Chapter   1

Overview

The MX6E PLUS is a Pentium II based system board that utilizes Intel **82440EX** chipset on **Micro ATX** PCI/ISA platform. This chipset is designed for Pentium II CPU, and supports new architectures such as high speed **AGP** graphic port, **SDRAM**, **Ultra DMA/33**, **Bus master IDE** and **USB** port. It has **three Dual in-line Memory Module (DIMM)** that allow to mix 3V EDO and SDRAM memory and expand up to a maximum of **256MB**. Also, this motherboard uses **2M bit Flash ROM** BIOS to reserve for future new functions.

In addition, MX6E PLUS also implements many special features.

Jumper-less Design Pentium II VID signal and SMbus clock generator provide CPU voltage auto-detection and allows user to set CPU frequency through CMOS setup, no jumper or switch is needed. The correct CPU information is saved into EEPROM, with these technologies, the disadvantages of Pentium base jumper-less design are eliminated. There will be no worry of wrong CPU voltage detection and no need to re-open the housing if CMOS battery loss. The only jumper left is to clear CMOS, which is a safety hook if you forget the password.

Battery-less Motherboard MX6E PLUS implements EEPROM and special circuit (patent applied) that allows you to save your current CPU and CMOS Setup configurations without the need of battery. The RTC (real time clock) can also keep running as long as power cord is plugged. If you lose your CMOS data by accident, you can just reload the CMOS configurations from EEPROM and the system will recover as usual.

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.

Zero Voltage Modem Wake Up In conjunction with ATX soft power On/Off, it is possible to have system totally power off and wakeup to automatically

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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 MX6E PLUS and MP56 internal modem card implement special circuit (patent applied) to make sure the modem card work properly without any power.

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. MX6E PLUS implements high efficient synchronous switching design that the temperature of MOS FET is far less than Schottky diode of Asynchronous design.

Over Current Protection Circuit The Over Current Protection was very popular implemented on the Baby AT or ATX 3.3V/5V/12V switching power supply. But unfortunately, the new generation Pentium II CPU uses different voltage that have regulator to transfer 5V to CPU voltage (for example, 2.8V), and make 5V over current protection useless. MX6E PLUS with switching regulator onboard support CPU over current protection, in conjunction with 3.3V/5V/12V power supply provide the full line over current protection.

CPU and Housing Fan Monitoring MX6E PLUS has one more "fan monitoring" function to prevent system overheat. There are two fan connectors, one is for CPU and the other can be an extra housing fan. The system will report and alarm fan malfunction though utility software such as Hardware Monitor utility (Small Icon for Hardware Monitoring).

CPU Thermal Protection MX6E PLUS has a special thermal detection circuit to have warning through application software when the temperature is higher than a predefined value.

System Voltage Monitoring Further more, MX6E PLUS 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 though utility software such as Hardware Monitor utility (Small Icon for Hardware Monitoring) 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 MX6E PLUS 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, Suspend to Hard Drive utility, and BIOS flash utility.

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

> *Note: This motherboard is battery-less, that means the RTC (real time clock) can keep running without battery as long as the power cord is plugged. But in case of power failure or the power cord unplugged, you need to reset date and time from "Standard CMOS Setup" section of BIOS Setup. For more information, please see "Chapter 3 BIOS Setup".*

Overview

1.1 Specifications

Form Factor	ATX
Board Size	244 mm x 218 mm
CPU	Intel Pentium II Processor
System Memory	3V EDO or SDRAM, 168-pin DIMM x3, maximum 256MB.
Chipset	Intel 82440EX AGPset
Expansion Slots	ISA x2, PCI x2 and AGP x1
Serial Port	Two serial ports UART 16C550 compatible, and the 3rd UART for IR function.
Parallel Port	One parallel port supports standard parallel port (SPP), enhanced parallel port (EPP) or extended capabilities port (ECP).
Floppy Interface	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
IDE Interface	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.
USB Interface	Two USB ports supported by USB bracket, the BIOS also supports USB driver to simulate legacy keyboard.
PS/2 Mouse	Mini-Din PS/2 mouse connector onboard.
Keyboard	Mini-Din PS/2 keyboard connector onboard.
RTC and Battery	RTC within Intel PIIX4E chipset. Lithium (CR-2032) battery is an option, no battery is needed if power cord is plugged.
BIOS	AWARD Plug-and-Play, 2M bit Flash ROM BIOS. Multi-language versions supported.

Suspend to Hard Drive	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.
Zero Voltage Modem Wake Up	Special circuit (patent applied) to support modem ring wake up by external box modem or internal AOpen F56/MP56 modem card.
LAN Wake Up	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.
RTC Wake Up Timer	Program the date/time to wake up your system.
Synchronous Switching Regulator	High efficient synchronous switching regulator.
Over-current Protection	CPU core voltage over-current protection to prevent any accident short circuit.
CPU Thermal Protection	Warning when CPU temperature is overheat. Option for OEM to have sensor at CPU heatsink.
Fan Monitoring	Two 3-pin fan connectors, warning when CPU or housing fan is malfunction.
System Voltage Monitoring	Warning when system voltage (5V,12V,3.3V and CPU core) are abnormal

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 AW32/AW35) for Suspend to Hard Drive to work properly. Of course, we recommend to use AOpen products for best compatibility.

To use Suspend to Hard Drive:

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.

Option2: Use /partiton switch (applied to FAT16/FAT32 file system):

To create a separate partiton for Suspend to Hard Drive, please make sure you have reserved 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

Tip: The following VGA cards 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.
ATI 3D RAGE PRO 2x (AGP)
PLOTECH 3D IMAGE 9850 (AGP)
CARDEX S3 Virge/GX (AGP)

Tip: The following sound cards have been tested OK for Suspend to Hard Drive.

AOpen AW32
AOpen AW35
AOpen MP32
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 Zero Voltage 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 MX6E PLUS 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.

External Modem Wake Up

Internal Modem Card Wake Up (such as MP56)
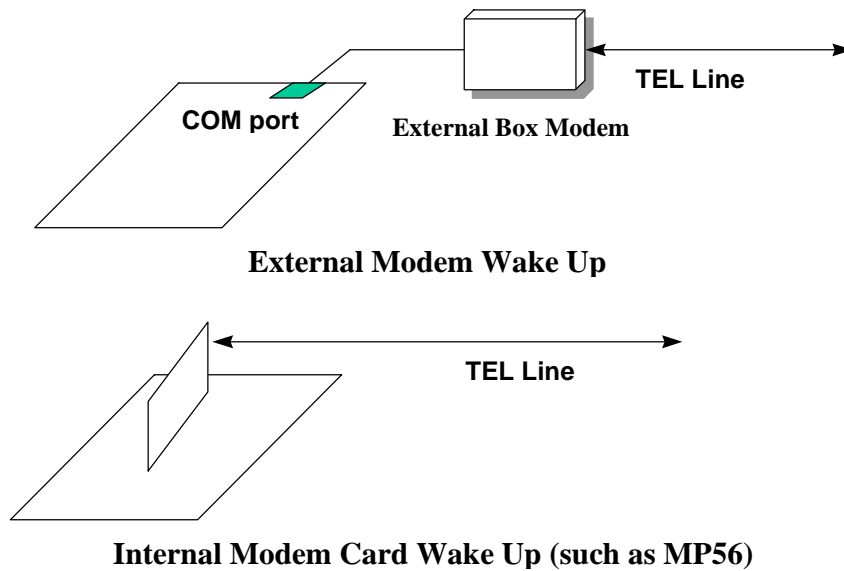
Overview

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 MX6E PLUS 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.
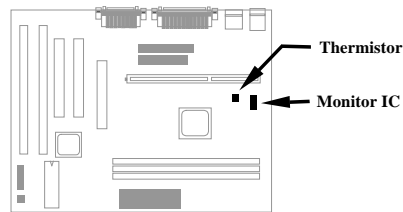
1.5   Fan Monitoring
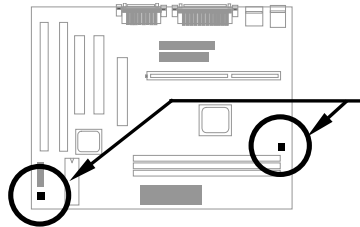
There are two fan connectors, one is for CPU, the other can be a housing fan. The fan monitoring function is implemented by connecting fan to 3-pin fan connector **CPUFAN** or **FAN** and installing Hardware Monitor utility.

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

1.6　CPU Thermal Protection

This mainboard implements special thermal protection circuits. When temperature is higher than a predefined value, there will be warning through application software such as Hardware Monitor utility to notify user. It is automatically implemented by BIOS and Hardware Monitor utility, no hardware installation is needed.

For OEM customer who needs more accurate temperature, MX6E PLUS reserves an option to use special CPU heatsink with thermal sensor on it. The CPU thermal sensor should be connected to **CN1**.

