Chapter 1

Overview

MX3L is a new generation Socket 370 based system board that utilizes Intel **82440LX** AGPset on **Micro ATX** PCI/ISA platform. This AGPset is designed for Celeron PPGA 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 install EDO and SDRAM and expand up to a maximum of **768MB**. Also, MX3L uses **2M bit Flash ROM** BIOS to reserve for future new functions.

Not only above features, MX3L also implements a lot of special features as the following.

Jumper-less Design 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 MX3L 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.

APM 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.

Overview

Zero Voltage Wake on Modem In conjunction with ATX soft power On/Off, it is possible to have system totally power off and wakeup to automatically answer a phone call such as answering machine or to send/receive fax. The most important break through is not only external box modem but also internal modem card can be used to support Wake On Modem. The MX3L and MP56 internal modem card implement special circuit (patent applied) to make sure the modem card work properly without any power.

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

Wake on RTC 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 accuracy is second.

Wake on Keyboard This feature allows you power on your system by clicking the hot key that you specified. Besides, you also may disable the function of power button and let the system can only be powered on through the preset keys (like a password).

Wake on Mouse This function allows you wake up the system by clicking mouse button twice successively.

AC Power Auto Recovery A traditional ATX system should remain at power off stage when AC power resumes from power failure. This design is inconvenient for a network server or workstation, without an UPS, that needs to keep power-on. This motherboard implements an AC Power Auto Recovery function to solve this problem. In BIOS Setup setting the item to Enabled lets the system can automatically power-on after AC power resumes.

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. MX3L implements high efficient synchronous switching design that the temperature of MOS FET is far less than Schottky diode of asynchronous design.

Over Current Protection The Over Current Protection was very popular implemented on the Baby AT or ATX 3.3V/5V/12V switching power supply. However, the new generation Celeron PPGA CPU uses different voltage that have regulator to transfer 5V to CPU voltage (for example, 2.0V), and make 5V over current protection useless. MX3L 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 MX3L 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 MX3L 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, MX3L 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 2.05V, that can be applied to various CPU type in future.

Resetable Fuse This motherboard implements resetable fuses to prevent any accidental short circuit caused by keyboard or USB devices hot plug.

FCC DoC certificate MX3L has passed FCC DoC test. The radiation is very low, you can use any kind of housing.

Powerful Utility Software AOpen Bonus Pack bundled CD contains many useful utilities, such as Norton Antivirus, ADM (Advanced Desktop Manager), AOchip, Hardware Monitoring utility, and Suspend to Hard Drive utility.

> *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	Micro ATX
Board Size	244 mm x 220 mm
CPU	Celeron PPGA
System Memory	168-pin DIMM x3, maximum 768MB EDO or 384 SDRAM.
Chipset	Intel 82440LX AGPset
Expansion Slots	ISA x1, PCI x3 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.

1.2   APM 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. Boot up your system into DOS command prompt. If you are Win'95 user, Please restart your Windows 95 under "Command Prompt" by pressing "F8" while system shows "Windows 95 Starting ...". Choose "Safe Mode Command Prompt Only" from selection so that system will start in DOS command prompt.

4. Copy AOZVHDD.EXE to the root directory of your C: drive.

5. Option 1: Use **/file** switch (applied to FAT16 file system):

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

        C:>AOZVHDD /c /file

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

Overview

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

To create a separate partition for Suspend to Hard Drive, please make sure you have 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.*

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.*

Creative Sound Blaster PCI 64
Creative Ensoniq
Creative Sound Blaster PCI 128
Videologic Sonic Storm

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 Wake On Modem

The Wake On Modem 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 MX3L 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 Wake On Modem applications.

TEL Line

COM port   **External Box Modem**

External Modem Wake Up

TEL Line

Internal Modem Card Wake Up (such as MP56)
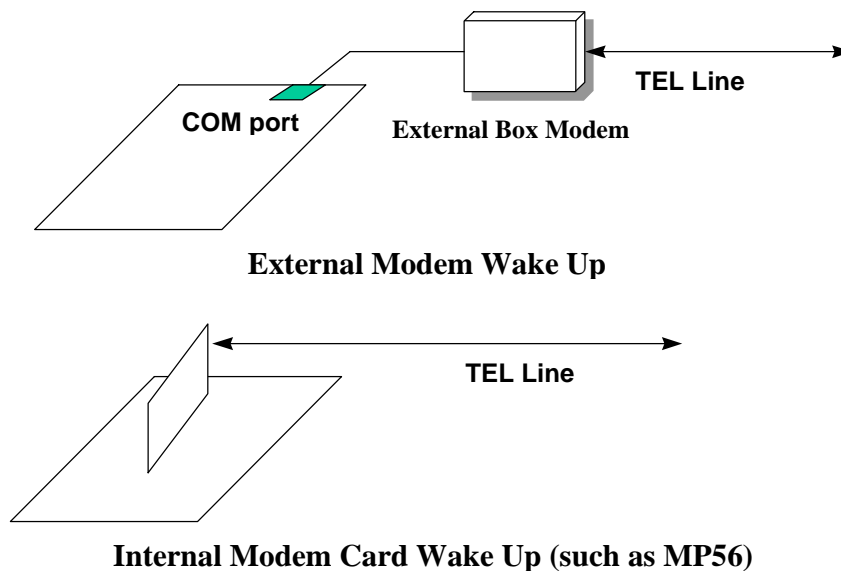
For Internal Modem Card (AOpen MP56):

1. Go into BIOS setup , Power Management à 0V Wake On Modem, 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 MX3L **WOM** connector.

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 WOM (on mainboard).*
>
> **Tip:** *You can combine Suspend to Hard Drive, 0V Wake On Modem and the software Acephone for the best solution of answering machine or to send/receive fax.*
>
> **Note:** *If you use external modem, the power of external modem must be kept on to receive signal from telephone line. Internal modem card has no such limitation.*

1.4 System Voltage Monitoring

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

1.5 Fan Monitoring
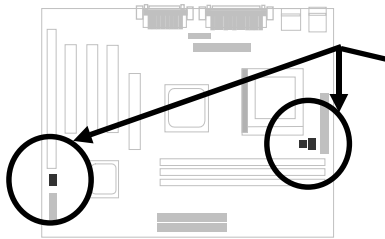
There are three fan connectors, two is for CPU, the other can be connected to a housing fan. The fan monitoring function is implemented by connecting fan to 3-pin fan connector **CPUFAN1** or **FAN** and installing Hardware Monitor utility.

