*Chapter 1*

# Overview

MX64 is a slot 1 based motherboard that utilizes **VIA 694X** AGPset on **Micro ATX** form factor. It implements an onboard audio CODEC and supports new architectures such as **AGP 4x**, **SDRAM**, **Ultra DMA 33/66**, **Bus master IDE** and **USB** ports. It supports three Dual in-line memory module (DIMM) slots that allow the installation of **SDRAM** memory and expansion up to a maximum of **768MB**.

In addition to the above features, MX64 also implements plenty of fabulous features.

**Jumper-less Design** Pentium II / Pentium III / Celeron VID signal and SMbus clock generator provide CPU voltage auto-detection and allows the user to set the CPU frequency through the CMOS setup, therefore no jumpers or switches are used. The correct CPU information is saved into the EEPROM. With these technologies, the disadvantages of the Pentium based jumper-less designs are eliminated. There will be no worry of wrong CPU voltage detection and no need to re-open the housing in case of CMOS battery loss. The only jumper left is to clear the CMOS, which is a safety hook if you forget the password.

**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.

**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 0V Wake On Modem. The MX64 and FM56-P 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 0V 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.

# Overview

**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.

**CPU Thermal Protection** MX64 has a special thermal detection circuit to have warning through application software when the temperature is higher than a predefined value.

**CPU and Housing Fan Monitoring** MX64 has one more "fan monitoring" function to prevent system overheat. The system will report and alarm fan malfunction though utility software such as Hardware Monitoring Utility (named AOhw140, where 140 means version number).

**System Voltage Monitoring** Furthermore, MX64 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 software such as Hardware Monitoring Utility for a warning to user.

**ACPI Suspend to DRAM** You can resume your original work directly from DRAM without going through the Win98 booting process and run your application again. Suspend to DRAM saves your current work into the system memory.

**Resetable Fuse** MX64 implements resetable fuses to prevent any accidental short circuit caused by keyboard or USB devices hot plug.

**FCC DoC Certificate** MX64 has passed FCC DoC test. The radiation is very low, you can use any kind of housing.

**PC99 Ready** For user's convenience in installing the PC system, AOpen adopts the recommended PC99 color scheme in all connectors that mount on this motherboard.

**Powerful Utility Software** AOpen Bonus Pack CD disc contains many useful utilities, such as Norton Antivirus, AOchip, Hardware Monitoring Utility, and Suspend to Hard Drive utility.

## 1.1   Specifications

| | |
|---|---|
| **Form Factor** | Micro ATX |
| **Board Size** | 220 mm x 245 mm |
| **CPU** | Intel Pentium II / Pentium III / Celeron |
| **System Memory** | DIMM 168-pin x3, maximum 768MB. |
| **Second-level Cache** | Built-in CPU depends on processor |
| **Chipset** | VIA 694X AGPset |
| **Expansion Slots** | PCI x 3 and AGP x 1 |
| **Audio CODEC** | AD1881 |
| **Serial Port** | Two serial ports UART 16C550 compatible |
| **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 33/66 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 build in chipset, Lithium (CR-2032) battery. |
| **BIOS** | AWARD Plug-and-Play, 2M bit Flash ROM BIOS. |

## 1.2  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 0V Wake On Modem, but if you use external modem, you have to keep the box modem always power-on. AOpen MX64 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 (For example, FM56-P, FM56-H, etc.) for 0V Wake On Modem applications.

**External Modem Wake Up**

**Internal Modem Card Wake Up (such as FM56-P)**
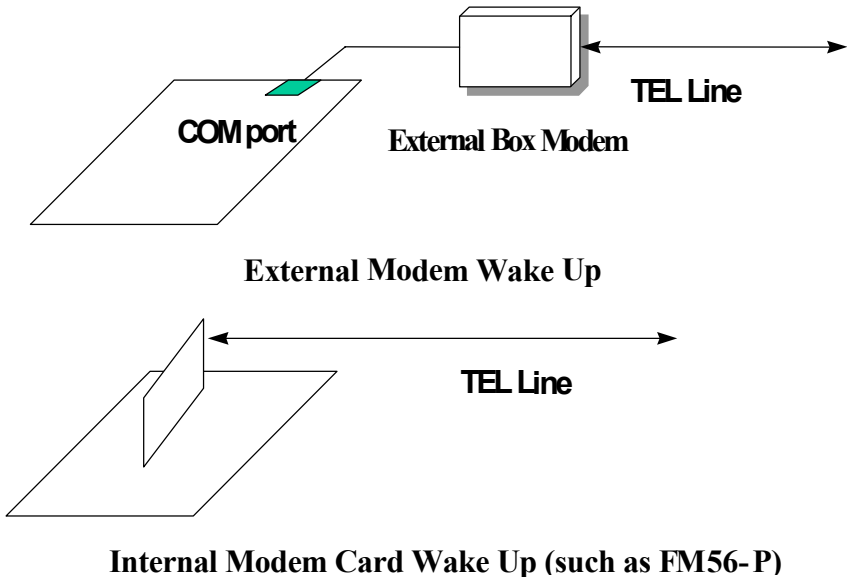
**For Internal Modem Card (AOpen FM56-P):**

