enter>. The following screen appears:

Phoenix - AwardBIOS CMOS Setup Utility		Item Help
SuperIO Device		Menu Level >>
Onboard FDC Controller	[Enabled]	
Onboard Serial Port 1	[3F8/IRQ4]	
Onboard IrDA Port	[Disabled]	
Onboard Parallel Port	[378/IRQ7]	
Parallel Port Mode	[SPP]	
EPP Mode Select	[EPP1..7]	
ECP Mode Use DMA	[3]	

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install add-in FDC or the system has no floppy drive, select Disabled in this field.

Options: Enabled, Disabled.

Onboard Serial Port 1

Select an address and corresponding interrupt for the serial ports.

Options: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

Onboard IrDA Port

Select an address and corresponding interrupt for IrDA port.

Options: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

Onboard Parallel Port

This field allows the user to configure the LPT port.

Options: 378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled.

Parallel Port Mode

This field allows the user to select the parallel port mode.

Options: SPP, EPP, ECP, ECP+EPP.

BIOS

EPP Mode Select

This item allows you to determine the IR transfer mode of onboard I/O chip.

Options: EPP1.9, EPP1.7.

ECP Mode USE DMA

This field allows the user to select DMA1 or DMA3 for the ECP mode.

Options: DMA1, DMA3.

4-5 Power Management Setup

Choose the “POWER MANAGEMENT SETUP” in the CMOS SETUP UTILITY to display the following screen. This menu allows the user to modify the power management parameters and IRQ signals. In general, these parameters should not be changed unless it’s absolutely necessary.

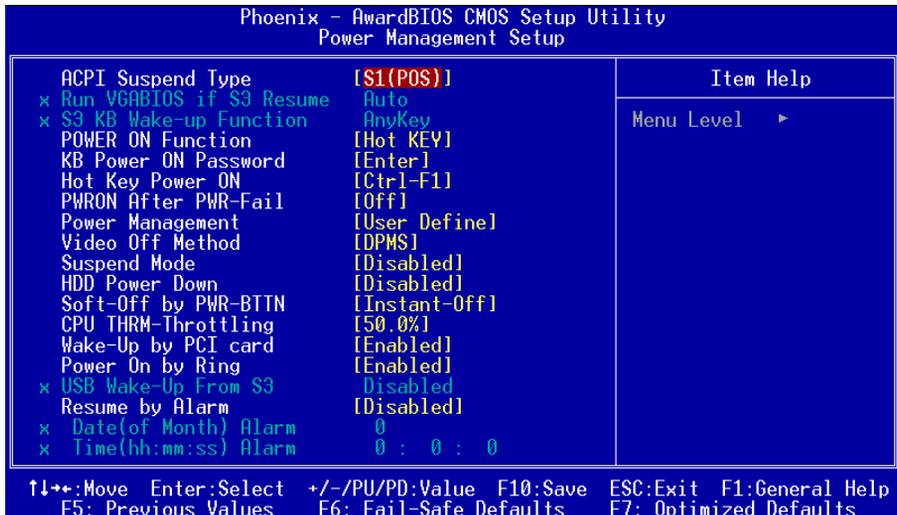


Figure 6: Power Management

ACPI Suspend Type

This item allows you to select S1(POS) or S3(STR) function. When set to “S3(STR)” or “S1&S3” the following two fields become available.

Options: S1(POS), S3(STR), S1&S3.

Run VGABIOS if S3 Resume

This determines whether or not to enable the system to run the VGA BIOS when resuming from S3(STR) or S1&S3.

Options: Auto, Yes, No.

S3 KB Wake-up Function

This determines whether or not to enable keyboard/mouse activity to awaken the system from S3(STR) or S1&S3.

Options: AnyKey or Mouse, By PowerOn Func., AnyKey, Mouse.

BIOS

POWER ON Function

Enables computer power on by keyboard, mouse, or hotkey activity. The default is HotKEY.

Password: Requires you to enter a password when using the keyboard to power on. Set the password in the next field “KB Power ON Password.”

HotKEY: Enables you to use a hot key combination to power on the computer. Set the hot key combination in the “Hot Key Power ON” field.

AnyKEY: Enables you to set any keyboard activity to power on the computer.

BUTTONONLY: Requires you to push the computer power button to power on the system.

Keyboard98: Enables you to set the Windows 98 key to power on the system.

Keyboard Power ON Password

Press “Enter” to create a password that is required when you use the keyboard to power on the system. You must set the POWER ON Function to “Password” to be prompted for a password at power on.

Hot Key Power ON

Enables you to set a hot key combination to be used for powering on the system. The default is Ctrl-F1.

Options: Ctrl+F1 ~ Ctrl+F12.

PWRON After PWR-Fail

This item enables your computer to automatically restart or return to its last operating status after power returns from a power failure.

Off: The system stays off after a power failure.

Former-Sts: The system returns to the state it was in just prior to the power failure.

Power Management

Use this to select your Power Management selection. The default is User define.

Max. saving: Maximum power savings. Inactivity period is 1 minute in each mode.

Min. saving: Minimum power savings. Inactivity period is 1 hour in each mode.

User define: Allows user to define PM Timers parameters to control power saving mode.

Video Off Method

This option allows you to select how the video will be disabled by the power management. The default is V/H Sync + Blank

V/H Sync + Blank: System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.

DPMS Support: Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.

Blank Screen: System only writes blanks to the video buffer.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Options: Disabled, 1 ~ 15 Min.

Soft-Off by PWR-BTTN

Use this to select your soft-off function. The default is Instant Off.

Instant Off: Turns off the system instantly.

Delay 4 Second : Turns off the system after a 4 second delay. If momentary press of button, the system will go into Suspend Mode. Press the power button again to make system back to work.

CPU THRM-Throttling

This item sets the percentage of time that the CPU is idled if CPU throttling is initiated by excess heat. The default setting is 50%.

Options: 12.5%, 25.0%, 37.5%, 50.0%, 62.5%, 75.0%, 87.5%.

PowerOn by PCI Card

An input signal form PME on the PCI card awakens the system from a soft off state.