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   Battery-less Design
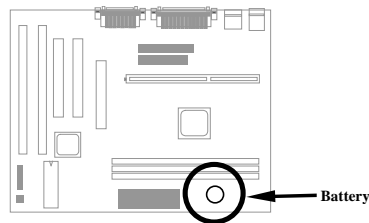
To preserve the earth, AOpen MX6E PLUS implements the world first battery-less motherboard design. There is no need to have battery for RTC (real time clock) and CMOS Setup as long as the power cable is plugged. In case of the AC power is shutdown or power cord is removed by accident, the CMOS Setup and system configuration can be restored from EEPROM, only the system clock needed to be re-set to current date/time.

For the convenience of end user, MX6E PLUS still shipped with one Lithium (CR-2032) battery. If you prefer to use battery, you can still Insert it into battery socket. The RTC will still keep running even power cord is removed.

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 Locations

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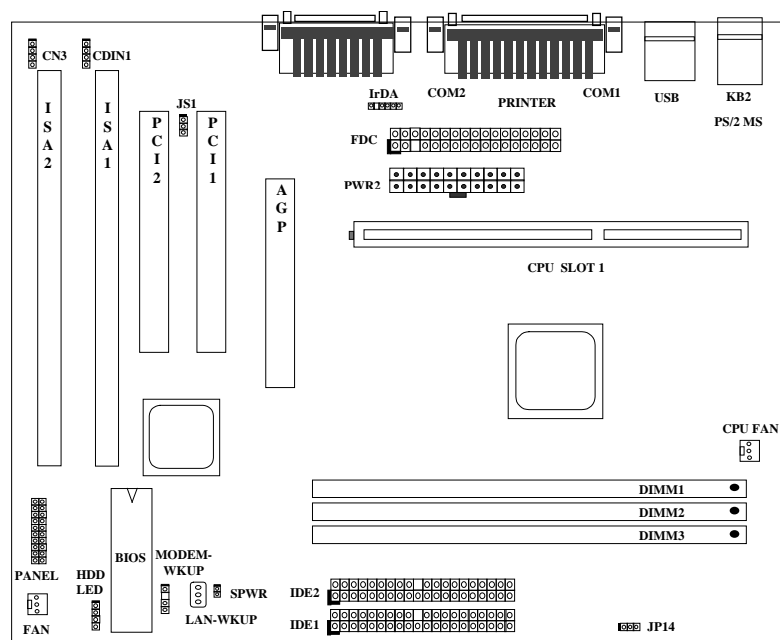
Jumpers:

JP14:	Clear CMOS
JS1:	Disable Sound

Connectors:

PS2:	PS/2 mouse connector
KB:	PS/2 keyboard connector
COM1:	COM1 connector
COM2:	COM2 connector
PRINTER:	Printer connector
PWR2:	ATX power connector
USB:	USB connector
FDC:	Floppy drive connector
IDE1:	IDE1 primary channel
IDE2:	IDE2 secondary channel
CPUFAN:	CPU fan connector
FAN:	Housing fan connector
IrDA:	IrDA (Infrared) connector
HDD LED:	HDD LED connector
PANEL:	Front panel (Multifunction) connector
SPWR:	ATX Soft-Power Switch Connector
MODEM-WKUP:	Modem Wake Up Connector
LAN-WKUP:	Lan Wake Up Connector
CDIN1:	CD-audio connector
CN3:	Mono in (Pin 1-2) and Mic out (Pin 3-4)

2.2 Jumpers

With the help of Pentium II VID signal and SMbus, this motherboard is jumper-less design. The only jumper left is to clear CMOS, which is a safety hook if you forget the password.

2.2.1 Selecting the CPU Frequency

Pentium II VID signal and SMbus clock generator provide CPU voltage auto-detection and allow user to set CPU frequency through CMOS setup, no jumper or switch is needed. The correct CPU information is saved into EEPROM, with these technologies, the disadvantages of Pentium base jumper-less design are eliminated. There will be no worry of wrong CPU voltage detection and no need to re-open the housing if CMOS battery loss.

The CPU frequency selection is set by going into:

BOIS Setup à **Chipset Features Setup** à **CPU Clock Frequency**

(The possible setting is 66, 68.5, 75 and 83.3 MHz)

BOIS Setup à **Chipset Features Setup** à **CPU Clock Ratio**

(The possible setting is 1.5x, 2x, 2.5x, 3x, 3.5x, 4x, 4.5x, 5x, 5.5x, 6x, 6.5x, 7x, 7.5x, and 8x)

*Core frequency = Ratio * External bus clock*

| INTEL Pentium II	CPU Core Frequency	Ratio	External Bus Clock
Klamath 233	233MHz =	3.5x	66MHz
Klamath 266	266MHz =	4x	66MHz
Klamath 300	300MHz =	4.5x	66MHz
Klamath 333	333MHz =	5x	66MHz
Celeron 266	266MHz=	4x	66MHz
Celeron 300	300MHz	4.5x	66MHz

2.2.2 Setting the CPU Voltage

This motherboard supports Pentium II VID function, the CPU core voltage is automatically detected, the range is from 1.3V to 3.5V.

2.2.3 Clearing the CMOS

JP14	Clear CMOS
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:
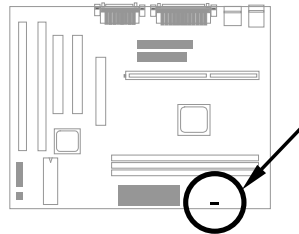
JP14
1 2 3
Normal Operation (default)

JP14
1 2 3
Clear CMOS

The procedure 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 (233MHz).*
>
> *Tip: Except using JP14, you may also press <Home> key. By this smart design, it would be more convenient to clear CPU frequency setting. For using this function, you just need to press <Home> key first and then press Power button at the same time. Please note that do not release <Home> key until POST screen appearing .*

Hardware Installation

2.2.6 Disable Onboard Sound Card

JS1	Disable Onboard Sound Card
1-2	Enabled (default)
2-3	Disabled

If you want to install other sound card, you have to disable the onboard sound card by setting this jumper to Disabled.

JS1

1
2
3

Enabled (default)

JS1

1
2
3

Disabled
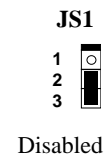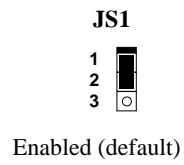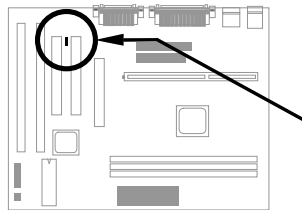
2.3 Connectors

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.*
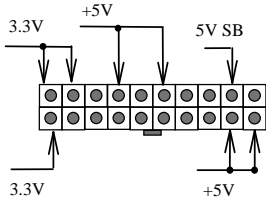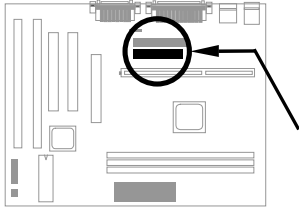
PWR2

2.3.2 ATX Soft-Power Switch Connector

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 3-pin fan connector onboard. The fan connector is marked **CPUFAN** and **FAN** on the system board.

GND
+12V
SENSE

CPUFAN & FAN

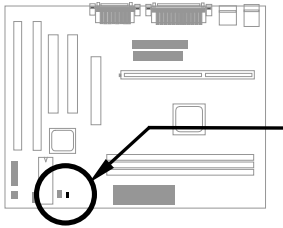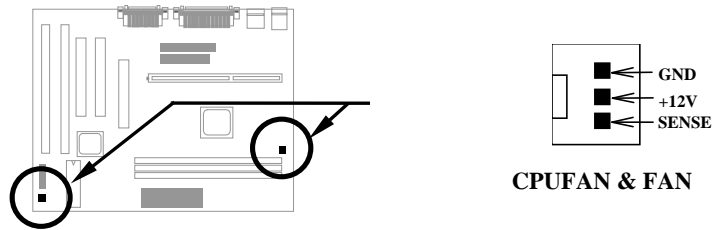> **Note:** Attach fan cable to either CPU FAN connector or FAN connector. Both of these two fans connectors can support hardware monitoring function, however, you can only use the CPU FAN connector to control the fan power ON/OFF.

2.3.4 PS/2 Mouse

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

PCB

PS/2 Mouse
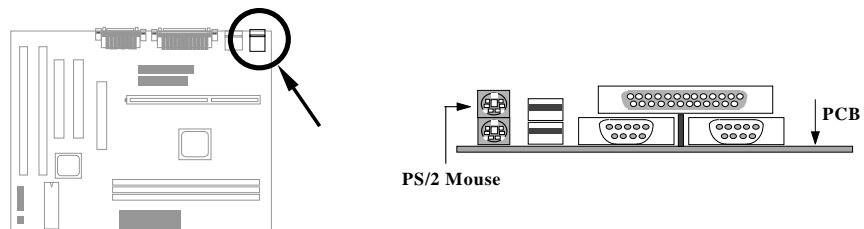
2.3.5   Keyboard

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.