1. Go into BIOS setup, Power Management → 0V Wake On Modem, select Enabled.
2. Setup your application, put into Windows 95.
3. Turn system power off by soft power switch.
4. Connect 4-pin Modem Ring-On cable from FM56-P RING connector to MX64 connector WKUP.
5. Connect telephone line to FM56-P. You are now ready to use Wake On Modem.

**For External Box Modem:**

1. Go into BIOS setup, Power Management → 0V Wake On Modem, select Enabled.
2. Setup your application, put into Windows 95 Start Up.
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 Wake On Modem.

*Tip: External 0V Wake On Modem 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).*

*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.*

## 1.3    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.

## 1.4    Fan Monitoring
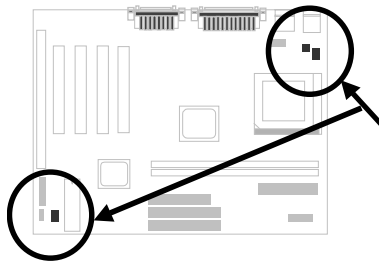


There are three fan connectors, two is for CPU, the other can be a housing fan. The fan monitoring function is implemented by connecting fan to 3-pin fan connector **CPUFAN1 and FAN**, and installing Hardware Monitoring Utility.

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

## 1.5 CPU Thermal Protection

This motherboard implements special thermal protection circuit below the CPU. When temperature is higher than a predefined value, the CPU speed will automatically slow down and there will be warning from BIOS and also Hardware Monitoring Utility software.

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

*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:
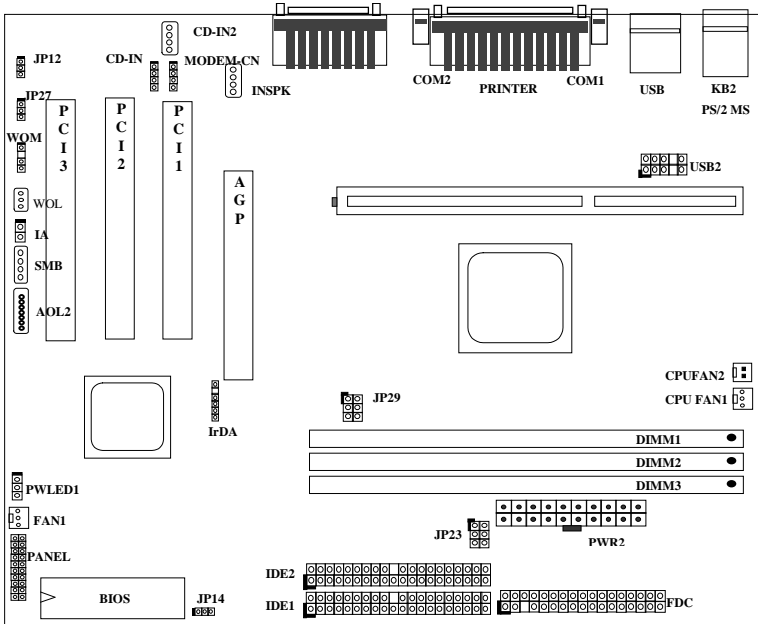
## Jumpers:

| | |
|---|---|
| **JP12:** | Sound |
| **JP14:** | Clear CMOS |
| **JP27:** | PC Beep |
| **JP23, JP29:** | Host CLK |

## 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 (port 1, 2) |
| **USB2:** | USB second connector (port 3, 4) |
| **FDC:** | Floppy drive connector |
| **IDE1:** | IDE1 primary channel |
| **IDE2:** | IDE2 secondary channel |
| **CPUFAN1:** | 3-pin CPU fan connector |
| **CDUFAN2:** | 2-pin CPU fan connector |
| **FAN1:** | 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:** | 0V Wake On Modem connector |
| **WOL:** | Wake On LAN connector |

# Hardware Installation

## 2.2 Jumpers

With the help of the Pentium II Pentium III / Celeron VID signal and SMbus, this motherboard is a jumper-less design.