Options: Enabled, Disabled.

Power On by Ring or WOL

When enabled, any modem or LAN activity awakens the system from power savings mode.

Options: Enabled, Disabled.

BIOS

USB Wake-Up From S3

When enabled, any USB activity awakens the system from S3 mode.

Options: Enabled, Disabled.

RTC Alarm Resume

When enabled, you can set the date and time in the following two fields. Any event occurring at the specified date or time awakens the system from power savings mode.

4-6 PNP/PCI Configuration

The PNP/PCI configuration program is for the user to modify the PCI/ISA IRQ signals when various PCI/ISA cards are inserted in the PCI or ISA slots.

WARNING: Conflicting IRQ's may cause the system to not find certain devices.

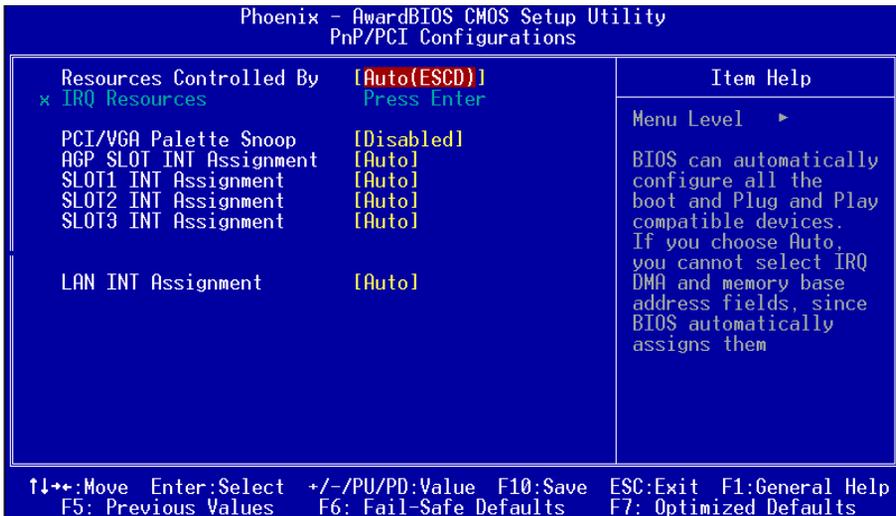


Figure 7: PNP/PCI Configuration Setup

Resources Controlled By

Determines what controls system PNP/PCI resources. The default is Auto (ESCD).

Manual: PNP Card's resources are controlled manually. The "IRQ Resources" field becomes available and you can set which IRQ-X and DMA-X are assigned to PCI/ISA PNP or Legacy ISA Cards.

Auto: If your ISA card and PCI cards are all PNP cards, BIOS assigns the interrupt resource automatically.

PCI/VGA Palette Snoop

This item is designed to overcome problems that may be caused by some nonstandard VGA cards. This board includes a built-in VGA system that does not require palette snooping therefore you must leave this item disabled.

Options: Enabled, Disabled.

AGP SLOT / AC97 / Slot 1 ~ Slot 3 / LAN INT Assignment

This setting enables the user to specify what IRQ will be assigned to the AGP/AC97/PCI Slot 1 ~ PCI Slot 5/LAN devices in the chosen slot.

Options: Auto, 3, 4, 5, 7,9 ,10, 11, 12, 14 & 15. The default is Auto.

Interrupt requests are shared as shown below:

	INT A	INT B	INT C	INT D	INT E	INT F	INT G	INT H
AGP Slot	v							
AC97		v						
Slot 1		v						
Slot 2			v					
Slot 3				v				
Onboard LAN (Optional)							v	
Onboard USB1	v							
Onboard USB2		v						
Onboard USB3			v					
Onboard USB4	v							
USB 2.0				v				
SM BUS		v						

IMPORTANT!

If using PCI cards on shared slots, make sure that the drivers support "Shared IRQ" or that the cards don't need IRQ assignments. Conflicts will arise between the two PCI groups that will make the system unstable or cards inoperable.

4-7 PC Health Status

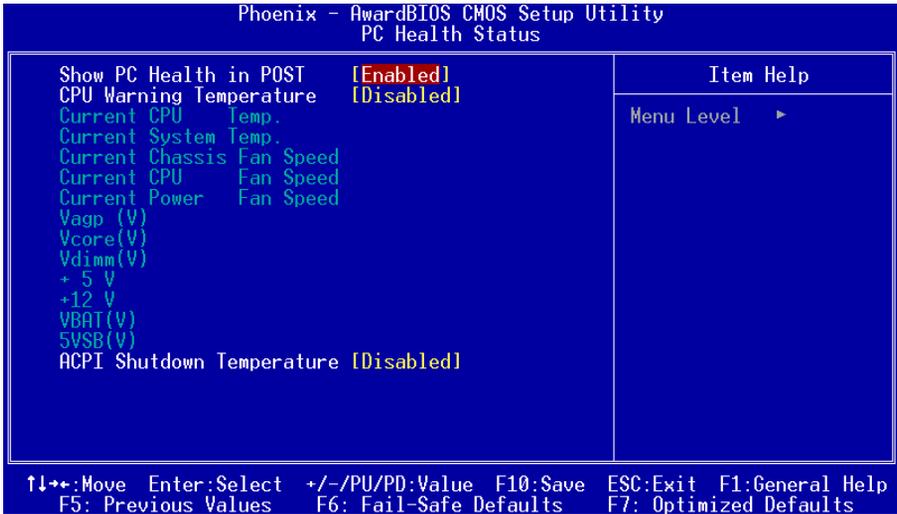


Figure 8: PC Health Status

Show PC Health in POST

When this function is enabled the PC Health information is displayed during the POST (Power On Self Test).

Options: Enabled, Disabled.

CPU Warning Temperature

Sets the temperature at which the computer will respond to an overheating CPU. The default is Disabled.

Options: Disabled, 50°C/122°F ~ 70°C/158°F.

Current CPU Temperature

Displays the current CPU temperature.

Current System Temperature

Displays the current system temperature.

Current CPU/Chassis/Power FAN Speed

Displays the current speed of the CPU, chassis, and power fan speed in RPMs.