PS/2 KB

PCB

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.**

COM1   **COM2**

PCB
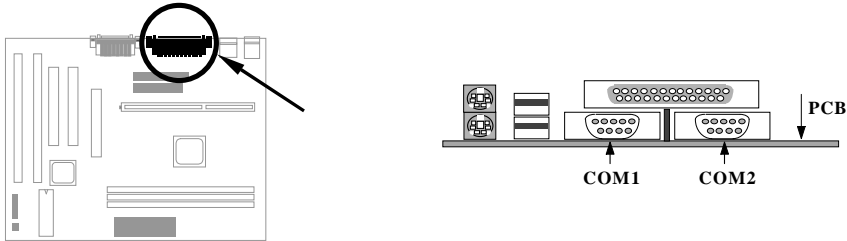
Hardware Installation

2.3.7 Printer

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.
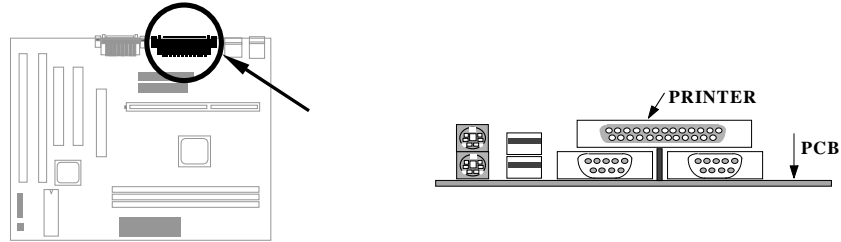
2.3.8 USB Device

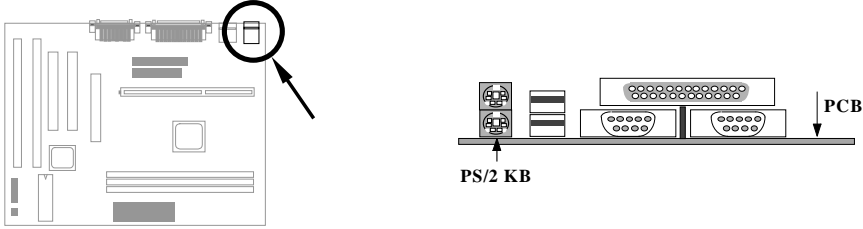You can attach USB devices to the USB connector. The motherboard contains two USB connectors, which are marked as **USB.**
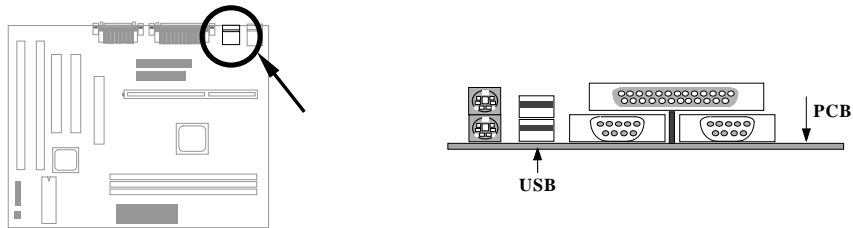
2.3.9 Floppy Drive

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

FDC
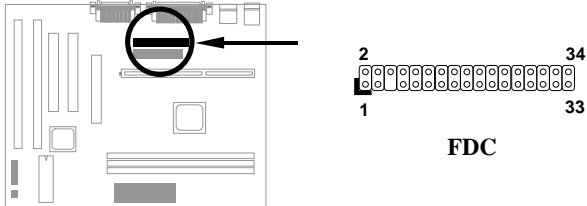
2.3.10 IDE Hard Disk and CD ROM

This mainboard 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.

IDE2

IDE1
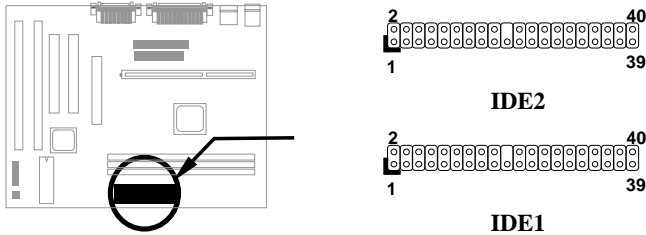
> ⚠ **Caution**: *The specification of IDE cable is maximum 46cm (18 inches), make sure your cable does not excess this length.*
>
> **Caution:** *For better signal quality, it is recommended to set far end side device to master mode and follow the suggested sequence to install your new device . Please refer to following figure.*

IDE2 (Secondary Channel)

Slave (4th) — **Master (3rd)**

IDE1 (Primary Channel)

Slave (2nd) — **Master (1st)**
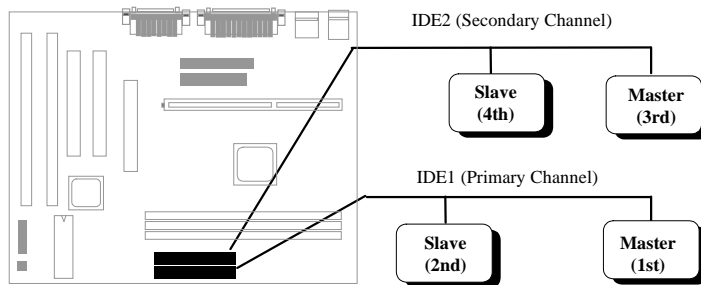
2.3.11 Hard Disk LED

The HDD LED connector is marked as **HDD LED** 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.

Pin	Description
1	HDD LED
2	GND
3	GND
4	HDD LED

1 +	1 +	1 +
2 -	2 -	2 -
3 -	3 -	3 -
4 +	4 +	4 +
HDD LED	**HDD LED**	**HDD LED**
4-pin connector	2-pin connector at pin 1-2	2-pin connector at pin 3-4

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.

```
        1   11
GND    [○ ○]  +5V
KEYLOCK [○ ○]  GND
GND    [○ ○]  Reserved
+5V    [○ ○]  GND
POWER LED [○ ○] NC
SPEAKER [○ ○]  NC
+5V    [○ ○]  GND
GND    [○ ○]  NC
NC     [○ ○]  RESET
SPEAKER [○ ○]  GND
       10   20
       PANEL
```


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.

PANEL

Hardware Installation

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.

Pin	Description
1	+5V
2	NC
3	IRRX
4	GND
5	IRTX
6	NC

1 2 3 4 5 6
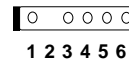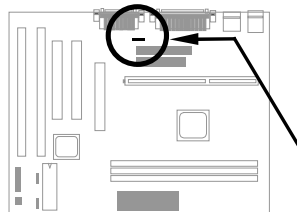
IrDA

2.3.14 Modem Wake-up Connector

This motherboard 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.

Pin	Description
1	+5V SB
2	NC
3	RING
4	GND

MODEM-WKUP

2.3.15 LAN Wake-up Connector

This mainboard implements a **LAN-WKUP** connector. To use LAN Wake-up function, you need a network card that supports this feature. In addition, you also need to install a network management software, such as ADM.

Pin	Description
1	+5V SB
2	GND
3	LID

LAN-WKUP

2-15
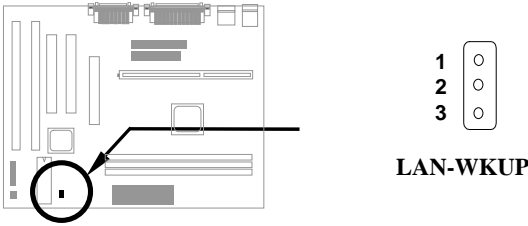
2.3.16 CD Audio Connector

This connector is used to connect CD audio cable.

```
1  ○
2  ○
3  ○
4  ○
```

CDIN1
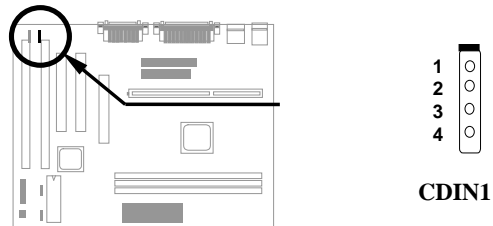
2.3.16 Mono In/Mic Out Connector

This connector is used to connect Mono In/Mic Out connector of an internal modem card. The pin 1-2 is **Mono In**, and the pin 3-4 is **Mic Out**. Please note that there is no standard for this kind of connector yet, only some internal modem cards implement this connector.

Please see the pin definitions to connect the cable.

