



## Electronic Emission Notices

### **Federal Communications Commission (FCC) Statement**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions contained in this manual, may cause harmful interference to radio and television communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- REORIENT OR RELOCATE THE RECEIVING ANTENNA
- INCREASE THE SEPARATION BETWEEN THE EQUIPMENT AND THE RECEIVER
- CONNECT THE EQUIPMENT INTO AN OUTLET ON A CIRCUIT DIFFERENT FROM THAT OF THE RECEIVER
- CONSULT THE DEALER OR AN EXPERIENCED AUDIO/TELEVISION TECHNICIAN

**NOTE:** Connecting this device to peripheral devices that do not comply with Class B requirements, or using an unshielded peripheral data cable, could also result in harmful interference to radio or television reception.

The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables.

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### **Trademarks**

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## HARDWARE CONFIGURATION

### Key Features :

#### Chipset

- ATI® RC350+SB200 chipset.

#### Processor

- Supports Intel® Celeron, Northwood and Prescott processors in the 478-pin package (**with 0.8V~1.6V voltage**)
- Supports 64-bit PSB (Processor System Bus) frequency of 400MHz (100MHz bus clock), 533MHz (133MHz bus clock)
- Supports 64-bit PSB (Processor System Bus) frequency of 800MHz (200MHz bus clock)

#### VRM 10.0 (Voltage Regulator Modules) on Board

- Flexible motherboard design with on board VRD 10.0, easy to upgrade with future Intel® Celeron, Northwood and Prescott processors.
- 0.8375V to 1.600V in 12.5mV steps.

#### System Memory

- A total of two 184pin DDR SDRAM sockets.
- DIMM size from 64 Mbytes to 2Gbyte.
- Support 266/333/400 DDR SDRAM memory type.
- 2.5V DRAM interface for DDR SDRAM.

#### On-board I/O

- On board two PCI fast IDE ports supporting up to 4 ATA, ATA2 , Ultra ATA33/66/100 IDE HDDs, CD-ROMs, ZIP drives and LS-120 drives as boot drive.
- One ECP/EPP parallel port.
- One 16550 Compatible UART serial port (By header).
- One floppy port supports two FDD of 360KB, 720KB, 1.2MB , 1.44MB and 2.88MB capacity.
- Six USB ports (four ports via two headers).
- PS/2 keyboard connector.
- PS/2 mouse is supported.
- One Front Panel Sound Connector.
- Infrared (IrDA) is supported via a header.

**System BIOS**

- PnP, APM, ATAPI for Windows®2000/XP.
- Full support of ACPI & DMI.
- Auto detects and supports LBA harddisks with capacities over 160GB.
- Easy to upgrade BIOS by end-user.

**Plug-and-Play**

- Supports Plug and Play specification 1.1.
- Plug and Play for Windows®2000 as well as Windows®XP.
- Fully steerable PCI interrupts.

**On-board AC97 Sound (optional)**

- Integrated AC97 controller with standard AC97 Codec.
- Direct Sound and Sound Blaster compatible.
- Full-Duplex 16-bit record and play back.
- PnP and APM 1.2 support.
- Windows®2000/XP drivers ready.
- Line-in, Line-out, Mic-in .
- Supports ALC650/ALC655 AC97 Code for six sound channel output (optional).

**On-board Realtek RTL8100C PCI LAN (optional)**

- Provides 32-bit performance, PCI bus master capability.
- Full compliance with IEEE 802.3u 100 Base-T specifications and IEEE 802.3X Full Duplex Flow Control.
- Supports 10 Mb/s and 100 Mb/s operation.
- Supports Wake-On-LAN function and remote wake-up.
- Supports ACPI, PCI Power management and PCI VPD.

**On Board VGA**

- Integrated ATI Radeon 9200 graphic core.
- Supports display ( CRT or TV out).
- Integrated DAC and CRT controllers.
- Full screen/Full speed video playback.
- Up to 2048x1536, non-interlaced screen resolution for CRT.

**TV Out**

- Integrated TV encoder.
- 10-bit DAC with 4-tap filter.
- PAL/NTSC TV Out with Composite and S-Video Outputs.
- ATI's exclusive "Composite Dot Crawl" freeze option for PAL and NTSC to improve the picture quality.
- TV-Out power management support.

**Full Featured Accelerated Graphics Port (AGP)**

- Supports AGP3.0 including 4X/8X AGP card.
- AGP 1.5V connector support only.
- High priority access support.

**Expanded USB Support**

- Two OHCI and 1 EHCI Host controllers to support 6 USB 1.1/2.0 devices.
- All 6 ports are USB 1.1("Full Speed", "Low Speed") and 2.0 ("High Speed") compatible.
- This motherboard support USB 2.0 feature only on Windows®2000/XP OS.(Please install the newest Microsoft service pack)

**Power Management**

- Supports SMM, APM and ACPI.
- Break switch for instant suspend/resume on system operations.
- Energy star "Green PC" compliant.
- Hardware monitoring circuit is supported, provide voltage, temperature, fan speed, etc. monitoring (optional).
- Supports suspend-to-RAM(STR) (optional).
- External Modem Ring-in Wake-up support.

**Note:** *Make sure that the current of your 5VSB power supply is over than 1.5A.*

**VIA VT6307 IEEE1394(optional)**

- Compliant with 1394 open HCI specifications v1.0 and v1.1.
- Integrated 400Mbit 2 ports PHY.

**Expansion Slots**

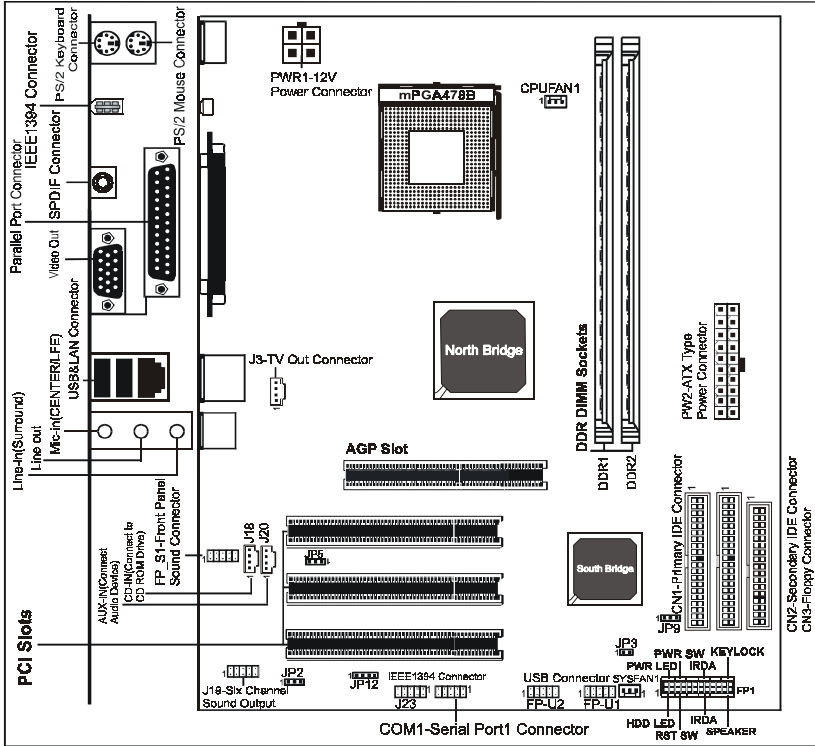
- 1 AGP slot (supports 1.5V AGP card only).
- 3 PCI bus master slots - ver. 2.1 compliant.



Static electricity can harm delicate components of the motherboard. To prevent damage caused by static electricity, discharge the static electricity from your body before you touch any of the computers electronic components.

## Motherboard Layout (35-AA43-X0-XX)

The following diagrams show the relative positions of the jumpers, connectors, major components and memory banks on the motherboard.



# The LAN, IEEE1394 and J19 connectors are optional.

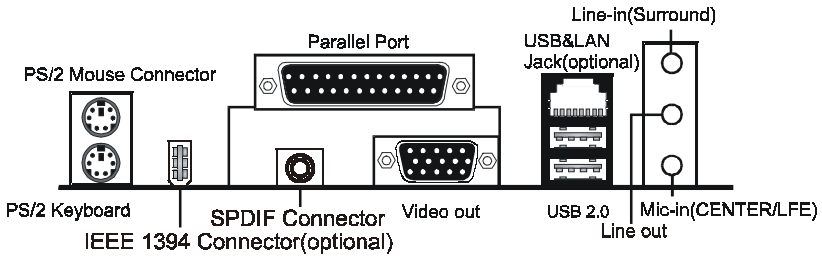
# The ALC650/ALC655 embeds an internal analog switch (by driver software) to share LINE input with Surround output, and share MIC input with CENTER/LFE output.

