

# AX5TC

## User's Guide

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# AX5C Maibrd

User's Guide

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## Orgizatio

Chapter 1, **Overview**, covers the introduction and specifications of the system board and special features.

Chapter 2, **Hardware Installatio** , describes hardware jumpers, connectors and memory configuration. There are user friendly drawings to locate jumper and connector.

Chapter 3, **AWARD BIOS**, explains the system BIOS and tells how to configure the system by setting the BIOS parameters.

Appendix A, **Frequently Asked Qestio** , collects most frequently asked question of this product.

Appendix B, **Troubleshooting** , includes first aid information you need if you meet trouble, the WWW address and worldwide service telephone/fax are also included.

Appendix C, **Jumper Settings Summary** , gives you a tabular summary of the jumper settings discussed in Chapter 2.

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## Conventions

The following conventions are used in this manual:

Text entered by user,  
default settings,  
recommended selections

Represent text input by the user,  
default settings and recommended  
selections

<Enter>, <Tab>,<Ctl>, <Alt>,  
<Ins>, <Del>, etc

Represent the actual keys that you  
have to press on the keyboard.



### Note:

Gives bits and pieces of additional  
information related to the current topic.



### Warning

Alerts you to any damage that might  
result from doing or not doing specific  
actions.



### Caution

Suggests precautionary measures to  
avoid potential hardware or software  
problems.



### Important

Reminds you to take specific action  
relevant to the accomplishment of the  
procedure at hand.



### Tip

Tells how to accomplish a procedure  
with minimum steps through little  
shortcuts.

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### **Appendix A Frequently Asked Questions**

### **Appendix B Troubleshooting**

### **Appendix C Jump to the Summary**

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## Chapter 1

# Overview

The AX5TC is a high-performance Pentium 4-based system board that utilizes the PCI/ISA architecture and **ATX** form factor. It integrates the Intel **82430TX** PCiset, an Ultra I/O controller, and a PCI mode 4 enhanced IDE controller with bus master and **Ultra DMA/33** to enhance system performance. It has **512KB** pipeline-burst second-level cache onboard and support **three Dual in-line memory modules (DIMM)** that allow to mix EDO and SDRAM memory and expansion up to a maximum of **256MB**. AX5TC uses **2M bit Flash ROM BIOS** to reserve for future new functions.

Not only above features, AX5TC implements most advanced technology such as High-quality DIP switch, CMOS and RTC battery-less backup, Synchronous switching regulator, CPU thermal protection, Fan monitoring, System voltage monitoring, Modem Wake Up and Suspend to Hard Drive.

In addition, AX5TC also implements many special features as following.

**Suspend To Hard Drive** "Immediately" turns on system and goes back to the original screen before power down. You can resume your original work directly from hard disk without go through the Win95 booting process and run your application again. Suspend to Hard Drive saves your current work (system status, memory image) into hard disk. Note that you have to use VESA compatible PCI VGA, Sound Blaster compatible sound card with APM driver, for Suspend to Hard Drive to work properly.

**0V Modem Card Wake-up** In conjunction with ATX soft power On/Off, it is possible to have system totally power off and wakeup to automatically answer a phone call such as answering machine or to send/receive fax. The most important break through is not only external box modem but also internal modem card can be used to support Modem Wake Up. The AX5TC and MP56 internal modem card implement special circuit (patent applied) to make sure the modem card work properly without any power.

## Overview

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**LAN Wake up** This feature is very similar as Modem Wake Up, but it is through local area network. To use LAN Wake Up function, you must have a network card that supports this feature and also need to install a network management software, such as ADM.

**RTC Wake Up Timer** The Wake Up Timer is more like an alarm, which wakes up and power on your system at a pre-defined time for specific application. It can be set to wake up everyday or on specific date within a month. The date/time accurate is second.

**High Efficient Synchronous Switching Regulator** Most of the current switching designs are Asynchronous mode, which from the technical point of view, still consumes very high power as well as heat. AX5TC implements high efficient synchronous switching design that the temperature of MOS FET is far less than Schottky diode of Asynchronous design.

**CPU Thermal Protection** AX5TC has a special thermal detection circuit to have warning through application software when the temperature is higher than a predefined value.

**CPU core current protection** AX5TC implements CPU core voltage 15A over-current protection to prevent any accident short circuit and prevent system damage.

**CPU and Housing Fan Monitoring** AX5TC has one more "fan monitoring" function to prevent system overheat. There are two fan connectors, one is for CPU and the other can be a extra housing fan. The system will report and alarm fan malfunction through utility software such as Hardware Monitor utility (named AOhw100, where 100 means version number).

**System Voltage Monitoring** Further more, AX5TC implements a voltage monitoring system, As you turn on your system, this smart design will continue to monitor your system working voltage. If any of the system voltage is over the component's standard. There will be alarm through software such as Hardware Monitor utility for a warning to user.

**Full-range CPU core voltage** This motherboard supports the CPU core voltage from 1.3V to 3.5V, that can be applied to various CPU type in future.

**FCC DoC certificate** AX5TC has passed FCC DoC test. The radiation is very low, you can use any kind of housing.

**Powerful utility softwares supported** AOpen Bonus Pack bundled CD contains many useful utilities, such as ADM (Advanced Desktop Manager), AOchip, Hardware Monitor utility, AcePhone, EasyAccess, Suspend to Hard Drive utility, and BIOS flash utility.

## Overview

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**Resettable Fuse** AX5TC implements resettable fuses to prevent any accidental short circuit caused by keyboard or USB devices hot plug.

**PCI Sound Card connector** The SB-LINK connector can be used to link Creative-compatible PCI sound card. If you have a Creative PCI sound card installed, it is necessary to link the card to this connector for compatibility issue under DOS environment.

**Multi-language BIOS** This breakthrough will help you set BIOS items without the language barrier.

# Overview

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## 1.1 Specifications

<b>Form Factor</b>	ATX
<b>Board Size</b>	305 mm x 208 mm
<b>CPU</b>	Intel Pentium Processor P54C, PP/MT (P55C), AMD K5/K6 and Cyrix 6x86/M2.
<b>System Memory</b>	3V EDO or SDRAM, 168-pin DIMM x3, maximum 256MB.
<b>Second-level Cache</b>	512KB pipeline-burst cache onboard
<b>Chipset</b>	Intel 82430TX PCIset
<b>Expansion Slots</b>	ISA x4 and PCI x4
<b>Serial Port</b>	Two serial ports UART 16C550 compatible, and the 3rd UART for IR function.
<b>Parallel Port</b>	One parallel port supports standard parallel port (SPP), enhanced parallel port (EPP) or extended capabilities port (ECP).
<b>Floppy Interface</b>	Floppy interface supports 3.5 inches drives with 720KB, 1.44MB or 2.88MB format or 5.25 inches drives with 360KB, 1.2MB format.
<b>IDE Interface</b>	Dual-channel IDE interface support maximum 4 IDE hard disks or CDROM, mode 4 , bus master hard disk drives and Ultra DMA/33 mode hard drives are also supported.
<b>USB Interface</b>	Two USB ports supported by USB bracket, the BIOS also supports USB driver to simulate legacy keyboard.
<b>PS/2 Mouse</b>	Mini-Din PS/2 mouse connector onboard.
<b>Keyboard</b>	Mini-Din PS/2 keyboard connector onboard.
<b>RTC and Battery</b>	RTC within Intel PIIX4 chipset. Lithium (CR-2032) battery is an option, no battery is needed if power cord is plugged.
<b>BIOS</b>	AWARD Plug-and-Play, 2M bit Flash ROM BIOS. Multi-language versions supported.

## Overview

<b>Suspend to Hard Drive</b>	Supported by BIOS, save your work to hard disk and resume within a very short time. VESA compatible VGA and Sound Blaster compatible sound card required.
<b>0V Modem Wake Up</b>	Special circuit (patent applied) to support modem wake up by external box modem or internal AOpen F56/MP56 modem card.
<b>LAN Wake Up</b>	By using a network card that supports this feature and a network management software (such as ADM), you can wake up a system through a local area network.
<b>RTC Wake Up Timer</b>	Program the date/time to wake up your system.
<b>Synchronous Switching Regulator</b>	High efficient synchronous switching regulator for future CPU.
<b>Over-current Protection</b>	CPU core voltage 15A over-current protection to prevent any accident short circuit.
<b>CPU Thermal Protection</b>	Warning when CPU temperature is higher than a predefined value.
<b>Fan Monitoring</b>	Three fan connectors, warning when CPU or housing fan is malfunction.
<b>System Voltage Monitoring</b>	Warning when system voltage (5V,12V,3.3V,2.8V) are abnormal.
<b>SB-LINK connector supported</b>	The SB-LINK connector can be used to link Creative PCI sound card.

# Overview

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## 1.2 Suspend to Hard Drive

Suspend to Hard Drive saves your current work (system status, memory and screen image) into hard disk, and then the system can be totally power off. Next time, when power is on, you can resume your original work directly from hard disk within few second without go through the Win95 booting process and run your application again. If your memory is 16MB, normally, you need to reserve at least 16MB HDD space to save your memory image. Note that you have to use VESA compatible PCI VGA (AOpen PV70/PT70), Sound Blaster compatible sound card and sound driver that supports APM (AOpen AW35 or MP56) for Suspend to Hard Drive to work properly. Of course, we recommend to use AOpen products for best compatibility.

Although Suspend to Hard Drive is so powerful, it is actually a little complicated to set up this function. To use Suspend to Hard Drive, please make sure you have read the following in detail.

1. Go into BIOS setup, Power Management à Suspend Mode Option, select "Suspend to Disk".
2. Go into BIOS setup, PNP/PCI Configuration à PnP OS Installed, select "No". This can give BIOS the capability to allocate system resources for Suspend to Hard Drive.
3. Bootup your system into DOS command prompt. If you are Win'95 user, Please restart your Windows 95 under "Command Prompt" by pressing "F8" while system shows "Windows 95 Starting ...". Choose "Safe Mode Command Prompt Only" from selection so that system will start in DOS command prompt.
4. Copy AOZVHDD.EXE to the root directory of your C: drive.
5. **Option 1: Use /file switch (applied to FAT16 file system):**

Please use following command to create a hidden file in the root directory of your hard disk for Suspend to Hard Drive to save the system status and memory image.

```
C:>AOZVHDD /c /file
```

Please make sure that you have enough continuous HDD space for creating this hidden file. For example, if you have 32MB of system memory and 4MB of VGA memory, you need at least 36MB (32MB + 4MB) of continuous HDD space. If AOZVHDD failed to allocate the HDD space, you may run "DEFRAG" Utility or "Disk Defragmenter" which come with MS-DOS or Win'95 to free HDD space.

## Overview

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### **Option2: Use /partition switch (applied to FAT16/FAT32 file system):**

To create a separate partition for Suspend to Hard Drive, please make sure you have allocated a free partition. We suggest you reserve the free partition which space is appropriate for your future memory expansion. For example, if you have 32MB of system memory and 4MB of VGA memory currently, but you plan to upgrade system memory to 64MB in the near future, then you may reserve a 68MB (64MB+4MB) space by using a disk utility (such as fdisk). Next, use following command to create a suspend partition:

```
C:>AOZVHDD /c /partition
```

If there is no extra free partition and you don't want your data lost, please do not use this partition method.

6. After creating above partition or hidden file, please reboot your system.
7. Push suspend switch (momentary mode) or use Win95 Suspend icon to force system goes into Suspend to Hard Drive mode and then turn system power off by power switch of your power supply.
8. Next time when you turn on your system, it will resume to your original work automatically.



**Warning:** Note that Intel Bus Master and Ultra DMA/33 IDE driver are not fully compatible with Suspend to Hard Drive function, installing these drivers may cause the system unstable. Under this situation, please uninstall the drivers.

**Warning:** This function does not support SCSI hard disks.



## Overview

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**Tip:** Following VGA card have been tested & recognized as VESA compatible VGA device.

*AOpen PV90 (Trident 9680)*

*AOpen PT60 (S3 Virge/BIOS R1.00-01)*

*AOpen PV60 (S3 Tiro64V+)*

*AOpen PT70 (S3 Virge/DX)*

*ProLink Trident GD-5440*

*ProLink Cirrus GD-5430*

*ProLink Cirrus GD-5446*

*ATI Mach 64 GX*

*ATI 3D RAGE II*

*Diamond Stealth64D (S3 868)*

*Diamond Stealth64V (S3 968)*

*KuoWei ET-6000.*



**Tip:** Following Sound card have been tested OK for Suspend to Hard Drive.

*AOpen AW32*

*AOpen AW35*

*AOpen MP56*

*Creative SB 16 Value PnP*

*Creative SB AWE32 PnP*

*ESS 1868 PnP*

*If your sound card can not work after resume from Suspend to Hard Drive, check your sound card vendor see if there is driver to support APM, and install it again.*

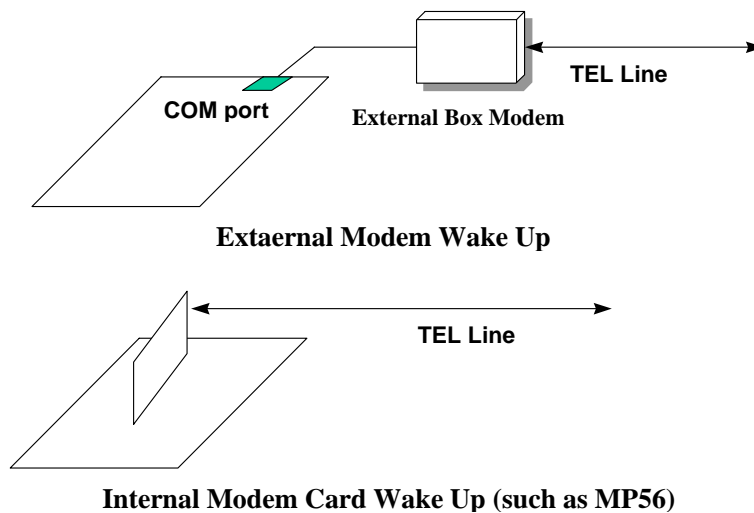


**Note:** The USB function has not been tested for Suspend to Hard Drive. If you find any unstable problem, please go into BIOS, Integrated Peripherals à USB Legacy Support. Disable the USB Legacy function.

## 1.3 0V Modem Wake Up

The Modem Wake Up discussed here is to wakeup from true power off (identified by fan of power supply is off), This motherboard still supports traditional green PC suspend mode but it is not discussed here.

With the help ATX soft power On/Off, it is possible to have system totally power off (The traditional suspend mode of power management function does not really turn off the system power supply), and wakeup to automatically answer a phone call such as answering machine or to send/receive fax. You may identify the true power off by checking fan of your power supply. Both external box modem and internal modem card can be used to support Modem Wake Up, but if you use external modem, you have to keep the box modem always power-on. AOpen AX5TC and internal modem card implement special circuit (patent applied) and make sure the modem card works properly without any power. We recommend you choose AOpen modem card (MP56) for Modem Wake Up applications.



## Overview

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### For Internal Modem Card (AOpen MP56):

1. Go into BIOS setup , Power Management à Modem Wake Up, select Enable.
2. Setup your application, put into Windows 95 StartUp or use Suspend to Hard Drive function.
3. Turn system power off by soft power switch.
4. Connect 4-pin Modem Ring-On cable from MP56 RING connector to AX5TC connector WKUP.
5. Connect telephone line to MP56. You are now ready to use Modem Ring-On.

### For External Box Modem:

1. Go into BIOS setup , Power Management à Modem Wake Up, select Enable.
2. Setup your application, put into Windows 95 StartUp or use Suspend to Hard Drive function.
3. Turn system power off by soft power switch.
4. Connect RS232 cable of external box Modem to COM1 or COM2.
5. Connect telephone line to external box Modem. Turn on Modem power (you must keep Modem power always on). You are now ready to use Modem Ring



**Tip:** External modem wake up signal is detected through COM1 or COM2. Internal modem card wake up signal is detected through cable from connector RING (on modem card) to WKUP (on mainboard).

**Tip:** You can combine Suspend to Hard Drive, Modem Wake Up and the software Acephone for the best solution of answering machine or to send/receive fax.

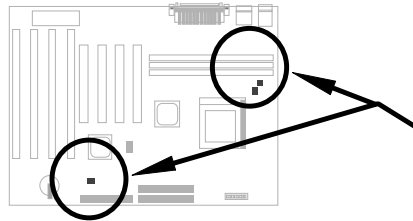


**Note:** If you use external modem, the power of external modem must be kept on to receive signal from telephone line. Internal modem card has no such limitation.

### 1.4 System Voltage Monitoring

This motherboard implements a voltage monitoring system. As you turn on your system, this smart design will continue to monitor your system working voltage. If any of the system voltage is over the component's standard. There will be alarm through application software such as Hardware Monitor utility for a warning to user. System voltage monitoring function monitors CPU core voltage. It is automatically implemented by BIOS and Hardware Monitor utility (the file name is like aohw100.exe, where 100 means the version number, no hardware installation is needed).

### 1.5 Fan Monitoring



There are three fan connectors, two is for CPU, the other can be a housing fan. The fan monitoring function is implemented by connecting fan to 3-pin fan connector **FAN2** and installing ADM or Hardware Monitor utility.