> **Note:** *You need a 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 a 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.

1.7 Battery-less Design
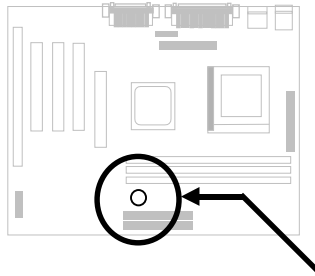
To preserve the earth, AOpen MX3L implements the battery-less motherboard design. There is no need to have battery for RTC (real time clock) and CMOS Setup as long as ATX power cable is plugged. In case of the AC power is shutdown or power cord is removed by accident, the CMOS Setup and system configuration can be restored from EEPROM, only the system clock needed to be re-set to current date/time.

For the convenience of end user, MX3L 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:
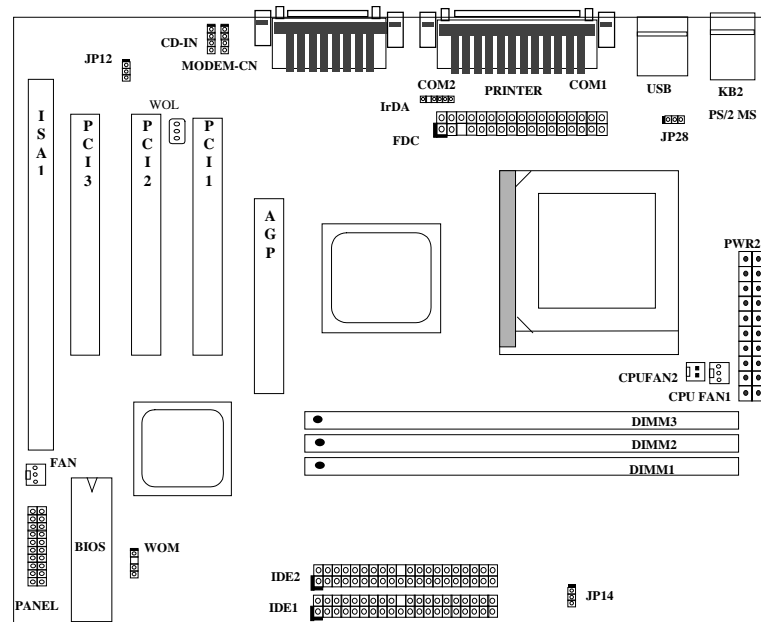
Jumpers:

JP12:	Enable/Disable Onboard Audio
JP14:	Clear CMOS
JP28:	Enable/Disable KB/MS Wake Up

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
CPUFAN1:	CPU fan connector
CDUFAN2:	CPU fan connector
FAN:	Housing Fan Connector
IrDA:	IrDA (Infrared) connector
PANEL:	Front panel (Multifunction) connector
CD-IN:	CD-audio connector
MODEM-CN:	Mono in (Pin 1-2) and Mic out (Pin 3-4)
WOM:	Wake On Modem connector
WOL:	Wake On LAN connector

2.2 Jumpers

With the help of VID signal and SMbus, this motherboard is jumper-less design.

2.2.1 Selecting the CPU Frequency

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 66.8, 68.5, 75, 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 Celeron PPGA	CPU Core Frequency	Ratio	External Bus Clock
Celeron PPGA 366	366MHz=	5.5x	66MHz
Celeron PPGA 400	400MHz=	6x	66MHz
Celeron PPGA 433	433MHz=	6.5x	66MHz

> **_Warning:_** _INTEL 440LX chipset supports maximum 66MHz external CPU bus clock, the higher clock settings are for internal test only._ **_These settings exceed the specification of LX chipset, which may cause serious system damage_**_._
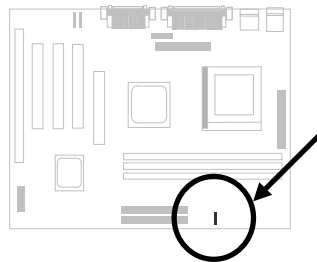
2.2.2 Setting the CPU Voltage

This motherboard supports Celeron PPGA VID function, the CPU core voltage is automatically detected, the range is from 1.3V to 2.05V.

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

Normal Operation
(default)

JP14

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 (300MHz).*
>
> *Tip: If your system hangs or fails to boot because of over-clocking, simply use <Home> key to restore to the default setting (300MHz). 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*
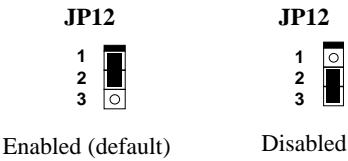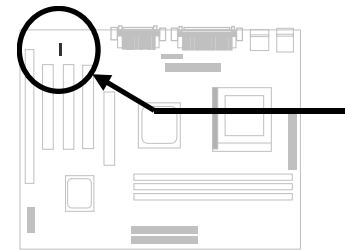
press Power button at the same time. Note that do not release <Home> key until POST screen appearing.

2.2.4 Onboard Audio

JP12	Onboard Audio
1-2	Enabled (default)
2-3	Disabled

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

JP12

JP12

Enabled (default)

Disabled

2.2.5 KB/MS Wakeup

JP28	KB/MS Wakeup
1-2	Disabled
2-3	Enabled

This jumper is used to enable or disable Keyboard/Mouse Power ON function. If you select Enabled, you may decide the wakeup mode from BIOS Setup. To implement this function, the 5V Stand By current must be greater than 800mA.

Note that only PS/2 mouse supports Wake On Mouse function.

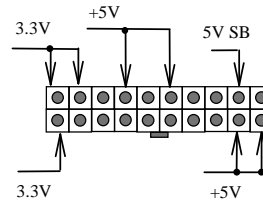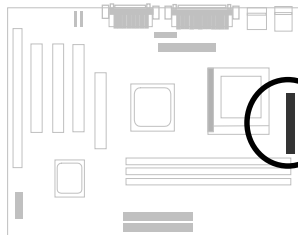**JP28**

JP28

Disabled

Enabled
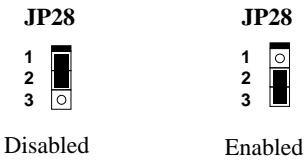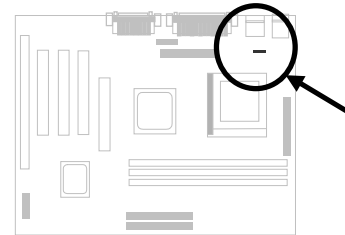
2.3 Connectors

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

2.3.3 Fan

Plug in the fan cable to the fan connectors onboard. The fan connectors are marked **CPUFAN1**, **CPUFAN2** and **FAN** on the system board. You can plug the CPU fan cable to both the 3-pin fan connector CPUFAN1 and the 2-pin fan connector CPUFAN2. FAN can be reserved for the housing fan. Note that only CPUFAN1 and FAN support the fan monitoring function, because a 3-pin fan has an extra pin called SENSE, which periodically sends fan signal out.