### NOTE

- 1) Be sure to check the cable orientation in order to match the colored strip to the pin1 end of the connector.
- 2) When you start up the system, please wait for 5 seconds after you power on AC.
- 3) It is not recommended to add a metal spacer plate on the back of the Socket478. Otherwise, some components will be short and damaged.

## Rear Panel

The back panel provides the following connectors:



### Mouse Connector

The mainboard provides a standard PS/2<sup>®</sup> mouse mini DIN connector for attaching a PS/2<sup>®</sup> mouse. You can plug a PS/2<sup>®</sup> mouse directly into this connector.

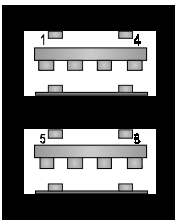
### Keyboard Connector

The mainboard provides a standard PS/2<sup>®</sup> keyboard mini DIN connector for attaching a PS/2<sup>®</sup> keyboard. You can plug a PS/2<sup>®</sup> keyboard directly into this connector.

### USB 2.0 Connector

The mainboard provides a UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB device directly into the connector.

#### USB 2.0 Connector



#### USB 2.0 Connector Description

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V/5VSB (optional)
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V/5VSB (optional)
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground



---

### **VIA VT6307 IEEE 1394 Connector (Optional)**

The mainboard provides a IEEE 1394 Connector and allows you to connect a IEEE 1394 device directly to the connector.

### **SPDIF Connector(Optional)**

The mainboard provides a S-Bracket (SPDIF) Connector that allows you to connect a S-Bracket (coaxial) for a Digital Interface (SPDIF).

### **Video Out Connector (Optional)**

The mainboard provides a Video out port to connect a 15-pin analog video monitor.

### **LAN Jack (Optional)**

The mainboard provides one standard RJ-45 jack for connection to Local Area Network(LAN). You can connect a network cable to the LAN jack.

### **Parallel Port Connector:LPT**

The mainboard provides a 25-pin female centronic connector as LPT. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.

### **Audio Port Connector**

**Line Out** is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic In** is a connector for microphones. The ALC650/ALC655 embeds an internal analog switch (by driver software) to share LINE input with Surround output, and share MIC input with CENTER/LFE output.

## Audio Configuration

After installing the audio driver, you can select 4/6 channel surround audio output in software utility and then connect surround speakers to appropriate audio ports.

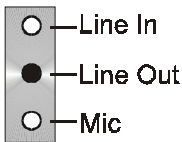
There are two ways to obtain 4/6 channel surround audio output:

1. 4/6 surround audio output of back panel only. All surround speaker connect to audio connector.
2. S-Bracket (optional cable). You have installed S-Bracket into the computer, and then connect two front speakers to back panel's "Line-out" port, and the rest of speakers to S-Bracket. Detail connection is refer to Page 17.

## Speaker Configuration

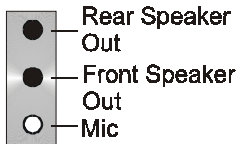
### Method 1: 4/6 Surround audio output of back panel only.

After installing the audio drivers, you can attach the speakers for 2-/4-/6-channel audio output. Always connect the speakers to the LINE OUT connectors. Different connector configurations for 2-/4-/6-channel operations are listed below:



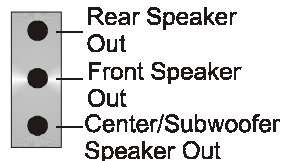
#### 2-Channel

In 2-channel configuration, Line Out, Line In and MIC functions all exist.




#### 4-Channel

When set to 4-channel configuration, Line In is replaced by Rear Speaker Out. Line in function does not exist.



#### 6-Channel

When set to 6-channel configuration, Line In is replaced by Rear Speaker Out. Mic is replaced by Center/Subwoofer Speaker Out. Line in and Mic do not exist function.

In utility, double click “AC97 Audio configuration” icon  from the window tray on the right bottom.

Then the “AC97 Audio Configuration” will appear. Click on the **Speaker Configuration** tab to select the audio mode.

A. When you choose 4-channel mode for 4 speaker output, the selected item is showed as below (Figure1)



(Figure1)

B. When you choose 6-channel mode for 5.1 speaker output, the selected item is showed as below (Figure2)



(Figure2)

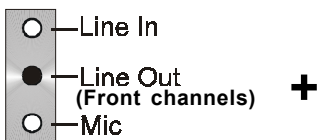
### Method 2: Using S-BRACKET connectors:

S-Bracket (The S-Bracket is showed in page 17) is an optional accessory. To use the S-Bracket, you should select correct setting in the software utility. For information about the setting, refer to selecting 4- or 6- Channel Setting later in the section.

Connector configurations for 4- and 6- channel using S-Bracket are described below:

## 4-Channel Analog Audio Output

### Back Panel

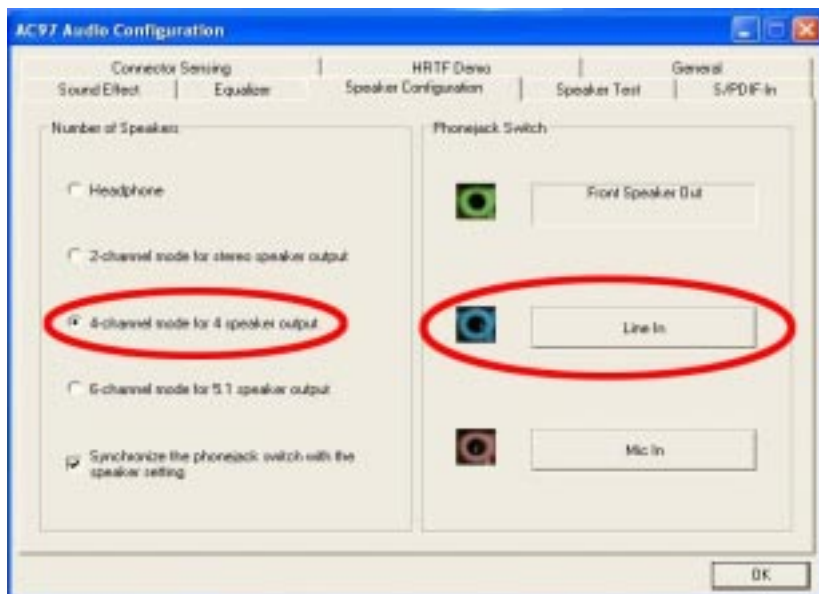


### S-Bracket



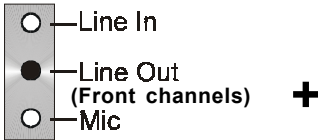
### Description:

Connect two speakers to back panel's Line Out connector and two speakers to one Line Out connector of S-Bracket, or four speaker to connector of S-Bracket. If you want to use **Line In** function, please click the **Rear Speaker Out** button (showed as below)



## 6-Channel Analog Audio Output

### Back Panel

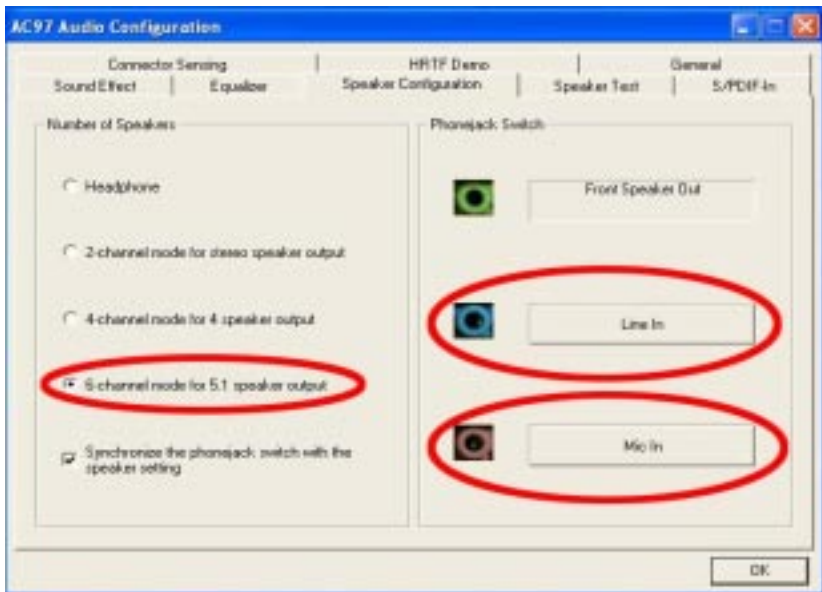


### S-Bracket



### Description:

Connect two speakers to back panel's Line Out connector and four speakers to both Line Out connectors of S-Bracket, or six speaker to the connector of S-Bracket if you want to use **Line In** and **MIC** function at the same time, please click the **Rear Speaker Out** and **Center/Subwoofer Speaker Out** buttons. (showed as below)



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## Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, USB Ports and CPU/System FAN etc.