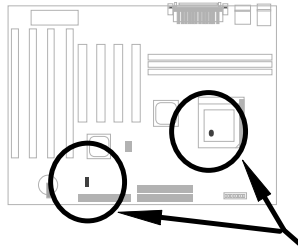


**Note:** You need 3-pin fan that supports SENSE signal for fan monitoring function to work properly.

## Overview

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### 1.6 CPU Thermal Protection



This motherboard implements special thermal protection circuit below the CPU. When temperature is higher than a predefined value, the CPU speed will automatically slow down and there will be warning from BIOS and also ADM (AOpen Desktop Manager, similar as Intel LDCM) or Hardware Monitor utility software.

ADM is a very powerful network and hardware monitor software. If you do not need network monitor function, you may also use Hardware Monitor utility, which is a small utility for hardware monitoring. Both ADM and Hardware Monitor utility are available on the bundled CD and our web site (<http://www.aopen.com.tw>).

CPU Thermal Protection is automatically implemented by BIOS and utility software, no hardware installation is needed.

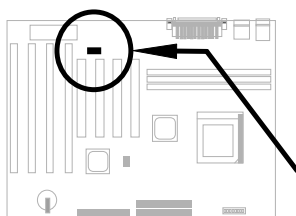
### 1.7 Multi-language BIOS

For giving AOpen 's worldwide users the best support, AOpen software team made every effort to overcome all difficulties and successfully develop a method to provide multi-language BIOS.

You may download and reflash a specified BIOS version from AOpen 's web site (For example, Chinese). After entering BIOS Setup, you can switch to another language by pressing F9. Then pressing F9 again will let you return to English screen.

This breakthrough will help you set BIOS items without the language barrier.

### 1.8 PCI Sound Card connector



AX5TC implements a SB-LINK connector to support Creative-compatible PCI sound card. If you have a Creative-compatible PCI sound card installed, it is necessary to link the card to SB-LINK connector for compatibility issue under DOS environment.

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## Chapter 2

# Hardware Installation

This chapter gives you a step-by-step procedure on how to install your system. Follow each section accordingly.



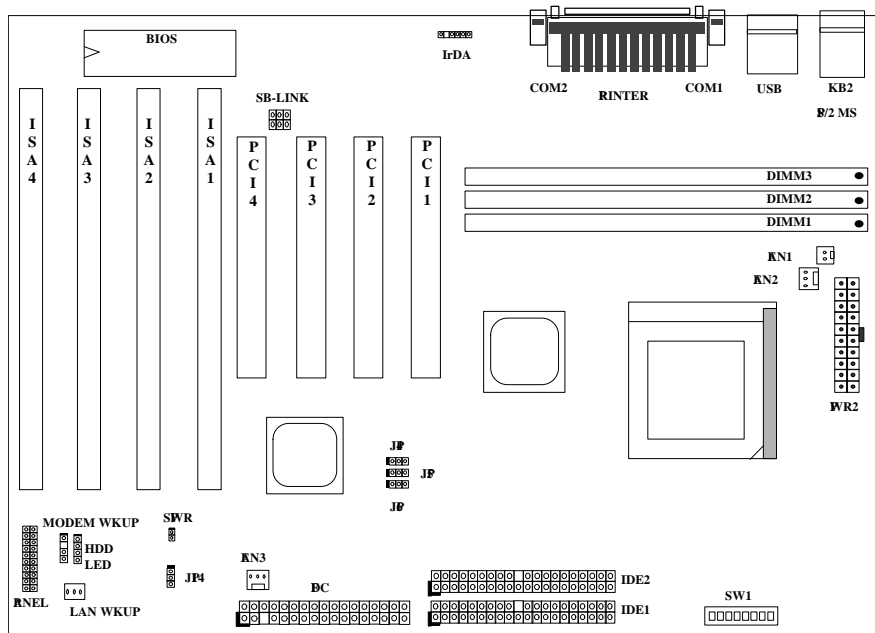
**Caution** *Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a system component.*

1. *Do not remove a component from its protective packaging until you are ready to install it.*
2. *Wear a wrist ground strap and attach it to a metal part of the system unit before handling a component. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.*

# Hardware Installation

## 2.1 Jumper and Connector

The following figure shows the locations of the jumpers and connectors on the system board :





## Hardware Installation

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### Jmørs:

<b>SW1:</b>	DIP Switch for CPU voltage and clock ratio
<b>JP4,JP5,JP6:</b>	CPU external (bus) clock
<b>JP14:</b>	Clear CMOS

### Coctos:

<b>PS2 MS:</b>	PS/2 mouse connector
<b>KB2:</b>	PS/2 keyboard connector
<b>COM1:</b>	COM1 connector
<b>COM2:</b>	COM2 connector
<b>PRINER:</b>	Printer connector
<b>PWR2:</b>	ATX power connector
<b>USB:</b>	USB connector
<b>BC:</b>	Floppy drive connector
<b>IDE1:</b>	IDE1 primary channel
<b>IDE2:</b>	IDE2 secondary channel
<b>AN1:</b>	CPU Fan connector
<b>AN2:</b>	CPU Fan connector
<b>AN3:</b>	Fan Connector
<b>IrDA:</b>	IrDA (Infrared) connector
<b>HDD ED:</b>	HDD LED connector
<b>PANEL</b>	Front panel (Multifunction) connector
<b>SPWR:</b>	ATX Soft-Power Switch Connector
<b>MODEM-WKUP:</b>	MODEM Wake Up Connector
<b>AN-WKUP:</b>	LAN Wake Up Connector
<b>SB-INK:</b>	Creative PCI sound card connector

## Hardware Installation

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### 2.2 Jumpers

Jumpers are made by pin headers and plastic connecting caps for the purpose of customizing your hardware. Doing so requires basic knowledge of computer hardware, be sure you understand the meaning of the jumpers before you change any setting. The onboard jumpers are normally set to their default with optimized settings.

On the mainboard, normally there is a bold line marked beside pin 1 of the jumper, sometimes, there are numbers also. If we connect (short) plastic cap to pin 1 and 2, we will say set it at 1-2, and when we say jumper is open, that means no plastic cap connected to jumper pins.



Open



Short



Jumper set at 1-2



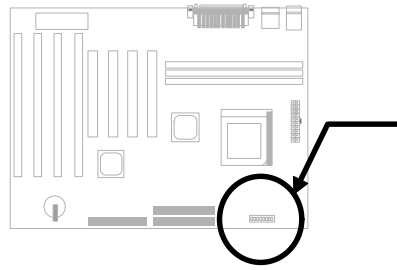
Jumper set at 2-3

## Hardware Installation

### 2.2.1 Setting CPU Vtag

<u>S4</u>	<u>S5</u>	<u>S6</u>	<u>S7</u>	<u>S8</u>	<u>Vcore</u>
ON	ON	ON	ON	OFF	3.52V
OFF	ON	ON	ON	OFF	3.45V
OFF	OFF	ON	ON	OFF	3.2V
ON	OFF	OFF	ON	OFF	2.9V
OFF	OFF	OFF	ON	OFF	2.8V
OFF	ON	OFF	OFF	OFF	2.2V
OFF	ON	OFF	ON	ON	1.8V

**SW1** is used to select CPU core voltage (Vcore) and ratio, there are totally eight switches on the DIP. After installing CPU, remember to set the switch 4-8 to specify a proper Vcore.



**2.9V**

K6-166/200 or M2



**2.8V**

P55C (MMX)



**2.2V**

K6-266/300



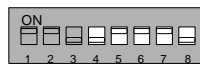
**1.8V**

Reserverd for future use



**3.52V**

6x86 or K5



**3.45V**

P54C



**3.2V**

K6-233

## Hardware Installation

Following table lists possible settings of current CPU available on the market. Note that the correct setting may vary because of new CPU product, refer to your CPU specification for more details.

CP	Type	Vcore	S4	S5	S6	S7	S8
INTEL P54C	Single Voltage	3.45V	OFF	ON	ON	ON	OFF
INTEL P55C	Dual Voltage	2.8V	OFF	OFF	OFF	ON	OFF
AMD K5	Single Voltage	3.52V	ON	ON	ON	ON	OFF
AMD K6-166/200	Dual Voltage	2.9V	ON	OFF	OFF	ON	OFF
AMD K6-233	Dual Voltage	3.2V	OFF	OFF	ON	ON	OFF
AMD K6-266/300	Dual Voltage	2.2V	OFF	ON	OFF	OFF	OFF
Cyrix 6x86	Single Voltage	3.52V	ON	ON	ON	ON	OFF
Cyrix 6x86L	Dual Voltage	2.8V	OFF	OFF	OFF	ON	OFF
Cyrix M2	Dual Voltage	2.9V	ON	OFF	OFF	ON	OFF
IDT C6	Single Voltage	3.45V	OFF	ON	ON	ON	OFF



**Warning** Please make sure that you have installed CPU fan properly if Intel PP/MT233 or AMD K6-200/233 is being selected to use. It may cause your system unstable if you can not meet the heat dissipation requirement from above CPU type. It is recommended to adopt larger fan on these CPU for better air flow in the system.



**Tip** Normally, for single voltage CPU, Vcpuio (CPU I/O Voltage) is equal to Vcore, but for CPU that needs dual voltage such as PP/MT(P55C) or Cyrix 6x86L, Vcpuio is different from Vcore and must be set to Vio (PBSRAM and Chipset Voltage). The single or dual voltage CPU is automatically detected by hardware circuit.

**Tip** For supporting more different CPUs in future, this motherboard uses five switches to specify Vcore. There are 32 settings totally, and the range is from 1.3V to 3.5V.

## Hardware Installation

This motherboard supports the CPU core voltage from 1.3V to 3.5V, that can be applied to the various CPU type in future. For your reference, all settings are listed in the following table.

<b><u>Vcore</u></b>	<b><u>S4</u></b>	<b><u>S5</u></b>	<b><u>S6</u></b>	<b><u>S7</u></b>	<b><u>S8</u></b>
1.30V	OFF	OFF	OFF	OFF	ON
1.35V	ON	OFF	OFF	OFF	ON
1.40V	OFF	ON	OFF	OFF	ON
1.45V	ON	ON	OFF	OFF	ON
1.50V	OFF	OFF	ON	OFF	ON
1.55V	ON	OFF	ON	OFF	ON
1.60V	OFF	ON	ON	OFF	ON
1.65V	ON	ON	ON	OFF	ON
1.70V	OFF	OFF	OFF	ON	ON
1.75V	ON	OFF	OFF	ON	ON
1.80V	OFF	ON	OFF	ON	ON
1.85V	ON	ON	OFF	ON	ON
1.90V	OFF	OFF	ON	ON	ON
1.95V	ON	OFF	ON	ON	ON
2.00V	OFF	ON	ON	ON	ON
2.05V	ON	ON	ON	ON	ON
2.0V	OFF	OFF	OFF	OFF	OFF
2.1V	ON	OFF	OFF	OFF	OFF
2.2V	OFF	ON	OFF	OFF	OFF
2.3V	ON	ON	OFF	OFF	OFF
2.4V	OFF	OFF	ON	OFF	OFF
2.5V	ON	OFF	ON	OFF	OFF
2.6V	OFF	ON	ON	OFF	OFF
2.7V	ON	ON	ON	OFF	OFF
2.8V	OFF	OFF	OFF	ON	OFF
2.9V	ON	OFF	OFF	ON	OFF
3.0V	OFF	ON	OFF	ON	OFF
3.1V	ON	ON	OFF	ON	OFF
3.2V	OFF	OFF	ON	ON	OFF
3.3V	ON	OFF	ON	ON	OFF
3.4V	OFF	ON	ON	ON	OFF
3.5V	ON	ON	ON	ON	OFF

## Hardware Installation

### 2.2.2 Selecting CPU Frequency

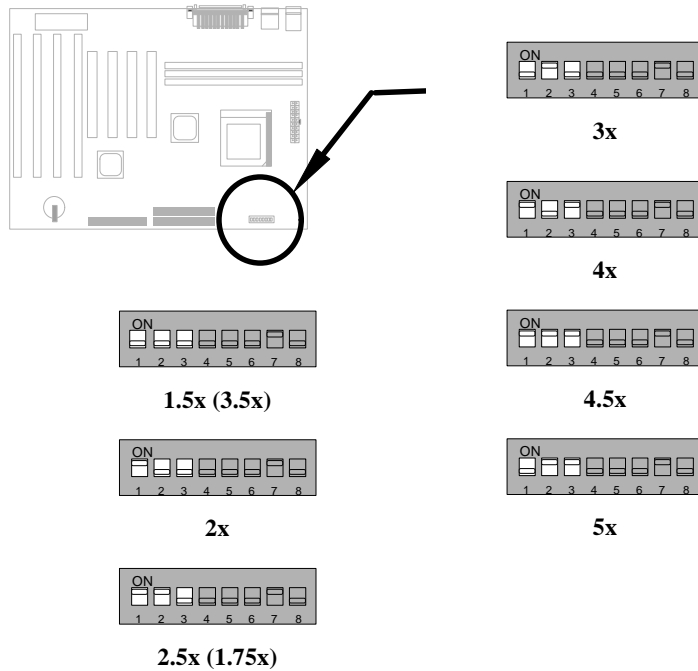
<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>CPU Frequency Ratio</u>
OFF	OFF	OFF	1.5x (3.5x)
ON	OFF	OFF	2x
ON	ON	OFF	2.5x (1.75x)
OFF	ON	OFF	3x
ON	OFF	ON	4x
ON	ON	ON	4.5x
OFF	ON	ON	5x

Intel Pentium, Cyrix 6x86 and AMD K5/K6 CPU are designed to have different Internal (Core) and External (Bus) frequency. The ratio of Core/Bus frequency is selected by the switch 1-3 of **SW1**.



**Note:** Intel PP/MMX 233MHz is using 1.5x jumper setting for 3.5x frequency ratio, and AMD PR166 is using 2.5x setting for 1.75x frequency ratio.

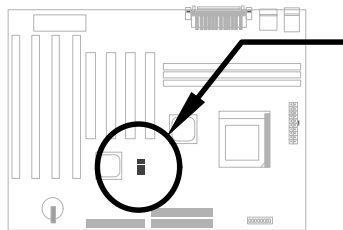
### Core frequency = Ratio External bus clock



## Hardware Installation

<u>JP</u>	<u>JF</u>	<u>JB</u>	<u>CE External Clock</u>
2-3	1-2	1-2	60MHz
1-2	1-2	1-2	66MHz
1-2	2-3	1-2	75MHz
2-3	1-2	2-3	83.3MHz

JP4, JP5 and JP6 are the selections of CPU external clock (bus clock), which is actually the clock from clock generator.



### JP & JF & JB



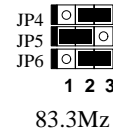
### JP & JF & JB



### JP & JF & JB



### JP & JF & JB



**Warning** INTEL X chipset supports only 60/66MHz external CPU bus clock, the 75/83.3 MHz settings are for internal test only, set to 75/83.3MHz exceed the specification X chipset, which may cause serious system damage.



**Caution** Following table are possible settings of current CPU available on the market. The correct setting may vary because of new CPU product, refer to your CPU specification for more details.



**Warning** Cyrix 6x86 P200+ uses 75MHz external clock, the jumper setting shown on the table below is for user's convenient. It may cause serious system damage to use 75MHz clock.

INTEL	CE Core	Ratio	External	S1	S2	S3	JP & JF & JB
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## Hardware Installation

Processor	Core Frequency	Ratio	External Bus Clock	S1	S2	S3	J1 & J2 & J3
P54C 90	90MHz =	1.5x	60MHz	OFF	OFF	OFF	2-3 & 1-2 & 1-2
P54C 100	100MHz =	1.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2
P54C 120	120MHz =	2x	60MHz	ON	OFF	OFF	2-3 & 1-2 & 1-2
P54C 133	133MHz =	2x	66MHz	ON	OFF	OFF	1-2 & 1-2 & 1-2
P54C 150	150MHz =	2.5x	60MHz	ON	ON	OFF	2-3 & 1-2 & 1-2
P54C 166	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 1-2 & 1-2
P54C 200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2

INTEL Pentium MMX	Core Frequency	Ratio	External Bus Clock	S1	S2	S3	J1 & J2 & J3
PP/MT 150	150MHz =	2.5x	60MHz	ON	ON	OFF	2-3 & 1-2 & 1-2
PP/MT 166	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 1-2 & 1-2
PP/MT 200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2
PP/MT 233	233MHz =	3.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2

Cyrix 6x86 & 6x86L	Core Frequency	Ratio	External Bus Clock	S1	S2	S3	J1 & J2 & J3
P150+	120MHz =	2x	60MHz	ON	OFF	OFF	2-3 & 1-2 & 1-2
P166+	133MHz =	2x	66MHz	ON	OFF	OFF	1-2 & 1-2 & 1-2
P200+	150MHz =	2x	75MHz	ON	OFF	OFF	1-2 & 2-3 & 1-2

Cyrix M2	Core Frequency	Ratio	External Bus Clock	S1	S2	S3	J1 & J2 & J3
MX-PR166	150MHz =	2.5x	60MHz	ON	ON	OFF	2-3 & 1-2 & 1-2
MX-PR200	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 1-2 & 1-2
	150MHz =	2x	75MHz	ON	OFF	OFF	1-2 & 2-3 & 1-2
MX-PR233	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2
	166MHz =	2x	83.3MHz	ON	OFF	OFF	2-3 & 1-2 & 2-3
MX-PR266	233MHz =	3.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2

AMD K5	Core Frequency	Ratio	External Bus Clock	S1	S2	S3	J1 & J2 & J3
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## Hardware Installation

PR90	90MHz =	1.5x	60MHz	OFF	OFF	OFF	2-3 & 1-2 & 1-2
PR100	100MHz =	1.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2
PR120	90MHz =	1.5x	60MHz	OFF	OFF	OFF	2-3 & 1-2 & 1-2
PR133	100MHz =	1.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2
PR166	116MHz =	1.75x	66MHz	ON	ON	OFF	1-2 & 1-2 & 1-2

AMD K6	CP Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP & JP & JP
PR2-166	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 1-2 & 1-2
PR2-200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2
PR2-233	233MHz =	3.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2
PR2-266	266MHz =	4x	66MHz	ON	OFF	ON	1-2 & 1-2 & 1-2
PR2-300	300MHz =	4.5x	66MHz	ON	ON	ON	1-2 & 1-2 & 1-2

IDT C6	CP Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP & JP & JP
C6-150	150MHz =	2x	75MHz	ON	OFF	OFF	1-2 & 2-3 & 1-2
C6-180	180MHz =	3x	60MHz	OFF	ON	OFF	2-3 & 1-2 & 1-2
C6-200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2



**Note:** Cyrix 6x86, M2 and AMD K5 CPU use P-rating for the reference of CPU benchmark compared with INTEL P54C, their internal core frequency is not exactly equal to P-rating marked on the CPU. For example, Cyrix P166+ is 133MHz but performance is almost equal to P54C 166MHz and AMD PR133 is 100MHz but performance is almost equal to INTEL P54C 133MHz.