CPUFAN1 & FAN

SENSE
+12V
GND

CPUFAN2

GND
+12V

2-7
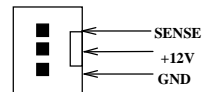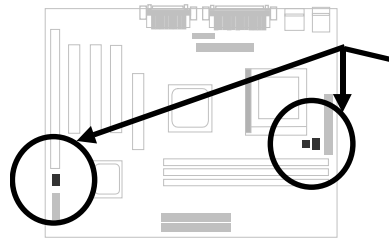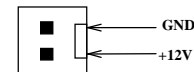
Hardware Installation

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.

PS/2 Mouse

PCB
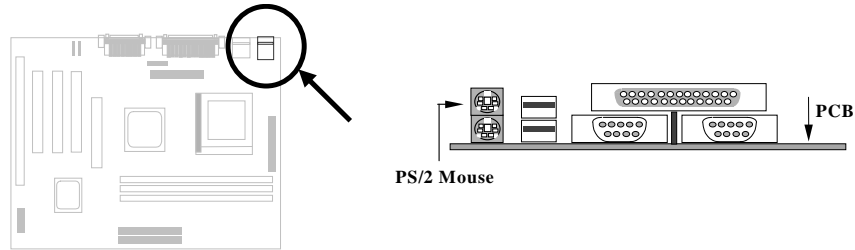
2.3.5 Keyboard

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
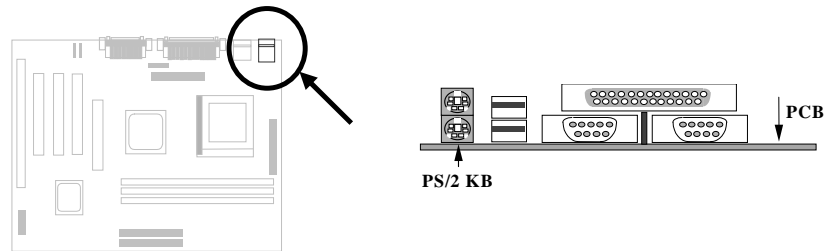
2.3.6 Serial Devices (COM1/COM2)

The onboard serial connectors are 9-pin D-type connectors 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.**

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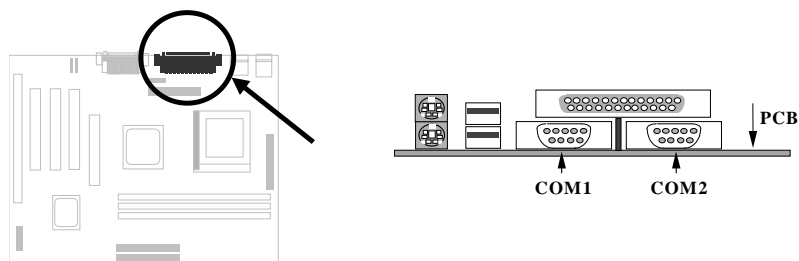
The onboard printer connector is a 25-pin D-type connector marked **PRINTER**. The view angle of drawing shown here is from back panel of the housing.
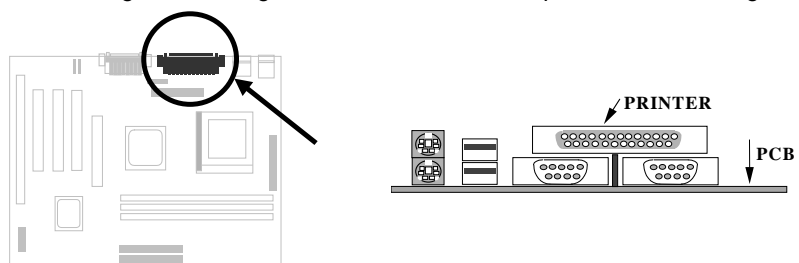
2.3.8 USB Device

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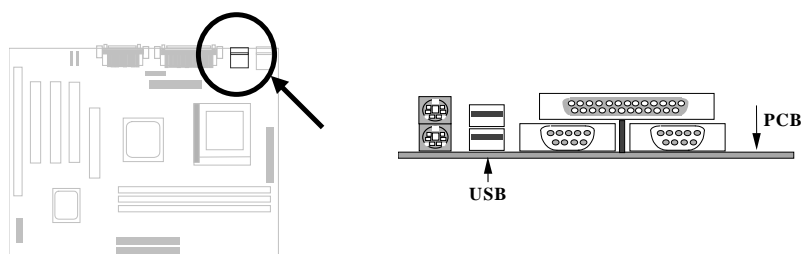
Hardware Installation

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
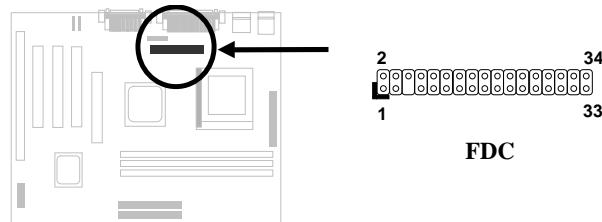
2.3.10 IDE Hard Disk and CD ROM

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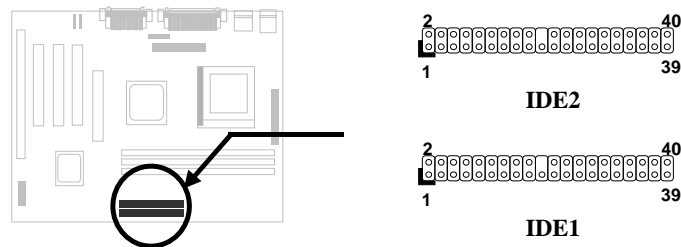
Caution: *The specification of IDE cable is maximum 46cm (18 inches), make sure your cable does not excess this length.*

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 the following figure.*

IDE1 (Primary Channel)