Pin	Description
1	
2	
3	
4	

```
1  ○
2  ○
3  ○
4  ○
```

Mono In/Mic Out
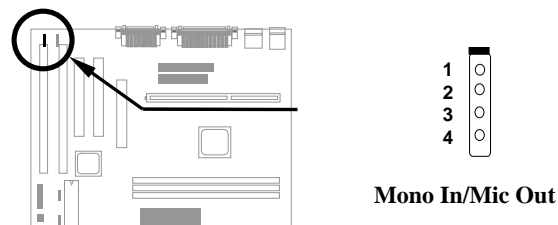
2.4 Configuring the System Memory

Pin 1
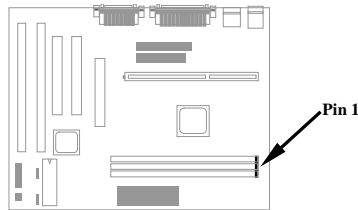
The DIMM types supported are EDO (Extended Data Out) and SDRAM (Synchronous DRAM). This mainboard has three 168 pin DIMM sockets (Dual-in-line Memory Module) that allow you to install system memory up to **256MB**.

DIMM modules can be identified by the 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.*

168   85

Pin 129   Pin 114
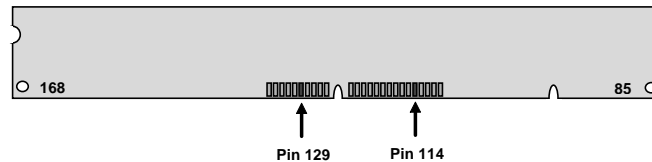
> **Warning:** *If you want to install DRAMs on DIMM2 and DIMM3 at the same time, it is very important to identify single/double side. Under this configuration, only single side DRAMs are acceptable.*

II. Speed:

SDRAM: normally marked as 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.

EDO: the access time of EDO RAM can be 60ns or 70ns.

Hardware Installation

III. Buffered and non-buffered: 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:

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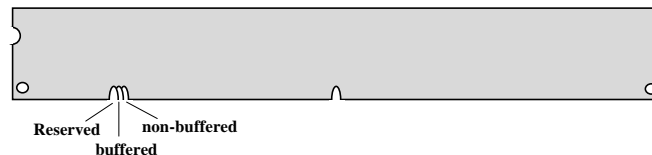
Because the positions are different, only non-buffered DIMMs can be inserted into the DIMM sockets on this motherboard. Although most of DIMMs on current market are non-buffered, we still recommend you to ask your dealer for the correct type.

IV. 2-clock and 4-clock signals: Although both of 2-clock and 4-clock signals are supported by AX6LC Lite, we strongly recommend you to choose 4-clock SDRAM in consideration of reliability.

> ***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) and 72-bit wide (with parity) DIMM modules.

There is no jumper setting required for the memory size or type. It is automatically detected by the system BIOS, and the total memory size is to add them together. **The maximum is 256MB**.

EX chipset only supports 3V EDO or SDRAM, so we can mix EDO and SDRAM without any problem.

Every DIMM socket can be EDO or SDRAM. **Please note that the maximum DRAM size of DIMM1 is 128MB, but DIMM2 plus DIMM3 can only be 128MB**.

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

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
4M by 16	4Mx64	x1	4	32MB	Yes
4M by 16	4Mx64	x2	8	64MB	Yes
8M by 8	8Mx64	x1	8	64MB	Yes
8M by 8	8Mx64	x2	16	128MB	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.

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

Hardware Installation

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

Size/Type	Vendor	Model	Single/Double	Chip Count
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	Hyndai	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

Memory error checking is supported by parity check. To use parity check you need 72 bit DIMM (64+8 bit parity), which are automatically detected by BIOS.

Warning: *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***.*

Tip: *The parity mode uses 1 parity bit for each byte, normally it is even parity mode, that is, each time the memory data is updated, parity bit will be adjusted to have even count "1" for each byte. When next time, if memory is read with odd number of "1", the parity error is occurred and this is called single bit error detection.*

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 Entering the Award BIOS Setup Menu

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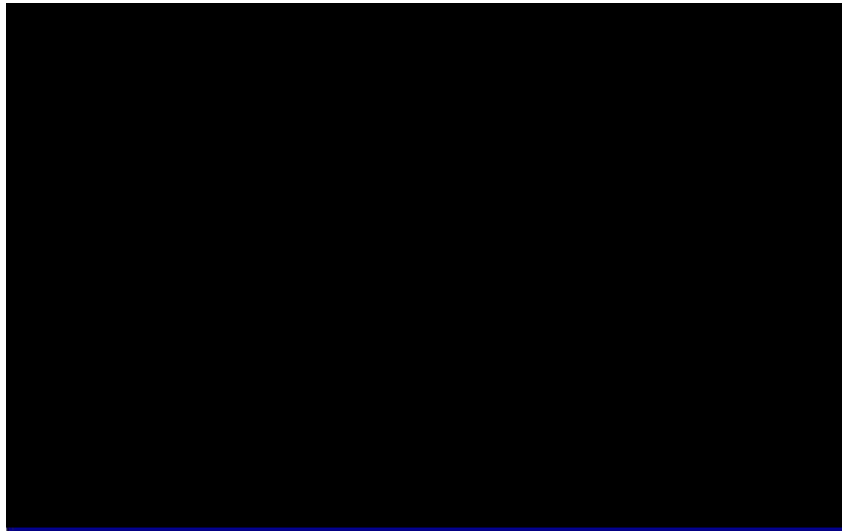
> ***Tip****: Choose "Load Setup Defaults" for recommended optimal performance. Choose "Load Turbo Defaults" for best performance with light system loading. Refer to section 3.7.*

The section at the bottom of the screen tells how to control the screen. Use the arrow keys to move between items, ▬▬▬ F2 to color scheme of the display, ▬▬▬ 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 ▬▬▬ 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 ▭▭▭ or ▭▭▭ to select the value for each item.
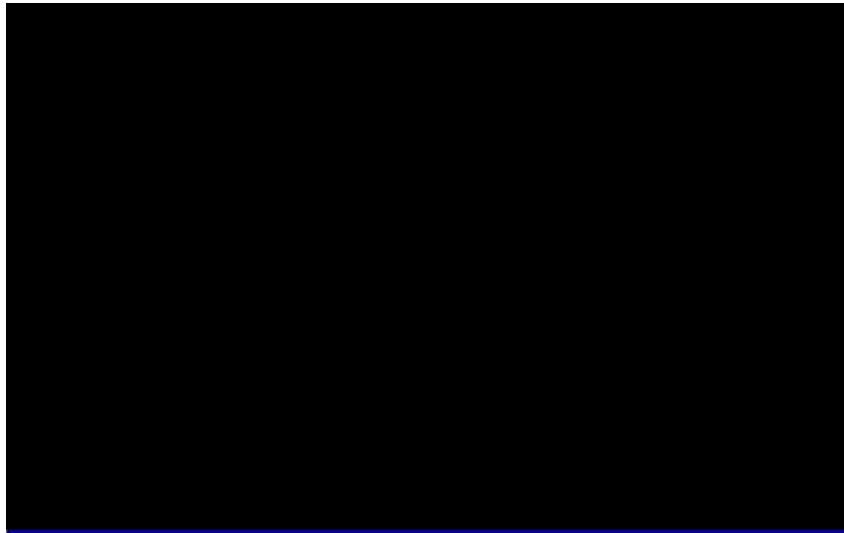
Standard CMOS à Date

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

Standard CMOS à Time

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

AWARD BIOS

Standard CMOS à **Primary Master** à **Type**
Standard CMOS à **Primary Slave** à **Type**
Standard CMOS à **Secondary Master** à **Type**
Standard CMOS à **Secondary Slave** à **Type**

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.

Tip: 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".

Standard CMOS à **Primary Master** à **Mode**
Standard CMOS à **Primary Slave** à **Mode**
Standard CMOS à **Secondary Master** à **Mode**
Standard CMOS à **Secondary Slave** à **Mode**

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.

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.

3.3   BIOS Features Setup

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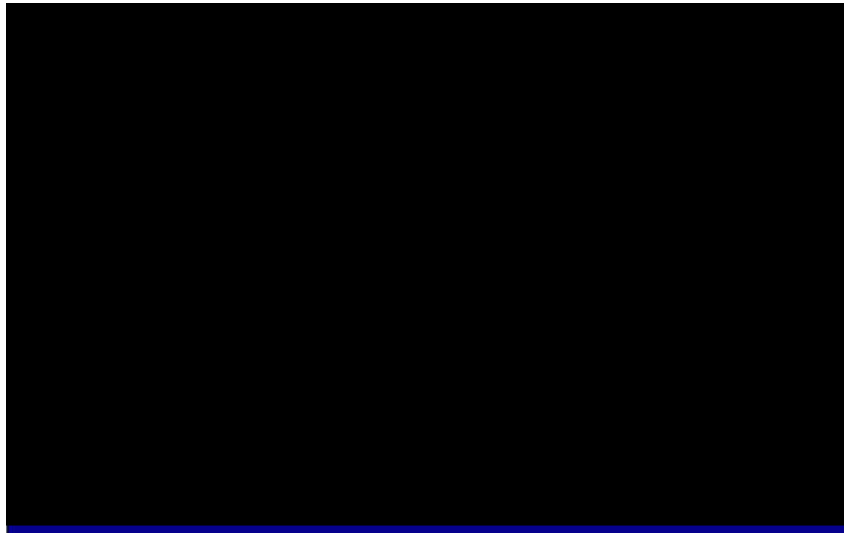
BIOS Features à **Virus Warning**