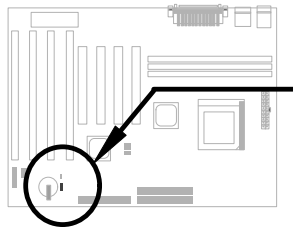
**Note:** INTEL X chipset does not support CPU with 50/55MHz external bus clock, so that INTEL P54C 75MHz, Cyrix P120+, P133+ and AMD PR75 are not supported by this mainboard.

## Hardware Installation

### 2.2.3 Clearing CMOS

<b>JP4</b>	<b>Clear CMOS</b>
1-2	Normal operation (default)
2-3	Clear CMOS

You need to clear the CMOS if you forget your system password. To clear the CMOS, follow the procedures listed below:



**JP4**



Normal Operation  
(default)

**JP4**



Clear CMOS

#### **Steps to clear CMOS:**

1. Turn off the system and unplug the AC power.
2. Remove ATX power cable from connector PWR2.
3. Locate **JP14** and short pins 2-3 for a few seconds.
4. Return **JP14** to its normal setting by shorting pins 1-2.
5. Connect ATX power cable back to connector PWR2.
6. Turn on the system power.
7. Press **[DEL]** during bootup to enter the BIOS Setup Utility and specify a new password, if needed.



**TIP** If your system hangs or fails to boot because of over-clocking, please clear CMOS and the system will go back to default setting. Except using JP14, you can also press <Home> key to clear CMOS while system booting.

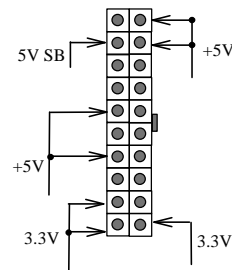
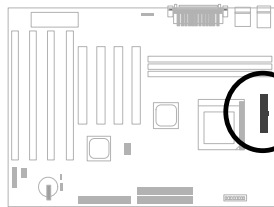
## 2.3 Cables

### 2.3.1 Power Cable

The ATX power supply uses 20-pin connector shown below. Make sure you plug in the right direction.



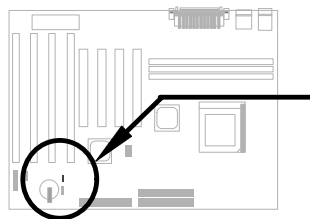
**Caution** Make sure that the power supply is off before connecting or disconnecting the power cable.



**WR2**

### 2.3.2 ATX Soft-Power Switch

The ATX soft-power switch connector is a 2-pin header on the system board. Locate the power switch cable from your ATX housing. It is 2-pin female connector from the housing front panel. Plug this connector to the soft-power switch connector marked **SPWR**.

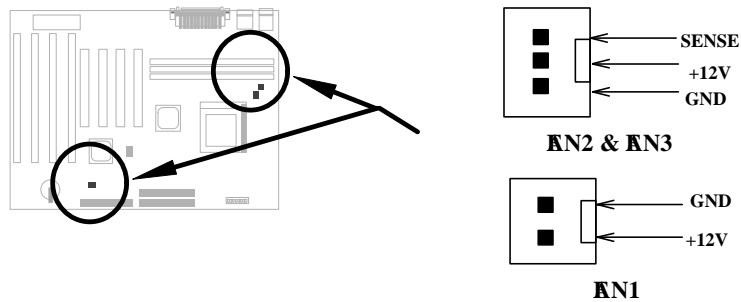


**SPWR**

## Hardware Installation

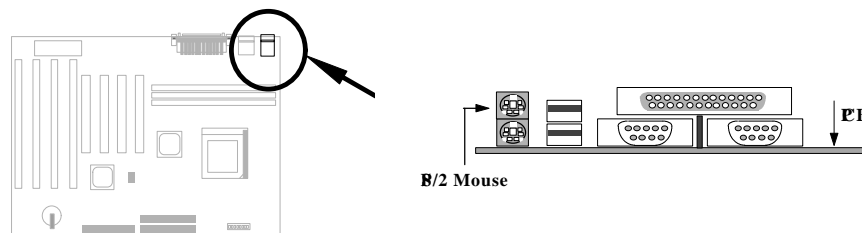
### 2.3.3 Fan

Plug in the fan cable to the fan connectors onboard. The fan connectors are marked **FAN1**, **FAN2** and **FAN3** on the system board. You can plug the CPU fan cable to both the 2-pin fan connector FAN1 and the 3-pin fan connector FAN2. FAN3 can be reserved for the housing fan. Note that only FAN2 supports the fan monitoring function, because 3-pin fan has an extra pin called SENSE, which periodically sends fan signal out.



### 2.3.4 PS/2 Mouse

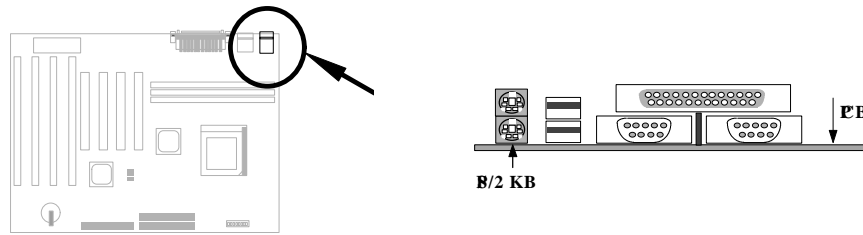
The onboard PS/2 mouse connector is a 6-pin Mini-Din connector marked **PS2 MS**. The view angle of drawing shown here is from back panel of the housing.



## Hardware Installation

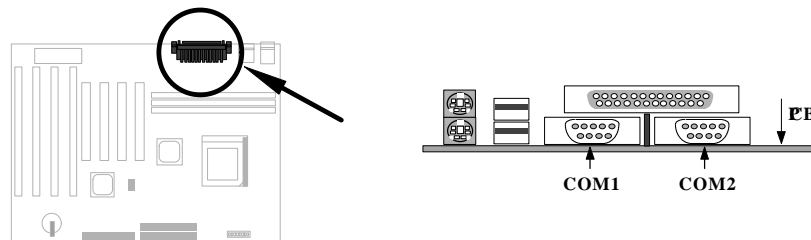
### 2.3.5 Keybrd

The onboard PS/2 keyboard connector is a 6-pin Mini-Din connector marked **KB2**. The view angle of drawing shown here is from back panel of the housing.



### 2.3.6 Serial Devices (COM1/COM2)

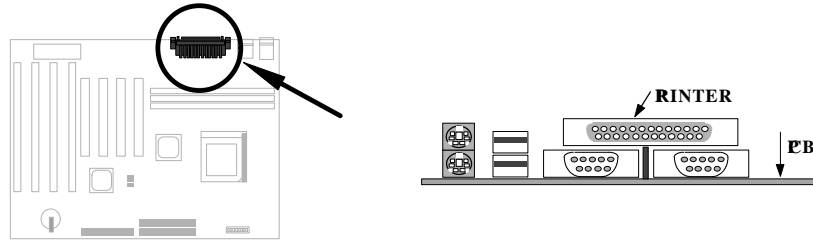
The onboard serial connectors are 9-pin D-type connector on the back panel of mainboard. The serial port 1 connector is marked as **COM1** and the serial port 2 connector is marked as **COM2**.



## Hardware Installation

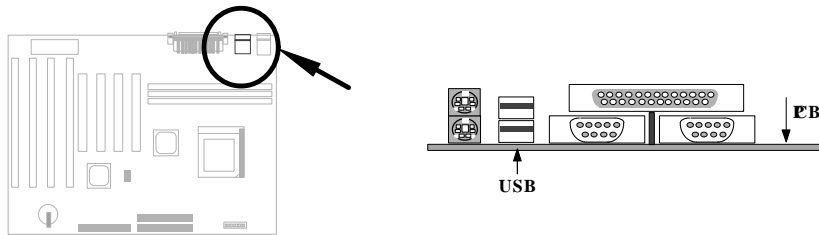
### 2.3.7 Priter

The onboard printer connector is a 25-pin D-type connector marked **PRINTER**. The view angle of drawing shown here is from back panel of the housing.



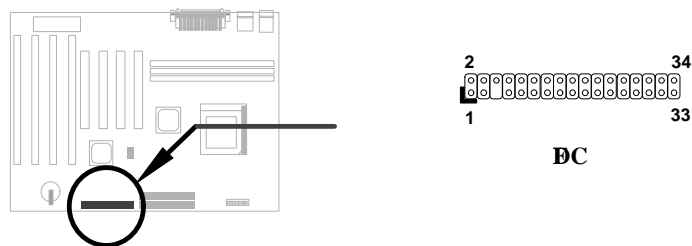
### 2.3.8 USB Device

You can attach USB devices to the USB connector. The motherboard contains two USB connectors, which are marked as **USB**.



### 2.3.9 Floppy Drive

Connect the 34-pin floppy drive cable to the floppy drive connector marked as **DC** on the system board.



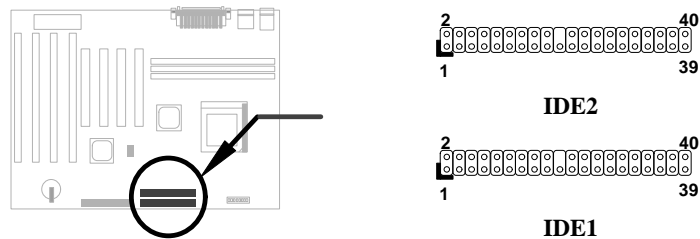
## Hardware Installation

### 2.3.10 IDE HardDisk and CD ROM

This motherboard supports two 40-pin IDE connectors marked as **IDE1** and **IDE2**. IDE1 is also known as primary channel and IDE2 as secondary channel, each channel supports two IDE devices that makes total of four devices.

In order to work together, the two devices on each channel must be set differently to master and slave mode, either one can be hard disk or CDROM. The setting as master or slave mode depends on the jumper on your IDE device, please refer to your hard disk and CDROM manual accordingly.

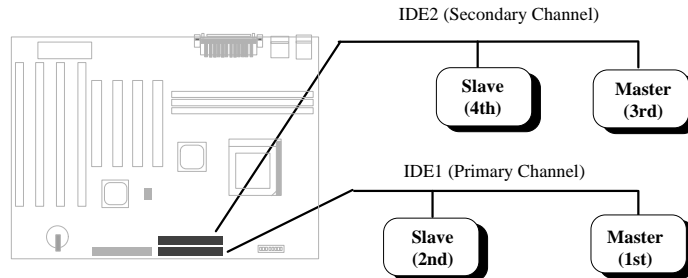
Connect your first IDE hard disk to master mode of the primary channel. If you have second IDE device to install in your system, connect it as slave mode on the same channel, and the third and fourth device can be connected on secondary channel as master and slave mode respectively.



**Caution** : The specification of IDE cable is maximum 46cm (18 inches), make sure your cable does not exceed this length.

**Caution** For better signal quality, it is recommended to set far end side device to master mode and follow the suggested sequence to install your new device . Please refer to following figure.

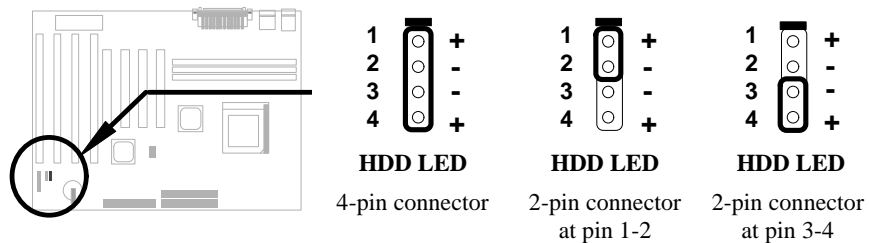
## Hardware Installation



### 2.3.11 HardDisk ED

The HDD LED connector is marked as **HDD ED** on the board. This connector is designed for different type of housing, actually only two pins are necessary for the LED. If your housing has four pin connector, simply plug it in. If you have only two pin connector, please connect to pin 1-2 or pin 3-4 according to the polarity.

<u>Pin</u>	<u>Description</u>
1	HDD LED
2	GND
3	GND
4	HDD LED



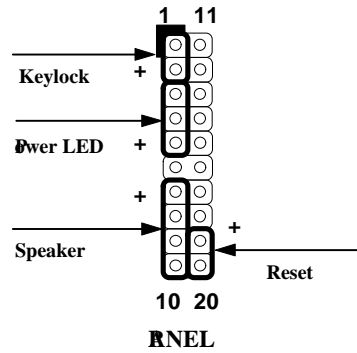
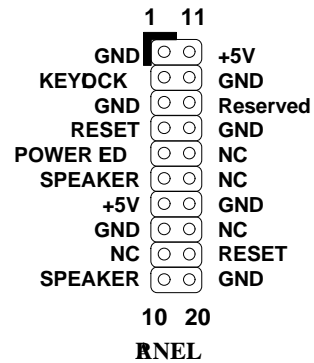
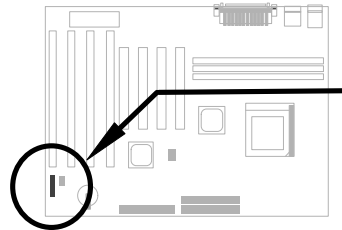


## Hardware Installation

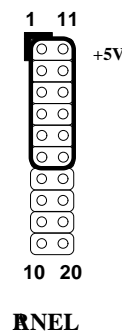
### 2.3.12 Panel Connector

The Panel (multifunction) connector is a 20-pin connector marked as **PANEL** on the board. Attach the power LED, keylock, speaker, and reset switch to the corresponding pins as shown in the figure.

Some housings have a five-pin connector for the keylock and power LED. Since power LED and keylock are aligned together, you can still use this kind of connector.



Other housings may have a 12-pin connector. If your housing has this type of connector, connect it to PANEL as shown in the figure. Make sure that the red wire of the connector is connected to +5V.



## Hardware Installation



**Note:** If your housing comes with Turbo switch and Turbo LED connectors, you may use these connectors for Suspend switch and Green mode LED functions, respectively.

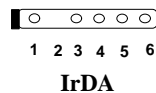
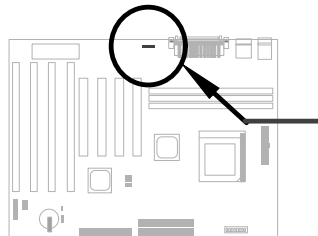
**Note :** Pressing the Suspend switch allows you to manually force the system to suspend mode. However, this is possible only if the Power Management function in the BIOS Setup menu is enabled.

### 2.3.13 IrDA Connector

The IrDA connector can be configured to support wireless infrared module, with this module and application software such as Laplink or Win95 Direct Cable Connection, user can transfer files to or from laptops, notebooks, PDA and printers. This connector supports HPSIR (115.2Kbps, 2 meters), ASK-IR (56Kbps) and Fast IR (4Mbps, 2 meters).

Install infrared module onto IrDA connector and enable infrared function from BIOS setup, make sure to have correct orientation when you plug onto IrDA connector.

<u>Pin</u>	<u>Description</u>
1	+5V
2	NC
3	IRRX
4	GND
5	IRTX
6	NC

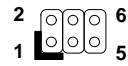
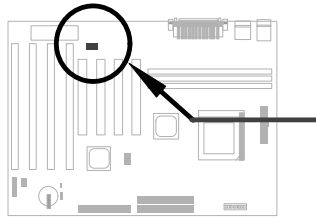


## Hardware Installation

### 2.3.14 SB-LINK

**SB-LINK** is used to connect Creative PCI sound card. If you have a Creative PCI sound card installed, it is necessary to link the card to this connector for compatibility issue under DOS environment.