Vagp (V)

The voltage level of power supplied to AGP card.

Vcore (V)

The voltage level of the CPU(Vcore).

Vdimm(V)

The voltage level of the DRAM.

VBAT(V)

The voltage level of the battery.

+ 5V, + 12V, 5VSB(V)

The voltage level of the switching power supply.

ACPI Shutdown Temperature

This is the temperature that the computer will turn off the power to combat the effects of an overheating system. (requires ACPI to be enabled in Power Management BIOS and ACPI compliant operating system.) The default is Disabled.

Options available are 60°C/140°F to 95°C/203°F in increments of 5°C.

4-8 Power BIOS Features

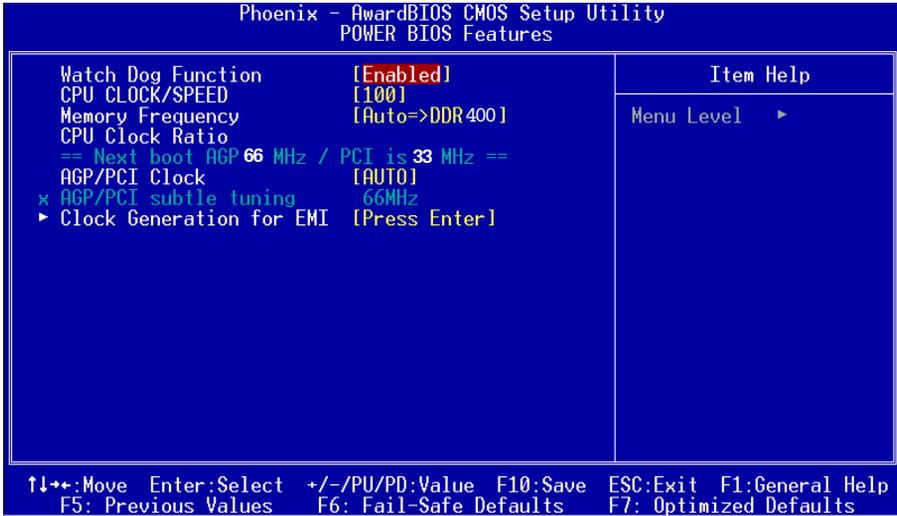


Figure 9: Frequency/Voltage Control

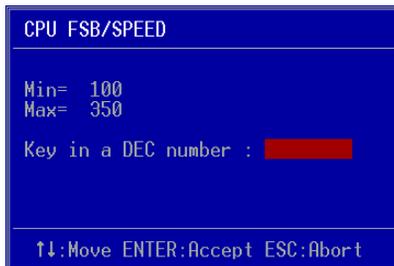
Watching-Dog Function

If you select “Enabled” and overclock fail before POST code 26h, the system will reset automatically by default configuration.

Options: Enabled, Disabled.

CPU FSB/SPEED

Enables you to set the CPU front side bus speed at increments of 1MHz step. The default is 100 MHz. Press <Enter> to display the following screen:



Key in the DEC (decimal) number for the CPU FSB/SPEED.

Note: Overclocking failure will result in no display on the monitor. At this moment, press *<Insert>* key to return to the initial or default setting to boot up your system.

Memory Frequency

Enables you to select a ratio of the DDR DRAM to match the installed DRAM frequency 266/333/400MHz. We recommend that you leave this item at the default value.

When the FSB is 400MHz the options will display 3:4 =>DDR266.

When the FSB is 533MHz the options will display 1:1 =>DDR266, 4:5 =>DDR333 and Auto =>DDR333 (by SPD).

When the FSB is 800MHz the options will display 1:1=>DDR400, 5:4=>DDR320 and Auto=>DDR400 (by SPD).

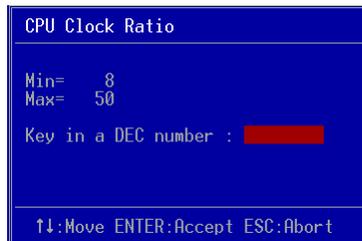
CPU Clock Ratio

Use this item to select a multiplier for the system front side bus (FSB) frequency. The value of the multiplier must be set so that:

$$\text{Multiplier} \times \text{Front side Bus Frequency} = \text{CPU Clock Speed}$$

For example, if you have a processor that is rated to run at 800 MHz and the system is running a front side bus frequency of 100 MHz, you should select a multiplier of 8 so that:

$$8 (\text{Multiplier}) \times 100 \text{ MHz (front side bus)} = 800 \text{ MHz (CPU clock)}$$



Key in the DEC (decimal) number for the CPU Clock Ratio.

BIOS

AGP/PCI Clock

Enables you to set the host clock to work concurrently with the PCI bus or the AGP bus. The default is AUTO.

AUTO: The system sets the item automatically.

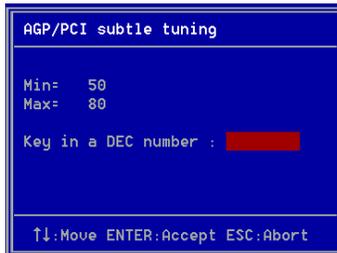
AGP-FSB*2/3 PCI-FSB/3: The system sets the host clock to work with the PCI and AGP bus.

AGP-FSB*2/4 PCI-FSB/4: The system sets the host clock to work with the PCI and AGP bus.

By subtle tuning item: The system sets the host clock according to the number produced by the subtle tuning item.

AGP/PCI subtle tuning

Enables you to subtly tune the AGP/PCI frequency at increments of 1MHz step. The default is 66 MHz. Press <Enter> to display the following screen:



Key in the DEC (decimal) number for the AGP/PCI subtle tuning.

► Clock Generation for EMI

Scroll to Clock Generation for EMI and press <Enter>. The following screen appears:



Auto Detect PCI Clk

When enabled the mainboard automatically disables the clock source for a PCI slot which does not have a module in it, reducing EMI (ElectroMagnetic Interference).

Spread Spectrum Modulated

If you enable spread spectrum, it can significantly reduce the EMI (ElectroMagnetic Interference) generated by the system.