Virus Warning Enabled Disabled	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.
	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.
```

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 **CPU L2 Cache ECC Checking**

CPU L2 Cache ECC Checking
Enabled
Disabled

This item lets you enable or disable L2 Cache ECC checking.

BIOS Features à **Quick 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

Zip: IOMEGA ZIP Drive

AWARD BIOS

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.

BIOS Features à Boot Up NumLock Status

Boot Up NumLock Status
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 Features à Boot Up System Speed

Boot Up System Speed
High
Low

Select High or Low system speed after boot.

BIOS Features à Typematic Rate Setting

Typematic Rate Setting
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 Features à Typematic Rate (Chars/Sec)

Typematic Rate
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.

BIOS Features à Typematic Delay (Msec)

Typematic Delay	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.
250	
500	
750	
1000	

BIOS Features à Security Option

Security Option	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.
Setup	
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 Features à PCI/VGA Palette Snoop

PCI/VGA Palette Snoop	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.
Enabled	
Disabled	

BIOS Features à OS Select for DRAM > 64MB

OS Select for DRAM > 64MB	Set to OS/2 if your system is utilizing an OS/2 operating system and has a memory size of more than 64 MB.
OS/2	
Non-OS/2	

AWARD BIOS

BIOS Features à **Video BIOS Shadow**

Video BIOS Shadow 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-CBFF Shadow**
BIOS Features à **CC00-CFFF Shadow**
BIOS Features à **D000-D3FF Shadow**
BIOS Features à **D400-D7FF Shadow**
BIOS Features à **D800-DBFF Shadow**
BIOS Features à **DC00-DFFF Shadow**

C8000-CBFFF Shadow 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 F000 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.

![black screen placeholder]

> **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 à Auto Configuration

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

Chipset Features à DRAM Speed Selection

DRAM Speed Selection	There are two sets of DRAM timing parameters can
50 ns	be automatically set by BIOS, 50ns and 60ns.
60 ns	

Chipset Features à MA Wait State

MA Wait State	To enable or disable one additional MA (DRAM
Slow	memory address) wait state. The default setting is
Fast	**Slow**. Set it to Fast if you have heavy loading (many chip count) or lower speed DRAM.

Chipset Features à EDO RAS# to CAS# Delay

EDO RAS# to CAS# Delay	This option allows you to set the wait state between
2	row address strobe (RAS) and column address strobe
3	(CAS) signals.

Chipset Features à EDO RAS# Precharge Time

EDO RAS# Precharge Time	This parameter specifies the number of clocks
3	required to deassert the RAS signal to prevent DRAM from losing data after performing a read. This
4	operation is called Precharge.

Chipset Features à **EDO DRAM Read Burst**

EDO DRAM Read Burst
x333
x222

Read Burst means to read four continuous memory cycles on four predefined addresses from the DRAM. The default value is **x222** for 60ns EDO DRAM. Which means the 2nd,3rd and 4th memory cycles are 2 CPU clocks for EDO. The value of x is the timing of first memory cycle.

Chipset Features à **EDO DRAM Write Burst**

EDO DRAM Write Burst
x333
x222

Write Burst means to write four continuous memory cycles on four predefined addresses to the DRAM. The default value is **x222** for 60ns EDO DRAM. Which means the 2nd,3rd and 4th memory cycles are 2 CPU clocks for EDO. The value of x is the timing of first memory cycle.

Chipset Features à **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 à **SDRAM RAS Precharge Time**

SDRAM RAS Prechatge Time
2T
3T

The RAS Precharge means the timing to inactive RAS and the timing for DRAM to do precharge before next RAS can be issued. RAS is the address latch control signal of DRAM row address. The default setting is **3 clocks**.

AWARD BIOS

Chipset Features à **DRAM ECC Function**

DRAM ECC Function
Enabled
Disabled

This item lets you enable or disable DRAM ECC function. The ECC algorithm has the ability to detect double bit error and automatically correct single bit error.

Chipset Features à **CPU-to-PCI IDE Posting**

CPU-to-PCI IDE Posting
Enabled
Disabled

To enable or disable CPU to PCI IDE post write cycle. The IDE write cycles will be queued in the FIFO or buffer, and CPU can be released to do next job. Disable it, if you find any IDE compatibility problem.

Chipset Features à **Video BIOS Cacheable**

Video BIOS Cacheable
Enabled
Disabled

Allows the video BIOS to be cached to allow faster video performance.

Chipset Features à **Video RAM Cacheable**

Video RAM Cacheable
Enabled
Disabled

This item lets you cache Video RAM A000 and B000.

Chipset Features à **8 Bit I/O Recovery Time**

8 Bit I/O Recovery Time
1
2
3
4
5
6
7
8
NA

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 **4 ISA clock.** If set to NA, the chipset will insert 3.5 system clocks.

Chipset Features à 16 Bit I/O Recovery Time

16 Bit I/O Recovery Time
1
2
3
4
NA

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 **1 ISA clocks**. If set to NA, the chipset will automatically insert 3.5 system clocks.

Chipset Features à Memory Hole At 15M-16M

Memory Hole At 15M-16M
Enabled
Disabled

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.

Chipset Features à Passive Release

Passive Release
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 Delayed Transaction

Delayed Transaction
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.

AWARD BIOS

Chipset Features à AGP Aperture Size (MB)

AGP Aperture Size (MB)
4
8
16
32
64
128
256

This item lets you determine the effective size of the Graphic Apeture.

Chipset Features à Pentium II Micro Codes

Pentium II Micro Codes
Enabled
Disabled

The micro codes are used to fix bugs of Pentium II CPU, we strongly recommand to enable this item for system reliability reason. However, this microcode may slightly reduce CPU performance. We provide this option for your convenience if you like to test it.

Chipset Features à Manufacture Frequency Default

Manufacture Frequency Default
Depends on the CPU type

This item only reminds you of the actual CPU frequency while clearing CMOS or pressing "Home" key. The default setting is 233 Mhz, you can modify it to match the actual CPU frequency by using the utility - flash.exe.

Chipset Features à System Frequency

System Frequency
233 Mhz
266 Mhz
300 Mhz
333 Mhz
Manual

This item lets you set CPU frequency. If you want to set other value, please choose "Manual " to set CPU clock frequency and clock ratio manually.

Chipset Features à **CPU Clock Frequency**

CPU Clock Frequency
66.8 Mhz
68.5 Mhz
75.0 Mhz
83.3 Mhz

This item lets you set external clock (bus clock). The possible settings of current Klamath CPU available on the market are 66.8 Mhz, the correct setting may vary because of new CPU product, refer to your CPU specification for more details.

Chipset Features à **CPU Clock Ratio**

CPU Clock Ratio
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0

Intel Pentium II (Klamath) is designed to have different Internal (Core) and External (Bus) frequency. This item lets you select the ratio of Core/Bus frequency. The default value is 3.5x.

3.5 Power Management Setup

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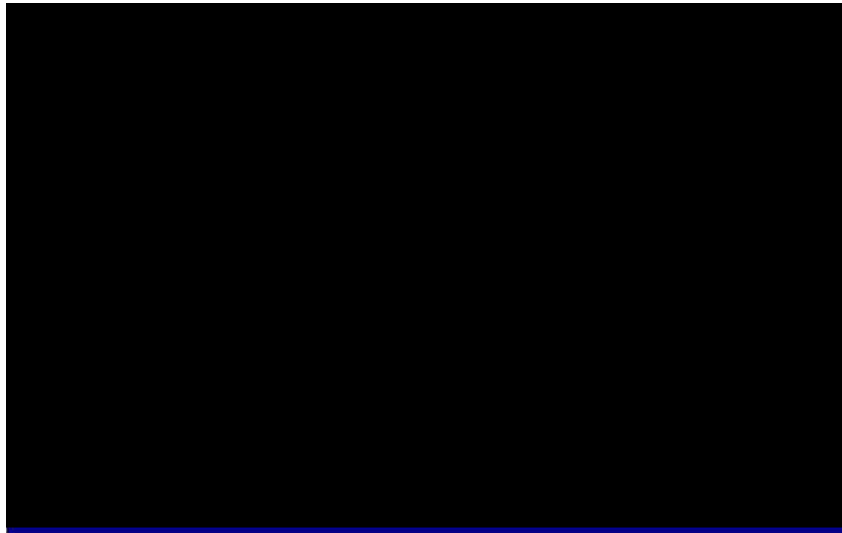
Power Management à Power Management

Power Management	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 Define to choose your own parameters.
Max Saving	
Mix Saving	
User Define	
Disabled	

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

Power Management à PM Controlled by APM

PM Controlled by APM
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

Video Off After
N/A
Doze
Standby
Suspend

To turn off video monitor at which power down mode.

Power Management à Doze Mode

Doze 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 Doze mode. The system activity (or event) is detected by monitoring the IRQ signals or other events (such as I/O).

AWARD BIOS

Power Management 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, 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 or other events (such as I/O).