### Floppy Disk Drive Connector:CN3

The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.

### Hard Disk Connectors:CN1&CN2

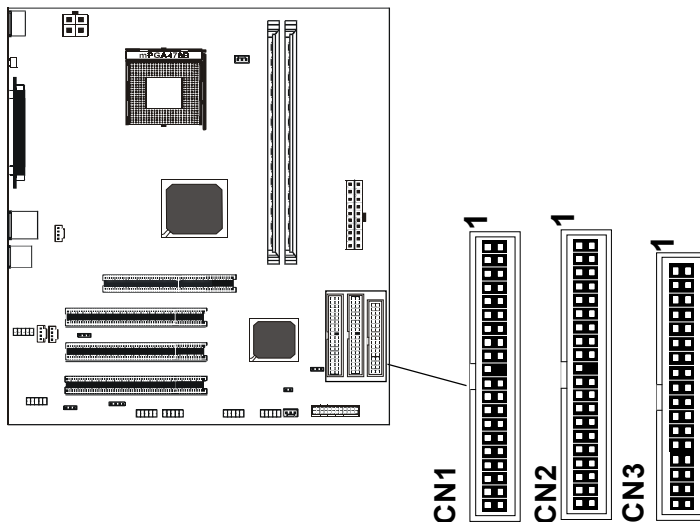
The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 33/66/100 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices.

#### CN1 (Primary IDE Connector)

The first hard drive should always be connected to CN1. CN1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

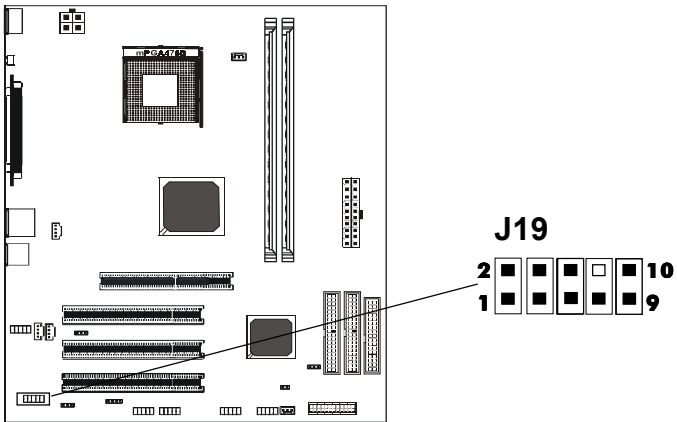
#### CN2 (Secondary IDE Connector)

CN2 can also connect a Master and a Slave drive.



## Back Panel Bracket-Six Channel Audio Output Connector: J19 (Optional)

The motherboard provides six channel output(FL/FR,RL/RR,CEN/LEF) connector,that allows you to use the 6 channel audio output features at the same time.

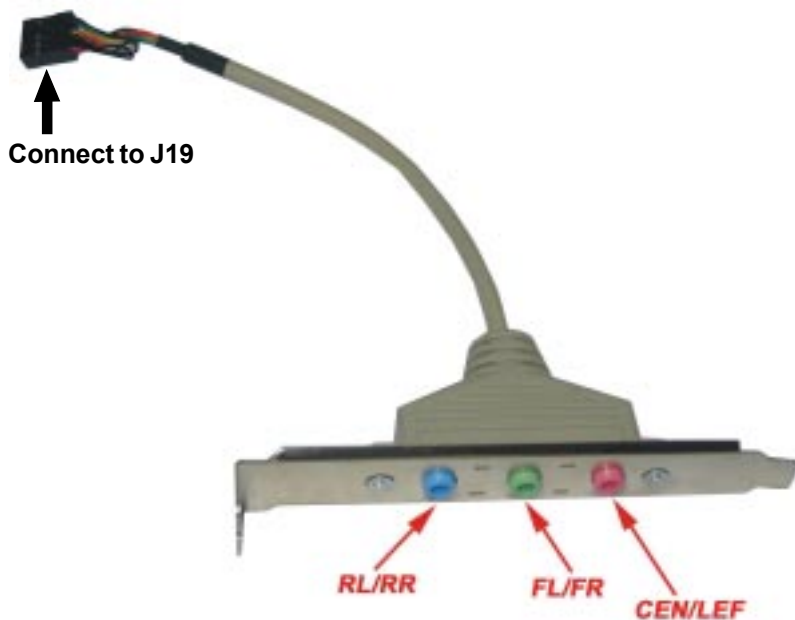




## J19-Back Panel Bracket

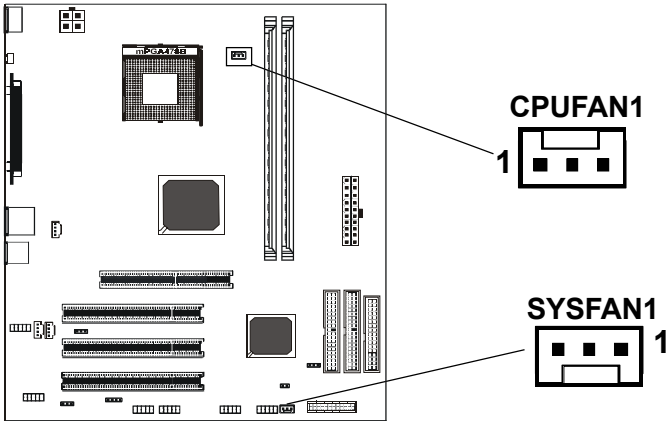
PIN	SIGNAL	DESCRIPTION
1	SOUT-L	Audio left surrounding output
2	SOUT-R	Audio right surrounding output
3	GND	Ground
4	GND	Ground
5	CET-OUT	Audio center output
6	LFE-OUT	Audio bass output
7	GND	Ground
8	NC	Key
9	SPK L	Front left output
10	SPK R	Front right output

### Back Panel Cable (optional)



## Fan Power Connectors:CPUFAN1/SYSFAN1

The CPUFAN1 (processor fan), SYSFAN1 (system fan) support system cooling fan with +12V.It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

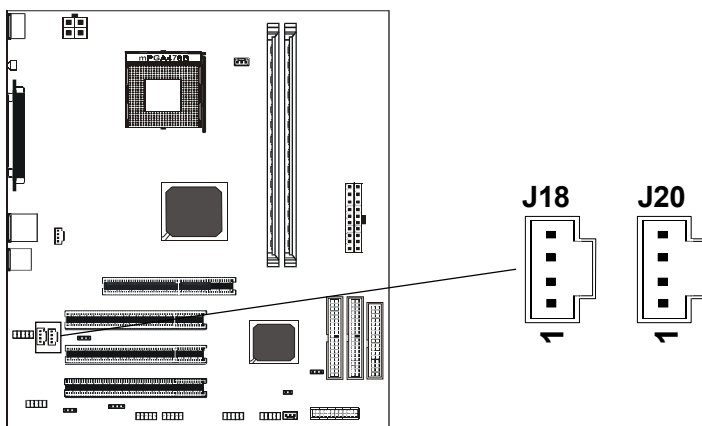


## AUX-IN Connector: J20

The connector is for Audio Device.

## CD-IN Connector: J18

The connector is for CD-ROM Drive.



### J20: AUX-IN

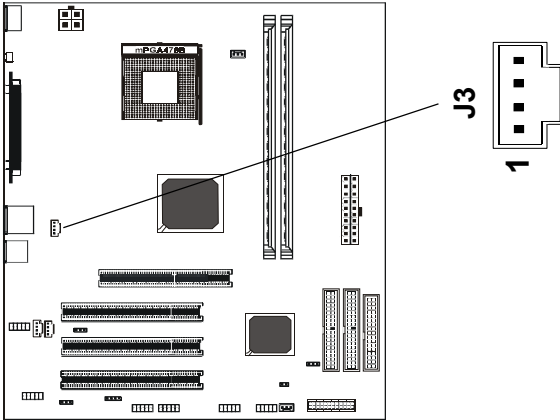
PIN	Assignment
1	AUX-L
2	GND
3	GND
4	AUX-R

### J18 : CD-IN

PIN	Assignment
1	CD-L
2	GND
3	GND
4	CD-R

## TV Out Connector

The mainboard provides TV Out connectors.