4-9 Defaults Menu

Selecting “Defaults” from the main menu shows you two options which are described below

Load Fail-Safe Defaults

When you press <Enter> on this item you get a confirmation dialog box:

Load Fail-Safe Defaults (Y/N)? N

Pressing ‘Y’ loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box:

Load Optimized Defaults (Y/N)? N

Pressing ‘Y’ loads the default values that are factory settings for optimal performance system operations.

4-10 Supervisor/User Password Setting

These items are used to install a password. A Supervisor password takes precedence over a User password, and the Supervisor limits the activities of a User. You can set either a supervisor or user password, or both of them:

Supervisor password: authorized to enter and change the options of the setup menus.

User password: authorized to enter, but not authorized to change the options of the setup menus.

When you select Set User/Supervisor Password, the following message appears prompting you to type a password:

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now clears any previously entered password from CMOS memory. You will be prompted to confirm the password. Type the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, press <Enter> when you are prompted to enter the password. A message will confirm the password is disabled:

PASSWORD DISABLED.

Once the password is disabled, the system will boot and you can enter Setup freely. When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This prevents unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup menu “Security” option. If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

4-11 Exiting BIOS

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing “Y” stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

Section 5 Driver Installation

Easy Driver Installation



Insert the bundled CD-disk, the main menu screen will appear. The main menu displays buttons that link you to the supported drivers, utilities and software.

- Step 1 :** Click “**INTEL CHIPSET INF FILES**” to install chipset driver.
- Step 2 :** Click “**GRAPHICS DRIVER**” to install graphical driver.
- Step 3 :** Click “**C-MEDIA AUDIO DRIVER**” to install audio driver.
- Step 4 :** Click “**USB V2.0 DRIVER (README.HTM)**” for installation introduction to install USB V2.0 driver.
- Step 5 :** Click “**REALTEK LAN DRIVER**” to install LAN driver. (Optional)

Drivers Installation

C-Media Audio Configuration Brief Guide

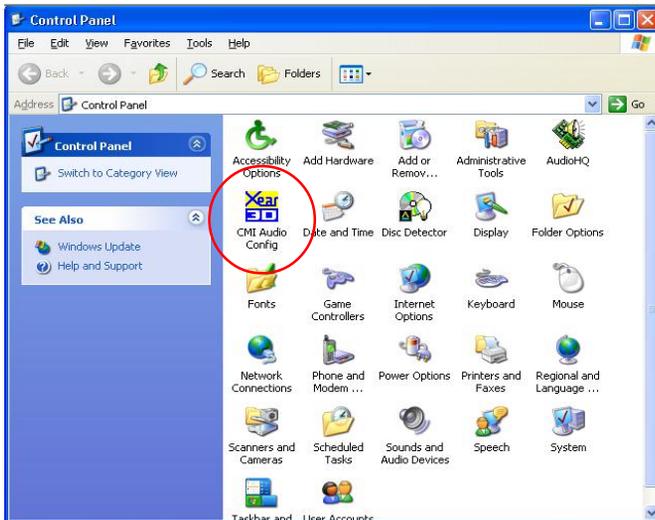
Below is list brief guide of C-Media Audio Configuration. For more detailed information, please refer to user’s manual in the attached CD.

You are able to access the control panel from two places:

- a) The system tray in the right-bottom of your screen. You can click right button of the mouse on it to get an audio-related pop-up menu as follows

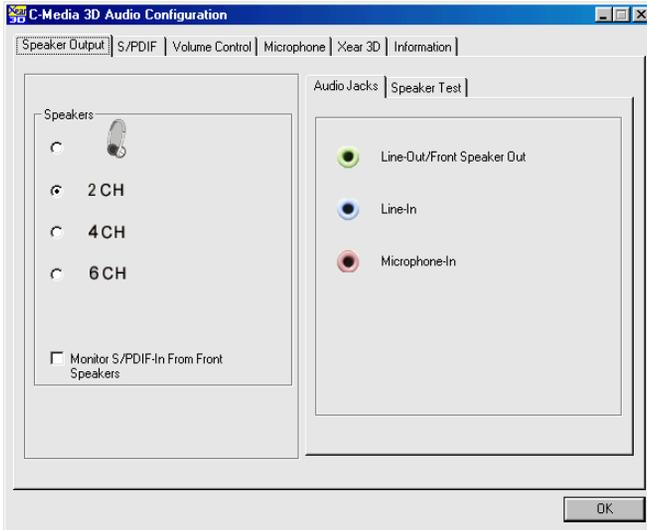


- b) In the “Control Panel” (Start=>Setting=>Control Panel), double-click “CMI Audio Config” to open it.

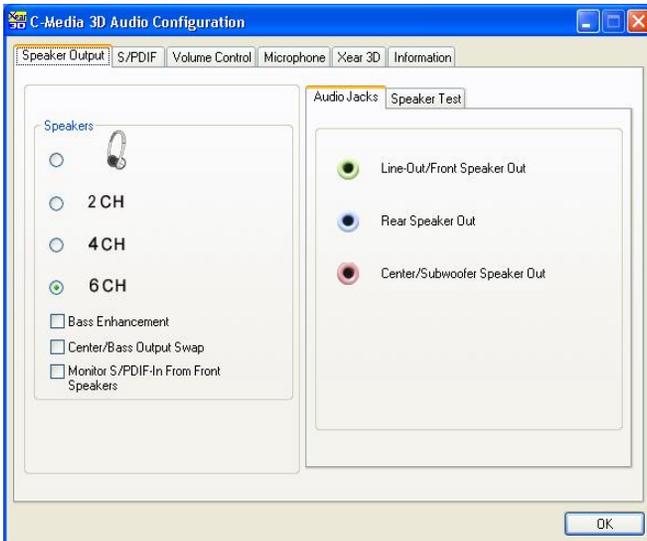


1. Speaker output:

When you open the “3D Audio Configuration”, you will see the default Output tab as the figure below. “Speaker Output” tab collects main setting/options for analog output to speakers.