<u>Pin</u>	<u>Description</u>
1	GNT#
2	GND
3	NC
4	REQ#
5	GND
6	SIRQ#



**SB-LINK**

## Hardware Installation

### 2.3.15 Wake-Up Connector

This mainboard implements special circuit to support Modem Ring-On, both Internal Modem Card (AOpen MP56) and external box Modem are supported. Since Internal Modem card consumes no power when system power is off, it is recommended to use Internal Modem. To use AOpen MP56, connect 4-pin cable from **RING** connector of MP56 to **WKUP** connector on the mainboard.

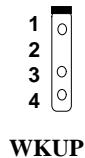
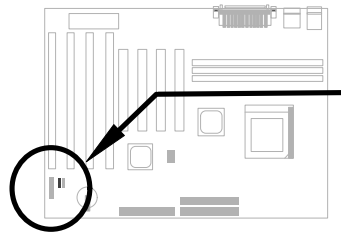
<u>Pin</u>	<u>Description</u>
1	+5V SB
2	NC
3	RING
4	GND



**Note:** Wake-Up Connector and Modem Ring-On are patent applied.



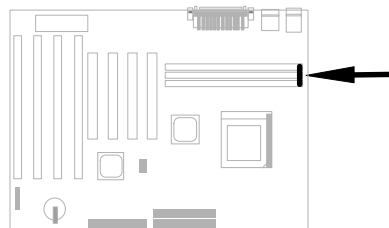
**Tip:** Not only for Modem Ring-On, there are many other possible applications. For example, IR wakeup or voice wakeup.



WKUP

### 2.4 Config System Memory

### Memory



The DIMM types supported are EDO (Extended Data Out) and SDRAM (Synchronous DRAM). This motherboard has three 168 pin DIMM sockets (Dual-in-line Memory Module) that allow you to install system memory up to 256 MB.

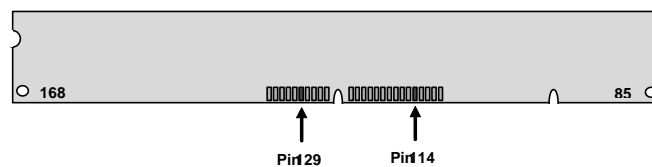
## Hardware Installation

DIMM modules can be identified by following factors:

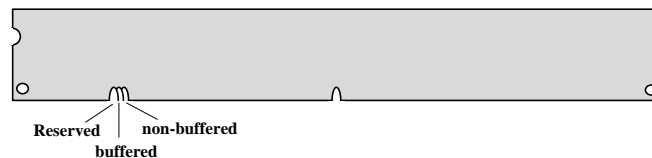
- I. **Size:** single side, 1Mx64 (8MB), 2Mx64 (16MB), 4Mx64 (32MB), 8Mx64 (64MB), 16Mx64 (128MB), and double side, 1Mx64x2 (16MB), 2Mx64x2 (32MB), 4Mx64x2 (64MB), 8Mx64x2 (128MB).



**Tip** Here is a trick to check if your DIMM is single-side or double-side -- if there are traces connected to golden finger pin 114 and pin 129 of the DIMM, the DIMM is probably double-side; otherwise, it is single-side. Following figure is for your reference.



- II. **Speed** normally marked as -12, which means the clock cycle time is 12ns and maximum clock of this SDRAM is 83MHz. Sometimes you can also find the SDRAM marked as -67, which means maximum clock is 67MHz.
- III. **Buffered/Unbuffered** This motherboard supports non-buffered DIMMs. You can identify non-buffered DIMMs and buffered DIMMs according to the position of the notch, following figure is for your reference:



Because the positions are different, only non-buffered DIMMs can be inserted into the DIMM sockets on this motherboard. Although most of DIMMs on current market are non-buffered, we still recommend you to ask your dealer for the correct type.

- IV. **2-clock and 4-clock signals:** Although both of 2-clock and 4-clock signals are supported by this motherboard, we strongly recommend you to choose 4-clock SDRAM in consideration of reliability.

## Hardware Installation

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**Tip** To identify 2-clock and 4-clock SDRAM, you may check if there are traces connected to golden finger pin 79 and pin 163 of the SDRAM. If there are traces, the SDRAM is probably 4-clock; otherwise, it is 2-clock.

**V. Parity:** This motherboard supports standard 64 bit wide (without parity) SDRAM.

There is no jumper setting required for the memory size or type. It is automatically detected by the system BIOS. Note that because TX chipset limitation, the maximum is only 256MB.

**Total Memory Size = Size of DIMM1 + Size of DIMM2 + Size of DIMM3**



**Caution** There are some old DIMMs made by EDO or PM memory chip, they can only accept 5V power and probably can not fit into the DIMM socket, make sure you have 3.3V true SDRAM DIMM before your insert it.

## Hardware Installation

There is an important parameter affects SDRAM performance, **CAS latency time**. It is similar as CAS Access Time of EDO DRAM and is calculated as number of clock state. The SDRAM that AOpen had tested are listed below. If your SDRAM has unstable problem, go into BIOS "Chipset Features Setup", change CAS Latency Time to 3 clocks.

Manufacturer	Model	Suggested CAS Latency Time	5V Tolerance
Samsung	KM416511220AT-G12	2	Yes
NEC	D4S16162G5-A12-7JF	2	No
Hitachi	HMS216805TT10	2	No
Fujitsu	81117822A-100FN	2	No
TI	TMX626812DGE-12	2	Yes
TI	TMS626812DGE-15	3	Yes
TI	TMS626162DGE-15	3	Yes
TI	TMS626162DGE-M67	3	Yes

The driving capability of new generation chipset is limited because the lack of memory buffer (to improve performance). This makes DRAM chip count an important factor to be taking into consideration when you install DIMM. Unfortunately, there is no way that BIOS can identified the correct chip count, you need to calculate the chip count by yourself. The simple rule is: By visual inspection, use only DIMM which is less than 16 chips.



**Warning** : Although Intel X chipset supports x4 SDRAM chip. Due to loading issue, it is not recommended to use this kind of SDRAM.



**Tip** The DIMM chip count can be calculated by following example:

For 64 bit DIMM using 1M by 16 bit SDRAM, the chip count is  $64/16=4$  chips.

## Hardware Installation

Following table list the recommended DRAM combinations of DIMM:

DIMM Data chip	Bit size per side	Single/ Double side	Chip count	DIMM size	Recommended
1M by 16	1Mx64	x1	4	8MB	Yes
1M by 16	1Mx64	x2	8	16MB	Yes
2M by 8	2Mx64	x1	8	16MB	Yes
2M by 8	2Mx64	x2	16	32MB	Yes

DIMM Data chip	Bit size per side	Single/ Double side	Chip count	DIMM size	Recommended
2M by 32	2Mx64	x1	2	16MB	Yes, but not tested.
2M by 32	2Mx64	x2	4	32MB	Yes, but not tested.
4M by 16	4Mx64	x1	4	32MB	Yes, but not tested.
4M by 16	4Mx64	x2	8	64MB	Yes, but not tested.
8M by 8	8Mx64	x1	8	64MB	Yes, but not tested.
8M by 8	8Mx64	x2	16	128MB	Yes, but not tested.

Following table are possible DRAM combinations that is **NOT** recommended:

DIMM Data chip	Bit size per side	Single/ Double side	Chip count	DIMM size	Recommended
4M by 4	4Mx64	x1	16	32MB	No
4M by 4	4Mx64	x2	32	64MB	No
16M by 4	16Mx64	x1	16	128MB	No
16M by 4	16Mx64	x2	32	256MB	No



**Warning** : You can only install one or two 64M bit (for example, 2M by 32, 4M by 16, and 8M by 8, etc.) DIMMs because of hardware limitation. Generally speaking, many large-size DIMMs are made by 64M bit chips.



## Hardware Installation

The EDO and SDRAM that AOpen had tested are listed below.

Size/Type	Ved	Model	Size/Die	Ch/Co
8M/EDO	Micron	MT4LCM16E5TG6	x1	8
16M/EDO	Micron	MT4LC2M8E7DJ-6	x1	4
16M/EDO	Hitachi	51W17805BJ6	x1	8
32M/EDO	Hitachi	51W17405BLTS6	x1	16
64M/EDO	Hyundai	HY51V65804 TC-60	x1	8
8M/SDRAM	SEC	KM416511220AT-G12	x1	4
8M/SDRAM	TI	TMS626162DGE M-67	x1	4
8M/SDRAM	TI	TMS626162DGE-15	x1	4
16M/SDRAM	TI	TMS626162DGE-15	x2	8
16M/SDRAM	TI	TMS626812DGE-15	x1	8
16M/SDRAM	NEC	D4516821G5-A12-7JF	x1	8
16M/SDRAM	Toshiba	TC59S1608AFT-12A	x1	8
16M/SDRAM	TI	TMS626812DGE-12A	x1	8
16M/SDRAM	TI	TMS626812DGE-12A	x1	8
16M/SDRAM	LGS	GM72V16821BT10K	x1	8
32M/SDRAM	Toshiba	TC59S1608AFT-12A	x2	16
32M/SDRAM	NEC	D4516821G5-A10-7JF	x2	16
128M/SDRAM	NEC	D4564841G5-A10-9JF	x2	16
16M/SDRAM	IBM	0316169CT3B	x2	8
16M/SDRAM	Hitachi	HM5216165TT10	x1	8
16M/SDRAM	IBM	0316809CT4B	x1	8

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## Chapter 3

# Award BIOS

This chapter tells how to configure the system parameters. You may update your BIOS via AWARD Flash Utility.

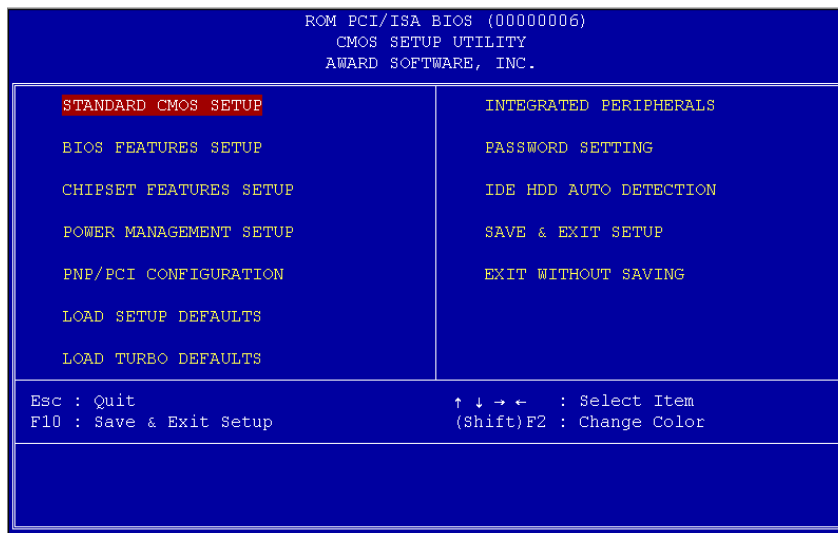


**Important** Because the BIOS code is the most often changed part of the mainboard design, the BIOS information contained in this chapter (especially the Chipset Setup parameters) may be a little different compared to the actual BIOS that came with your mainboard.

# AWARD BIOS

## 3.1 Eterigh AwardBIOS SetpMen

The BIOS setup utility is a segment of codes/routines residing in the BIOS Flash ROM. This routine allows you to configure the system parameters and save the configuration into the 128 byte CMOS area, (normally in the RTC chip or directly in the main chipset). To enter the BIOS Setup, press **[DEL]** during POST (Power-On Self Test). The BIOS Setup Main Menu appears as follows.



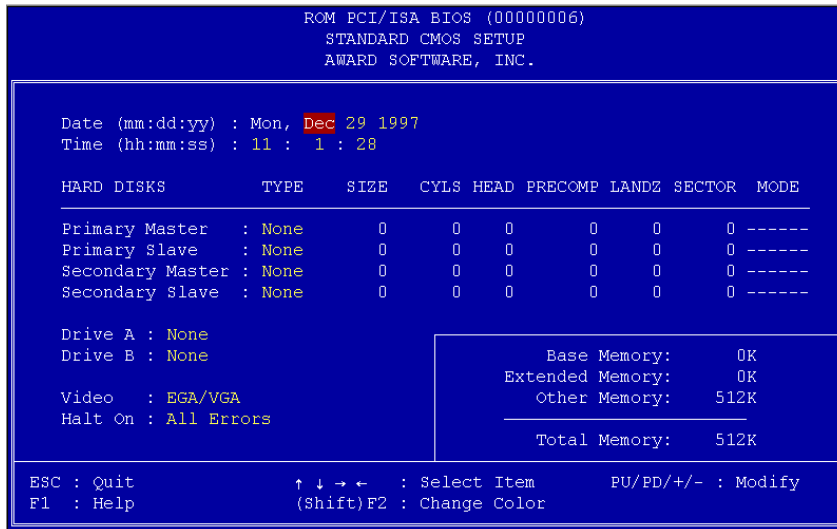
**Tip** : Choose "Load Setup Defaults" for recommended optimal performance. Choose "Load Turbo Defaults" for best performance with light system loading. Refer to section 3.7.

The section at the bottom of the screen tells how to control the screen. Use the arrow keys to move between items, **[SHIFT] [F2]** to color scheme of the display, **[ESC]** to exit, and **[F10]** to save the changes before exit. Another section at the bottom of the screen displays a brief description of the highlighted item.

After selecting an item, press **[ENTER]** to select or enter a submenu.

### 3.2 Standard CMOS Setup

The "Standard CMOS Setup" sets the basic system parameters such as the date, time, and the hard disk type. Use the arrow keys to highlight an item and **PGUP** or **PGDN** to select the value for each item.



#### Standard CMOS → Date

To set the date, highlight the Date parameter. Press **PGUP** or **PGDN** to set the current date. The date format is month, date, and year.

#### Standard CMOS → Time

To set the time, highlight the Time parameter. Press **PGUP** or **PGDN** to set the current time in hour, minute, and second format. The time is based on the 24 hour military clock.

## AWARD BIOS

---

**StadrCMOS** à **Primary Master** à **Yp**  
**StadrCMOS** à **Primary Slave** à **Yp**  
**StadrCMOS** à **Secdry Master** à **Yp**  
**StadrCMOS** à **Secdry Slave** à **Yp**

Type
Auto
User
None
1
2
...
45

This item lets you select the IDE hard disk parameters that your system supports. These parameters are Size, Number of Cylinder, Number of Head, Start Cylinder for Pre-compensation, Cylinder number of Head Landing Zone and Number of Sector per Track. The default setting is **Auto**, which enables BIOS to automatically detect the parameters of installed HDD at POST (Power-On Self Test). If you prefer to enter HDD parameters manually, select **User**. Select **None** if no HDD is connected to the system.

The IDE CDROM is always automatically detected.



**IP** For an IDE hard disk, we recommend that you use the "IDE HDD Auto Detection" to enter the drive specifications automatically. See the section "IDE HDD Auto Detection".

**StadrCMOS** à **Primary Master** à **Me**  
**StadrCMOS** à **Primary Slave** à **Me**  
**StadrCMOS** à **Secdry Master** à **Me**  
**StadrCMOS** à **Secdry Slave** à **Me**

Mode
Auto
Normal
LBA
Large

The enhanced IDE feature allows the system to use a hard disk with a capacity of more than 528MB. This is made possible through the Logical Block Address (LBA) mode translation. The LBA is now considered as a standard feature of current IDE hard disk on the market because of its capability to support capacity larger than 528MB. Note that if HDD is formatted with LBA On, it will not be able to boot with LBA Off.

## AWARD BIOS

---

**Standard CMOS**    à **Drive A**  
**Standard CMOS**    à **Drive B**

**Drive A**

None  
360KB 5.25"  
1.2MB 5.25"  
720KB 3.5"  
1.44MB 3.5"  
2.88MB 3.5"

These items select floppy drive type. The available settings and types supported by the mainboard are listed on the left.

**Standard CMOS**    à **Video**

**Video**

EGA/VGA  
CGA40  
CGA80  
Mono

This item specifies the type of video card in use. The default setting is VGA/EGA. Since current PCs use VGA only, this function is almost useless and may be disregarded in the future.

**Standard CMOS**    à **Halt On**

**Halt On**

No Errors  
All Errors  
All, But Keyboard  
All, But Diskette  
All, But Disk/Key

This parameter enables you to control the system stops in case of Power-On Self Test (POST) error.