### 2.2.1 Selecting the CPU Frequency

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

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, 75, 83.3, 100, 105, 110, 112, 115, 120, 124, 133, 140, 150, 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 / Pentium III | CPU Core Frequency | Ratio | FSB Clock |
|---|---|---|---|
| Pentium II 233 | 233MHz= | 3.5x | 66MHz |
| Pentium II 266 | 266MHz= | 4x | 66MHz |
| Pentium II 300 | 300MHz= | 4.5x | 66MHz |
| Pentium II 333 | 333MHz= | 5x | 66MHz |
| Pentium II 350 | 350MHz= | 3.5x | 100MHz |
| Pentium II 400 | 400MHz= | 4x | 100MHz |
| Pentium II 450 | 450MHz= | 4.5x | 100MHz |
| Pentium III 450 | 450MHz= | 4.5x | 100MHz |
| Pentium III 500 | 500MHz= | 5x | 100MHz |
| Pentium III 550 | 550MHz= | 5.5x | 100MHz |
| Pentium III 533 | 533MHz= | 4x | 133MHz |
| Pentium III 600 | 600MHz= | 4.5x | 133MHz |

| Intel Celeron | CPU Core Frequency | Ratio | FSB Clock |
|---------------|--------------------|-------|-----------|
| Celeron 266 | 266MHz= | 4x | 66MHz |
| Celeron 300 | 300MHz= | 4.5x | 66MHz |
| Celeron 300A | 300MHz= | 4.5x | 66MHz |
| Celeron 333 | 333MHz= | 5x | 66MHz |
| Celeron 366 | 366MHz= | 5.5x | 66MHz |
| Celeron 400 | 400MHz= | 6x | 66MHz |
| Celeron 433 | 433MHz= | 6.5x | 66MHz |
| Celeron 466 | 466MHz= | 7x | 66MHz |

**Home** *Tip: If your system hangs or fails to boot because of over-clocking, simply use <Home> key to restore to the default setting. Press <Home> key and the power button at the same time. Note that do not release <Home> key until POST screen appears.*

*Warning: the VIA 694X chipset supports a maximum of 133MHz FSB. The higher clock settings are for internal testing only. **These settings exceed the specification of the chipset, which may cause serious system damage**.*

## 2.2.2 Setting the CPU Voltage

This motherboard supports the Pentium II / Pentium III / Celeron VID function, the CPU core voltage is automatically detected and ranged 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 procedure below:

JP14

**1 2 3**
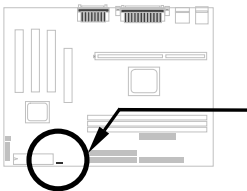
Normal Operation
(default)

JP14

**1 2 3**

Clear CMOS

# Hardware Installation

**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, simply use the <Home> key to restore 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 the <Home> key first and then press the Power button at the same time. Note: do not release the <Home> key until the POST screen appears.*

## 2.2.4 Host/PCI Clock

| JP23 | JP29 | Host Clock |
|------|------|------------|
| 1-2  | 1-2  | Auto (default) |
| 3-4  | 3-4  | 133~ 150MHz (4X) |
| 3-4  | 5-6  | 100 ~ 124MHz (3X) |
| 5-6  | 5-6  | 66 ~ 83MHz (2X) |

This jumper is used to specify the relation of PCI and host clock.

Generally speaking, we suggest you not to change the default setting Auto. But for overclocking, changing these jumper settings becomes a prerequisite. For example, you must set JP23 to "3-4" and JP29 to "5-6" if you want to overclock a 66MHz FSB clock CPU to 100MHz or higher.