Slave (2nd)   Master (1st)

IDE2 (Second Channel)

Slave (4th)   Master (3rd)
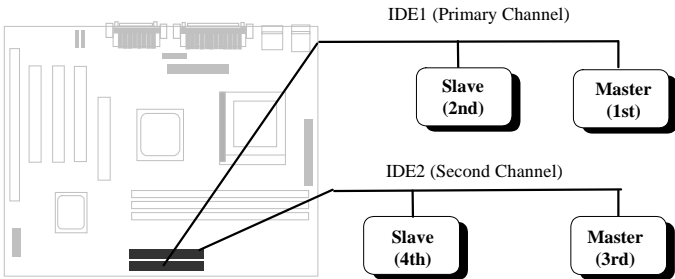
2.3.11 Panel Connector

The Panel (multifunction) connector is a 20-pin connector marked as **PANEL** on the board. Attach the power LED, keylock, speaker, SPWR, IDE LED 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. If your ATX housing supports ACPI specification, the ACPI & Power LED will keep flashing if you have enabled "suspend mode" item in BIOS Setup.

1   11

GND	SPWR
KEYLOCK	GND
+5V	ACPI & POWER LED
IDE LED	GND
IDE LED	+5V
+5V	NC
+5V	NC
GND	GND
NC	RESET
SPEAKER	GND

10   20

PANEL

Hardware Installation


```
         1   11
Keylock  +  ○○  +  SPWR
            ○○
IDE LED     ○○
            ○○  +  ACPI &
         +  ○○     Power LED
         +  ○○
            ○○  +
Speaker     ○○
            ○○     Reset
         10  20
```

PANEL
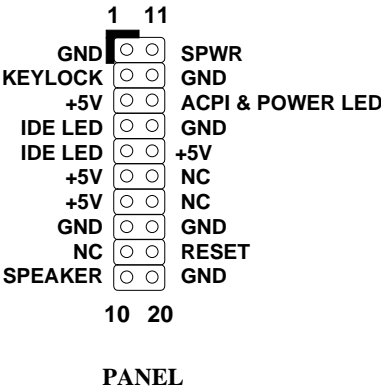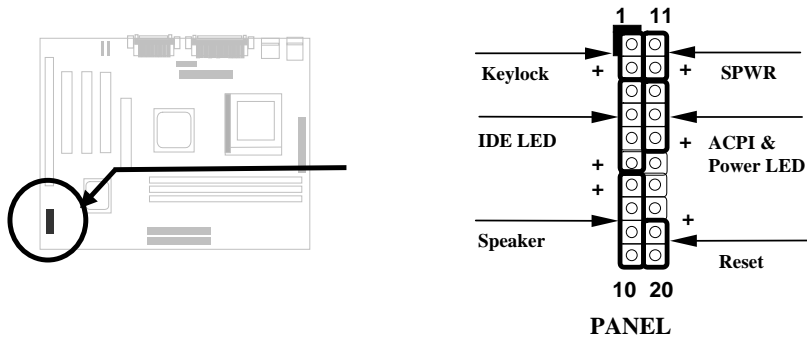
2.3.12 IrDA Connector

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
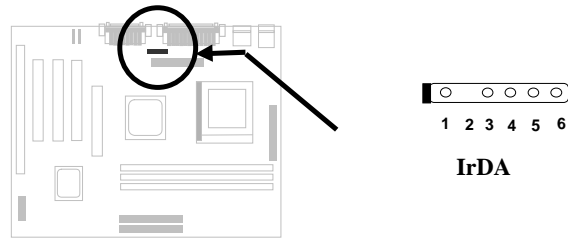
2.3.13 Wake On Modem Connector

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

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

WOM
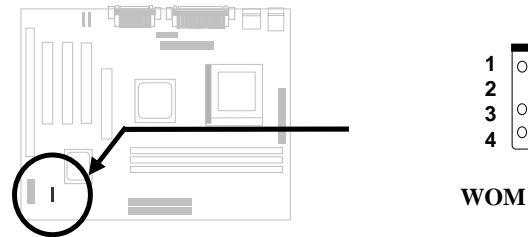
2.3.14 Wake On LAN Connector

This mainboard implements a **WOL** 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

WOL
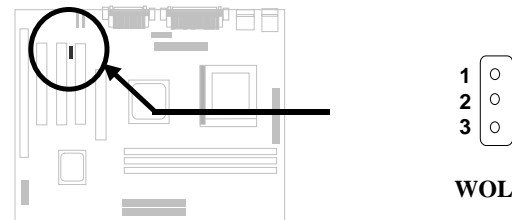
2.3.15 CD Audio Connector

This connector is used to connect CD audio cable.

Pin	Description
1	L
2	GND
3	GND
4	R

CD-IN
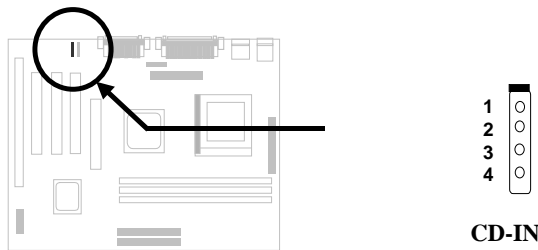
2.3.16 Mono In/Mic Out Connector

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	Mono In
2	GND
3	GND
4	Mic Out
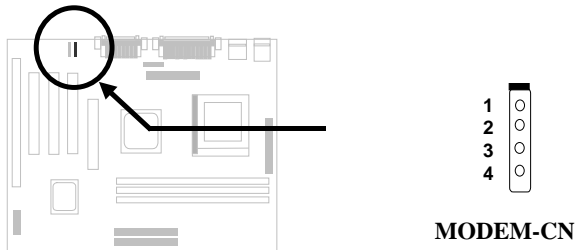
MODEM-CN

2.4 Configuring the System Memory

Pin1
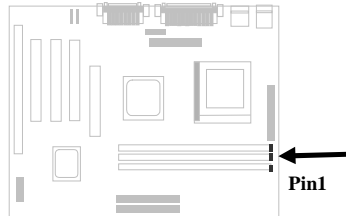
The DIMM types supported are EDO (Extended Data Out) and SDRAM (Synchronous DRAM). This mainboard has three 168-pin DIMM sockets (Dual-in-line Memory Module) that allow you to install system memory up to **768MB EDO DRAM or 384MB SDRAM**.