## AWARD BIOS

### 3.3 BIOS Features Setup

This screen appears when you select the option "BIOS Features Setup" from the main menu.

```
ROM PCI/ISA BIOS (00000006)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning           : Disabled
External Cache         : Enabled
Quick Power On Self Test : Enabled
Boot Sequence          : A,C,SCSI
Swap Floppy Drive      : Disabled
Boot Up NumLock Status : Off
Boot Up System Speed   : High
Typematic Rate Setting : Disabled
Typematic Rate (Chars/Sec) : 6
Typematic Delay (Msec) : 250
Security Option        : Setup
PCI/VGA Palette Snoop : Disabled
OS Select For DRAM > 64MB : Non-OS2

Video BIOS Shadow     : Enabled
C8000-CBFFF Shadow   : Disabled
CC000-CFFFF Shadow   : Disabled
D0000-D3FFF Shadow   : Disabled
D4000-D7FFF Shadow   : Disabled
D8000-DBFFF Shadow   : Disabled
DC000-DFFFF Shadow   : Disabled

ESC : Quit           ↑↓←→ : Select Item
F1  : Help           PU/PD/+/- : Modify
F5  : Old Values    (Shift)F2 : Color
F6  : Load Setup Defaults
F7  : Load Turbo Defaults
```

#### BIOS Features à Virus Warning

<b>Virus Warning</b>	Set this parameter to Enabled to activate the warning message. This feature protects the boot sector and partition table of your hard disk from virus intrusion.
Enabled	
Disabled	Any attempt during boot up to write to the boot sector of the hard disk drive stops the system and the following warning message appears on the screen. Run an anti-virus program to locate the problem.

```
! WARNING !
Disk Boot Sector is to be modified
Type "Y" to accept write, or "N" to abort write
Award Software, Inc.
```

## AWARD BIOS

### BIOS Features à External Cache

#### External Cache

Enabled  
Disabled

Enabling this parameter activates the secondary cache (currently, PBSRAM cache). Disabling the parameter slows down the system. Therefore, we recommend that you leave it enabled unless you are troubleshooting a problem.

### BIOS Features à Power-On Self-Test

#### Quick Power-on Self-test

Enable  
Disabled

This parameter speeds up POST by skipping some items that are normally checked.

### BIOS Features à Boot Sequence

#### Boot Sequence

A,C,SCSI  
C,A,SCSI  
C,CDROM,A  
CDROM,C,A  
D,A,SCSI  
E,A,SCSI  
F,A,SCSI  
SCSI,A,C  
SCSI,C,A  
C only  
LS/ZIP,C

This parameter allows you to specify the system boot up search sequence. The hard disk ID are listed below:

C: Primary master  
D: Primary slave  
E: Secondary master  
F: Secondary slave  
LS: LS120 drive  
ZIP: IOMEGA ZIP drive

### BIOS Features à Swap Floppy Drive

#### Swap Floppy Drive

Enabled  
Disabled

This item allows you to swap floppy drives. For example, if you have two floppy drives (A and B), you can assign the first drive as drive B and the second drive as drive A or vice-versa.



## AWARD BIOS

---

### BIOS Entries à **Boot Seek**

<b><u>Boot-up Floppy Seek</u></b> Enabled Disabled
--

When enabled, the BIOS issues the seek command to the floppy drive during POST to move floppy drive head forward and backward.

### BIOS Entries à **Boot NumLock Status**

<b><u>Boot-up NumLock Status</u></b> On Off
---

Setting this parameter to On enables the numeric function of the numeric keypad. Set this parameter to Off to disregard the function. Disabling the numeric function allows you to use the numeric keypad for cursor control.

### BIOS Entries à **Boot System Speed**

<b><u>Boot-up System Speed</u></b> High Low
---

Select High or Low system speed after boot.

### BIOS Entries à **Typematic Rate Setting**

<b><u>Typematic Rate Setting</u></b> Enabled Disabled
---

Set this parameter to Enable/Disable the keyboard repeat function. When enabled, continually holding down a key on the keyboard will generate repeatedly keystrokes.

### BIOS Entries à **Typematic Rate**

<b><u>Typematic Rate</u></b> 6 8 10 12 15 20 24 30
--

This item allows you to control the speed of repeated keystrokes. The default is 30 characters/sec.

## AWARD BIOS

### BIOS Entries à Typematic Delay

<b>Typematic Delay</b>
250
500
750
1000

This parameter allows you to control the delay time between the first and the second keystroke (where the repeated keystrokes begin). The typematic delay settings are 250, 500, 750, and 1000 msec.

### BIOS Entries à Security Option

<b>Security Option</b>
Setup
System

The **System** option limits access to both the System boot and BIOS setup. A prompt asking you to enter your password appears on the screen every time you boot the system.

The **Setup** option limits access only to BIOS setup.

To disable the security option, select Password Setting from the main menu, don't type anything and just press <Enter>.

### BIOS Entries à PCI/VGA Palette Sp

<b>PCI/VGA Palette Snoop</b>
Enabled
Disabled

Enabling this item informs the PCI VGA card to keep silent (and to prevent conflict) when palette register is updated (i.e., accepts data without responding any communication signals). This is useful only when two display cards use the same palette address and plugged in the PCI bus at the same time (such as MPEQ or Video capture). In such case, PCI VGA is silent while MPEQ/Video capture is set to function normally.

### BIOS Entries à OS Select foDRAM > 64MB

<b>OS Select for DRAM &gt; 64MB</b>
OS/2
Non-OS/2

Set to OS/2 if your system is utilizing an OS/2 operating system and has a memory size of more than 64 MB.

## AWARD BIOS

---

### BIOS Features à Video BIOS Shadow

<b>Video BIOS Shadow</b>
------------------------------

Enabled
Disabled

VGA BIOS Shadowing means to copy video display card BIOS into the DRAM area. This enhances system performance because DRAM access time is faster than ROM.

BIOS Features à C800-CBFShadow

BIOS Features à CC00-CFShadow

BIOS Features à D000-D3FShadow

BIOS Features à D400-D7FShadow

BIOS Features à D800-DBFShadow

BIOS Features à DC00-DFShadow

<b>C800-CBF Shadow</b>
----------------------------

Enabled
Disabled

These six items are for shadowing ROM code on other expansion cards. Before you set these parameters, you need to know the specific addresses of that ROM code. If you do not know this information, enable all the ROM shadow settings.



**Note:** The 000 and E000 segments are always shadowed because BIOS code occupies these areas.

### 3.4 Chipset Features Setup

The "Chipset Features Setup" includes settings for the chipset dependent features. These features are related to system performance.

```

ROM PCI/ISA BIOS (00000006)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration      : Enabled
DRAM Timing            : 70ns

DRAM Leadoff Timing    : 10/6/3/3
DRAM Read Burst (EDO/FP) : x222/x333
DRAM Write Burst Timing : x333
Fast EDO Lead Off      : Disabled
Refresh RAS# Assertion : 5 Clks
DRAM Page Idle Timer   : 6 Clks
DRAM Enhanced Paging   : Enabled
SDRAM(CAS Lat/RAS-to-CAS) : 3/3
SDRAM Speculative Read : Disabled
System BIOS Cacheable  : Disabled
Video BIOS Cacheable   : Enabled
8 Bit I/O Recovery Time : 4
16 Bit I/O Recovery Time : 1
Memory Hole At 15M-16M : Disabled
PCI Passive Release    : Disabled
PCI Delayed Transaction : Disabled
Mem. Drive Str. (MA/RAS) : 16mA/16mA

ESC : Quit      ↑↓←→ : Select Item
F1  : Help      PU/PD/+/- : Modify
F5  : Old Values (Shift)F2 : Color
F6  : Load Setup Defaults
F7  : Load Turbo Defaults
    
```



**Caution** Make sure you fully understand the items contained in this menu before you try to change anything. You may change the parameter settings to improve system performance. However, it may cause system unstable if the setting are not correct for your system configuration.

## AWARD BIOS

---

### Chipset Features → Auto Configuration

#### Auto Configuration

Enabled  
Disabled

When **Enabled**, the DRAM and cache related timing are set to pre-defined value according to CPU type and clock. Select **Disable** if you want to specify your own DRAM timing.

### Chipset Features → DRAM Timing

#### DRAM Timing

60 ns  
70 ns

There are two sets of DRAM timing parameters that can be automatically set by BIOS, 60ns and 70ns.



**Warning**: The default memory timing setting is 60ns to get the optimal performance. Because of the specification limitation of INTEL X chipset, 70ns SIMM can only be used with CPU external clock 60MHz. Do not use 70ns SIMM with 66MHz CPU external clock as it may result in unstable system behavior.

### Chipset Features → DRAM Leadoff Timing

#### DRAM Leadoff

##### Timing

11/7/3/4  
10/6/3/3  
11/7/4/4  
10/6/4/3

The Leadoff means the timing of first memory cycle in the burst read or write. Actually, this item controls only page miss read/write leadoff timing and the clocks of RAS precharge and RAS to CAS delay. The four digits represent Read Leadoff/ Write Leadoff/ RAS Precharge/ RAS to CAS delay. For example, default is **10/6/3/3**, which means you have 10-x-x-x DRAM page miss read and 6-x-x-x DRAM write, with 3 clocks RAS precharge and 3 clocks RAS to CAS delay.

## AWARD BIOS

### Chipset Entries → DRAM Read Burst (EDO/F)

#### DRAM Read Burst (EDO/F)

x444/x444  
x333/x444  
x222/x333

Read Burst means to read four continuous memory cycles on four predefined addresses from the DRAM. The default value is **x222/x333** for 60ns EDO or FPM (Fast Page Mode) DRAM. Which means the 2nd,3rd and 4th memory cycles are 2 CPU clocks for EDO and 3 clocks for FPM. The value of x is the timing of first memory cycle and depends on the "DRAM Leadoff Timing" setting.

### Chipset Entries → DRAM Write Burst Timing

#### DRAM Write Burst Timing

x444  
x333  
x222

Write Burst means to write four continuous memory cycles on four predefined addresses to the DRAM. This item sets the DRAM write timing of the 2nd,3rd and 4th memory cycles. There is no difference of EDO and FPM DRAM on the write burst timing. The value of x depends on the "DRAM Leadoff Timing" setting.

### Chipset Entries → Fast EDO Lead Off

#### Fast EDO Lead Off

Enabled  
Disabled

This item enables fast EDO read timing, results 1 clock pull-in for read leadoff latency of EDO read cycles. It must be Disabled, if any FPM DRAM is installed.

### Chipset Entries → Refresh RAS# Assertion

#### Refresh RAS# Assertion

5 Clks  
4 Clks

This item controls the number of clocks RAS is asserted for refresh cycle.

## AWARD BIOS

---

### Chipset Features → DRAM Page Idle Timer

#### DRAM Page Idle Timer

2 Clks  
4 Clks  
6 Clks  
8 Clks

This item determines the amount of time in CPU clocks that DRAM page will be close after CPU becomes idle.

### Chipset Features → DRAM Enhance Page

#### DRAM Enhance Page

Enabled  
Disabled

When Enabled, TX chipset will keep DRAM page open as long as possible according to enhanced method.

### Chipset Features → SDRAM(CAS Lat/RAS-to-CAS)

#### SDRAM(CAS Lat/RAS-to-CAS)

2/2  
3/3

These are timing of SDRAM CAS Latency and RAS to CAS Delay, calculated by clocks. They are important parameters affects SDRAM performance, default is 2 clocks. If your SDRAM has unstable problem, change 2/2 to 3/3.

### Chipset Features → SDRAM Speculative Read

#### SDRAM Speculative Read

Enabled  
Disabled

Enable this item reduce one clock of SDRAM read leadoff timing by presenting the SDRAM read request before the controller chip decodes the final memory target. This Item must be **Disabled** if more than one DIMM is installed in the system.

### Chipset Features → System BIOS Cacheable

#### System BIOS Cacheable

Enabled  
Disabled

Enabling this item allows you to cache the system BIOS to further enhance system performance.

## AWARD BIOS

### Chipset Entries à Video BIOS Cacheable

<b><u>Video BIOS Cacheable</u></b>	Allows the video BIOS to be cached to allow faster video performance.
Enabled	
Disabled	

### Chipset Entries à 8 Bit I/O Recovery Time

<b><u>8 Bit I/O Recovery Time</u></b>	For some old I/O chips, after the execution of an I/O command, the device requires a certain amount of time (recovery time) before the execution of the next I/O command. Because of new generation CPU and mainboard chipset, the assertion of I/O command is faster, and sometimes shorter than specified I/O recovery time of old I/O devices. This item lets you specify the delay of 8-bit I/O command by count of ISA bus clock. If you find any unstable 8-bit I/O card, you may try to extend the I/O recovery time via this item. The BIOS default value is <b>4 ISA clock</b> . If set to NA, the chipset will insert 3.5 system clocks.
1	
2	
3	
4	
5	
6	
7	
8	
NA	

### Chipset Entries à 16 Bit I/O Recovery Time

<b><u>16 Bit I/O Recovery Time</u></b>	The same as 16-bit I/O recovery time. This item lets you specify the recovery time for the execution of 16-bit I/O commands by count of ISA bus clock. If you find any of the installed 16-bit I/O cards unstable, try extending the I/O recovery time via this item. The BIOS default value is <b>1 ISA clocks</b> . If set to NA, the chipset will automatically insert 3.5 system clocks.
1	
2	
3	
4	
NA	

### Chipset Entries à Memory Hole At 15M-16M

<b><u>Memory Hole At 15M-16M</u></b>	This option lets you reserve system memory area for special ISA cards. The chipset accesses code/data of these areas from the ISA bus directly. Normally, these areas are reserved for memory mapped I/O card.
Enabled	
Disabled	



## AWARD BIOS

---

### Chipset Features à PCI Passive Release

<b><u>PCI Passive Release</u></b> Enabled Disabled	This item lets you control the Passive Release function of the PIIX4 chipset (Intel PCI to ISA bridge). This function is used to meet latency of ISA bus master. Try to enable or disable it, if you have ISA card compatibility problem.
--	---

### Chipset Features à PCI Delayed Transaction

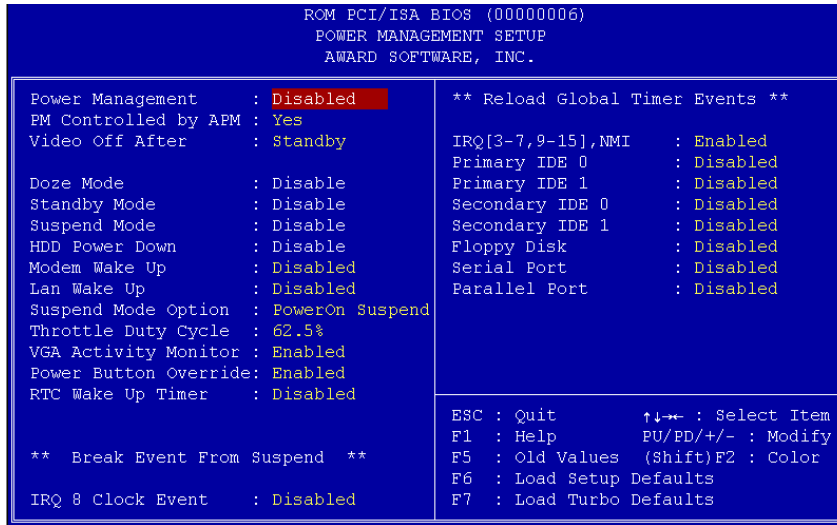
<b><u>PCI Delayed Transaction</u></b> Enabled Disabled	This item lets you control the Delayed Transaction function of the PIIX4 chipset (Intel PCI to ISA bridge). This function is used to meet latency of PCI cycles to or from ISA bus. Try to enable or disable it, if you have ISA card compatibility problem.
--	--

### Chipset Features à Mem. Drive Str. (MA/RAS)

<b><u>Mem. Drive Str. (MA/RAS)</u></b> 10mA/10mA 10mA/16mA 16mA/10mA 16mA/16mA	This option controls the driving strength of memory address and control signals. It is recommended to use less driving current for light memory loading, to prevent undershoot or overshoot.
--	--

### 3.5 Power Management Setup

The Power Management Setup screen enables you to control the mainboard's green features. See the following screen.



#### Power Management à Power Management

<u>Power Management</u>
Max Saving
Mix Saving
User Defined
Disabled

This function allows you to set the default parameters of power-saving modes. Set to **Disable** to turn off power management function. Set to User Defined to choose your own parameters.

Mode	Doze	Standby	Suspend	HDD Power Down
Min Saving	1 hour	1 hour	1 hour	15 min
Max Saving	1 min	1 min	1 min	1 min

## AWARD BIOS

---

### Power Management à PM Controlled APM

<b><u>PM Controlled by APM</u></b> Yes No	If "Max Saving" is selected, you can turn on this item, transfer power management control to APM (Advanced Power Management) and enhance power saving function. For example, stop CPU internal clock.
---	---

### Power Management à Video Off After

<b><u>Video Off After</u></b> N/A Doze Standby Suspend	To turn off video monitor at which power down mode.
--	---

### Power Management à Doze Md

<b><u>Doze Mode</u></b> Disabled 1 Min 2 Min 4 Min 8 Min 12 Min 20 Min 30 Min 40 Min 1 Hour	This item lets you set the period of time after which the system enters into Doze mode. In this mode, the CPU clock slows down. The ratio is specified in the "Throttle Duty Cycle". Any activity detected returns the system to full power. The system activity (or event) is detected by monitoring the IRQ signals.
---	--

## AWARD BIOS

### **Pwer Maagemen**    **à**   **Standby Mode**

#### Standby Mode

Disabled  
1 Min  
2 Min  
4 Min  
8 Min  
12 Min  
20 Min  
30 Min  
40 Min  
1 Hour

This item lets you set the period of time after which the system enters into Standby mode. In this mode, CPU clock slows down, hard disk will be shut off and the monitor power-saving feature activates. Any activity detected returns the system to full power. The system activity (or event) is detected by monitoring the IRQ signals.