**JP29  JP23**

2 4 6   2 4 6

1 3 5   1 3 5
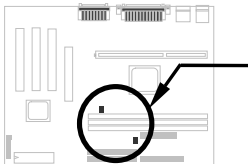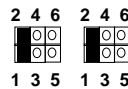
Auto (Default)

**JP29  JP23**

2 4 6   2 4 6

1 3 5   1 3 5
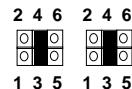
133-150 MHz (4X)

**JP29  JP23**

2 4 6   2 4 6

1 3 5   1 3 5

**JP29  JP23**

2 4 6   2 4 6

1 3 5   1 3 5
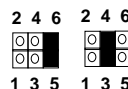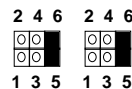
100-124 MHz
(3X)

66-83 MHz (2X)

# Hardware Installation

| Mode | CPU (Host) | AGP | Memory | PCI |
|------|-----------|-----|--------|-----|
| 2X | 66 | 66 | 66 | 33 |
| 3X | 100 | 66 | 133/100/66 | 33 |
| 3X, overclocking | 112 | 66 | 149/112/74.6 | 33 |
| 4X | 133 | 66.5 | 133/100 | 33 |
| 4X, overclocking | 150 | 77.5 | 150 | 37.5 |

## 2.2.5  On Board Audio

| JP12 | On Board Audio |
|------|----------------|
| 1-2 | Enabled (default) |
| 2-3 | Disabled |

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



**JP12**

1
2
3
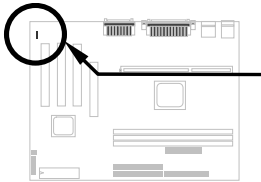
Enabled (default)

**JP12**

1
2
3

Disabled

## 2.3  Connectors

### 2.3.1  Power Cable

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

*Caution: Make sure that the power supply is off before connecting or disconnecting the power cable.*
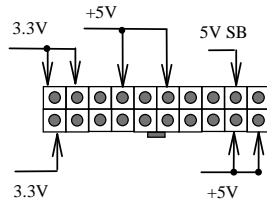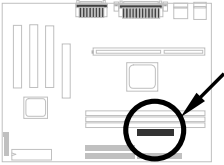
**PWR2**

### 2.3.2  Fan

The CPU fan connectors are marked as **CPUFAN1** and **CPUFAN2** on the system board. You can plug the CPU fan cable to both the 2-pin fan connector CPUFAN2 and the 3-pin fan connector CPUFAN1. And **FAN** connector can be used to connect housing fan. Note that only CPUFAN1 and FAN support the fan monitoring function, because 3-pin fan has an extra pin called SENSE, which periodically sends fan signal out.
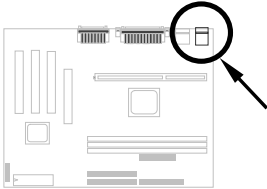
SENSE
+12V
GND

**CPUFAN1 & FAN**

GND
+12V
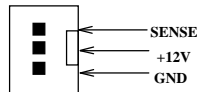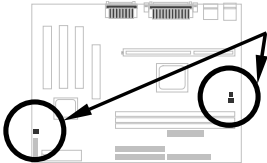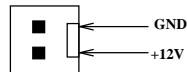
**CPUFAN2**

# Hardware Installation

## 2.3.3 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 the back panel of the housing.



PS/2 Mouse    PCB
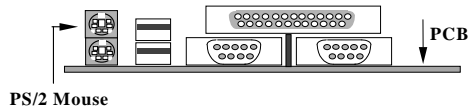
## 2.3.4 Keyboard

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



PS/2 KB    PCB
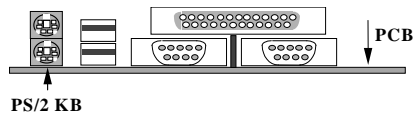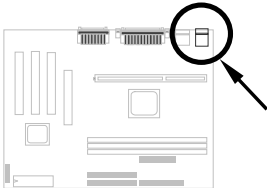
## 2.3.5 Serial Devices (COM1/COM2)

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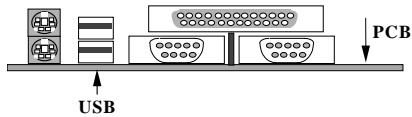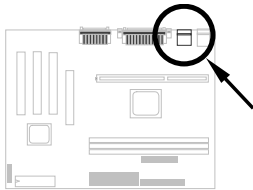


COM1    COM2    PCB
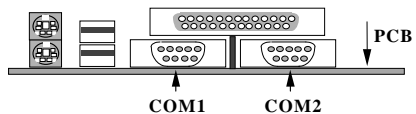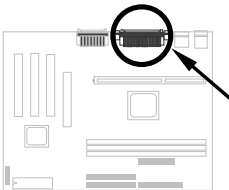
## 2.3.6  Printer