### J3 : TV Out

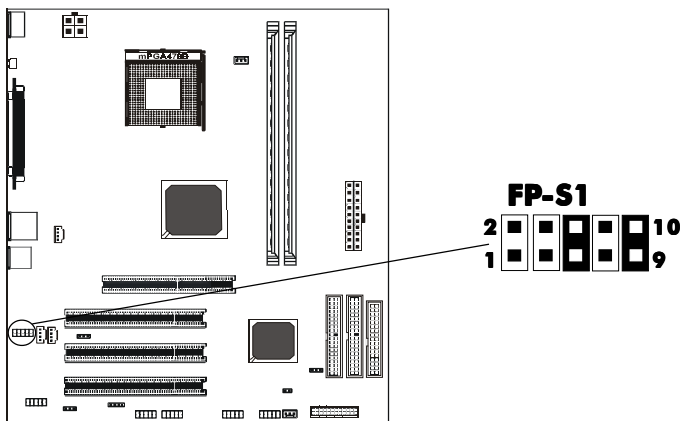
PIN	Assignment
1	C
2	GND
3	COMP/B
4	Y

### TV Out cable (optional)



## Front Panel Audio Header: FP-S1

This mainboard supports front panel microphone and speaker out ports. If your computer case has these ports, connect them to FP-S1.



### FP-S1

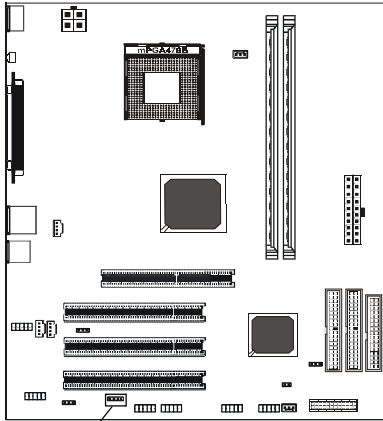
PIN	Assignment
1	MIC
2	GND
3	REF
4	POWER
5	AUD-OUT-R
6	AUD-RET-R
7	Reserved
8	Key(No pin)
9	AUD-OUT-L
10	AUD-RET-L

#### Note:

If you want to use "Front Audio" connector, you must remove 5-6,9-10 jumper. In order to utilize the front audio header, your chassis must have front audio connector. Also please make sure the pin assignment on the cable is the same as the pin assignment on the MB header. To find out if the chassis you are buying support front audio connector, please contract your dealer.

## Chassis Alarm Lead:JP12(optional)

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



### JP12 Pin Definition

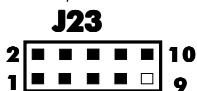
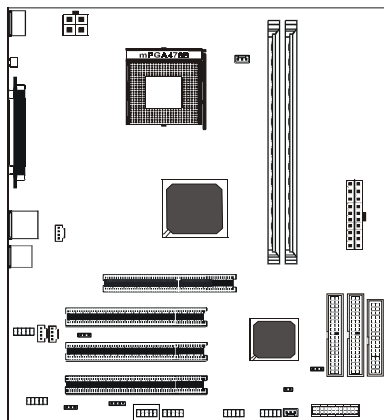
PIN	Assignment
1	+5VSB
2	KEY
3	Chassis Signal
4	GND

#### Note:

*If you want to use "Chassis Alarm" Connector, you must remove 3-4 jumper.*

## IEEE 1394 Connector: J23 (optional)

The mainboard provides one 1394 pin headers that allow you to connect IEEE 1394 ports.



## IEEE1394 Pin Definition

PIN	SIGNAL
1	TPA+
2	TPA-
3	Ground
4	Ground
5	TPB+
6	TPB-
7	Cable power
8	Cable power
9	Key (no pin)
10	Ground

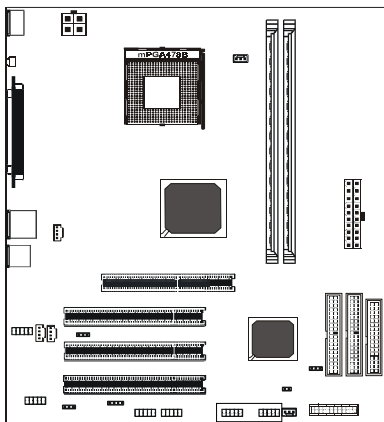
## IEEE 1394 Cable (optional)





## USB Connectors: FP-U1/FP-U2

This mainboard has USB ports. Some computer cases have a special module that mounts USB ports at the front of the case. If you have this kind of case, use auxiliary USB connectors FP-U1/FP-U2 to connect the front mounted ports to the mainboard.



### FP-U2



### FP-U1

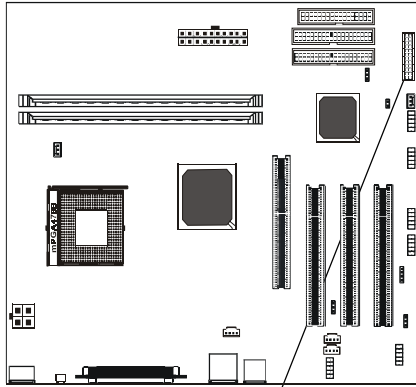


### FP-U1

PIN	Assignment
1	VCC
2	VCC
3	USBP0-
4	USBP1-
5	USBP0+
6	USBP1+
7	GND
8	GND
9	KEY
10	OC#

## Front Panel Header: FP1

The mainboard provides one front panel connector.

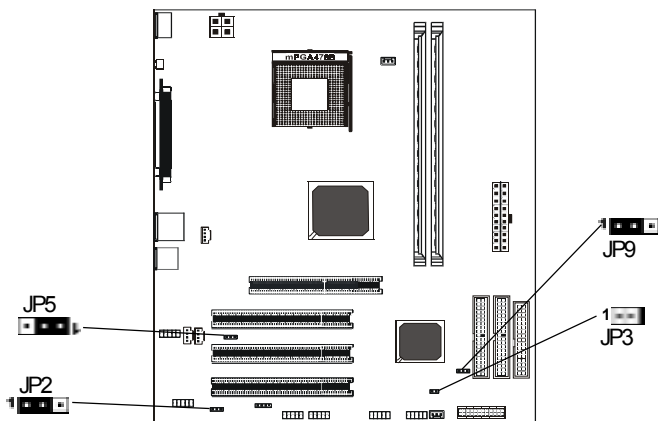


### FP1

	24	■	23	VCC
KEYLOCK	22	■	21	GND
KEY	20	□	19	NC
KEY	18	□	17	SPEAKER
IRRX	16	■	15	IRTX
GND	14	■	13	VCC
KEY	12	□	11	NC
KEY	10	□	9	NC
GND	8	■	7	RESET
PWR_SW	6	■	5	GND
PW_LED-	4	■	3	HDD_LED-
PW_LED+	2	■	1	HDD_LED+

## Jumper Setting

This chapter explains how to configure the motherboard's hardware. Before using your computer, make sure all jumpers and DRAM modules are set correctly. Refer to this chapter whenever in doubt.



### JP9 - CMOS Clear

JP9	Selection
1-2*	Normal*
2-3	CMOS Clear

### JP2- On Board AC97 Sound Select

JP2	Function
1-2*	AC97 Sound Enable*
2-3	AC97 Sound Disable

### JP5 - On Board LAN Select (optional)

JP5	Function
1-2*	LAN Enable*
2-3	LAN Disable

### JP3 - On Board IEEE1394 Select (optional)

JP3	Function
Open*	IEEE1394 Enable*
1-2	IEEE1394 Disable



Close

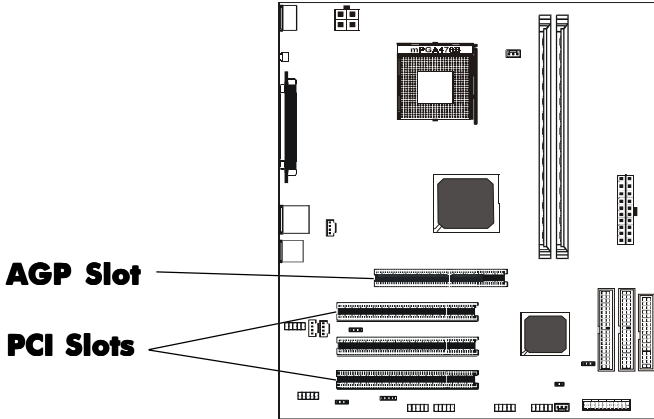


Open

\* = Default setting.