Power Management 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".

Power Management 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).

Power Management à **Modem Wake Up**

Modem Wake Up
Enabled
Disabled

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

Power Management à **LAN Wake Up**

LAN Wake Up
Enabled
Disabled

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

Power Management à **Suspend Mode Option**

Suspend Modem Option
PowerOn Suspend
Suspend to Disk

You can select suspend mode by this item. **Power On Suspend** 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 or I/O. **Suspend to Hard Drive** 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, which depending on your memory size. You need utility AOZVHDD to reserve disk space.

Power Management à **VGA Active Monitor**

VGA Active Monitor
Enabled
Disabled

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

AWARD BIOS

Power Management à Power Button Override

Power Button Override	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.
Enabled	
Disabled	

Power Management à RTC Wake Up Timer

RTC Wake Up Timer	This option lets you enable or disable the RTC Wake Up function.
Enabled	
Disabled	

Power Management à WakeUp Date (of Month)

WakeUp Date (of Month)	This item is displayed when you enable the RTC Wake Up Timer option. Here you can specify what date you want to wake up the system. For Example, setting to 15 will wake up the system on the 15th day of every month.
0	
1	
.....	
31	

Note: Setting this item to 0 will wake up the system on the specified time (which can be set in the WakeUp Time item) every day.

Power Management à **WakeUp Time (hh:mm:ss)**

WakeUp Time (hh:mm:ss) hh:mm:ss	This item is displayed when you enable the RTC Wake Up Timer option. Here you can specify what time you want to wake up the system.

Power Management à **IRQ 8 Clock Event**

IRQ 8 Clock Event 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 **Disabled**, OS/2 may fail to go into Doze/Standby/Suspend mode.

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 port.

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.

PNP/PCI Configuration à **PnP OS Installed**

| **PnP OS Installed**
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. |

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, DMAs, and I/O address.

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 Configuration à **DMA 0**
PNP/PCI Configuration à **DMA 1**
PNP/PCI Configuration à **DMA 3**
PNP/PCI Configuration à **DMA 5**
PNP/PCI Configuration à **DMA 6**
PNP/PCI Configuration à **DMA 7**

DMA 0 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 Configuration à **PCI IDE IRQ Map To**

PCI IDE IRQ Map To 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 Configuration à **Primary IDE INT#**
PNP/PCI Configuration à **Secondary IDE INT#**

Primary IDE INT# 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)
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 Configuration à **Used MEM Base Addr**

Used MEM base addr
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 Configuration à **Used MEM Length**

Used MEM Length
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

PNP/PCI Configuration à **PCI Slot1 IRQ (Right)**
PNP/PCI Configuration à **PCI Slot2 IRQ**

PCI Slot1 IRQ
3
4
5
7
9
10
11
12
14
15
Auto

This item is reserved for engineering purpose to let you assign an IRQ manually to the add-on card on each PCI slot. If you select Auto, system will automatically assign an available value to the device.

It is suggested to use default setting, which is Auto, in order to comply with PnP specification completely.

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.
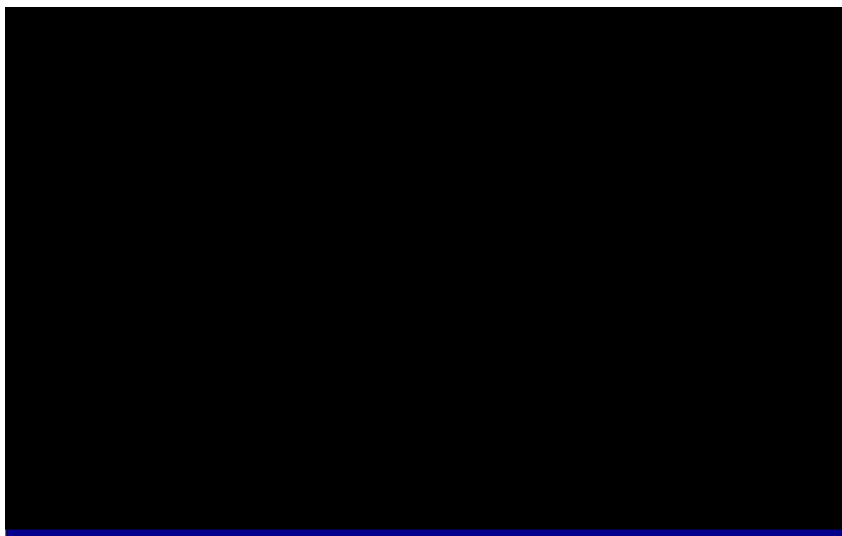
Integrated Peripherals à IDE HDD Block Mode

IDE HDD Block Mode
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.

Integrated Peripherals à **IDE Primary Master PIO**
Integrated Peripherals à **IDE Primary Slave PIO**
Integrated Peripherals à **IDE Secondary Master PIO**
Integrated Peripherals à **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 "Connectors" for details on how to connect IDE device(s).

Integrated Peripherals à **IDE Primary Master UDMA**
Integrated Peripherals à **IDE Primary Slave UDMA**
Integrated Peripherals à **IDE Secondary Master UDMA**
Integrated Peripherals à **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 à **On-Chip Primary PCI IDE**
Integrated Peripherals à **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 Support

USB Legacy Support	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.
Enabled	
Disabled	

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

USB IRQ Released	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.
Yes	
No	

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

Integrated Peripherals à Onboard FDC Controller

Onboard FDC Controller	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.
Enabled	
Disabled	

Integrated Peripherals à Onboard Serial Port 1
Integrated Peripherals à Onboard Serial Port 2

Onboard Serial Port 1
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

Onboard UART 2 Mode
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/IRQ5
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
SPP
EPP
ECP
ECP + EPP

This item lets you set the parallel port mode. The mode options are SPP (Standard and Bidirection Parallel Port), EPP (Enhanced Parallel Port) and ECP (Extended Parallel Port). SPP 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.

Integrated Peripherals à ECP Mode Use DMA

ECP Mode Use DMA
3
1

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

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.

3. At the next prompt, re-type your password and press again to confirm the new password. After the password entry, the screen automatically reverts to the main screen.

To disable the password, press 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 Load EEPROM Default

Except "Load Setup Default" and "Load Turbo Default", you may also use "Save EEPROM Default " to save your own settings into EEPROM, and reload by using this item.

3.14 Save EEPROM Default

You may use this item to save your own settings into EEPROM. Then, if the data in CMOS is lost or you forget the previous settings, you may use "Load EEPROM Default " to reload.

3.15 Exit without Saving

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.

3.16 NCR SCSI BIOS and Drivers

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.

3.17 BIOS Flash Utility

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.aopen.com.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.

[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 floppy without loading any memory handler (HIMEM, EMM386, QEMM386, ...) or device driver.

2. Execute

     C:> AOFLASH Biosfile.bin

    Biosfile.bin is the filename of the BIOS code.

AWARD BIOS

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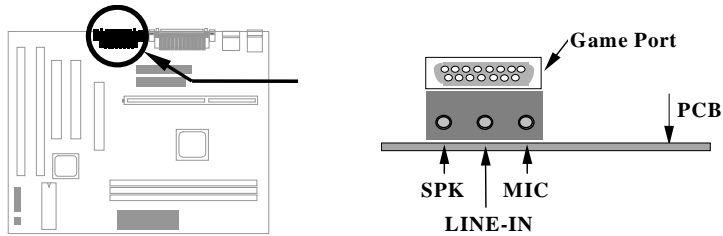
> ***Tip:*** *You may load back original BIOS "BIOS.OLD" by the same procedure.*

Chapter 4

Audio

This motherboard comes with a 16-bit sound processor (Crystal CX4235) onboard.

To fully utilize the audio functions, you may connect various peripheral devices that the audio chip supports. The following figure shows the different devices that you can connect.
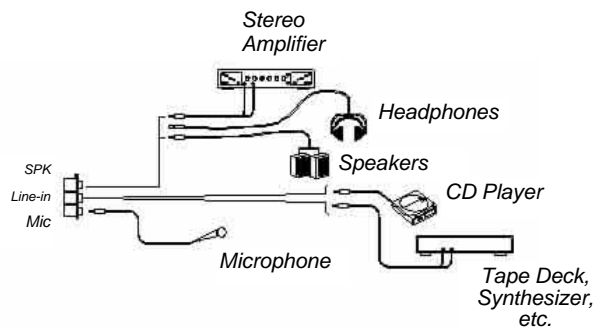
Audio

4.1   Features

The onboard audio has the following features:

Advanced technology support

- Microsoft Direct Sound
- Plug and Play

MIDI interface

- Built-in MIDI interface for external MIDI devices

Software-controllable audio

- Supports various audio devices all controllable through software
- Adjusts master volume, CD audio, line-in, and microphone inputs
- Software setting of I/O address, DMA and IRQ

Stereo digitized voice channel

- Full-duplex, 16-bit digital audio playback and recording in both stereo and mono modes
- Programmable sampling rate from 8 KHz to 44.1 KHz

3D Sound-Surround

- Adjustable Space effect via software
- Preset capability (maximum of three different settings)

4.2   Setting Up in Windows 95

AOpen Bonus Pack CD-ROM contains the Windows 95 drivers and software (including the Music Center application). Please see the online help for details.

Note: Refer to your Windows 95 manual or online help for any questions on Windows 95.

4.2.1 Installing the Drivers and the Application