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

**PRINTER**

**PCB**
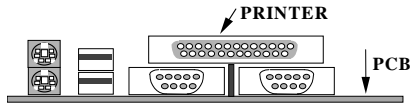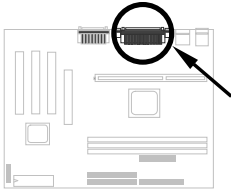
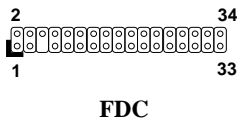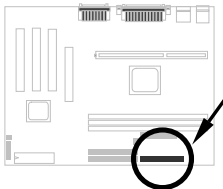## 2.3.7  USB Device

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

**PCB**

**USB**

## 2.3.8  Floppy Drive

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

**2**                    **34**

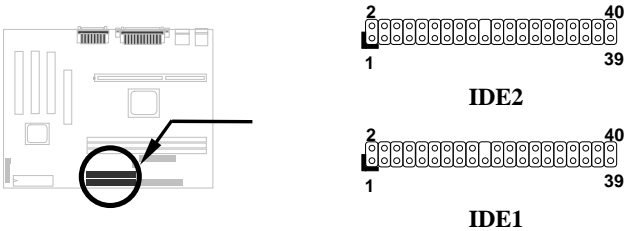**1**                    **33**

**FDC**

# Hardware Installation

## 2.3.9  IDE Hard Disk and CD ROM

This motherboard supports two 40-pin IDE connectors marked as **IDE1** and **IDE2.**  IDE1 is also known as the primary channel and IDE2 as the secondary channel. Each channel supports two IDE devices that make a 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 the hard disk or the CDROM. The setting as master or slave mode depends on the jumper on your IDE device, so 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.

**2                                    40**

**IDE2**

**1                                    39**

**2                                    40**

**IDE1**

**1                                    39**

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

*Caution: For better signal quality, it is recommended to set the far end side device to master mode and follow the suggested sequence to install your new device. Please refer to the following figure.*
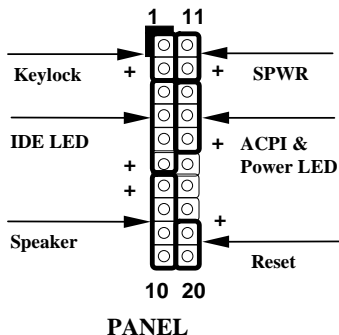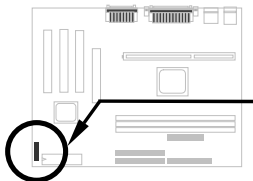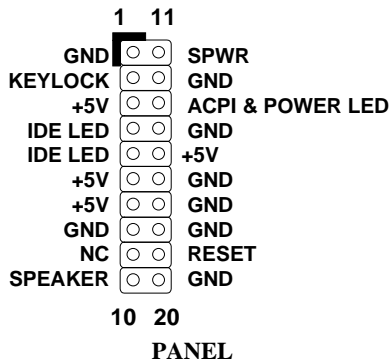
IDE2 (Secondary Channel)

Slave (4th)     Master (3rd)

IDE1 (Primary Channel)

Slave (2nd)     Master (1st)
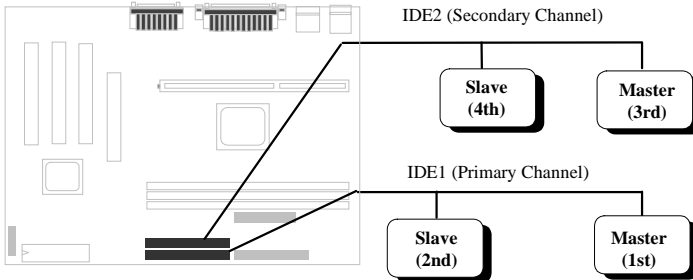
## 2.3.10 Panel Connector

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.

If your ATX housing supports ACPI specification, the ACPI & Power LED will keep flashing if you have enabled "suspend mode" item in the BIOS Setup.

```
          1   11
   GND  [ ○ ○ ]  SPWR
KEYLOCK [ ○ ○ ]  GND
   +5V  [ ○ ○ ]  ACPI & POWER LED
IDE LED [ ○ ○ ]  GND
IDE LED [ ○ ○ ]  +5V
   +5V  [ ○ ○ ]  GND
   +5V  [ ○ ○ ]  GND
   GND  [ ○ ○ ]  GND
    NC  [ ○ ○ ]  RESET
SPEAKER [ ○ ○ ]  GND
         10   20
           PANEL
```

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

> **Caution:** *Locate the power switch cable from your ATX housing. It is 2-pin female connector from the housing front panel. Plug this connector onto the soft-power switch connector on the panel, which is marked as* **SPWR**.