## Slots

The motherboard provides one AGP slot , three 32-bit PCI bus slots.



### **AGP (Accelerated Graphics Port) Slot**

The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller.

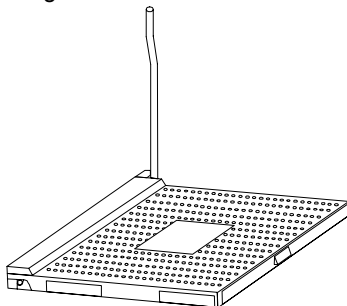
### **PCI (Peripheral Component Interconnect) Slots**

The PCI slots allow you to insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

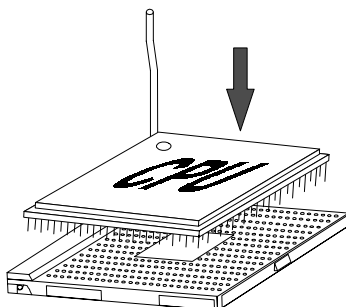
## CPU Installation

Please refer to the following steps to install the CPU.

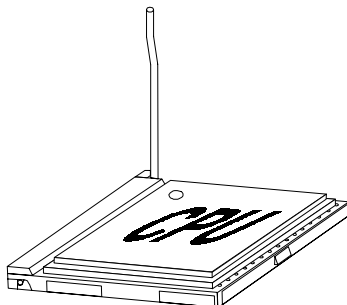
1. Please turn off the power and unplug the power cord before installing the CPU. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90 degree angle.



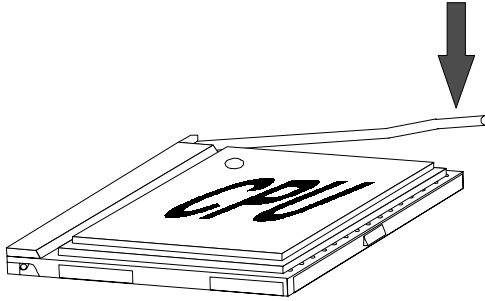
2. Look for the gold arrow. The gold arrow should point towards the lever pivot. The CPU can only fit in the correct orientation.



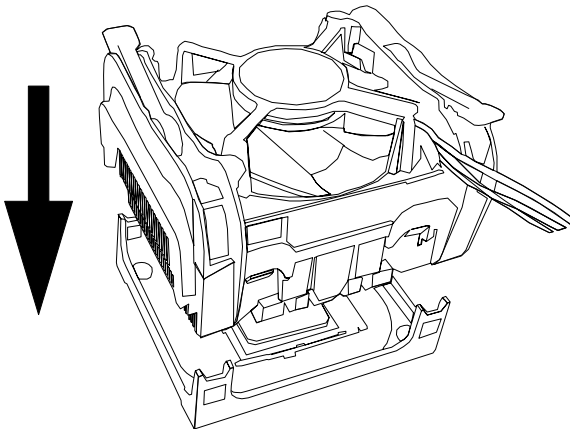
2. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.

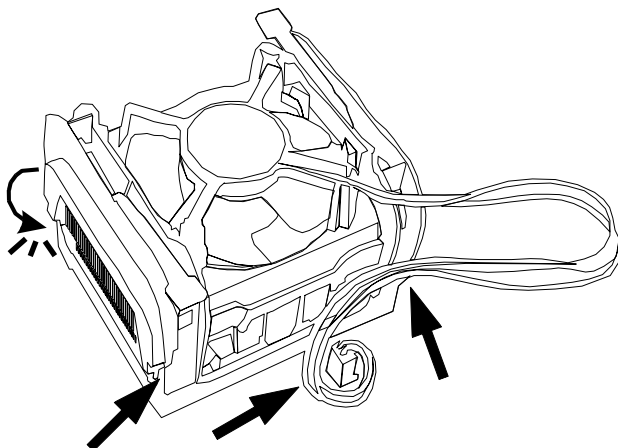


4. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



5. Position the CPU cooler set onto the CPU.





6. Use one end of the clip to hook the latch of the CPU sliding plate and then hook the other three latch to fix the cooling fan set. At last, connect the fan to the power supply connector provided on your mainboard.



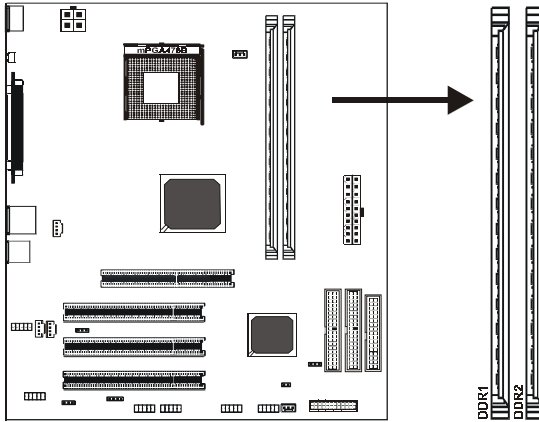
CAUTION!

**When using Prescott CPU, It is recommended that the CPU heat sink should be copper base and with fins radiated to all four directions so that the CPU power generating area can be blown.**

## Memory Configurations

### 1. DDR DIMM Sockets Location

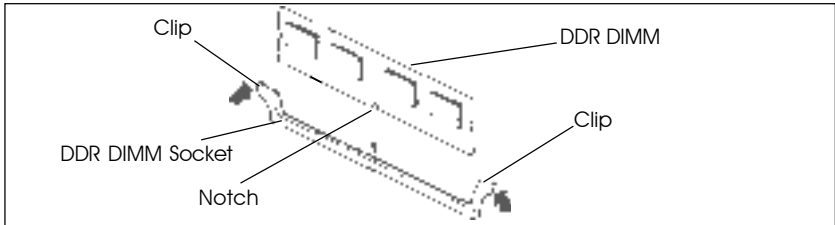
Please refer to the following figure for the location of the DDR DIMM Sockets.



### 2. Install DDR DIMMs

**Please follow the following steps to install DDR DIMMs.**

- Locate the DDR DIMM sockets.
- Holding the DDR DIMM by the edges, remove it from its antistatic package.
- Make sure the clips at either end of the socket are pushed away from the socket.



- Position the DDR DIMM above the socket. Align the two small notches in the bottom edge of the DDR DIMM with the keys in the socket.
- Insert the bottom edge of the DDR DIMM into the socket.
- When the DDR DIMM is seated, push down on the top edge of the DDR DIMM until the retaining clips at the ends of the socket snap into place. Make sure the clips are firmly in place.



**Please unplug the power supply before installing and removing any device, otherwise you'll cause the system damage.**

Please refer to recommended DDR400 vendors list of page 47.



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## BIOS Setup

This chapter discusses Award's Setup Program built into the ROM BIOS. The Setup Program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM, which retains the setup information when the power is turned off.

### Starting Setup

The Award BIOS is immediately activated when you turn on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup Program can be activated :

1. By pressing <Del> immediately after switching the system on, or
2. By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test )

#### ***Press DEL to enter SETUP***

If the message disappears before you can respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing the <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not reset, an error message will be displayed and you will again be asked to ...

#### ***PRESS F1 TO CONTINUE, DEL TO ENTER SETUP***

### Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

### In Case of Problems

If, after making and saving system changes with the Setup Program, you discover that your computer does not reset, use the Award BIOS defaults to override the CMOS settings.

## Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from various setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

Phoenix - Award BIOS CMOS Setup Utility	
<ul style="list-style-type: none"> <li>▶ <b>Standard CMOS Features</b></li> <li>▶ Advanced BIOS Features</li> <li>▶ Advanced Chipset Features</li> <li>▶ Integrated Peripherals</li> <li>▶ Power Management Setup</li> <li>▶ PnP/PCI Configurations</li> <li>▶ PC Health Status</li> </ul>	<ul style="list-style-type: none"> <li>Load Fail-Safe Defaults</li> <li>Load Optimized Defaults</li> <li>Set Supervisor Password</li> <li>Set User Password</li> <li>Save &amp; Exit Setup</li> <li>Exit Without Saving</li> </ul>
Esc : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item
Time, Date, Hard Disk Type ... ..	