<2 channel mode>

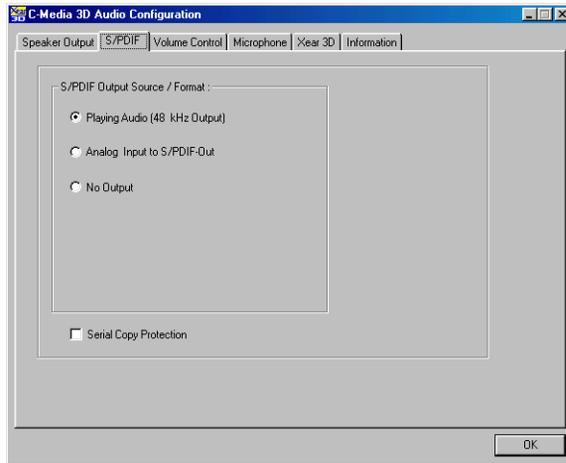


<6 channel mode>

Drivers Installation

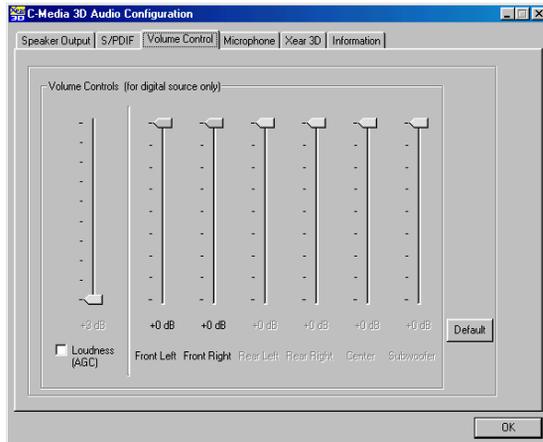
2. S/PDIF:

C-Media driver supports digital S/PDIF output (Sony/Philips Digital InterFace, developed by SONY/PHILIPS to provide a low-distortion digital data transfer between audio devices). There may be an optical or coaxial connector for S/PDIF on your system. When you select S/PDIF tab, you will see the setting page as the figure below.



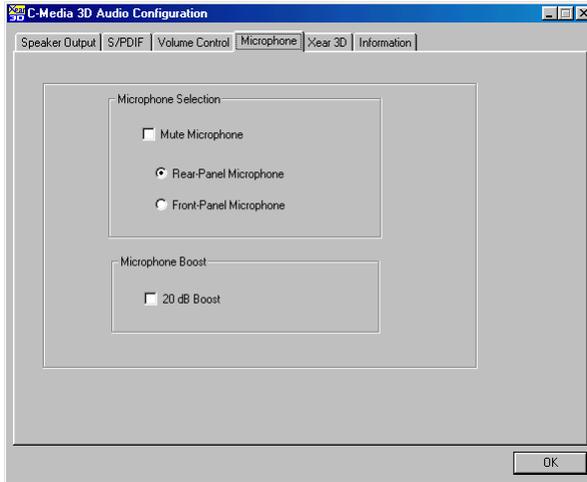
3. Volume Control:

C-Media driver provides the digital volume control for all 6 channels in 3D Audio Configuration. You can regulate each volume to the speaker for current playing digital sound sources. It's not effective for analog input sources.



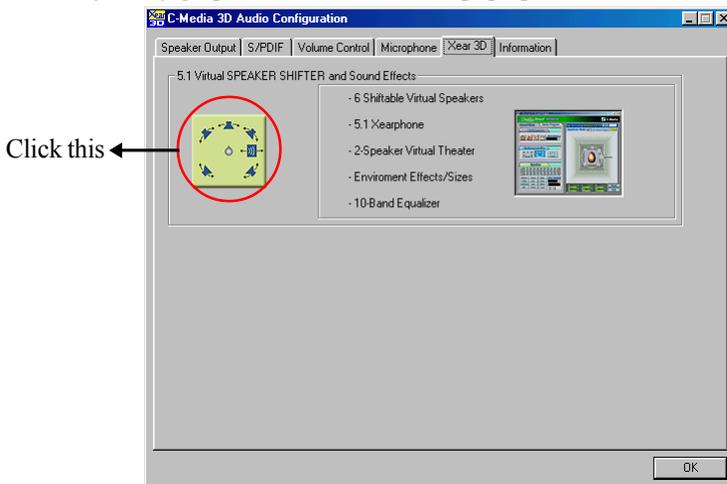
4. Microphone:

C-Media driver provides microphone setting in 3D Audio Configuration directly for more convenience. You can control microphone options in the tab though you can also reach them in Microsoft volume control.



5. Xear 3D:

C-Media driver now supports Xear 3D- 5.1 Virtual SPEAKER SHIFTER and sound effects. Just click the left button in Xear 3D tab and then the new friendly/fancy graphic user interface will pop up.



Drivers Installation

- ◆ **Xear 3D - 5.1 Virtual SPEAKER SHIFTER:**

The SPEAKER SHIFTER block provides an advanced, amazing and considerate feature- dynamically adjustable multi-channel sound system no matter what listening appliance you use and what application you are running. You do NOT have to endure unbalanced speaker placement due to spatial limitation. You can enjoy multi-channel surround sound with even an earphone or usual 2 speakers.

- ◆ **Xear 3D - Sound Effect:**

Xear 3D Advanced Program provides another functional block- Sound Effect. You can create a different feeling for your music including 27 Environment Effects, Environment Size & 10-Band Equalizer with 12 pre-set models.



- ◆ **Xear 3D - Multi-channel Music Demo:**

This demo program provides each speaker testing and three 5.1-channel music. You can get feeling about 5.1-channel surround music and use it to test SPEAKER SHIFTER, too. All demo music/sound here will repeat playing if you don't press "Stop" button.