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. The following figure is for your reference.*

168   85

Pin 129   Pin 114
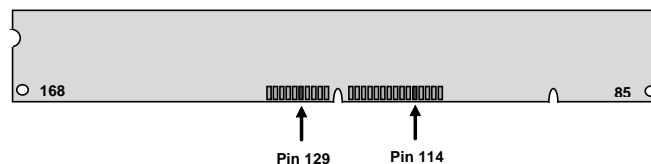
II. Speed:

SDRAM: normally marked as -12, which means the clock cycle time is 12ns and maximum clock of this SDRAM is 83MHz. Sometimes you can also find the SDRAM marked as -67, which means maximum clock is 67MHz.

EDO: the access time of EDO RAM can be 50ns or 60ns.

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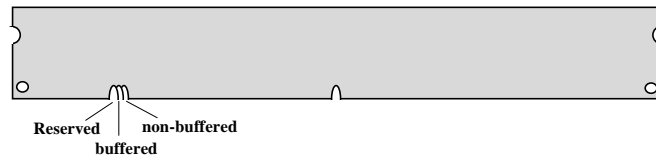
Because the positions are different, only non-buffered DIMMs can be inserted into the DIMM sockets on this motherboard. Although most of DIMMs on current market are non-buffered, we still suggest you to ask your dealer for the correct type.

IV. 2-clock and 4-clock signals: Although both of 2-clock and 4-clock signals are supported by this motherboard, we strongly recommend choosing 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 768MB**.

LX chipset can only use 3V EDO or SDRAM, so we can mix EDO and SDRAM.

Every DIMM socket can be EDO or SDRAM. For EDO, maximum is 256MB. For SDRAM, maximum is 128MB.

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

> *Note: 768MB memory is achieved by using double-sided buffered EDO DIMMs.*

The following table lists 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.

The following table lists the possible DRAM combinations that is **NOT** recommended:

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

> *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.*

2.5 Onboard Audio

This motherboard comes with a 16-bit sound processor (ESS Solo-1) onboard.
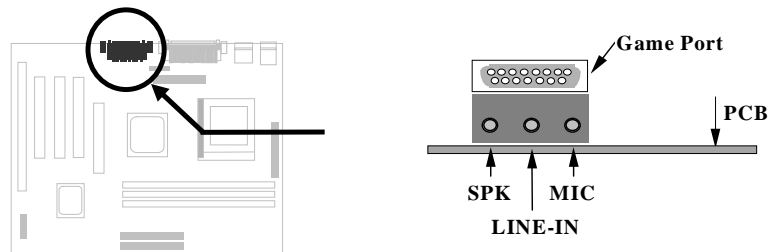
To fully utilize the audio functions, you may connect various peripheral devices that the audio chip supports. The following figure shows the different devices that you can connect.
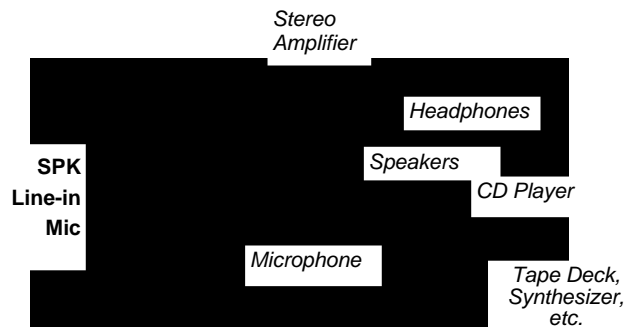
The onboard audio has the following features:

Advanced technology support

q   ESS Solo-1 PCI audio accelerator in 16 bits stereo chip
q   High-quality ESFM music synthesizer
q   64 voices software wavetable
q   3-D stereo effects processor
q   Support DLS (downloadable sound)
q   Support Microsoft DirectMusic
q   Support Microsoft positional 3D
q   Support DirectSound and DirectSound 3D
q   ADPCM data compression
q   Internal modem connector
q   Full DOS game compatibility
q   Plug and Play
q   Record, compress, and play back voice, sound, and music
q   16-bit stereo ADC and DAC
q   Programmable independent sample rate from 6 KHz up to 48 KHz for record and playback
q   Full duplex operation for simultaneous record and playback
q   Support full DOS compatible modes: PC/PCI, TDMA, DDMA
q   Sound Blaster Pro & Windows Sound System compatible
q   Stereo Input for Line-in, CD-Audio, Auxiliary in and a mono microphone in
q   MPU-401(UART mode) interface for wavetable synthesizers and MIDI devices
q   Integrated dual game port
q   Separate mono input (MONO-IN) and mono output (MONO-OUT) for speakerphone
q   Support windows95/98 or windows NT 4.0
q   WDM streaming driver support windows98 and windows NT 5.0

Software-controllable audio

q   Supports various audio devices all controllable through software
q   Adjusts master volume, CD audio, line-in, AUX, mono in, mono out, synthesis wave and microphone inputs

Stereo digitized voice channel

q   Full-duplex operation for simultaneous record and playback

Hardware Installation

2.5.1 Setting Up in Windows 95/98

This motherboard comes with CD-ROM disc (AOpen Bonus Pack) containing the Windows 95/98 drivers and software (including the Music Center application). Refer to their online help for details.

> **Note:** Refer to your Windows 95/98 manual or online help for any questions on Windows 95/98.

Installing the Drivers and the Application

After turning on the system, Windows 95/98 begins loading and starts detecting new hardware installed on the system.

1. When Windows 95/98 detects the presence of the onboard audio chip, it begins to build the driver database. The New Hardware Found dialog box displays.

2. Select **Driver from disk provided by hardware manufacturer** and click on **OK**. Windows 95/98 prompts you for the driver disk.

3. Insert the driver disk in the appropriate drive and specify another drive, if required. Then click on OK. The system copies the necessary driver files to your hard disk drive.

> **Tip:** Prepare the Windows 95/98 CD-ROM disk before setting up the sound card. Windows 95/98 will prompt you to insert the Windows 95/98 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 recommend that you keep the existing file.

4. Windows 95/98 makes changes to the system settings and begins detecting the following new hardware components:

   - ES1941 PCI AudioDrive
   - ES1941 DOS Enumlation
   - Gameport Joystick

Windows 95/98 makes final changes to the system settings.

Install the Application

1. Insert AOpen Bonus Pack disc, setup the applications from "Motherboard Drivers" of the autorun program, or browse CD and select X:\Mx3l\ Sound\Setup.exe.