**(Note : The figures of BIOS Setup Menu included here only show a typical case, and may not be exactly the same as the one on your unit.)**

Note that a brief description of each highlighted item will appear at the bottom of the screen.

**Standard CMOS Features** This setup page includes all the items of Award™ special standard features.

**Advanced BIOS Features** This setup page includes all the items of Award™ special enhanced features.

**Advanced Chipset Features** This setup page includes all the items of chipset special features.

**Integrated Peripherals** This section page includes all the items of IDE hard drive and Programmed Input / Output features.

**Power Management Setup** This entry only appears if your system supports Power Management "Green PC" standards.

**PNP/PCI Configurations** This entry appears if your system supports PNP/PCI.

**PC Health Status** Display CPU and Case Fan Speed etc.

**Load Fail-Safe Defaults**  
Use this menu, to load the BIOS values for the best system performance, but the system stability may be affected.

- Load Optimized Defaults** The chipset defaults are settings which provide for maximum system performance. While Award has designed the custom BIOS to maximize performance, the manufacturer has the right to change these defaults to meet its needs.
- Set Supervisor/User Password** Changes, sets, or disables password. It allows you to limit access to the system and the Setup Program.
- Save & Exit Setup** Saves value changes to CMOS and exits setup.
- Exit Without Saving** Abandons all CMOS value changes and exits setup.

## Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes one or more setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> key to select the desired value in each item.

### Phoenix - Award BIOS CMOS Setup Utility Standard CMOS Features

		Item Help
Date (mm :dd :yy)	Mon, Jan 5 2004	
Time (hh :mm:ss)	9 : 21 : 10	
▶ IDE Primary Master	[None]	Menu Level ▶
▶ IDE Primary Slave	[None]	Change the day, month, year and century
▶ IDE Secondary Master	[None]	
▶ IDE Secondary Slave	[None]	
Drive A	[1.44M, 3.5 in.]	
Drive B	[None]	
Video	[EGA/VGA]	
Halt on	[All, but keyboard]	
Base Memory	640K	
Extended Memory	227328K	
Total Memory	228352K	

↑↓→ Move Enter: Select +/-/PU/PD : Value F10 : Save ESC : Exit F1 :General Help  
F5 : Previous Values F6 : Fail-Safe Defaults F7 : Optimized Defaults

**(Note : The figures of BIOS Setup Menu included here only show a typical case, and may not be exactly the same as the one on your unit.)**

**Date** The date format is <day-of-the-week>. <month> <day> <year>.

**Time** The time format is <hour> <Minute> <second> displayed in 24-hour military-time clock. For example, 1 p. m. is displayed as 13:00:00.

**IDE Primary Master**

**IDE Primary Slave** These categories identify the types of the two channels that have been installed in the computer.

**IDE Secondary Master**

**IDE Secondary Slave**

If the controller of the HDD interface is SCSI, the selection shall be "None".

**Drive A** This category identifies the types of floppy disk drive A or drive B that has been installed in the computer.

**Drive B**

**Video** The default setting is EGA/VGA.

**Halt on** You can select which type of error will cause the system to halt.

## **Advanced BIOS Features**

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Phoenix - Award BIOS CMOS Setup Utility  
Advanced BIOS Features

▶ CPU Feature	[Press Enter]	▲	Item Help
▶ Hard Disk Boot Priority	[Press Enter]	■	Menu Level ▶
Virus Warning	[Disabled]		Select Hard Disk Boot Device Priority
CPU L1 & L2 Cache	[Enabled]		
Quick Power On Self Test	[Enabled]		
First Boot Device	[Floppy]		
Second Boot Device	[Hard Disk]		
Third Boot Device	[CDROM]		
Boot Other Device	[Enabled]		
Boot Up Floppy Seek	[Enabled]		
Boot Up Numlock Status	[On]		
Gate A20 Option	[Fast]		
Typematic Rate Setting	[Disabled]		
x Typematic Rate (Chars/Sec)	6		
x Typematic Delay (Msec)	250		
Security Option	[Setup]		
APIC Mode	[Enabled]		
MPS Version Control For OS	[1.4]		
OS Select For DRAM > 64MB	[Non-OS2]		
HDD S.M.A.R.T. Capability	[Disabled]		
Full Screen LOGO Show	[Enabled]		
Small Logo (EPA) Show	[Enabled]	▼	

↑↓→ Move Enter: Select  
F5 : Previous Values

+/-/PU/PD : Value F10 : Save ESC : Exit F1 :General Help  
F6 : Fail-Safe Defaults F7 : Optimized Defaults

### Virus Warning:

This item can be set to Enabled or Disabled, the default setting being Disabled. When this feature is enabled, if there is any attempt from a software or an application to access the boot sector or the partition table, the BIOS will warn you that a boot virus is attempting to access the hard disk.

### CPU Level 1 Cache:

This item is used to enable or to disable the CPU level 1 cache. When the cache is set to Disabled it is much slower, so the default setting for this item is Enabled since it will speed up memory access. Some old and very poorly written programs will make the computer malfunction or crash if the system speed is too high. In this case, you should disable this feature. The default setting is Enabled.

### CPU Level 2 Cache:

This item is used to enable or to disable the CPU level 2 cache ECC checking function. The default setting is Enabled.

**Quick Power On Self Test:**

After the computer has been powered on, the BIOS of the motherboard will run a series of tests in order to check the system and its peripherals. If the Quick Power on Self-Test feature is enable, the BIOS will simplify the test procedures in order to speed up the boot process. The default setting is Enabled.

**First Boot Device:**

When the computer boots up, the BIOS attempts to load the operating system from the devices in the sequence selected in these items: floppy disk drive A, LS/ZIP devices, hard drive C, SCSI hard disk drive or CD-ROM. There are ten options for the boot sequence that you can choose (The default setting is Floppy.):

Floppy→LS120→Hard disk→CDROM→ZIP100→USB-FDD→USB-ZIP→  
USB-CDROM→LAN→Disabled

**Second Boot Device:**

Description is the same as the First Boot Device, the default setting is Hard disk.

**Third Boot Device:**

Description is same as the First Boot Device, the default setting is CDROM.

**Boot Other Device:**

Two options are available: Enabled or Disabled. The default setting is Enabled. This setting allows the BIOS to try three kinds of boot devices that set from the above three items.

**Boot Up NumLock Status:**

On: At boot up, the Numeric Keypad is in numeric mode. (Default Settings)

Off: At boot up, the Numeric Keypad is in cursor control mode.

**Gate A20 Option**

This item allows you to select how gate A20 is handled. Gate A20 is a device used to address memory above 1 Mbytes. When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows.

**Typematic Rate Setting:**

This item allows you to adjust the keystroke repeat rate. When set to Enabled, you can set the two keyboard typematic controls that follow (Typematic Rate and Typematic Rate Delay). If this item is set to Disabled, the BIOS will use the default setting. The default setting is Disabled.

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### Typematic Rate (Chars/Sec):

When you press a key continuously, the keyboard will repeat the keystroke according to the rate you have set (Unit: characters/second.. Eight options are available:

6→ 8→ 10→ 12→ 15→ 20→ 24→ 30→ Back to 6. The default setting is 6.

### Typematic Delay (Msec):

When you press a key continuously, if you exceed the delay you have set here, the keyboard will automatically repeat the keystroke according to a certain rate (Unit: milliseconds). Four options are available: 250→ 500→ 750→ 1000→ Back to 250. The default setting is 250.

### Security Option:

This option can be set to System or Setup. The default setting is Setup. After you have created a password through PASSWORD SETTING, this option will deny access to your system (System) or modification of computer setup (BIOS Setup) by unauthorized users.

**SYSTEM:** When you choose System, a password is required each time the computer boots up. If the correct password is not given, the system will not start.

**SETUP:** When you choose Setup, a password is required only when accessing the BIOS Setup. If you have not set a password in the PASSWORD SETTING option, this option is not available. *To disable security, select Set Supervisor Password at main menu and then you will be asked to enter password. Do not type anything and just press the Enter key and it will disable security. Once security is disabled, the system will boot and you can enter the BIOS setup menu freely*

**Notice :** Don't forget your password. If you forget the password, you will have to open the computer case and clear all information in the CMOS before you can start up the system. But by doing this, you will have to reset all previously set options.