### **Pwer Maagemen**    **à**   **Suspend Mode**

#### Suspend Mode

Disabled  
1 Min  
2 Min  
4 Min  
8 Min  
12 Min  
20 Min  
30 Min  
40 Min  
1 Hour

This item lets you set the period of time after which the system enters into Suspend mode. The Suspend mode can be Power On Suspend or Suspend to Hard Drive, selected by "Suspend Mode Option".

### **Pwer Maagemen**    **à**   **HDD Power Down**

#### HDD Power Down

Disabled  
1 Min  
.....  
15 Min

This option lets you specify the IDE HDD idle time before the device enters the power down state. This item is independent from the power states previously described in this section (Standby and Suspend).

## AWARD BIOS

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### **Pwer Maagmen**    à    **Mdm Wake Up**

#### Modem Wake Up

Disabled  
Enabled

This motherboard implements AOpen special circuit to detect modem ring signal and wakeup from soft power off. The most possible applications are automatic answering machine and fax send/receive. It does not like traditional green PC suspend mode, the system can be true power off, (identified by the fan of your power supply is off). You can use external box modem or AOpen MP56/F56 internal modem card for modem ring-on, but MP56/F56 is recommended, since MP56/F56 has special circuit to cooperate with this mainboard and the modem power and system power can be off together.

### **Pwer Maagmen**    à    **LAN Wake Up**

#### LAN Wake Up

Enabled  
Disabled

This option lets you specify enable or disable LAN Wake Up function.

### **Pwer Maagmen**    à    **Suspend Optio**

#### Suspend Mode Option

Power On Suspend  
Suspend to Disk

You can select suspend mode by this item. **Power OnSuspend** is the traditional Green PC suspend mode, the CPU clock is stop, all other devices are shut off. But power must be kept On to detect activities from modem, keyboard/mouse and returns the system to full power. The system activities is detected by monitoring the IRQ signals. **Suspend to Disk** saves system status, memory and screen image into hard disk, then the power can be totally Off. Next time, when power is turned On, the system goes back to your original work within just few seconds. You need utility AOZVHDD to reserve disk space.

## AWARD BIOS

### Pøwer Maagemen à Throttle Duty Cycle

#### Throttle Duty Cycle

12.5 %  
25.0 %  
37.5 %  
50.0 %  
62.5 %  
75.0 %  
87.5 %

Clock Throttling means at the Doze/Standby state, the CPU clock count in a given time (not the frequency) is reduced to the ratio specified in this parameter. Actually, the period per CPU clock is not changed. For example, a 66MHz CPU clock remains the same 30ns clock period when system goes into Doze/Suspend. The chipset generates the STPCLK (stop clock) signal periodically to prevent CPU from accepting clock from clock generator. For full power on, the CPU can receive 66M count in one second. If the Slow Clock Ratio is set to 50%, the CPU will only receive 33M clock count in one second. This will effectively reduce CPU speed as well as CPU power.

### Pøwer Maagemen à VGA Activity Monitor

#### VGA Activity Monitor

Enabled  
Disabled

To enable or disable the detection of VGA activity for power down state transition.

### Pøwer Maagemen à Power Button Override

#### Power Button Override

Disabled  
Enabled

This is a specification of ACPI and supported by hardware. When **Enabled**, the soft power switch on the front panel can be used to control power On, Suspend and Off. If the switch is pressed less than 4 sec during power On, the system will go into Suspend mode. If the switch is pressed longer than 4 sec, the system will be turned Off. The default setting is **Disabled**, soft power switch is only used to control On and Off, there is no need to press 4 sec, and there is no Suspend.

## AWARD BIOS

---

### Power Management à RTC WakeUp Timer

<b>RTC WakeUp Timer</b> Disabled Wake Up Power Off	The RTC WakeUp Timer can be programmed at a specified date/time to wakeup the system. The Date/Time is set by " WakeUp Date (of Month)" and "WakeUp Time (hh:mm:ss)". For automatic power off, you can select the idle timer in "Doze Mode" + "Standby Mode" + "Suspend Mode" to power off after system is detected without any activities.
---	---

### Power Management à WakeUp Date (of Month)

<b>Date (of Month) Alarm</b> 0 1 2 ..... 30 31	This item selects the date of month to on which to wake up or power off the system. Set to <b>0</b> means everyday.
--	---

### Power Management à Wake Up Time (hh:mm:ss)

<b>Time (hh:mm:ss) Alarm</b> 07:00:00 .. : .. : ..	This item selects the time at which to wake up or power off the system. The format is hour:minute:second, note that hour is in 24 hours form.
--	---

### Power Management à IRQ 8 Clock Event

<b>IRQ 8 Clock Event</b> Enabled Disabled	To enable or disable the detection of IRQ8 (RTC) event for power down state transition. OS2 has periodically IRQ8 (RTC) interruptions, If IRQ8 is not set to <b>Disabled</b> , OS/2 may fail to go into Doze/Standby/Suspend mode.
---	--

## AWARD BIOS

---

**Power Management** à **IRQ [3-7,9-15],NMI**

**IRQ [3-7,9-15],NMI**

Enabled  
Disabled

To enable or disable the detection of IRQ3-7, IRQ9-15 or NMI interrupt events for power down state transition.

**Power Management** à **Primary IDE 0**

**Power Management** à **Primary IDE 1**

**Power Management** à **Secondary IDE 0**

**Power Management** à **Secondary IDE 1**

**Power Management** à **Floppy Disk**

**Power Management** à **Serial Port**

**Power Management** à **Parallel Port**

**Primary IDE 0**

Enabled  
Disabled

These items enable or disable the detection of IDE, floppy, serial and parallel port activities for power down state transition. Actually it detects the read/write to/from I/O or address port.



# AWARD BIOS

## 3.6 PNP/PCI Configuration Setup

The PNP/PCI Configuration Setup allows you to configure the ISA and PCI devices installed in your system. The following screen appears if you select the option "PNP/PCI Configuration Setup" from the main menu.

```
ROM PCI/ISA BIOS (00000006)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

PNP OS Installed      : No
Resources Controlled By : Manual
Reset Configuration Data : Disabled

IRQ-3 assigned to : Legacy ISA
IRQ-4 assigned to : Legacy ISA
IRQ-5 assigned to : PCI/ISA PnP
IRQ-7 assigned to : PCI/ISA PnP
IRQ-9 assigned to : PCI/ISA PnP
IRQ-10 assigned to : PCI/ISA PnP
IRQ-11 assigned to : PCI/ISA PnP
IRQ-12 assigned to : PCI/ISA PnP
IRQ-14 assigned to : PCI/ISA PnP
IRQ-15 assigned to : PCI/ISA PnP
DMA-0 assigned to : PCI/ISA PnP
DMA-1 assigned to : PCI/ISA PnP
DMA-3 assigned to : PCI/ISA PnP
DMA-5 assigned to : PCI/ISA PnP
DMA-6 assigned to : PCI/ISA PnP
DMA-7 assigned to : PCI/ISA PnP

PCI IDE IRQ Map To : PCI-AUTO
Primary IDE INT# : A
Secondary IDE INT# : B

Used MEM base addr : N/A

ESC : Quit      ↑↓←→ : Select Item
F1  : Help      PU/PD/+/- : Modify
F5  : Old Values (Shift)F2 : Color
F6  : Load Setup Defaults
F7  : Load Turbo Defaults
```

### PNP/PCI Configuration → PnP OS Installed

<b><u>PnP OS Installed</u></b>
Yes
No

Normally, the PnP resources are allocated by BIOS during POST (Power-On Self Test). If you are using a PnP operating system (such as Windows 95), set this item to Yes to inform BIOS to configure only the resources needed for booting (VGA/IDE or SCSI). The rest of system resources will be allocated by PnP operating system.

## AWARD BIOS

### PNP/PCI Configuration

### à Resources Controlled By

**Resources Controlled by**  
Auto  
Manual

Setting this option to Manual allows you to individually assign the IRQs and DMAs to the ISA and PCI devices. Set this to **Auto** to enable the auto-configuration function.

### PNP/PCI Configuration

### à Reset Configuration Data

**Reset Configuration Data**  
Enabled  
Disabled

In case conflict occurs after you assign the IRQs or after you configure your system, you can enable this function, allow your system to automatically reset your configuration and reassign the IRQs.

### PNP/PCI Configuration

### à IRQ3 (COM2)

### PNP/PCI Configuration

### à IRQ4 (COM1)

### PNP/PCI Configuration

### à IRQ5 (Network/Sound or Others)

### PNP/PCI Configuration

### à IRQ7 (Printer or Others)

### PNP/PCI Configuration

### à IRQ9 (Video or Others)

### PNP/PCI Configuration

### à IRQ10 (SCSI or Others)

### PNP/PCI Configuration

### à IRQ11 (SCSI or Others)

### PNP/PCI Configuration

### à IRQ12 (PS/2 Mouse)

### PNP/PCI Configuration

### à IRQ14 (IDE1)

### PNP/PCI Configuration

### à IRQ15 (IDE2)

### **IRQ 3**

Legacy ISA  
PCI/ISA PnP

If your ISA card is not PnP compatible and requires a special IRQ to support its function, set the selected IRQ to **Legacy ISA**. This setting informs the PnP BIOS to reserve the selected IRQ for the installed legacy ISA card. The default is **PCI/ISA PnP**. Take note that PCI cards are always PnP compatible (except old PCI IDE card).

## AWARD BIOS

---

**PNP/PCI C~~o~~figatio**      à **DMA 0**  
**PNP/PCI C~~o~~figatio**      à **DMA 1**  
**PNP/PCI C~~o~~figatio**      à **DMA 3**  
**PNP/PCI C~~o~~figatio**      à **DMA 5**  
**PNP/PCI C~~o~~figatio**      à **DMA 6**  
**PNP/PCI C~~o~~figatio**      à **DMA 7**

<b>DMA 0</b> Legacy ISA PCI/ISA PnP
---

If your ISA card is not PnP compatible and requires a special DMA channel to support its function, set the selected DMA channel to **Legacy ISA**. This setting informs the PnP BIOS to reserve the selected DMA channel for the installed legacy ISA card. The default is **PCI/ISA PnP**. Take note that PCI card does not require DMA channel.

**PNP/PCI C~~o~~figatio**      à **PCI IDE IRQ Map To**

<b>PCI IDE IRQ Map To</b> ISA PCI-Slot1 PCI-Slot2 PCI-Slot3 PCI-Slot4 PCI-Auto
--

Some old PCI IDE add-on cards are not fully PnP compatible. These cards require you to specify the slot in use to enable BIOS to properly configure the PnP resources. This function allows you to select the PCI slot for any PCI IDE add-on card present in your system. Set this item to **Auto** to allow BIOS to automatically configure the installed PCI IDE card(s).

**PNP/PCI C~~o~~figatio**      à **Primary IDE INT#**  
**PNP/PCI C~~o~~figatio**      à **Secondary IDE INT#**

<b>Primary IDE INT#</b> A B C D
---

These two items, in conjunction with item "PCI IDE IRQ Map To", specify the IRQ routing of the primary or secondary channel of the PCI IDE add-on card (not the onboard IDE). Each PCI slot has four PCI interrupts aligned as listed in the table below. You must specify the slot in the "PCI IDE IRQ Map To", and set the PCI interrupt (INTx) here according to the interrupt connection on the card.

PCI Slot	Location 1 (pin A6)	Location 2 (pin B7)	Location 3 (pin A7)	Location 4 (pin B8)
----------	------------------------	------------------------	------------------------	------------------------

## AWARD BIOS

Slot 1	INTA	INTB	INTC	INTD
Slot 2	INTB	INTC	INTD	INTA
Slot 3	INTC	INTD	INTA	INTB
Slot 4	INTD	INTA	INTB	INTC
Slot 5 (if any)	INTD	INTA	INTB	INTC

### PNP/PCI C<sup>o</sup>nfigatio

### à UsedMEM Base Ad

<b>Used MEM base addr</b>
N/A
C800
CC00
D000
D400
D800
DC00

This item, in conjunction with the "Used MEM Length", lets you set a memory space for non-PnP compatible ISA card. This item specifies the memory base (start address) of the reserved memory space. The memory size is specified in the "Used MEM Length".

### PNP/PCI C<sup>o</sup>nfigatio

### à UsedMEM l<sup>e</sup>gh

<b>Used MEM Length</b>
8K
16K
32K
64K

If your ISA card is not PnP compatible and requires special memory space to support its function, specify the memory size in this parameter to inform the PnP BIOS to reserve the specified memory space for installed legacy ISA card.

## AWARD BIOS

---

### 3.7 **Load Setup Defaults**

The "Load Setup Defaults" option loads optimized settings for optimum system performance. Optimal settings are relatively safer than the Turbo settings. We recommend you to use the Optimal settings if your system has large memory size and fully loaded with add-on card (for example, a file server using double-sided 8MB SIMM x4 and SCSI plus Network card occupying the PCI and ISA slots).

Optimal is not the slowest setting for this mainboard. If you need to verify a unstable problem, you may manually set the parameter in the "BIOS Features Setup" and "Chipset Features Setup" to get slowest and safer setting.

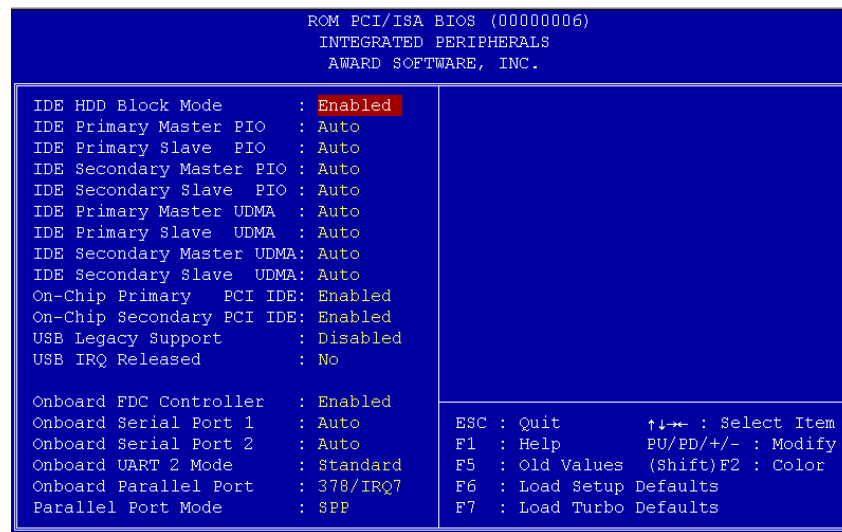
### 3.8 **Load Turbo Defaults**

The "Load Turbo Defaults" option gives better performance than Optimal values. However, Turbo values may not be the best setting of this mainboard but these values are qualified by the AOpen RD and QA department as the reliable settings especially if you have limited loading of add-on card and memory size (for example, a system that contains only a VGA/Sound card and two SIMMs).

To attain the best system performance, you may manually set the parameters in the "Chipset Features Setup" to get proprietary setting. Make sure that you know and understand the functions of every item in Chipset Setup menu. The performance difference of Turbo from Optimal is normally around 3% to 10%, depending on the chipset and the application.

### 3.9 Integrated Peripherals

The following screen appears if you select the option "Integrated Peripherals" from the main menu. This option allows you to configure the I/O features.



#### Integrated Peripherals

#### à IDE HDD Block Mode

<b>IDE HDD Block Mode</b>
Enabled
Disabled

This feature enhances disk performance by allowing multisector data transfers and eliminates the interrupt handling time for each sector. Most IDE drives, except with old designs, can support this feature.

## AWARD BIOS

---

- Integrated Peripherals → IDE Primary Master PIO
- Integrated Peripherals → IDE Primary Slave PIO
- Integrated Peripherals → IDE Secondary Master PIO
- Integrated Peripherals → IDE Secondary Slave PIO

### IDE Primary Master PIO

Auto  
Mode 1  
Mode 2  
Mode 3  
Mode 4

Setting this item to **Auto** activates the HDD speed auto-detect function. The PIO mode specifies the data transfer rate of HDD. For example: mode 0 data transfer rate is 3.3MB/s, mode 1 is 5.2MB/s, mode 2 is 8.3MB/s, mode 3 is 11.1MB/s and mode 4 is 16.6MB/s. If your hard disk performance becomes unstable, you may manually try the slower mode.



**Caution** It is recommended that you connect the first IDE device of each channel to the endmost connector of the IDE cable. Refer to section 2.3 "Connectors" for details on how to connect IDE device(s).

- Integrated Peripherals → IDE Primary Master UDMA
- Integrated Peripherals → IDE Primary Slave UDMA
- Integrated Peripherals → IDE Secondary Master UDMA
- Integrated Peripherals → IDE Secondary Slave UDMA

### IDE Primary Master UDMA

Auto  
Disabled

This item allows you to set the Ultra DMA/33 mode supported by the hard disk drive connected to your primary IDE connector.

- Integrated Peripherals → On-Chip Primary PCI IDE
- Integrated Peripherals → On-Chip Secondary PCI IDE

### On-Chip Primary PCI IDE

Enabled  
Disabled

This parameter lets you enable or disable the IDE device connected to the primary IDE connector.