Dos Legacy mode Setup

1. Insert AOpen Bonus Pack disc, setup the applications from "Motherboard Drivers" of the autorun program, or browse CD and select X:\Mx3l\ Sound\Setup.exe. Select Application button from setup menu.

2. Choose Dos Legacy Support item to begin setup.

3. If the system reboot under windows98, please select the driver form Windows98 instead of AOpen Bonus Pack disc.

2.5.2 Setting Up in NT4.0

The card package also comes with NT4.0 drivers. Please refer to your NT4.0 manual or online help for any questions on NT4.0.

Installing the Audio Drivers

Follow these steps to install the audio drivers:

1. 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:\Mx3l\Sound\Driver\NT40.
4. Press **OK** to continue with the installation.
5. An Audio Setup dialog box will appear. Select the default configuration resource and press **OK**.
6. Click on the **Restart Now** button.

Install MPU-401/Joystick Driver

Follow these steps to install the MPU401 or joystick drivers:

1. Select **MULTIMEDIA** from control panel and click on the Devices tab.

Hardware Installation

2. Press the **ADD** button. Select MPU-401 Compatible Driver /Microsoft Sidewinder 3D Pro Joystick and press OK..

3. Place your NT4.0 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.

> *Note: X: means your CD drive letter, please change it according to the actual drive letter.*

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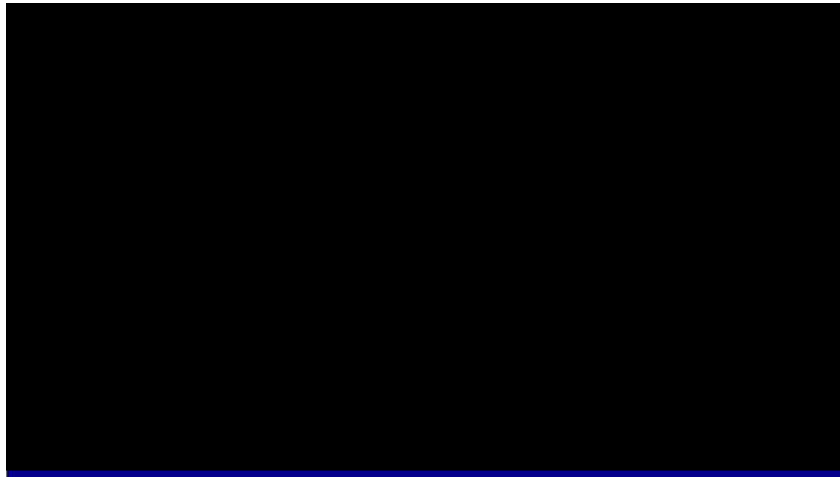
> **Tip***: Choose "Load Setup Defaults" for recommended optimal performance. Choose "Load Turbo Defaults" for best performance with light system loading. Refer to section 3.7.*

The section at the bottom of the screen tells how to control the screen. Use the arrow keys to move between items, F9 to change language, ESC to exit, and F10 to save the changes before exit. Another section at the bottom of the screen displays a brief description of the highlighted item.

After selecting an item, press Enter to select or enter a submenu.

3.2   Standard CMOS Setup

The "Standard CMOS Setup" sets the basic system parameters such as the date, time, and the hard disk type. Use the arrow keys to highlight an item and � 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 ▬▬▬ 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

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.
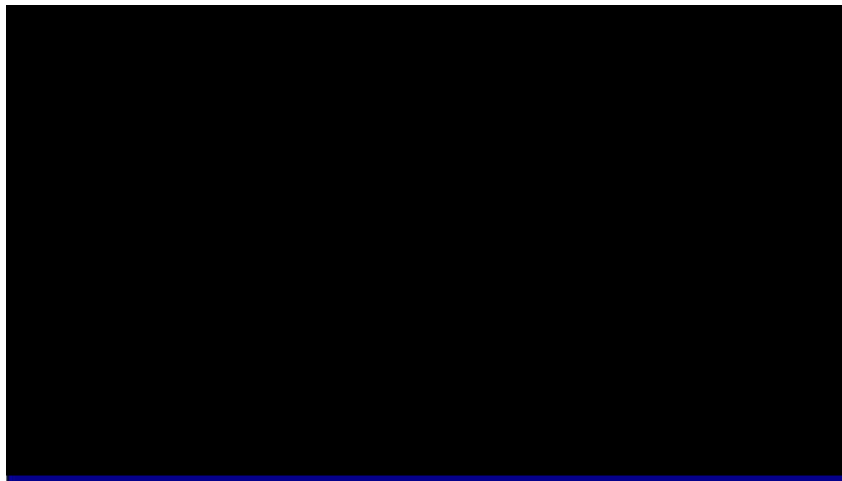
BIOS Features à Virus Warning

Virus Warning	Set this parameter to Enabled to activate the warning
Enabled	message. This feature protects the boot sector and partition
Disabled	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
CDROM,A,C
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 Security Option

Security Option
Setup
System

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

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

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

BIOS Features à PCI/VGA Palette Snoop

PCI/VGA Palette Snoop
Enabled
Disabled

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

BIOS Features à **OS Select for DRAM > 64MB**

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

BIOS Features à **Show Logo On Screen**

Show Logo On **Screen** Enabled Disabled	This item lets you decide if AOpen logo will appear in the POST screen.

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.