## 2.3.11 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, the user can transfer files to or from laptops, notebooks, PDA devices and printers. This connector supports HPSIR (115.2Kbps, 2 meters) and ASK-IR (56Kbps).

# Hardware Installation

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

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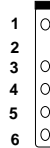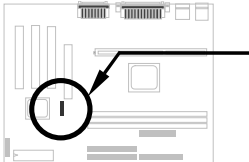


**IrDA**

## 2.3.12 Wake on Modem 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 an internal modem. To use AOpen MP56, connect 4-pin cable from **RING** connector of MP56 to the **WOM** connector on the motherboard.

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



```
1
2
3
4
```
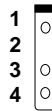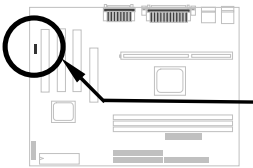
**WOM**

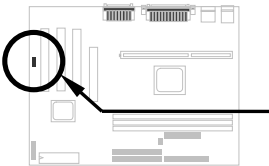## 2.3.13 Wake on LAN Connector

This motherboard 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 network management software, such as ADM.
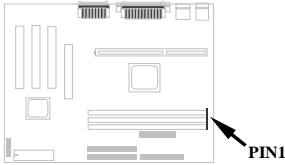
| Pin | Description |
|-----|-------------|
| 1   | +5V SB      |
| 2   | GND         |
| 3   | LID         |



```
1
2
3
```

**WOL**

# Hardware Installation

## 2.4  Configuring the System Memory



**PIN1**

The DIMM type supported is SDRAM (Synchronous DRAM), Registered SDRAM and Virtual Channel Memory. This motherboard has three 168-pin DIMM sockets (Dual-in-line Memory Module) that allow you to install system memory up to **768MB**.

*Warning: This motherboard does not support EDO DRAM.*

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        Pin 129    Pin 114        85
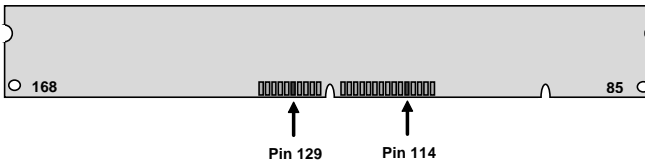
**II. Speed:** Normally marked as -12, which means the clock cycle time is 12ns and the maximum clock of this SDRAM is 83MHz. Sometimes you can also find the SDRAM marked as -67, which means maximum clock is 67MHz.

> **Caution:** *Some SDRAMs marked as -10 may work fine with 100 MHz CPU clock, but not all of this kind of modules can work properly under 100MHz external clock. We suggest you choose and install SDRAMs that match **PC 100** specification if 100MHz or above CPU clock is selected.*

**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. The following figure is for your reference:



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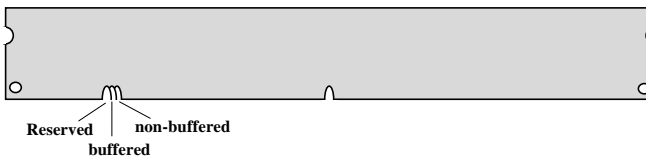
Because the positions are different, only non-buffered DIMMs can be inserted into the DIMM sockets on this motherboard. Although most DIMMs available in the current market are non-buffered, we still recommend you ask your dealer for the correct type.

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

> **Tip:** *To identify 2-clock and 4-clock SDRAM, you may check if there are traces connected to the golden finger pins 79 and 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.

**VI. SPD support:** The BIOS will automatically detect DIMMs with SPD, and set to the appropriate timing. DIMMs without SPD are still able to work fine on this board, but the BIOS POST screen will give you a warning message that you use a DIMM without SPD.

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 all of them added together.

# Hardware Installation

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

The following table list the recommended SDRAM 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 are possible SDRAM 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 |

To use parity checking, it is necessary to choose 72 bit DIMMs (64+8 bit parity), which are automatically detected by the BIOS.

*Chapter*

# o tware Installation

This chapter gives you a step-by-step procedure on how to install the driver and utility of this motherboard.  Because chipset and technology improvement is faster than operating system, sometimes we need certain procedures to successfully install necessary software. Please follow each section accordingly.

You can use the autorun menu of Bonus CD Disc. Choose Motherboard Drivers and select model name. There are INF utility, ATA/66 IDE and audio driver need to be installed.