After turning on the system, Windows 95 begins loading and starts detecting new hardware installed on the system.

1.   When Windows 95 detects the presence of the onboard audio chip, it begins to build the CX4235 driver database. The New Hardware Found dialog box displays.

2.   Select **Driver from disk provided by hardware manufacturer** and click on **OK**. Windows 95 prompts you for the driver disk.

3.   Specify the path of the Win95 driver from your CD-ROM drive, then click on **OK**. The system will copy the necessary driver files to your hard disk drive.

Tip: Prepare the Windows 95 CD-ROM disk before setting up the onboard audio. Windows 95 will prompt you to insert the Windows 95 CD-ROM disk when you install the joystick or MIDI device.

Note: If the file being copied is older than the file currently existing in your system, we suggest you to keep the existing file.

4.   Windows 95 makes changes to the system settings and begins detecting the following new hardware components:

- Crystal PnP Audio System Joystick

- Crystal PnP Audio System Control Registers

- Crystal PnP Audio System MPU-401 Compatible

Audio

- Crystal PnP Audio System CODEC

5.   Upon initial installation, the setup process begins setting up the software.

Windows 95 makes final changes to the system settings.

4.2.2 Removing the Drivers

Follow these steps to remove or uninstall the drivers:
1.   Execute **SETUP.EXE** on driver disk & click on **Uninstall Driver**.
2.   Click on **Uninstall Crystal Drivers** to uninstall the drivers.

The uninstallation process automatically removes the drivers and changes the system registry settings.

Important: *After removing the drivers, remember to remove the audio chip when you shutdown from the current Windows 95 session; otherwise, Windows 95 will again detect the audio chip at the next startup.*

4.3   Setting Up in DOS and Windows 3.x

4.3.1 Installing the Drivers and the Application

Follow these steps to install the drivers and the application:

1. Insert AOpen Bonus Pack into the appropriate CDROM drive.

2. At the DOS prompt, type

    `x:\Mx6eplus\Sound\Driver\Win31\setup` e

    depending on your CD-ROM drive.

3. Select the **install** option to start the installation process. A confirmation screen displays.

4. This screen describes the files setup will modify during installation. Read this message carefully. Select **Yes** to proceed with the installation. The install path confirmation screen displays.

5. Confirm the installation path by selecting **Begin Installation**. You can modify the source and destination directories. The Windows applications installation screen displays.

6. Press e if you want to install the Windows applications and drivers. Otherwise, press m. The hardware settings screen displays.

7. Select **Accept the above settings** to install the drivers and applications. You can modify any of the options before you begin installation.

    If you selected to install the Windows drivers and applications, the Windows-specific hardware settings screen displays.

8. Select **Accept the above settings** to install the Windows drivers and applications. You can modify any of the options before you begin installation.

    Skip this step if you did not select to install the Windows drivers and applications.

9. Follow the screen instructions to complete the installation.

    The installation program automatically updates your profiles (AUTOEXEC.BAT, CONFIG.SYS, and SYSTEM.INI) so that your hardware and software work properly.

> **Note:** Before any changes are made to your AUTOEXEC.BAT, CONFIG.SYS, WIN.INI and SYSTEM.INI files, backups of your original files are copied to the audio directory and are renamed as AUTOEXEC.###, CONFIG.###, WIN.### and SYSTEM.### respectively.

10. Reboot the system after installation.

> **Important:** You must reboot the system. The onboard audio does not work unless you reboot.

4.3.2 Removing the Drivers

Follow these steps to remove or uninstall the drivers:

1. Change the directory to where the audio driver files are located and type the following at the DOS prompt:

    setup e

2. Select the **uninstall** option to start the uninstallation process. Follow the screen instructions to complete the process.

4.4 Setting Up in NT3.51 / NT4.0

4.4.1 Installing the Audio Drivers

Follow these steps to install the audio drivers:

1. For NT3.51, select **DRIVERS** from control panel.
   For NT4.0, select **MULTIMEDIA** from control panel and click on the Devices tab.
2. Press the **ADD** button. Select **Unlisted or Updated Drivers** and press **OK**.
3. Browse and select X:\Mx6eplus\Sound\Driver\WinNT.
   (X: is your CD-ROM drive.)
4. Press **OK** to continue with the installation.
5. An Audio Setup dialog box will appear. Please select the default configuration resource and press **OK**.
6. Click on the **Restart Now** button.

4.4.2 Install MPU-401/Joystick Driver

Follow these steps to install the MPU401 or joystick drivers:
1. For NT3.51, select **DRIVERS** from control panel.
   For NT4.0, select **MULTIMEDIA** from control panel and click on the Devices tab.
2. Press the **ADD** button. Select **MPU-401 Compatible Driver /Microsoft Sidewinder 3D Pro Joystick** and press **OK**.
3. Place your NT4.0/NT3.51 installation CD and press **OK** (the default path is the i386 directory).
4. The Generic MPU-401/Joystick Setup dialog box will pop up. Select the default configuration resource and press **OK**.
5. Click on the **Restart Now** button.

Audio

4.5   Applications

4.5.1 Music Center
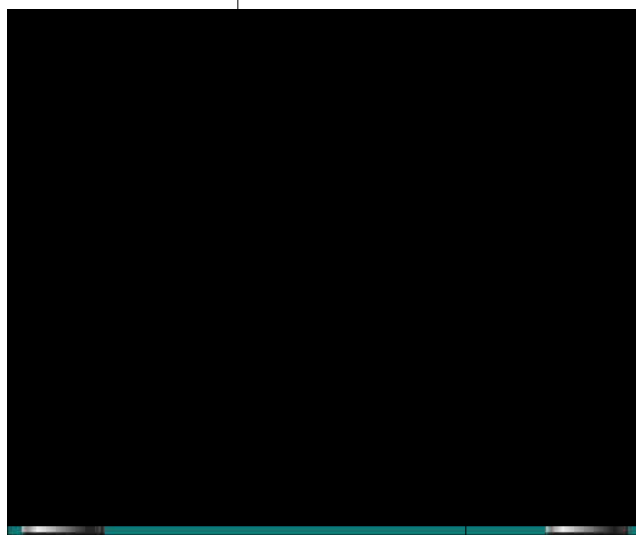
To startup this application, please click the Music Center Icon.

MIDI Player: plays MIDI audio files

3D Controller: controls the 3D effects

CD Player: plays audio CDs

Wave Player: plays and records waveform audio files

Multimedia Mixer: controls the combination and balance of sound output from different channels

For more information, please refer to the online help.

4.5.2 MIDI Board

To startup this application software, please click the MIDI Board Icon.

Tone Button: Sharp or disminish background music by the 12 tone buttons.

Rhythm & Tempo: To play several types of background music.

Menu Button: Turn on/off Menu.

MIDI Board Notes: Move cursor over the screen keyboard and click for playing or strick corrospondence key on PC keyboard to play specific tone.

Program Tuner: Drag the yellow point to select specific program for different instrument tune.

HotKey Button: Show keyboard mapping.

4.5.3 MIDI Player

MIDI player is very similar as Media Player that comes with Windows 95, but it is able to dynamic switch MIDI devices from one to another while playing MIDI file, so you can enjoy the sound quality between different MIDI device obviously.

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.aopen.com.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:

<div align="center">

`AP53/AX53 `<u>`R3.80`</u>` Oct.22.1996`

BIOS revision
</div>

Q: How can I identify the model name & revision of the mainboard from PCB?

A: The AOpen mainboard revision appears as REV:X.X on the PCB, usually it is under beneath of AOpen Logo & mainboard model name. For example, "AX6L REV:1.2" shall appear on the PCB as follows:

<div align="center">

AOpen®

AX6L
REV:1.2
</div>

Frequently Asked Questions

Q: What is MMX?

A: MMX is the new single-line multiple-instruction technology of the new Intel Pentium PP/MT (P55C) and Pentium II CPU. The AMD K6 and Cyrix M2 will support MMX, too. The MMX instructions are specifically useful for multimedia applications (such as 3D video, 3D sound, video conference). The performance can be improved if applications use these instructions. All AOpen MBs have at least dual power onboard to support MMX. It is not necessary to have special chipset for MMX CPU.

Q: What is USB (Universal Serial Bus)?

A: USB is a new 4-pin serial peripheral bus that is capable of cascading low/medium speed peripherals (less than 10Mbit/s) such as keyboard, mouse, joystick, scanner, printer and modem/ISDN. With USB, the traditional complex cables from back panel of your PC can be eliminated.

You need the USB driver to support USB device(s). AOpen MBs are all USB ready, you may get latest BIOS from AOpen web site (http://www.aopen.com.tw). Our latest BIOS includes the keyboard driver (called Legacy mode), that simulates USB keyboard to act as AT or PS/2 keyboard and makes it possible to use USB keyboard if you don't have driver in your OS. For other USB devices, you may get the drivers from your device vendor or from OS (such as Win95). Be sure to turn off "USB Legacy Support" in BIOS "Chipset Setup" if you have another driver in your OS.