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

  Auto Configuration      : Enabled    Pentium II Micro Codes   : Enabled

  DRAM Speed Selection     : 60ns      ******** Jumperless Setup ********
  MA Wait State            : Slow      Manufacture Freq Default :
  EDO RAS# To CAS# Delay   : 3         Clock Spread Spectrum    : Disabled
  EDO RAS# Precharge Time  : 4         System Frequency         : 300 MHz
  EDO DRAM Read Burst      : x333
  EDO DRAM Write Burst     : x333
  SDRAM(CAS Lat/RAS-to-CAS): 3/3
  SDRAM RAS Precharge Time : 3 T
  DRAM ECC Function        : Disabled
  CPU-To-PCI IDE Posting   : Enabled
  Video  BIOS Cacheable    : Disabled
  Video RAM Cacheable      : Disabled
  8 Bit I/O Recovery Time  : 4
  16 Bit I/O Recovery Time : 1         ESC : Quit         ↑↓←→ : Select Item
  Memory Hole At 15M-16M   : Disabled  F1  : Help         PU/PD/+/- : Modify
  Passive Release          : Disabled  F5  : Old Values  F9       : Language
  Delayed Transaction      : Disabled  F6  : Load Setup Defaults
  AGP Aperture Size (MB)   : 64        F7  : Load Turbo Defaults
```

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

AWARD BIOS

Chipset Features à **Auto Configuration**

Auto Configuration
Enabled
Disabled

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

Chipset Features à **DRAM Speed Selection**

DRAM Speed Selection
50 ns
60 ns

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

Chipset Features à **MA Wait State**

MA Wait State
Slow
Fast

To enable or disable one additional MA (DRAM memory address) wait state. The default setting is **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
2
3

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

Chipset Features à **EDO RAS# Precharge Time**

EDO RAS# Precharge Time
3
4

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

AWARD BIOS

Chipset Features à EDO DRAM Read Burst

EDO DRAM Read Burst	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.
x333	
x222	

Chipset Features à EDO DRAM Write Burst

EDO DRAM Write Burst	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.
x333	
x222	

Chipset Features à SDRAM(CAS Lat/RAS-to-CAS)

SDRAM(CAS Lat/RAS-to-CAS)	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.
2/2	
3/3	

Chipset Features à SDRAM RAS Precharge Time

SDRAM RAS Prechatge Time	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**.
2T	
3T	

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.

AWARD BIOS

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.

Chipset Features à AGP Aperture Size (MB)

AGP Aperture Size (MB)	This item lets you determine the effective size of the Graphic Aperture.
4	
8	
16	
32	
64	
128	
256	

Chipset Features à Pentium II Micro Codes

Pentium II Micro Codes	The micro codes are used to fix bugs of Pentium II CPU, we strongly recommend 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.
Enabled	
Disabled	

Chipset Features à Manufacture Frequency Default

Manufacture Frequency Default	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.
Depends on the CPU type	

Chipset Features à Clock Spread Spectrum

Clock Spread Spectrum	This item is used to set clock spread spectrum for EMI testing. Normally, you don't need to change the default setting.
On	
Off	

AWARD BIOS

Chipset Features à System Frequency

System Frequency
300 MHz
333 MHz
366 MHz
400 MHz
433 MHz
466 MHz
500 MHz
533 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.
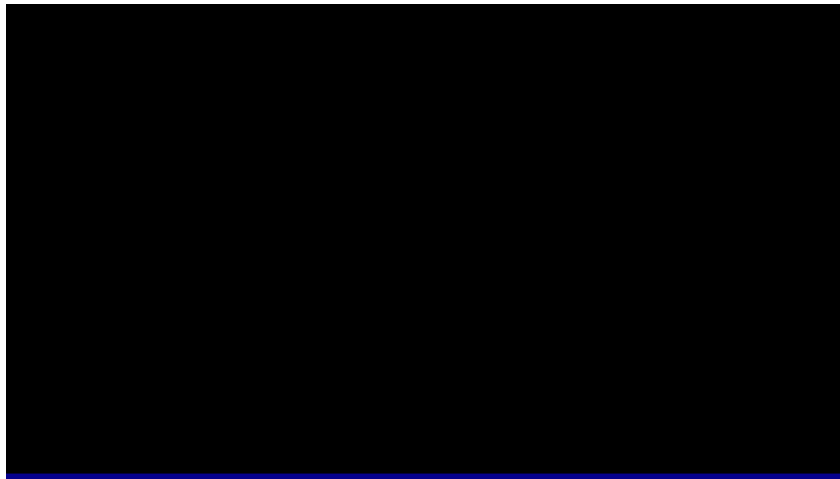
Power Management à **Power Management**

Power Management
Max Saving
Mix Saving
User Define
Disabled

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

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

AWARD BIOS

Power Management à **PM Controlled by APM**

PM Controlled by APM	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.
Yes	
No	

Power Management à **Video Off Method**

Video Off Method	This determines the way that monitor is off. Blank Screen writes blanks to video buffer. V/H SYNC+Blank allows BIOS to control VSYNC and HSYNC signals. This function applies only for DPMS (Display Power Management Standard) monitor. The DPMS mode uses DPMS function provided by VGA card.
V/H SYNC + Blank	
DPMS	
Blank Screen	

Power Management à **Video Off After**

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

Power Management à **Modem Use IRQ**

Modem Use IRQ	This item lets you set an IRQ for the modem.
3	
4	
5	
7	
9	
10	
11	
N/A	

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).

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".

AWARD BIOS

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 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 0V Wake On Modem

0V Wake On Modem
Enabled
Disabled

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

Power Management à Wake On LAN

Wake On LAN
Enabled
Disabled

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

Power Management à Throttle Duty Cycle

Throttle Duty Cycle
12.5 %
25.0 %
37.5 %
50.0 %
62.5 %
75.0 %
87.5 %

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

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.

Power Management à Soft-Off by PWR-BTTN

Soft-Off by PWR-BTTN
Delay 4 sec.
Instant-Off

This is a specification of ACPI and supported by hardware. When **Delay 4 sec.** is selected, 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 **Instant-Off**, soft power switch is only used to control On and Off, there is no need to press 4 sec, and there is no Suspend.

Power Management à Wake On RTC Timer

Wake On RTC Timer
Enabled
Disabled

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

AWARD BIOS

Power Management à Date (of Month) Alarm

Date (of Month) Alarm	This item is displayed when you enable the Wake On RTC 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 Wake On RTC Timer item) every day.*