# o tware Installation

## 4.1 Software Installation in Windows 95

For installing Windows 95, please make sure you have followed below procedures.

1. First, don't install any add-on card.
2. Install Window 95 into your system.
3. Install Windows 95 OSR2 v2.1, 1212 or 1214 version and later with USB support. Otherwise, you need to install USBSUPP.EXE.
4. Install the VIA 4 in 1 driver, which includes VIA Bus Master IDE Driver, AGP Vxd driver, IRQ routing driver, and VIA chipset function registry program.
5. Install the onchip audio driver.
6. Finally, Install other add-on cards.

> *Note: Make sure you have set the display mode to the default setting (640 x 480, 16 colors) prior to uninstalling the VIA 4 in 1 driver.*
>
> *Note: Both VIA AGP driver and audio driver don't support Windows NT.*

## 4.2 Software Installation in Windows 98

For installing Windows 98, please make sure you have followed below procedures.

1. First, don't install any add-on card.
2. Enable **USB Controller** in BIOS Setup menu to make BIOS fully capable of controlling IRQ assignment.
3. Install Window 98 into your system.
4. Install the VIA 4 in 1 driver, which includes VIA Bus Master IDE Driver, AGP Vxd driver, IRQ routing driver, and VIA chipset function registry program.
5. Install the onchip audio driver.
6. Finally, Install other add-on cards.
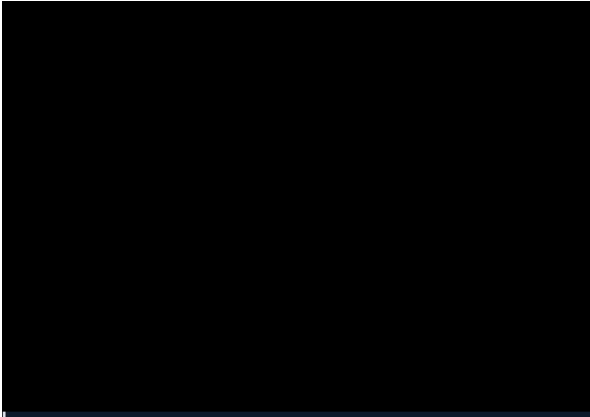
> ***Note:*** *Make sure you have set the display mode to the default setting (640 x 480, 16 colors) prior to uninstalling the VIA 4 in 1 driver.*
>
> ***Note:*** *Both VIA AGP driver and audio driver don't support Windows NT.*

# o tware Installation

## 4.3  VIA 4 in 1 Driver

You can install the VIA 4 in 1 ( IDE Busmaster, VIA AGP, IRQ Routing Driver, VIA Registry ) from the Bonus Pack CD disc autorun menu.
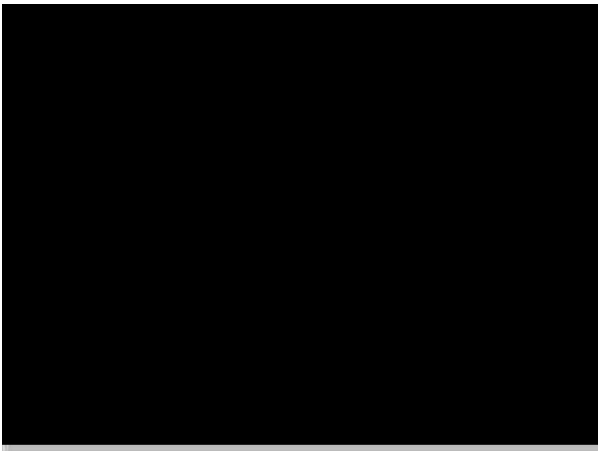
## 4.4  Onboard Audio CODEC

When VIA 4 in 1 driver was installed, choose to reboot your system. When the system restarts, the Audio device will be automatically detected. Give the correct path from the AOpen Bonus Pack Disc ( driver path can refer to readme.txt under the motherboard directory ).

**Add New Hardware Wizard**

This wizard searches for new drivers for:

PCI Multimedia Audio Device

A device driver is a software program that makes a hardware device work.

< Back    Next >    Cancel

# o tware Installation

## 4.5  Install Hardware Monitoring Utility

The hardware monitoring function is automatically implemented by the BIOS and Hardware Monitoring Utility, no hardware installation is needed.