Q: What is FCC 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.

A-2
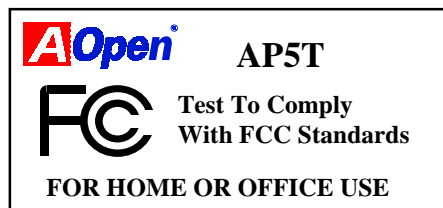
Q: What is Bus Master IDE (DMA mode)?

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 the 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.

Mode	Clock per 33MHz PCI	Clock count	Cycle time	Data Transfer rate
PIO mode 0	30ns	20	600ns	(1/600ns) x 2byte = 3.3MB/s
PIO mode 1	30ns	13	383ns	(1/383ns) x 2byte = 5.2MB/s
PIO mode 2	30ns	8	240ns	(1/240ns) x 2byte = 8.3MB/s
PIO mode 3	30ns	6	180ns	(1/180ns) x 2byte = 11.1MB/s
PIO mode 4	30ns	4	120ns	(1/120ns) x 2byte = 16.6MB/s
DMA mode 0	30ns	16	480ns	(1/480ns) x 2byte = 4.16MB/s
DMA mode 1	30ns	5	150ns	(1/150ns) x 2byte = 13.3MB/s
DMA mode 2	30ns	4	120ns	(1/120ns) x 2byte = 16.6MB/s
DMA/33	30ns	4	120ns	(1/120ns) x 2byte x2 = 33MB/s

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

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 "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 AX5T with Intel TX chipset can support ACPI.

Q: What is ATX 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.

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.

Q: What is the AGP (Accelerated Graphic Port)?

A: AGP is a PCI-like bus interface targeted for high-performance 3D graphic. AGP supports only memory read/write operation and single-master single-slave one-to-one only. The AGP uses both rising and falling edge of the 66MHz clock and produces 66MHz x 4byte x 2 = 528MB/s data transfer rate.

Q: Does Pentium, Pentium Pro or Pentium II support Deturbo mode?

A: The Deturbo mode was originally designed to slow down CPU speed for old applications (especially old games). It uses programming loop to wait or delay special event. This programming method is considered very bad since the delay of loop highly depends on the CPU speed and the application fails at high-speed CPU. Almost all new applications (including games) use RTC or interrupt to wait event. There is no need for Deturbo mode now. The Turbo switch is now used as Suspend switch. However, some MBs still support Turbo/Deturbo function via keyboard. You can set the system to Deturbo by pressing <Ctrl> <Alt> <->. To back to Turbo mode, press <Ctrl> <Alt> <+>. Note that the Deturbo mode has been removed in new MBs since these require more code space in Flash ROM.

Q: Power Management Icon does not appear in the Windows 95 Control Panel even though the APM under BIOS Setup is enabled.

A-4

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 go into suspend mode under Win95?

A: This problem may be caused by your CDROM settings. The CDROM Auto Insert Notification of Win95 is dafault 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 è System è Device Manager è CDROM è Setting, and disable the "Auto Insert Notification" function.

Q: Which version of the 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 LDCM (LAN 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.

Frequently Asked Questions

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 2.1	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	Yes	Yes
Real-Time CPU/Memory Utilization Monitoring	Yes	No
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

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.

Tip: 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.aopen.com.tw*

USA   *http://www.aopen-usa.com*

                http://www.aopenamerica.com

Europe *http://www.aopen.nl*

*Important: Make sure that you have tried listed procedures in this appendix before you call your distributor. If the problem still exist, fill out the attached **Technical Problem Report Form**. Please 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. For getting better efficiency, we don't recommand you report the problem through phone.*

Troubleshooting

No display.

a. Check all jumper settings to make sure that you have set the proper jumpers, especially those for CPU type, single/dual voltage (P54C/MMX), CPU frequency and ratio.

b. 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.

c. Is there a short on the motherboard? (Is the fan of the power supply working properly?)

d. Turn off the power and remove all add-on cards, IDE cables and floppy cables from your mainboard. Only install the VGA card to simplify the problem.

e. If you use a PCI VGA card, reinstall it to other PCI slot or try another card.

f. Check if the memory (SIMM/DIMM) were installed properly. Reinstall the SIMM/DIMM to other socket or try another SIMM/DIMM.

g. Make sure the flat cable matches pin1 of IDE connector and your IDE device.

There is display, but can 't enter BIOS Setup.

a. For checking if the keyboard works properly, press the <Num Lock> key to enable/disable the Num Lock function, and check if the LED will ON and OFF accordingly.

b. Check if Turbo Switch was released, don 't use Turbo Switch before system boots. (In fact, there is no Turbo function after Pentium machine. Now Turbo Switch usually acts as Suspend Switch.)

System sometimes auto reboots.

a. Clear CMOS. BIOS will load default setting, use the slowest and most reliable setting.

b. Repeat the steps in "No display" section carefully.

There is display, but can 't boot.

a. Check BIOS Setup if the HDD is set to LBA (more than 540MB) format.

b. Load default setting.

c. Boot system from floppy drive. If pass, the problem should be caused by the IDE cable or HDD itself.

HDD Controller Fail, can't detect HDD.

a. Make sure the Master/Slaver setting for HDD is correct.

b. Check IDE cable or try another HDD.

Mouse/Printer/Floppy is not working properly.

a. Check if Serial/Parallel/Floppy cable was installed properly.

b. If possible, use another peripheral to double check if the mainboard is defective.

Keyboard has no response when system boots, or BIOS shows the message "Keyboard Controller Error ".

a. Press the <Num Lock> key to enable and disable Num Lock function, check if the LED will ON and OFF accordingly.

b. Is the mainboard fuse burned? (Use an multi-meter to check. The fuse is usually located near the keyboard socket. It is usually green and marked as F1,3A/125V.)

COMS data lost, or Battery Low

a. Does the voltage of the onboard battery is lower than 2.5V?

b. Make sure the Clear CMOS jumper is set correctly.

Troubleshooting

<table>
<tr><td colspan="3" align="center">Technical Problem Report Form</td></tr>
<tr><td colspan="3">Model Name:

Serial Number:</td></tr>
<tr>
<td>Contact:</td>
<td colspan="2">Name:

TEL: FAX:

Email Address:</td>
</tr>
<tr>
<td>Error Symptom:</td>
<td colspan="2"></td>
</tr>
<tr>
<td>System Configuration:
(Please list model name and version.)</td>
<td>OS:

CPU:

HDD:

VGA:

Modem:</td>
<td>BIOS:

SIMM:

CDROM:

Sound:

Others:</td>
</tr>
</table>

Appendix   C

Jumper Table Summary

Selecting the CPU Frequency

This motherboard is jumper-less design. The only jumper left is Clear CMOS, which is reserved in case you forget your password.

The CPU frequency selection is set by going into:

BOIS Setup à **Chipset Features Setup** à **CPU Clock Frequency**
(The possible setting is 66, 68.5, 75 and 83.3 MHz)

BOIS Setup à **Chipset Features Setup** à **CPU Clock Ratio**
(The possible setting is 1.5x, 2x, 2.5x, 3x, 3.5x, 4x, 4.5x, 5x, 5.5x, 6x, 6.5x, 7x, 7.5x, and 8x)

INTEL Pentium II	CPU Core Frequency	Ratio	External Bus Clock
Klamath 233	233MHz =	3.5x	66MHz
Klamath 266	266MHz =	4x	66MHz
Klamath 300	300MHz =	4.5x	66MHz
Klamath 333	333MHz =	5x	66MHz
Celeron 266	266MHz=	4x	66MHz
Celeron 300	300MHz	4.5x	66MHz

Selecting the CPU Voltage

This motherboard supports Pentium II (Klamath) VID function, the CPU core voltage is automatically detected, the range is from 1.3V to 3.5V.

Jumper Table Summary

Clear CMOS

JP14	Clear CMOS
1-2	Normal operation (default)
2-3	Clear CMOS

Tip: *If your system hangs or fails to boot because of over-clocking, simply use <Home> key to restore to the default setting (233MHz). By this smart design, it would be more convenient to clear CPU frequency setting. For using this function, you just need to press <Home> key first and then press Power button at the same time. Please note that do not release <Home> key until POST sreen appearing.*