## AWARD BIOS

### Integrated Peripherals      à    USB Legacy Spt

<u>USB Legacy Support</u> Enabled Disabled
--

This item lets you enable or disable the USB keyboard driver within the onboard BIOS. The keyboard driver simulates legacy keyboard command and let you use USB keyboard during POST or after boot if you don't have USB driver in the operating system.



**Caution** : You can not use both USB driver and USB legacy keyboard at the same time. Disable "USB Legacy Support" if you have USB driver in the operating system.

### Integrated Peripherals      à    USB IRQ Released

<u>USB IRQ Released</u> Yes No
--------------------------------------

USB device is default to use PCI INTD#, the same as PCI slot4. If you installed PCI card on slot4 and require to use INTD#, set this item to Yes. The USB device will then be disabled.



**Note**: Normally, PCI VGA does not need PCI interrupt, you may put PCI VGA on slot4.

### Integrated Peripherals      à    Onboard FDC Controller

<u>Onboard FDC Controller</u> Enabled Disabled
--

Setting this parameter to **Enabled** allows you to connect your floppy disk drives to the onboard floppy disk connector instead of a separate controller card. Change the setting to Disabled if you want to use a separate controller card.



## AWARD BIOS

---

### Integrated Peripherals

### à Onboard Serial Port 1 à Onboard Serial Port 2

<b>Onboard Serial Port 1</b>
Auto
3F8/IRQ4
2F8/IRQ3
3E8/IRQ4
2E8/IRQ3
Disabled

This item allow you to assign address and interrupt for the board serial port. Default is **Auto**.



**Note:** If you are using an network card, make sure that the interrupt does not conflict.

### Integrated Peripherals

### à Onboard UART 2 Mode

<b>Onboard UART 2 Mode</b>
Standard
HPSIR
ASKIR

This item is configurable only if the "Onboard UART 2" is enabled. This allows you to specify the mode of serial port2. The available mode selections are:

- **Standard** - Sets serial port 2 to operate in normal mode. This is the default setting.
- **HPSIR** - Select this setting if you installed an Infrared module in your system via IrDA connector (refer to section 2.3 "Connectors"). This setting allows infrared serial communication at a maximum baud rate of 115K baud.
- **ASKIR** - Select this setting if you installed an Infrared module via IrDA connector (refer to section 2.3 "Connectors"). This setting allows infrared serial communication at a maximum baud rate of 19.2K baud.

## AWARD BIOS

### Integrated Peripherals

#### à Onboard Parallel Port

##### Onboard Parallel Port

3BC/IRQ7  
378/IRQ7  
278/IRQ7  
Disabled

This item controls the onboard parallel port address and interrupt.



**Note:** If you are using an I/O card with a parallel port, make sure that the addresses and IRQ do not conflict.

### Integrated Peripherals

#### à Parallel Port Mode

##### Parallel Port Mode

Normal  
SPP  
EPP 1.7 + SPP  
EPP 1.9 + SPP  
ECP  
EPP 1.7 + ECP  
EPP 1.9 + ECP

This item lets you set the parallel port mode. The mode options are **Normal** (Standard and Bidirection Parallel Port), EPP (Enhanced Parallel Port) and ECP (Extended Parallel Port). Normal is the IBM AT and PS/2 compatible mode. EPP enhances the parallel port throughput by directly writing/reading data to/from parallel port without latch. ECP supports DMA and RLE (Run Length Encoded) compression and decompression. EPP1.7 and EPP1.9 are protocol difference.

### Integrated Peripherals

#### à ECP Mode Use DMA

##### ECP Mode Use DMA

3  
1

This item lets you set the DMA channel of ECP mode.

## AWARD BIOS

---

### 3.10 Password Setting

Password prevents unauthorized use of your computer. If you set a password, the system prompts for the correct password before boot or access to Setup.

To set a password:

1. At the prompt, type your password. Your password can be up to 8 alphanumeric characters. When you type the characters, they appear as asterisks on the password screen box.
2. After typing the password, press **Enter**.
3. At the next prompt, re-type your password and press **Enter** again to confirm the new password. After the password entry, the screen automatically reverts to the main screen.

To disable the password, press **Enter** when prompted to enter the password. The screen displays a message confirming that the password has been disabled.

### 3.11 IDE HDD Auto-Detection

If your system has an IDE hard drive, you can use this function to detect its parameters and enter them into the "Standard CMOS Setup" automatically.

This routine only detects one set of parameters for your IDE hard drive. Some IDE drives can use more than one set of parameters. If your hard disk is formatted using different parameters than those detected, you have to enter the parameters manually. If the parameters listed do not match the ones used to format the disk, the information on that disk will not be accessible. If the auto-detected parameters displayed do not match those that used for your drive, ignore them. Type **N** to reject the values and enter the correct ones manually from the Standard CMOS Setup screen.

### 3.12 Save & Exit Setup

This function automatically saves all CMOS values before leaving Setup.

### 3.13 Exit withSavig

Use this function to exit Setup without saving the CMOS value changes. Do not use this option if you want to save the new configuration.

### 3.14 NCR SCSI BIOS adDrivers

The NCR 53C810 SCSI BIOS resides in the same flash memory chip as the system BIOS. The onboard NCR SCSI BIOS is used to support NCR 53C810 SCSI control card without BIOS code.

The NCR SCSI BIOS directly supports DOS, Windows 3.1 and OS/2. For better system performance, you may use the drivers that come with the NCR SCSI card or with your operating system. For details, refer to the installation manual of your NCR 53C810 SCSI card.

### 3.15 BIOS FlashUtility

The BIOS Flash utility allows you to upgrade the system BIOS. To get the AOpen Flash utility and the upgrade BIOS file, contact your local distributor or visit our homepage at <http://www.aprcon.tw>. Please make sure that you have the correct BIOS ready, the BIOS filename is normally like AP5TR110.BIN, which means model AP5T BIOS revision 1.10.

There are two useful programs, Checksum utility CHECKSUM.EXE and AOpen Flash utility AOFLASH.EXE. Follow the procedures below to upgrade your BIOS.

#### [CHECKSUM.EXE]

This utility will help you to determine if the BIOS has been downloaded correctly or not.

1. Execute  
C:> CHECKSUM Biosfile.bin  
Biosfile.bin is the filename of the BIOS code.
2. The utility will show "Checksum is ssss".
3. Compare the "ssss" with original checksum posted on Web or BBS. If they are different, please do not proceed any further and try to download the BIOS again.

## AWARD BIOS

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### [AOFLASH.EXE]

This utility will try to check the mainboard model, BIOS version and Super/Ultra IO chip model. To ensure the correct BIOS file for the correct mainboard and IO chip. This utility will permanently replace your original BIOS content after flashing.

1. Bootup the system from DOS prompt without loading any memory manager (HIMEM, EMM386, QEMM386, ...).
2. Execute  
C:> AOFLASH Biosfile.bin  
Biosfile.bin is the filename of the BIOS code.
3. After loading the new BIOS code, the utility will prompt you to save original BIOS code into your HDD or floppy. Please press "Y" to store it as "BIOS.OLD".
4. After the old BIOS has been successfully saved, press "Y" to replace BIOS.
5. DO NOT turn off the power during "FLASHING".
6. Reboot the system by turn off the power after "FLASHING".
7. Press "DEL" key to enter BIOS setup during POST.
8. Reload the "BIOS SETUP DEFAULT" and reconfigure other items as previous set.
9. Save & Exit. Done!



**Warning** DO NOT turn off the power during "FLASHING". If the BIOS programming is not successfully finished, the system will not be boot again, and you may need to physically replace the BIOS chip.



**Tip** You may load back original BIOS "BIOS.OLD" by the same procedure.

## Appendix C

# Jumper Table Summary

### Setting CPU Vtag

<u>S4</u>	<u>S5</u>	<u>S6</u>	<u>S7</u>	<u>S8</u>	<u>CE Core Voltage</u>
ON	ON	ON	ON	OFF	3.52V (Cyrix 6x86 or AMD K5)
OFF	ON	ON	ON	OFF	3.45V (Intel P54C or IDT C6)
OFF	OFF	ON	ON	OFF	3.2V (AMD K6-233)
ON	OFF	OFF	ON	OFF	2.9V (K6-166/200 or M2)
OFF	OFF	OFF	ON	OFF	2.8V (Intel P55C)
OFF	ON	OFF	OFF	OFF	2.2V (AMD K6-266/300)
OFF	ON	OFF	ON	ON	1.8V (For future use)

<u>CE</u>	<u>Type</u>	<u>S4</u>	<u>S5</u>	<u>S6</u>	<u>S7</u>	<u>S8</u>	<u>Vcore</u>
INTEL P54C	Single Voltage	OFF	ON	ON	ON	OFF	3.45V
INTEL MMX P55C	Dual Voltage	OFF	OFF	OFF	ON	OFF	2.8V
AMD K5	Single Voltage	ON	ON	ON	ON	OFF	3.52V
AMD K6-166/200	Dual Voltage	ON	OFF	OFF	ON	OFF	2.9V
AMD K6-233	Dual Voltage	OFF	OFF	ON	ON	OFF	3.2V
AMD K6-266/300	Dual Voltage	OFF	ON	OFF	OFF	OFF	2.2V
Cyrix 6x86	Single Voltage	ON	ON	ON	ON	OFF	3.52V
Cyrix 6x86L	Dual Voltage	OFF	OFF	OFF	ON	OFF	2.8V
Cyrix M2	Dual Voltage	ON	OFF	OFF	ON	OFF	2.9V
IDT C6	Single Voltage	OFF	ON	ON	ON	OFF	3.45V



**Warning** Make sure that you have installed CPU fan properly if Intel PP/M233 or AMD K6 is being selected to use. It may cause your system unstable if you can not meet the heat dissipation requirement from above CPU. It is recommended to adopt larger fan on these CPU for better air flow in the system.

## Jumper Table Summary



**TIP** Normally, for single voltage CPU, Vcpuio (CPU I/O Voltage) is equal to Vcore, but for CPU that needs dual voltage such as PP/MT(P55C) or Cyrix 6x86L, Vcpuio is different from Vcore and must be set to Vio (PBSRAM and Chipset Voltage). The single or dual voltage CPU is automatically detected by hardware circuit.

### Selecting CPU Frequency

<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>CPU Frequency Ratio</u>	<u>J1</u>	<u>J2</u>	<u>J3</u>	<u>CPU External Clock</u>
OFF	OFF	OFF	1.5x (3.5x)	2-3	1-2	1-2	60MHz
ON	OFF	OFF	2x	1-2	1-2	1-2	66MHz
ON	ON	OFF	2.5x (1.75x)	1-2	2-3	1-2	75MHz
OFF	ON	OFF	3x	2-3	1-2	2-3	83.3MHz
ON	OFF	ON	4x				
ON	ON	ON	4.5x				
OFF	ON	ON	5x				



**Note:** Intel PP/MTMMX 233MHz is using 1.5x jumper setting for 3.5x frequency ratio, and AMD PR166 is using 2.5x setting for 1.75x frequency ratio.



**Warning** INTEL X chipset supports only 60/66MHz external CPU bus clock, the 75/83.3MHz settings are for internal test only, set to 75/83.3MHz exceed the specification X chipset, which may cause serious system damage.



**Warning** Cyrix 6x86 P200+ uses 75MHz external clock, the jumper setting shown on the table below is for user's convenient. It may cause serious system damage to use 75MHz clock.



**Warning** Although you may set 75MHz x 2 for Cyrix MX-PR200 and 83.3MHz x 2 for Cyrix MX-PR233, note that 75/83.3MHz settings may cause serious system damage.

INTEL	CPU Core	Ratio	External	S1	S2	S3	J1 & J2 & J3
-------	----------	-------	----------	----	----	----	--------------

## Jumper Table Summary

Intelium	Frequency	Ratio	Bus Clock	S1	S2	S3	JP & JP & JP
P54C 90	90MHz =	1.5x	60MHz	OFF	OFF	OFF	2-3 & 1-2 & 1-2
P54C 100	100MHz =	1.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2
P54C 120	120MHz =	2x	60MHz	ON	OFF	OFF	2-3 & 1-2 & 1-2
P54C 133	133MHz =	2x	66MHz	ON	OFF	OFF	1-2 & 1-2 & 1-2
P54C 150	150MHz =	2.5x	60MHz	ON	ON	OFF	2-3 & 1-2 & 1-2
P54C 166	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 1-2 & 1-2
P54C 200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2

INTEL Intelium MMX	Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP & JP & JP
PP/MT 150	150MHz =	2.5x	60MHz	ON	ON	OFF	2-3 & 1-2 & 1-2
PP/MT 166	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 1-2 & 1-2
PP/MT 200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2
PP/MT 233	233MHz =	3.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2

Cyrix 6x86 & 6x86L	Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP & JP & JP
P150+	120MHz =	2x	60MHz	ON	OFF	OFF	2-3 & 1-2 & 1-2
P166+	133MHz =	2x	66MHz	ON	OFF	OFF	1-2 & 1-2 & 1-2
P200+	150MHz =	2x	75MHz	ON	OFF	OFF	1-2 & 2-3 & 1-2

Cyrix M2	Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP & JP & JP
MX-PR166	150MHz =	2.5x	60MHz	ON	ON	OFF	2-3 & 1-2 & 1-2
MX-PR200	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 1-2 & 1-2
	150MHz =	2x	75MHz	ON	OFF	OFF	1-2 & 2-3 & 1-2
MX-PR233	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2
	166MHz =	2x	83.3MHz	ON	OFF	OFF	2-3 & 1-2 & 2-3
MX-PR266	233MHz =	3.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2

AMD K5	Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP & JP & JP
PR90	90MHz =	1.5x	60MHz	OFF	OFF	OFF	2-3 & 1-2 & 1-2
PR100	100MHz =	1.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2
PR120	90MHz =	1.5x	60MHz	OFF	OFF	OFF	2-3 & 1-2 & 1-2
PR133	100MHz =	1.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2
PR166	116MHz =	1.75x	66MHz	ON	ON	OFF	1-2 & 1-2 & 1-2

AMD K6	Core	Ratio	External	S1	S2	S3	JP & JP & JP
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## Jumper Table Summary

	Frequency		Bus Clock				
PR2-166	166MHz =	2.5x	66MHz	ON	ON	OFF	1-2 & 1-2 & 1-2
PR2-200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2
PR2-233	233MHz =	3.5x	66MHz	OFF	OFF	OFF	1-2 & 1-2 & 1-2
PR2-266	266MHz =	4x	66MHz	ON	OFF	ON	1-2 & 1-2 & 1-2
PR2-300	300MHz =	4.5x	66MHz	ON	ON	ON	1-2 & 1-2 & 1-2

IDT C6	Core Frequency	Ratio	External Bus Clock	S1	S2	S3	JP & JP & JP
C6-150	150MHz =	2x	75MHz	ON	OFF	OFF	1-2 & 2-3 & 1-2
C6-180	180MHz =	3x	60MHz	OFF	ON	OFF	2-3 & 1-2 & 1-2
C6-200	200MHz =	3x	66MHz	OFF	ON	OFF	1-2 & 1-2 & 1-2

### Clear CMOS

<b>JP4</b>	<b>Clear CMOS</b>
1-2	Normal operation (default)
2-3	Clear CMOS

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## Appendix B

# Troubleshooting

In case you encounter any of the troubles listed below, follow the procedures accordingly to resolve the problem. If the first corrective action listed did not work, then try the next one.



**Important** Make sure that you have tried listed procedures in this appendix before you call your distributor.



**IP** There are many useful information in our homepage, such as jumper settings, latest BIOS, drivers, and more FAQs. Visit our homepage to see if there is answer of your problem.

**Taiwan** <http://www.aprcn.tw>

**USA** <http://www.apusa.com>

<http://www.apamerica.com>

**Europe** <http://www.aprh>

### Display

1. Check all jumper settings according to section 2.2 "Jumpers". Make sure that you have set the proper jumpers especially those for CPU frequency, core and IO voltage select functions. Ask your CPU dealer for the correct CPU specifications.
2. Check the power cord or power switch of your system. The simple way to identify power failure is to check the CPU fan and the power supply fan. If these are not working, then the power is down.
3. Turn off the power and remove all add-on cards, connectors and SIMMs from your mainboard. Then reinstall the VGA card and two SIMMs. Turn on the power again. If you can see the POST (power-on-self-test) screen,

## Troubleshooting

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the problem is your add-on cards or peripheral. try to reinstall the add-on cards one by one to find out which card is causing the problem.

4. Check the monitor and VGA cable. Press the <Num Lock> key to enable/disable the Num Lock function. If the Num Lock LED works properly, this indicates that your CPU, SIMM and BIOS bootup sequence are properly functioning. The problem may be caused by your VGA or monitor.