Hardware Monitoring Utility (the program's file name is like aohwxxx.exe, where xxx means the version number) is developed by AOpen which monitors the status of system voltage, thermal, & fan. This utility is especially designed for personal user. You may install it on your AOpen motherboard based system which comes with Hardware Monitoring features. To install Hardware Monitoring Utility, please follow the procedure below.

Choose "Hardware Monitoring Utility" from the autorun menu of AOpen Bonus Pack CD disc.
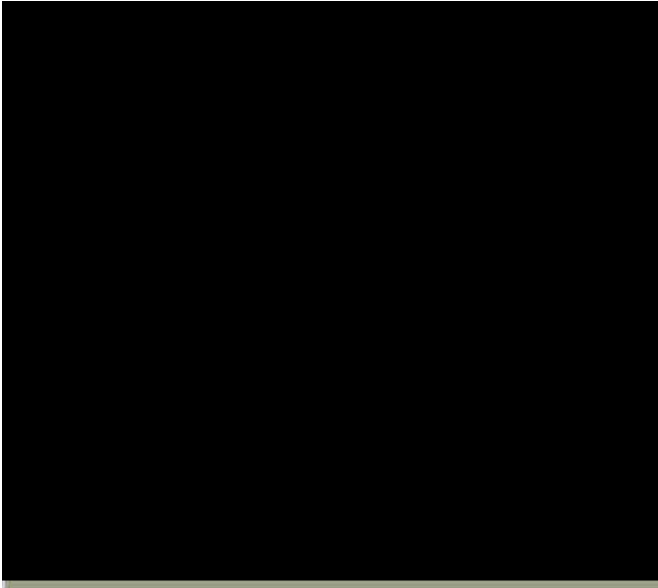
## 4.6 Install Norton AntiVirus

You can install this antivirus software from AOpen Bonus Pack CD disc, please follow the procedure below.

To install Norton Antivirus, please follow the procedure below.

To run AOchip, please follow the procedure below.

1. Choose "Norton Antivirus" from the autorun menu of AOpen Bonus Pack CD disc.

2. Choose one language version accordingly and click "OK" button.

~ 0r ~

Brazilian version: Run \Nav\Brazilian\Setup.exe

Simple Chinese version: Run \Nav\China\Setup.exe

Traditional Chinese version: Run \Nav\Chinese\Setup.exe

Dutch version: Run \Nav\Dutch\Setup.exe

English version: Run \Nav\English\Setup.exe

French version: Run \Nav\French\Setup.exe

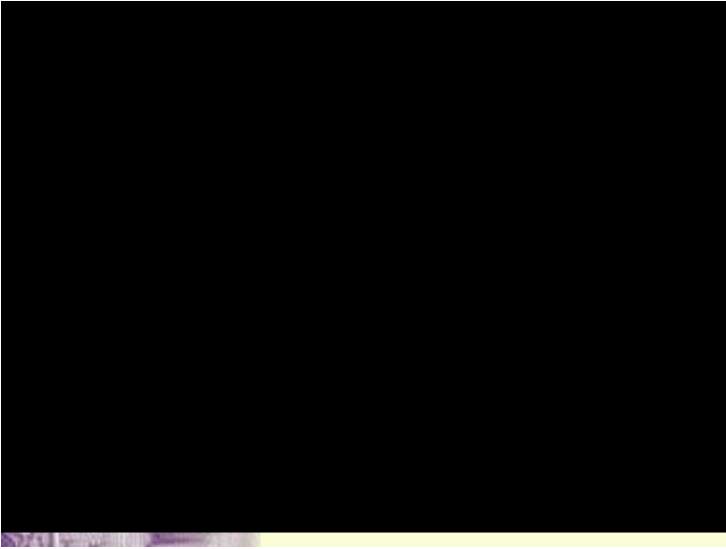German version: Run \Nav\German\Setup.exe

Italian version: Run \Nav\Italian\Setup.exe

Japanese version: Run \Nav\Japanese\Setup.exe

Korean version: Run \Nav\Korean\Disk1\Setup.exe

Spanish version: Run \Nav\Spanish\Setup.exe

# o tware Installation

## 4.7  Install Docucom Reader

The AOpen Bonus Pack CD disc includes an online manual of this motherboard, which is PDF file format. You must use Docucom Reader to read these PDF files.

To install Docucom Reader, please follow the procedure below.

Choose "Docucom Reader" from the autorun menu of AOpen Bonus Pack CD disc.

~ 0r ~

Run \Utility\Docucom\Setup\Setup.exe

*Chapter*

# ward    I

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 motherboard 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 motherboard.*

**I**

## 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.