Power Management à Time (hh:mm:ss) Alarm

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

Power Management à IRQ 8 Break Suspend

IRQ 8 Break Suspend	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.
Enabled	
Disabled	

Power Management à IRQ [3-7,9-15],NMI

IRQ [3-7,9-15],NMI	To enable or disable the detection of IRQ3-7, IRQ9-15 or NMI interrupts events for power down state transition.
Enabled	
Disabled	

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**

<u>Primary IDE 0</u>
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.
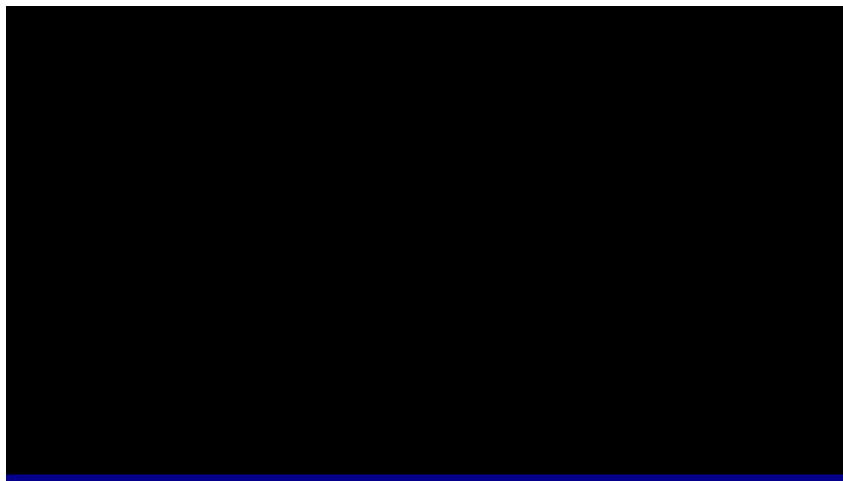
PNP/PCI Configuration à **PnP OS Installed**

PnP OS Installed	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.
Yes	
No	

PNP/PCI Configuration à Resources Controlled By

Resources Controlled by	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.
Auto	
Manual	

PNP/PCI Configuration à Reset Configuration Data

Reset Configuration Data	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.
Enabled	
Disabled	

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	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).
Legacy ISA	
PCI/ISA PnP	

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 Assign IRQ for USB

Assign IRQ for USB
Enabled
Disabled

This item lets you set an IRQ for USB.

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**
PNP/PCI Configuration à **PCI Slot3 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 DIMM 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 DIMMs).

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.
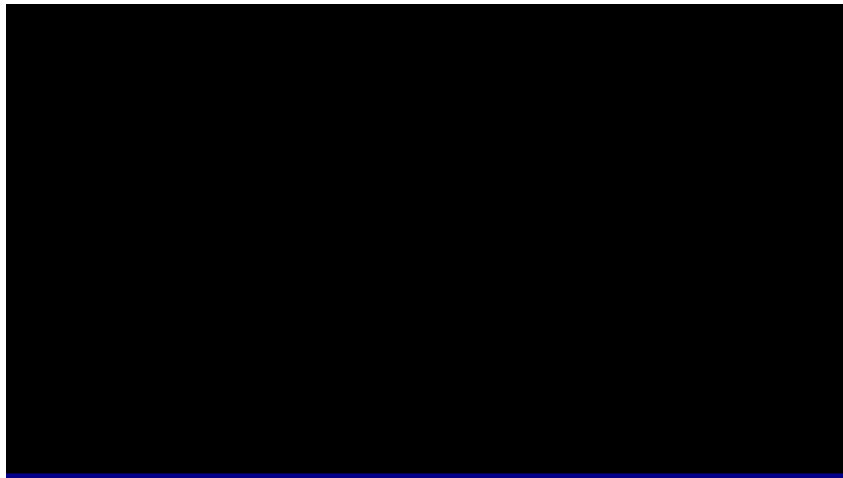
Integrated Peripherals à **IDE HDD Block Mode**

IDE HDD Block Mode	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.
Enabled	
Disabled	

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 Keyboard Support

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

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

Integrated Peripherals à Init Display First

Init Display First PCI AGP	If you installed a PCI VGA card and an AGP card at the same time, this item lets you decide which one is the initial display card.

Integrated Peripherals à Power On Function

Power On Function Button Only Keyboard 98 Password Hot Key Mouse Left Mouse Right	This item is used to select Wake on Keyboard/Mouse mode. **Button Only:** Disable Wake on KB/MS function. You can boot up your system by power button only. **Keyboard 98:** If selecting this option, you can boot up the system by power button and the "Wake" key on Keyboard 98. **Password:** Disable the function of power button and let the system can only be powered on through the preset keys (like a password). **Hot Key:** If selecting this option, you also need to specify the hot key from "Hot Key Power On" item. **Mouse Left:** This function allows you wake up the system by clicking left mouse button twice successively. **Mouse Right:** This function allows you wake up the system by clicking right mouse button twice successively.

Caution: To implement Wake On Keyboard/Mouse
function, you must set JP28 to Enabled.

Caution: Wake On Mouse function applies to PS/2
mouse only.

Caution: If you set a Password but forget it, please
clear CMOS.

Integrated Peripherals à Keyboard Power On Password

Keyboard Power On Password	You can specify 1-5 keys as a password.

Integrated Peripherals à Hot Key Power On

Hot Key Power On	If you select "Hot Key" option in "Power On Function" Item, you need to specify a hot key here.
Ctrl-F1	
Ctrl-F2	
Ctrl-F3	
Ctrl-F4	
Ctrl-F5	
Ctrl-F6	
Ctrl-F7	
Ctrl-F8	
Ctrl-F9	
Ctrl-F10	
Ctrl-F11	
Ctrl-F12	

AWARD BIOS

Power Management à AC PWR Auto Recovery

AC PWR Auto Recovey
Former-Sts
On
Off

A traditional ATX system should remain at power off stage when AC power resumes from power failure. This design is inconvenient for a network server or workstation, without an UPS, that needs to keep power-on. This item is used to solve this problem. Selecting On lets the system can automatically power-on after AC power resumes; in the other hand, the system will power-off if you select Off. If Former-Sts option is selected, the system will power-on or power-off based on the original state.

Integrated Peripherals à Onboard FDC Controller

Onboard FDC Controller
Enabled
Disabled

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

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 UART Mode Select

UART Mode Select
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.

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.

AWARD BIOS

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.

Integrated Peripherals à EPP Mode Select

EPP Mode Select
EPP1.7
EPP1.9

This item lets you select EPP 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

AOpen Easy Flash is more user friendly than traditional flash method. The BIOS binary file and flash routine are combined together and you simply run a single file to complete the flash process.

1. Get new BIOS upgrade program from AOpen's web site. For example, MX3L200.EXE.
2. Reboot the system to DOS mode without loading any memory handler (such as EMM386) or device driver. It needs around 520K free memory space.
3. Execute A:> MX3L200
   DO NOT turn off the power during FLASH PROCESS.
4. Reboot the system by turn off the power after flash is completed.
5. Reload the "BIOS SETUP DEFAULT" and reconfigure other items as previous set. Save & Exit. Done!

> ***Note:*** *The upgrade of new BIOS will permanently replace your original BIOS content after flashing. The original BIOS setting and Win95/Win98 PnP information will be refreshed and you probably need to re-configure your system.*