### **Unstable system with HDD, HDD with IDE System sometimes lag or freeze.**

1. Check all jumper settings according to section 2.2 "Jumpers". Make sure that you have set the proper jumpers especially those for CPU frequency, core and IO voltage select functions. Ask your CPU dealer for correct CPU specification. The remarked CPU is very popular in the market, we recommend that you use a Box CPU, i.e., CPU sold in package with warranty card inside.
2. Check if your SIMM has less than 24 chips. Refer to section 2.4 "Configuring the System Memory" for details.
3. Set DRAM timing to 70ns and disable all enhanced chipset features in BIOS. The default BIOS timing is 60ns for better performance. If you are using an old SIMM or a remarked SIMM, you may need to manually slow down the DRAM timing and disable the chipset features. Refer to chapter 3 "Chipset Features Setup" for details.
4. Disable the power management and USB functions. Some add-on cards, drivers or applications may not be compatible with these functions.
5. Disable the external cache (2nd level cache) in chapter 3 "Advanced CMOS Setup" (AMI) or "BIOS Features Setup" (AWARD). If the system works fine, your cache module or onboard PBRAM may be malfunction.
6. Enter BIOS and set the HDD "Block" and "32-bit" mode parameters to OFF. Refer to Chapter 3 "Standard CMOS Setup" (AMI) or "Integrated Peripherals" (AWARD) for details. Also, if possible set HDD PIO mode 2 or 3 to a slower transfer speed.
7. Turn off the power and remove all add-on cards, connectors and SIMMs from your mainboard. Then reinstall the VGA card, two SIMMs and connect only one hard disk to the end-most connector of the IDE cable. The IDE cable length must not exceed 46cm (18inches), refer to section 2.3 "Connectors". If the system functions properly, reinstall the add-on cards one by one. This will help you find out which card or device is causing the problem. Be sure to connect the 2nd IDE device (HDD/CD-ROM) to the primary channel slave mode.

## Troubleshooting

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8. If your CPU bus frequency is 66MHz, set the CPU external/bus frequency to 60MHz, but leave the CPU core/bus frequency ratio unchanged. Normally, CPU with 66MHz bus frequency works properly at slower speed, e.g., 60MHz. This will help you identify if the CPU is remarked or if the mainboard or add-on card is unstable at 66MHz.

### Keyboard, Printer or Floppy is not working properly.

1. Check the cable and bracket. Make sure that pin 1 of the cable is connected to pin1 of the connector. Pin 1 of the flat cable is indicated by a red-colored wire. Refer to section 2.3 "Connectors".
2. If possible, use another system to test the peripherals and cables. Check if these are working properly.
3. If possible, use another peripheral to double check if the mainboard or the cable is defective.

### CMOS data lost, forgot password

1. Refer to section 2.2 "Jumpers". Locate the CMOS jumper and follow the procedures on how to clear the CMOS. Load the BIOS optimal settings (AMI) or load BIOS default settings (Award).
2. If your mainboard comes with a battery, simply change it. If your mainboard comes with Dallas DS12887A compatible RTC, the occurrence of low battery problem is very rare since RTC battery is expected to last for 7 years. In this case, you have to send the mainboard back to your distributor.

### Incompatible add-on card peripheral, operating system, and application

1. Check all jumper settings according to section 2.2 "Jumpers".
2. Check if you have a Legacy ISA card (non PnP). If yes, set the IRQ and DMA for this card to Legacy/ISA. Refer to Chapter 3 "PCI/PnP Setup" section. If you are using a PnP operating system such as Win95, enable the "Plug-and-Play Aware O/S" parameter in BIOS and let the OS configure the system.
3. Disable all enhanced chipset features. Refer to Chapter 3 "Chipset Features Setup" for details.
4. Disable the power management and USB functions. Some add-on cards, drivers or applications are not compatible with these functions.

## Troubleshooting

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5. Disable the external cache (2nd level cache) and system BIOS cacheable or VGA BIOS cacheable parameters in BIOS. Refer to Chapter 3 "Advanced CMOS Setup" section. Some applications has trouble at higher system speed.
6. Visit our WWW home page, (address <http://www.aprcm.tw>), check the FAQ area (frequently asked question) and download the latest BIOS, try again with the latest BIOS.



**Important** If problem still exist after you have done all the corrective actions listed in this appendix, fill out the attached problem report form. Write down your configuration and error symptoms as detailed as possible. The more detailed information you give us, the faster we can identify and solve your problem. You can copy this form and fax it to your distributor or send the form via e-mail. Refer to Appendix B "Frequently Asked Question" for information on how to identify the BIOS and the mainboard versions.

## Troubleshooting

<b>Technical Problem Report Form</b>																									
<b>ROM:</b>	Name: _____  TEL: _____ FAX: _____  Email address: _____																								
<b>Error Symptom:</b>	_____  _____  _____																								
<b>Error Type:</b> (Please mark in the box and list the model and version below.)	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><input type="checkbox"/> PS/2 mouse</td> <td style="width: 50%; border: none;"><input type="checkbox"/> COM1/COM2, serial mouse.</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Printer</td> <td style="border: none;"><input type="checkbox"/> Parallel Tape</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Floppy</td> <td style="border: none;"><input type="checkbox"/> Floppy Tape</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> IDE HDD</td> <td style="border: none;"><input type="checkbox"/> IDE CDROM</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Keyboard</td> <td style="border: none;"><input type="checkbox"/> VGA</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sound/Modem</td> <td style="border: none;"><input type="checkbox"/> SCSI HDD</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> SCSI CDROM</td> <td style="border: none;"><input type="checkbox"/> SCSI Tape</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Ethernet</td> <td style="border: none;"><input type="checkbox"/> Tokenring</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> USB</td> <td style="border: none;"><input type="checkbox"/> DOS</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Win95</td> <td style="border: none;"><input type="checkbox"/> Windows 3.1</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Window NT</td> <td style="border: none;"><input type="checkbox"/> OS/2</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> UNIX</td> <td style="border: none;"><input type="checkbox"/> Others: _____</td> </tr> </table>	<input type="checkbox"/> PS/2 mouse	<input type="checkbox"/> COM1/COM2, serial mouse.	<input type="checkbox"/> Printer	<input type="checkbox"/> Parallel Tape	<input type="checkbox"/> Floppy	<input type="checkbox"/> Floppy Tape	<input type="checkbox"/> IDE HDD	<input type="checkbox"/> IDE CDROM	<input type="checkbox"/> Keyboard	<input type="checkbox"/> VGA	<input type="checkbox"/> Sound/Modem	<input type="checkbox"/> SCSI HDD	<input type="checkbox"/> SCSI CDROM	<input type="checkbox"/> SCSI Tape	<input type="checkbox"/> Ethernet	<input type="checkbox"/> Tokenring	<input type="checkbox"/> USB	<input type="checkbox"/> DOS	<input type="checkbox"/> Win95	<input type="checkbox"/> Windows 3.1	<input type="checkbox"/> Window NT	<input type="checkbox"/> OS/2	<input type="checkbox"/> UNIX	<input type="checkbox"/> Others: _____
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<b>System Config</b> (Please list model name and version.)	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">MB: _____</td> <td style="width: 50%; border: none;">BIOS: _____</td> </tr> <tr> <td style="border: none;">CPU: _____</td> <td style="border: none;">SIMM: _____</td> </tr> <tr> <td style="border: none;">HDD: _____</td> <td style="border: none;">CDROM: _____</td> </tr> <tr> <td style="border: none;">VGA: _____</td> <td style="border: none;">OS: _____</td> </tr> <tr> <td colspan="2" style="border: none;">Others: _____</td> </tr> </table>	MB: _____	BIOS: _____	CPU: _____	SIMM: _____	HDD: _____	CDROM: _____	VGA: _____	OS: _____	Others: _____															
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CPU: _____	SIMM: _____																								
HDD: _____	CDROM: _____																								
VGA: _____	OS: _____																								
Others: _____																									

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## Appendix A

# Frequently Asked Question



**Note:** FAQ may be updated without notice. If you cannot find the information that you need in this appendix, visit our WWW home page, (address: <http://www.aprcn.tw>) and check the FAQ area and other new information.

### Q: How can I identify the mainboard BIOS version?

A: The AOpen mainboard BIOS version appears on the upper-left corner of the POST (Power-On Self Test) screen. Normally, it starts with R and is found in between the model name and the date. For example:

AP53/AX53 R3.80 Oct.22.1996

BIOS revision

### Q: How can I identify the mainboard revision?

A: The AOpen mainboard revision appears as Rev x.x on the PCB, near the PCI slot. For example, for AP5T revision 3.4, the revision number appears on the PCB as follows:

AP5T revision 3.4

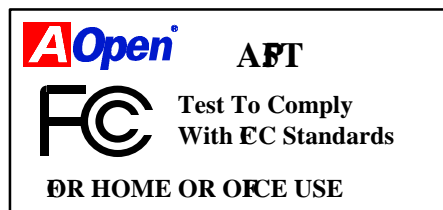
AP5T MB  
Rev 3.4

## Frequently Asked Questions

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**Q: What is EC DoC (Declaration of Conformity)?**

A: The DoC is new certification standard of FCC regulations. This new standard allows DIY component (such as mainboard) to apply DoC label separately without a shielding of housing. The rule to test mainboard for DoC is to remove housing and test it with regulation 47 CFR 15.31. The DoC test of mainboard is more difficult than traditional FCC test. If the mainboard passes DoC test, that means it has very low EMI radiation and you can use any kind of housing (even paper housing). Following is an example of DoC label.



**Q: What is Bus Master IDE (DMA mode)?**

A: The traditional PIO (Programmable I/O) IDE requires the CPU to involve in all the activities of the IDE access including waiting for the mechanical events. To reduce the workload of the CPU, the bus master IDE device transfers data from/to memory without interrupting CPU, and releases CPU to operate concurrently while data is transferring between memory and IDE device. You need the bus master IDE driver and the bus master IDE HDD to support bus master IDE mode. Note that it is different with master/slave mode of the IDE device connection. For more details, refer to section 2.3 "Connectors".

**Q: What is Ultra DMA/33?**

A: This is the new specification to improve IDE HDD data transfer rate. Unlike traditional PIO mode, which only uses the rising edge of IDE command signal to transfer data, the DMA/33 uses both rising edge and falling edge. Hence, the data transfer rate is double of the PIO mode 4 or DMA mode 2. (16.6MB/s x2 = 33MB/s).

The following table lists the transfer rate of IDE PIO and DMA modes. The IDE bus is 16-bit, which means every transfer is two bytes.



## Frequently Asked Questions

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Mode	Clock per 33MHz $\mu$ s	Clock count	Cycle time	Data Transfer rate
PIO mode 0	30ns	20	600ns	$(1/600\text{ns}) \times 2\text{byte} = 3.3\text{MB/s}$
PIO mode 1	30ns	13	383ns	$(1/383\text{ns}) \times 2\text{byte} = 5.2\text{MB/s}$
PIO mode 2	30ns	8	240ns	$(1/240\text{ns}) \times 2\text{byte} = 8.3\text{MB/s}$
PIO mode 3	30ns	6	180ns	$(1/180\text{ns}) \times 2\text{byte} = 11.1\text{MB/s}$
PIO mode 4	30ns	4	120ns	$(1/120\text{ns}) \times 2\text{byte} = 16.6\text{MB/s}$
DMA mode 0	30ns	16	480ns	$(1/480\text{ns}) \times 2\text{byte} = 4.16\text{MB/s}$
DMA mode 1	30ns	5	150ns	$(1/150\text{ns}) \times 2\text{byte} = 13.3\text{MB/s}$
DMA mode 2	30ns	4	120ns	$(1/120\text{ns}) \times 2\text{byte} = 16.6\text{MB/s}$
DMA/33	30ns	4	120ns	$(1/120\text{ns}) \times 2\text{byte} \times 2 = 33\text{MB/s}$

**Q: What is FastROM BIOS? What is the BIOS size?**

A: All the mainboards need BIOS (Basic Input/Output System). BIOS is a set of basic I/O control routine grouped together, it provides low level hardware support to the operating system. Traditional mainboard stores BIOS code in EPROM (Erasable Programmable ROM), if BIOS has to be upgraded, you need to remove EPROM from mainboard, clear by ultra-violet (UV) light, re-program, and then insert back.. AOpen mainboards use much easier Flash ROM, only Flash ROM programming utility is necessary, no need to open housing and change the BIOS ROM. You may connect to <http://www.aopen.com.tw> to download BIOS for upgrade.

**Q: Why will the system BIOS assign IRQ to the PCI VGA card?**

A: Based on the PCI/PnP specification, system BIOS will automatically assign an IRQ to each PCI add-on card detected regardless of VGA requirement. If you do not want BIOS to assign an IRQ to the installed PCI VGA card, enter the BIOS PCI/PnP Setup and set the specific PCI slot IRQ Priority to "None".

**Q: What is ACPI (Advanced Configuration & Power Interface) and DPM?**

A: The ACPI is new power management specification of 1997 (PC97). It intends to save more power by taking full control of power management to operating system and not through BIOS. Because of this, the chipset or super I/O chip needs to provide standard register interface to OS (such as Win97) and provides the ability for OS to shutdown and resume power of different part of chip. The idea is a bit similar to the PnP register interface.

ACPI defines momentary soft power switch to control the power state transition. Most likely, it uses the ATX form factor with momentary soft power switch. The most attractive part of ACPI for desktop user is probably the

## Frequently Asked Questions

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"OnNow" feature, an idea from notebook. This feature allows you to immediately resume to your original work without the long time waiting from bootup, entering Win95 and running Winword. The AX5TC with Intel TX chipset can support ACPI.

### **Q: What is AX Soft Power On/Off and Momentary Switch?**

A: The Soft Power On of the ATX specification means to provide a standby current for special circuit to wait for wakeup event when main power is off. For example, Infrared wakeup, modem wakeup, or voice wakeup. Currently, the most simple usage is to provide standby current for power switch circuit so that power switch can turn on/off the main power through soft power control pin. The ATX power specification does not mention anything about the power switch type. You can use toggle or momentary switch, note that ACPI specification requires momentary switch for power state control. All the AOpen ATX MBs support momentary switch and AX5T/AX5TC/AX58/AX6L support modem wakeup (Modem Ring-On).

Soft Power Off means to turn off system through software, Windows 95 Shutdown function can be used to verify if your mainboard supports soft power off. AOpen AX5T/AX5TC/AX58/AX6F/AX6L support soft power off.

### **Q: Power Management does not appear in Windows 95 Control Panel event though APM in BIOS Setup is enabled**

A: This problem occurs if you did not enable the APM function before you install Windows 95. If you have already installed Windows 95, re-install it after the BIOS APM function is enabled.

### **Q: Why does the system fail to boot up after Windows 95?**

A: This problem may be caused by your CDROM settings. The CDROM Auto Insert Notification of Win95 is default enabled, the system will continue to monitor your CDROM, auto-execute application when a CD diskette is loaded, and prevents the system from entering into suspend mode. To resolve this, go into Control Panel → System → Device Manager → CDROM → Setting, and disable the "Auto Insert Notification" function.

## Frequently Asked Questions

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**Q: How do I determine the version of Windows '95 that I am using?**

A: You may determine the version of Windows '95 by following steps.

1. Double click "System" in "Control Panel".
2. Click "General".
3. Look for "System" heading & refer to following,

4.00.950	Windows 95
4.00.950A	Windows 95 + Service Pack or OEM Service Release 1
4.00.950B	OEM Service Release 2 or OEM Service Release 2.1

If you are running OSR 2.1, you may tell it from by checking "USB Supplement to OSR2" in the list of installed program of Add/Remove program tool under Control Panel, and checking for version 4.03.1212 of the Ntkern.vxd file in the Windows\System\Vmm32 folder.

**Q: What is DCM (Desktop Client Manager)?**

A: This is a software of Intel. The major goal is to provide an easy way for corporate network administrator to monitor the status of all the clients (workstation). You need at least DMI BIOS for LDCM. AOpen BIOS is also DMI ready but unfortunately, Intel LDCM needs Intel network card and ATI VGA to work properly. It is obviously not suitable for home user to pay LDCM extra cost.

**Q: What is ADM (Advanced Desktop Manager)?**

A: This is a desktop client and server management software developed by AOpen. It is similar as Intel LDCM with some improvement. ADM is not only for corporate network management, it can also be used as system status monitoring utility, for example, CPU fan, thermal and system voltage monitoring.

Features	ADM 2.0	LDCM 3.0
VGA card	No limitation	Only ATI
Network card	No limitation	Only Intel
Support DMI BIOS 2.0	Yes	Yes
Support Win95	Yes	Yes
Support Win NT	No (will be supported on ADM 2.1)	Yes
Real-Time CPU/Memory Utilization Monitoring	Yes	No

## Frequently Asked Questions

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Features	ADM 2.0	LDCM 3.0
Multi-Machine Monitoring on One Screen	Yes	No
Remote Management Protocol	Standard SNMP protocol	Intel proprietary RAP protocol
Standard SNMP Trap	Yes (so that can work with standard software such as HP Open View)	No
Remote File Transfer	No	Yes

**Q: Why do AOpen mainboards (MB) have cache module expansion slot?**

A: Faster CPU speed requires more difficult and complex MB timing design. Every trace and components delay must be taken into consideration. The expansion cache slot design will cause 2 or 3ns delay in PBSRAM timing, and the extended trace length to the cache module through the golden finger will further delay the timing by 1 or 2ns. This may result in unreliable system once the cache module and slot becomes worn. All AOpen MBs support 512KB PBSRAM onboard. For better performance (around 3% higher than 256KB), we strongly recommend you to use 512KB onboard. Otherwise, reliable 256KB is better than unreliable 512KB with cache module. AOpen is the first company to promote this concept since the fourth quarter of 1995.