### OS Select For DRAM > 64MB:

When the system memory is bigger than 64MB, the communication method between the BIOS and the operating system will differ from one operating system to another. If you use OS/2, select OS2; if you are using another operating system, select Non-OS2. The default setting is Non-OS2.

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

This field allows you to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system that utilizes HDD monitoring technology. This parameter is normally disabled because it may decrease system performance. Configuration options: [Disabled] [Enabled].

### Full Screen LOGO Show

This item enables you to show the company logo on the boot up screen setting are

**Enabled:** Show a still image (logo) on the full screen while booting.


**Disabled:** Show the post messages at boot.

## Advanced Chipset Features

The Chipset Features Setup option is used to change the values of the chipset registers. These registers control most of the system options in the computer.

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It must be stated that these items should not be altered. The default settings have been chosen because they provide the best operating conditions for your system.

Phoenix - Award BIOS CMOS Setup Utility  
Advanced Chipset Features

Memory Frequency For	[Auto]		Item Help
AGP Aperture Size	[64MB]		
UMA Frame Buffer Size	[32MB]		
Video Display Devices	[CRT Only]		
Tv Standard	[NTSC]		
Memory Hole	[Disabled]		
Current FSB Frequency	100 MHz		
FSB Over Clock By	[ +0 MHz]		
DRAM Over Clock By	[ +0 MHz]		
System BIOS Cacheable	[Disabled]		
Video RAM Cacheable	[Disabled]		
Spectrum Spreading Amount	[Disabled]		
Memory Timing Parameter	[Auto]		
AUTO CAS Latency	3 Clocks		
AUTO TRCD	3 Clocks		
AUTO TRP	4 Clocks		
AUTO TRAS	8 Clocks		
x    MANUAL CAS Latency	1 Clock		
x    MANUAL TRCD	1 Clock		
x    MANUAL TRP	1 Clock		
x    MANUAL TRAS	1 Clock		
Memory Enhancement	[Disabled]		

↑↓→ Move    Enter: Select    +/-/PU/PD : Value    F10 : Save    ESC : Exit    F1 :General Help  
 F5 : Previous Values    F6 : Fail-Safe Defaults    F7 : Optimized Defaults

### AGP Aperture Size (MB):

Seven options are available: 32→ 64→ 128→ 256→ 512→ 1GB→ 2GB→None. This option specifies the amount of system memory that can be used by the AGP device. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space.

### System BIOS Cacheable:

You can select Enabled or Disabled. The default setting is Disabled. When you select Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.



## Integrated Peripherals

The Integrated Peripherals Setup allows the user to configure the onboard IDE controller, floppy disk controller, the printer port and the serial ports.

Phoenix - Award BIOS CMOS Setup Utility  
Integrated Peripherals

▶ South OnChip IDE Device	[Press Enter]	▲ ↓ ▼	Item Help
▶ South OnChip PCI Device	[Press Enter]		Menu Level ▶
Init Display First	[PCI Slot]		
USB EHCI Controller	[Enabled]		
OnChip USB Controller	[Enabled]		
OnChip USB KBC Controller	[Enabled]		
IDE HDD Block Mode	[Enabled]		
POWER ON Function	[BUTTON ONLY]		
x Hot Key Power ON	Ctrl-F1		
Onboard FDC Controller	[Enabled]		
Onboard Serial Port 1	[Auto]		
Onboard Serial Port 2	[Disabled]		
x UART Mode Select	Normal		
x UR2 Duplex Mode	Half		
Onboard Parallel Port	[378/IRQ7]		
Parallel Port Mode	[SPP]		
x ECP Mode Use DMA	3		
AC Power Failure	[System Off]		
Game Port Address	[201]		
Midi Port Address	[330]		
Midi Port IRQ	[10]		

↑↓→ Move Enter: Select +-/PU/PD : Value F10 : Save ESC : Exit F1 :General Help  
F5 : Previous Values F6 : Fail-Safe Defaults F7 : Optimized Defaults

### USB EHCI Controller:

Allows you to enable or disable the USB 2.0 EHCI Controller.

### OnChip USB Controller:

Two options are available: Enabled and Disabled. The default setting is Enabled. This motherboard provide two Universal Serial Bus (USB) ports, can supports USB devices. If you don't want to use USB devices, set it to Disabled, then the item USB Keyboard Support will also be disabled.

### OnChip USB KBC Controller:

Two options are available: Enabled and Disabled. The default setting is Enabled. If your system contains a USB keyboard, set it to Enabled.

### IDE HDD Block Mode:

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support. The default setting is Enabled.

### Power On Function:

This item allows you to select which way you want your system to power on. Five items are available: Hot key→ Any key→ Button only→ Keyboard 98.

**Hot Key Power On:**

There are twelve options available, Ctrl-F1 to Ctrl-F12. You can select this item and using the Ctrl plus the one of each function key (F1 to F12) to power on the computer. The default setting is Ctrl-F1.

**Onboard FDC Controller:**

Two options are available: Enabled and Disabled. The default setting is Enabled. You can enable or disable the onboard FDC controller.

**Onboard Serial Port 1:**

This is used to specify the I/O address and IRQ of Serial Port 1. Six options are available: Disabled → 3F8/IRQ4 → 2F8/IRQ3 → 3E8/IRQ4 → 2E8/IRQ3 → AUTO. The default setting is Auto.

**Onboard Parallel Port:**

Sets the I/O address and IRQ of the onboard parallel port. Four options are available: Disable → 3BC/IRQ7 → 378/IRQ7 → 278/IRQ5 . Default setting is 378/IRQ7.

**Parallel Port Mode:**

Four options are available: SPP → EPP → ECP → ECP+EPP. The default setting is SPP mode.

**ECP Mode Use DMA:**

Two options are available: 1 → 3. The default setting is 3. When the mode selected for the parallel port mode is ECP, the DMA channel selected can be Channel 1 or Channel 3.

**AC Power Failure:**

This setting lets you set the system action after a power failure. Three options are available:

System Off → System On → Previous. The default setting is System Off.

**Game Port Address:**

Three options are available: Disabled . 201 . 209. The default setting is 201. This item sets the address of the onboard game port connector.

**Midi Port Address:**

Three options are available: Disabled . 330 . 300 . The default setting is 330. This item sets the address of the onboard midi port connector.

**Midi Port IRQ:**

Two options are available: 5 . 10. The default setting is 10. This item sets the IRQ of the onboard midi port connector. If you choose disable the Midi Port Address, then this field is not available.

## Power Management Setup

The Power Management Setup Menu allows you to configure your system to most save energy while operating in a manner consistent with your own style of computer use.

### Phoenix - Award BIOS CMOS Setup Utility Power Management Setup

ACPI function	[Enabled]	Menu Level
ACPI Suspend Type	[S1 (POS)]	
Power Management Option	[User Define]	Menu Level ▶
HDD Power Down	[Disabled]	
Doze Mode	[Disable]	
Video Off Option	[Suspend - > Off]	
Video Off Method	[V/H SYNC+Blank]	
MODEM Use IRQ	[3]	
Soft- Off by PWRDTN	Instant-Off	
Modem Ring Resume	[Disabled]	
RTC Alarm Resume	[Disabled]	
x Date (of Month)	0	
x Resume Time (hh: mm: ss)	0 : 0 : 0	
▶ IRQ/Event Activity Detect	[Press Enter]	

↑↓→ Move Enter: Select  
F5 : Previous Values

+/-/PU/PD : Value F10 : Save ESC : Exit F1 :General Help  
F6 : Fail-Safe Defaults F7 : Optimized Defaults

### ACPI Function (Advanced Configuration and Power Interface):

ACPI gives the operating system direct control over the power management and Plug and Play functions of a computer. There are two options that can be selected, "Enabled" and "Disabled". You can select "Enabled" to enable ACPI functions. If you want ACPI functions to work normally, you should notice two things. One is your operating system must support ACPI, as of now only Microsoft® Windows® 98/2K/XP supports these functions. The second thing is that all devices and add-on cards in your system must fully support ACPI, both hardware and software (drivers). If you want to know if your devices or add-on cards support ACPI or not, please contact the device or add-on card manufacture for more information. If you want to know more about ACPI specifications, please go to the address below for more detailed information:

<http://www.teleport.com/~acpi/acpihtml/home.htm>

**Note:** If you enable the ACPI function in the BIOS setup, the SMI function will not work.

### ACPI Suspend Type:

Two options are available: S1(POS) and S3(STR). The default setting is S1(POS). Generally, ACPI has six states: System S0 state, S1, S2, S3, S4, S5. S1 and S3 states are described below:

### The S1 (POS) State (POS means Power On Suspend):

While the system is in the S1 sleeping state, its behavior is as described below:

# The processor is not executing instructions. The processor's complex context is maintained.

# Dynamic RAM context is maintained.

# Power Resources are in a state compatible with the system S1 state. All Power Resources that supply a System Level reference of S0 are in the OFF state.