- ◆ **Xear 3D - Play3D Demo:**

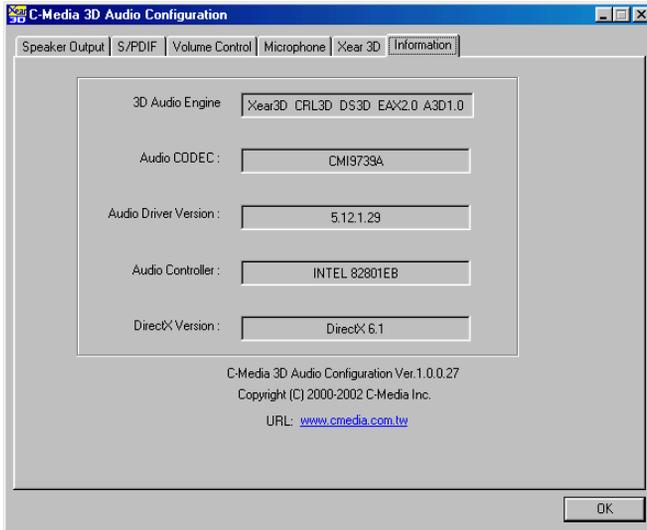
Xear 3D Advanced Program also provides interesting Play3D demo programs as below. After installing the program with setup program, you will find the program from the path: "Start->Programs->C-Media 3D Audio->Play3D Demo".



Drivers Installation

6. Information :

There is a C-Media audio-related Information tab in 3D Audio Configuration. You can get a whole picture about the audio chip, driver version, 3D Audio Engine, Microsoft DirectX Version, and Configuration Version itself.



Appendix A

A-1 Update Your System BIOS

Download the xxxxx.EXE file corresponding to your model from our website to an empty directory on your hard disk or floppy. Run the downloaded xxxxx.EXE file and it will self extract. Copy these extracted files to a bootable DOS floppy disk.

Note: The DOS floppy disk should contain NO device drivers or other programs.

1. Type "A:\AWDFLASH and press <Enter> Key.
2. You will see the following setup screen.
3. Please key in the xxxxx.bin BIOS file name.

```
FLASH MEMORY WRITER V7.88
(C)Award Software 2000 All Rights Reserved

For xxx-W83627-6A69LPA9C-0  DATE: 05/11/2000
Flash Type -
File Name to Program : _____

Error Message:
```

4. If you want to save the previous BIOS data to the diskette, please key in [Y], otherwise please key in [N].

```
FLASH MEMORY WRITER V7.88
(C)Award Software 2000 All Rights Reserved

For xxx-W83627-6A69LPA9C-0  DATE: 05/11/2000
Flash Type - xxxxx E82802AB /3.3V
File Name to Program : xxxxx.bin

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

Appendix

5. Key in File Name to save previous BIOS to file.

```
FLASH MEMORY WRITER V7.88
(C)Award Software 2000 All Rights Reserved

For xxxx-W83627-6A69LPA9C-0 DATE: 05/11/2000
Flash Type - xxxxx E82802AB /3.3V

File Name to Program : xxxxx.bin
File Name to Save : xxxxx.bin

Error Message:
```

6. To confirm and proceed, please key in [Y] to start the programming.

```
FLASH MEMORY WRITER V7.88
(C)Award Software 2000 All Rights Reserved

For xxxx-W83627-6A69LPA9C-0 DATE: 05/11/2000
Flash Type - xxxxx E82802AB /3.3V

File Name to Program : xxxxx.bin
Checksum : 938EH
File Name to Save : xxxxx.bin

Error Message: Are you sure to program (y/n)
```

7. The BIOS update is finished.

```
FLASH MEMORY WRITER V7.88
(C)Award Software 2000 All Rights Reserved

For xxxx-W83627-6A69LPA9C-0 DATE: 05/11/2000
Flash Type - xxxxx E82802AB /3.3V

File Name to Program : xxxxx.bin
Checksum : 4B04H
Verifying Flash Memory - 7FE00 OK

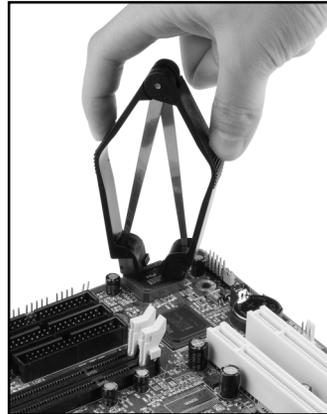
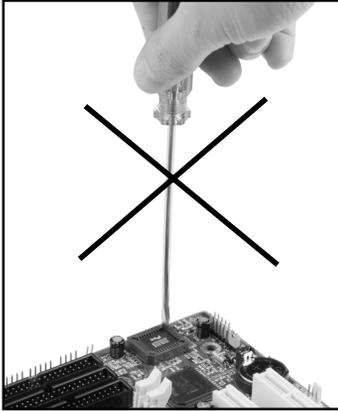
█ Write OK █ No Update █ Write Fail