# Devices states are compatible with the current Power Resource states. Only devices which solely reference Power Resources which are in the ON state for a given device state can be in that device state. In all other cases, the device is in the D3 (off) state.

# Devices that are enabled to wake the system and that can do so from their current device state can initiate a hardware event which transitions the system state to S0. This transition causes the processor to continue execution where it left off. To transition into the S1 state, the operating software does not have to flush the processor's cache. From the software point of view, this state is functionally the same as the S2 state. The operational difference can be that some Power Resources that could be left ON in the S2 state might not be available to the S3 state. As such, additional devices can be required to be in logically lower D0, D1, D2, or D3 state for S3 than S2. Similarly, some device wake events can function in S2 but not S3. Because the processor context can be lost while in the S3 state, the transition to the S3 state requires that the operating software flush all dirty cache to DRAM.

Above information for system S0 & S3 were refer to ACPI Specification Rev. 1.0.

### **Power Management Option:**

This item allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. Suspend Mode
2. HDD Power Down

There are three options for power management, three of which have fixed mode settings:

- User Define

"User Define" defines the delay for accessing the power modes.

- Min Saving

When these two saving modes are enabled, the system is set up for minimum power savings.

Suspend Mode = 1 Hour

- Max Saving

When the two saving modes are enabled, the system is set up for maximum power savings.

Suspend Mode = 1 Min

### **MODEM Use IRQ:**

You can specify the IRQ for modem use. Eight options are available: N/A → 3 → 4 → 5 → 7 → 9 → 10 → 11. The default setting is 3.

### **Modem Ring Resume**

Two options are available: Enabled and Disabled. Default setting is Disabled. If you connect an external modem to the onboard serial port, the system will be turned on when a telephone ring-up occurs.

### **RTC Alarm Resume**

Two options are available: Enabled and Disabled. Default setting is Disabled. The RTC alarm can turn on the system. You can set Date (of month) and Time (hour, minute, and second) when you set this item to Enabled.

## PNP/PCI Configurations

This section describes how to configure the PCI bus system. This section covers some very technical items and it is recommended that only experienced users should make any changes to the default settings.

### Phoenix - Award BIOS CMOS Setup Utility PnP/PCI Configurations

Reset Configuration Data	[Disabled]	Item Help
x Resources Controlled By IRQ Resources	[Auto (ESCD)] Press Enter	Menu Level ▶
PCI/VGA Palette Snoop	[Disabled]	Default is Disabled.
Assign IRQ For VGA	[Enabled]	Select Enabled to reset extended System Configuration Data
Assign IRQ For USB	[Enabled]	ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
PCI Latency Timer (CLK)	[ 64]	

↑↓→ Move Enter: Select +/PU/PD : Value F10 : Save ESC : Exit F1 :General Help  
F5 : Previous Values F6 : Fail-Safe Defaults F7 : Optimized Defaults

### Resources Controlled By:

Two options are available: Auto(ESCD) and Manual. Default setting is Auto(ESCD). When the setting is Auto(ESCD), the IRQ Resources can not be changed. When resources are controlled manually, the IRQ Resources can then be changed. The Award Plug and Play BIOS has the capability to automatically configure all of the boot and PnP compatible devices. If you select Auto (ESCD), The IRQ Resources item will be disabled as the BIOS automatically assigns them. But if you have trouble in assigning the interrupt resources automatically, you can select Manual to set which IRQ is assigned to PCI cards.

### PCI /VGA Palette Snoop:

This option allows the BIOS to preview VGA Status, and to modify the information delivered from the Feature Connector of the VGA card to the MPEG Card. This option can solve the display inversion to black after you have used the MPEG card.

## Set Supervisor/User Password

You can set either supervisor or user password, or both of them. The difference between them are:

**Supervisor Password :** You can enter the Setup Program and change the options of the setup menus.

**User Password :** You can enter the Setup Program but can not change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

### ***ENTER PASSWORD:***

Type the password, up to eight characters in length, and press<Enter>. The new password will clear the previously entered password from the CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and operate without a password.

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

### ***PASSWORD DISABLED.***

Once the password is disabled, the system will reset and you can enter the Setup Program freely.

When a password is enabled, you will be prompted to enter it every time you try to enter setup. This prevents an unauthorized person from changing any setting of your system configuration.

In addition, when a password is enabled, you can require the BIOS to request a password every time your system is rebooted. This would further prevent unauthorized use of your computer.

The password requirement is defined by the Security Option of the BIOS Features Setup Menu. If the Security Option is set to "System", the password will be required both at resetting and at entering setup. If the option is set to "Setup", the prompt only appears when you try to enter setup.

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## Flash Update Procedure

A program AWDFLASH.EXE is included in the utility diskette or CD (X:\Utility\AWDFLASH.EXE). The user is recommended to follow the procedure below to update the flash BIOS.

(X: your CD driver letter).

1. Create a DOS-bootable floppy diskette. Copy the new BIOS file (just obtained or downloaded) and the utility program AWDFLASH.EXE to the diskette.
2. Allow the PC system to boot from the DOS diskette.
3. At the DOS prompt, key in

**AWDFLASH**  
and hit <ENTER>

4. Enter the file name of the new BIOS.
5. The question: "Do you want to save BIOS (Y/N)?" is displayed.

*Key in "N" if there is no need to save the existing BIOS content.*

*Key in "Y" if a backup copy of the existing BIOS is needed.*

*(A file name has to be assigned to the existing BIOS binary file.)*

6. The message : "press"Y" to program or "N" to exit" is displayed.

*Key in "Y"*

7. Wait until the flash-update is completed.
8. Power down the PC system.
9. Restart the PC.

### **Warning:**

DO not turn off or RESET the computer during the flash process.

If you are unsure how to upgrade the BIOS, it is best to take your computer to an Authorized Service Center and have a trained technician do the work for you.

## APPENDIX

### 1. Note to User:

The bundled driver CD attached an Auto-Run feature for all the drivers that the motherboard need. Please select the drivers that you want to install and click the button on the installation panel.

### 2. Note to Add-on AGP Card's User:

If you use an Add-on card on the AGP Slot, please follow below steps to get an optimal performance.

- 1.Install all drivers of the bundled driver CD with an Auto-Run feature.
- 2.Browse the bundled driver CD, select the following directory and double-click the **setup.exe** icon to add the AGP miniport driver.  
(**Note:** This manual assumes that your CD-ROM device letter is D:)

Win 9X/ME:

D:\ATI Chipset\RS3xx\_9x\GART9x\

Win 2000/XP/NT4.0:

D:\ATI Chipset\RS3xxVGA\GARTnt\

- 3.Reboot your system.
- 4.Install the VGA driver of your Add-on card.

### 3. Recommended memory modules

Size	Vendor	Part Number	Chip Brand	Chip Number
256M	Infineon	HYS64D32300GU-5-B	Infineon	HYB250256800BT-5
	KingMax	--	KingMax	KDL388P4EA-50
	Transcend	--	Transcend	A2S56D30ATP-5
	Kingston	KVR400X64C3A/256	Hynix	HY5DU56822BT-D43
	Kingston	KVR400X64C3A/256	Winbond	W942508CH-5
	Kingston	KVR400X64C3A/256	Mosel Vitelic	V58C2256804SAT-5
	OEM	--	Samsung	K4H560838E-TCCC
	Microworks	M368L3223ETM-CCC	Samsung	K4H560838E-TCCC
	Adata	--	Adata	ADD8608A8A-5B
	NANYA	--	NANYA	NT256D64S88BIG-5T
	CORSAIR	CMX256A-3200LL	--	--
GEIL	GE2563200B	--	--	
512M	Infineon	HYS64D64300GU-5-B	Infineon	HYB250256800BT-5
	Microworks	M368L6423ETM-CCC	Samsung	K4H560838E-TCCC
	Kingston	KVR400X64C3A/512	Kingston	D3208DL1T-5
	Kingston	KVR400X64C3/512	Kingston	D3208DL1T-5
	Hynix	HYMD26464B8J-D43AA	Hynix	HY5DU56822BT-D43