F1: Reset F10: Exit
```

Appendix B

B-1 EEPROM BIOS Remover

Do not remove the BIOS chip, unless instructed by a technician and only with a PLCC IC extractor tool.



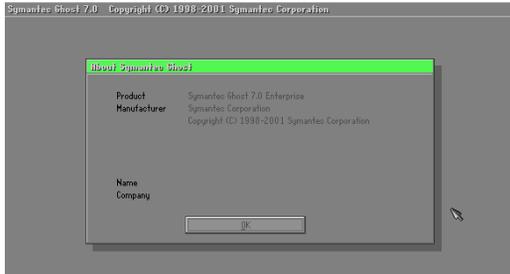
The BIOS socket is fragile may be damaged if an improper method to replace the BIOS chip is applied.

Appendix C

C-1 GHOST 7 Quick User's Guide (Optional)

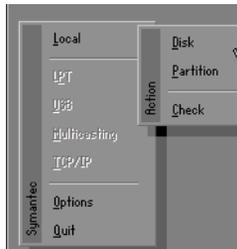
Installation is very easy. You only need to copy the **Ghost7** folder or **Ghost.exe** to your hard disk.

Main Menu



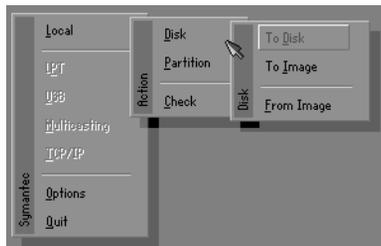
Description of Menu

Ghost clones and backs up **Disk** and **Partition**.



In which **Disk** indicates hard disk options
Partition indicates partition options
Check indicates check options

Disk



Appendix

There are 3 hard disk functions:

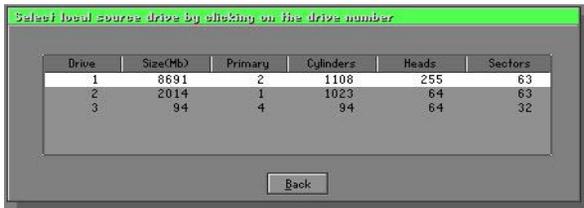
1. Disk To Disk (disk cloning)
2. Disk To Image (disk backup)
3. Disk From Image (restore backup)

Important!

1. To use this function, the system must have at least 2 disks. Press the **Tab** key to move the cursor.
2. When restoring to a destination disk, all data in that disk will be completely destroyed.

Disk To Disk (Disk Cloning)

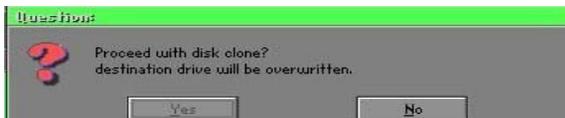
1. Select the location of the **Source drive**.
2. Select the location of the **Destination drive**.



3. When cloning a disk or restoring the backup, set the required partition size as shown in the following figure.

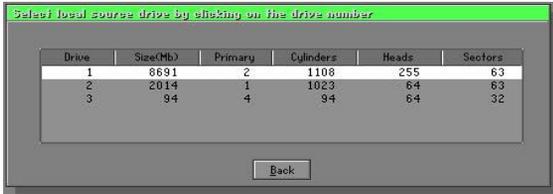


4. Click OK to display the following confirmation screen. Select **Yes** to start.

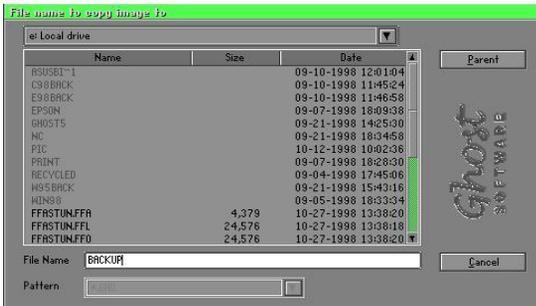


Disk To Image (Disk Backup)

1. Select the location of the Source drive.



2. Select the location for storing the backup file.

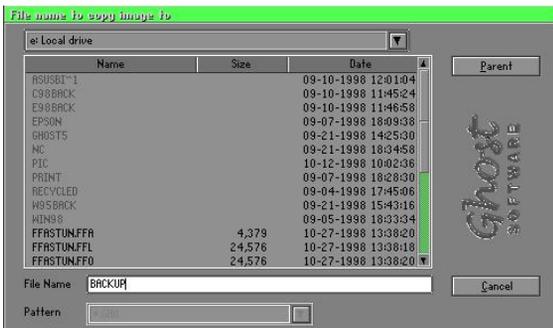


3. Click **OK** to display the following confirmation screen. Select **Yes** to start.



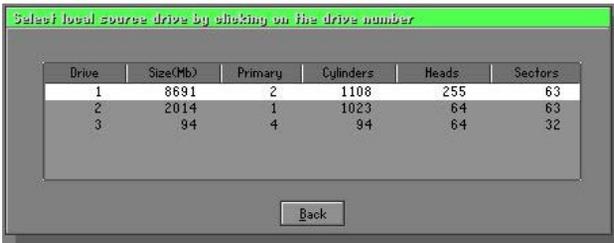
Disk From Image (Restore Backup)

1. Select the Restoring file.



Appendix

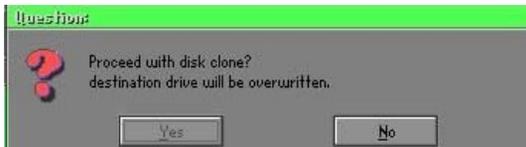
2. Select the **Destination drive** of the disk to be restored.



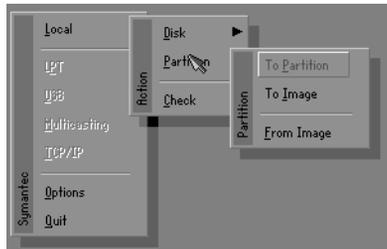
3. When restoring disk backup, set the required partition size as shown in the following figure.



4. Click **OK** to display the following confirmation screen. Select **Yes** to start.



Partition



There are 3 partition functions:

1. **Partition To Partition** (partition cloning)
2. **Partition To Image** (partition backup)
3. **Partition From Image** (restore partition)

Partition To Partition (Partition Cloning)

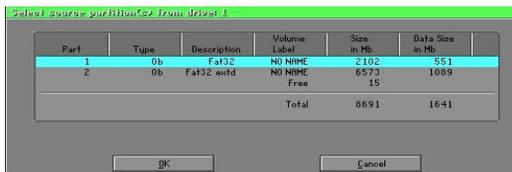
The basic unit for partition cloning is a “partition”. Refer to “disk cloning” for the operating method.

Partition To Image (Partition Backup)

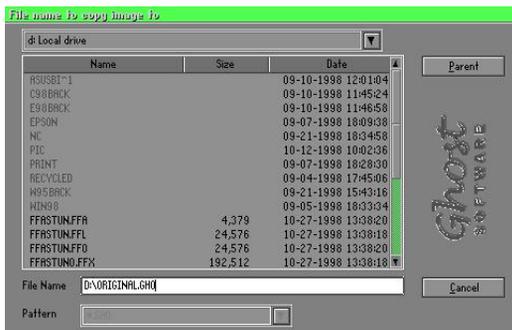
1. Select the disk to be backed up.



2. Select the first partition to be backed up. This is usually where the operating system and programs are stored.

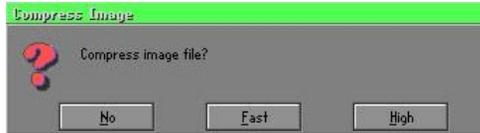


3. Select the path and file name to store the backup file.



Appendix

4. Is the file compressed? There are 3 options:
 - (1) No: do not compress data during backup
 - (2) Fast: Small volume compression
 - (3) High: high ratio compression. File can be compressed to its minimum, but requiring longer execution time.

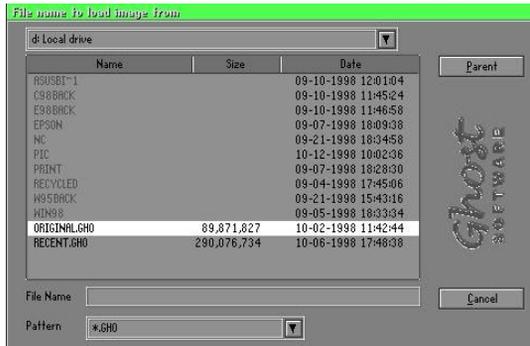


5. Select Yes to start performing backup.

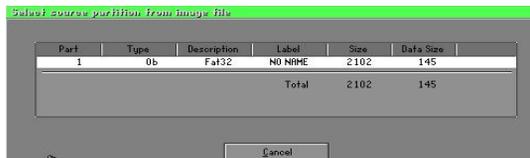


Partition From Image (Restore Partition)

1. Select the backup file to be restored.



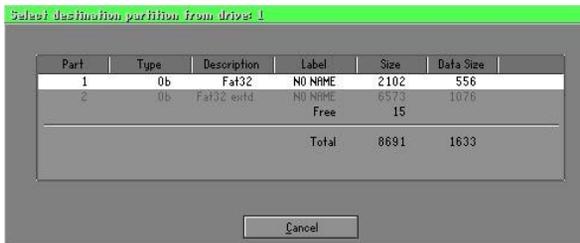
2. Select the source partition.



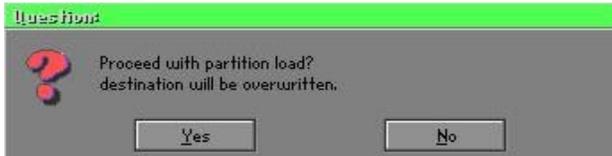
3. Select the disk to be restored.



4. Select the partition to be restored.



5. Select Yes to start restoring.



Check

This function is to check possible error caused by defective FAT or track during backup or restoring.

How to Reinstall Windows in 2 Minutes

This chapter guides you how to setup your computer properly and, if necessary, reinstall Windows in 2 minutes. Ghost provides different methods to complete this task. The following two sections explain how to create an emergency Recover Floppy and Recover CD:

Emergency Recover Floppy

Divide a hard disk into two partitions. The first partition is to store the operating system and application programs. The second partition is to back up the operating system and data. The size of the partition can be determined according to the backup requirements. For example, the **Windows** operating system needs 200MB of hard disk space, Plus complete **Office** programs require 360MB. The remaining space can be used to store data.

After installing **Windows**, use **Ghost** to create a backup area for the system and to store the file (Image file) in drive D. The file is named **Original.gho**. Then, create a recover floppy disk containing:

- ◆ Bootable files (Command.com, Io.sys, and MSDOS.SYS)
- ◆ Config.sys (configuration setup file)
- ◆ Autoexec.bat (auto-execution batch file)
- ◆ Ghost.exe (Ghost execution file)

There are two ways to create the content of the recover floppy for restoring:

- (1) To load **Windows** automatically after booting, store the **Autoexec.bat** file with a command line:

```
Ghost.exe clone, mode=pload, src=d:\original.gho:2,dst=1:1 -fx -sure -rb
```

Command Description: Runs the restore function automatically with the Image File. Stored in drive D. After execution, it will exit Ghost and boots the system.

Refer to the [Introducing Ghosts Functions] for details.

- (2) After booting, the screen displays the Menu. Select Backup or Restore: Since the user may install other applications in the future, he/she may alter **Autoexec.bat** file to back up or restore the user-defined Image file as follows:

Backup

Back up Windows and application programs as a file (Recent.gho). Command is:

```
Ghost -clone,mode=pdump,src=1:1,dst=d:\Recent.gho -fx -sure -rb
```

Restore

Restore types include [**General Windows**] and [**Windows and Application Programs**]. If you select [**General Windows**], the system is restored to the general **Windows** operation condition. The command is:

```
Ghost.exe -clone,mode=pload,src=d:\Original.gho,dst=1:1 -fx -sure -rb
```

If you select [**Windows and Application Programs**], the latest backup file (Recent.gho) is restored, skipping the installation and setup of application programs.

For description of related parameters, refer to [**Introducing Ghosts Functions**].

For more information about menu design, refer to Config.sys and Autoexec.bat under /Menu in the CD. You can also create a backup CD containing Ghost.exe and these two files.

Recover CD

The following is a simple guide to create a recover CD:

1. First, create a recover floppy disk contains the following with any copy program such as “Easy CD Create” (Note 2) :

Bootable files (Command.com and Io.sys and MSDOS.SYS)

Config.sys (Configuration setup file)

Autoexec.bat (Auto-execution batch file)

Mscdex.exe (CD-Rom execution file)

Ghost.exe (Ghost execution file)

Oakcdrom.sys (ATAPI CD-ROM compatible driver)

The content of Config.sys is:

```
DEVICE=Oakcdrom.sys /d:idecd001
```

The content of Autoexec.bat includes:

```
MSCDEX.EXE /D:IDECD001 /L:Z
```

```
Ghost.exe clone,mode=load,src=z:\original.gho,dst=1 -sure -rb
```

2. Write the backup image file (original.gho) of the entire hard disk or partition into the recover CD. Use the Recover CD to boot up the system and restore the backup files automatically.

For description of related parameters, refer to **[Introducing Ghosts Functions]**.

Note: For more details about copy the creation program and method to create a recover CD, please refer to the related software and its associated operating manual.

Note: Ghost may be executed in interactive or in batch mode. Most of the Ghost switches are used to assist in batch mode operation. To list switches, type ghost.exe -h.