Chapter 1

Overview

The AP57 is a high-performance Pentium ®-based system board that utilizes the PCI/ISA architecture. It integrates the SiS 5571 PCIset, a super I/O controller, and a PCI mode 4 enhanced IDE controller with bus master support to enhance system performance. It has four single in-line memory module (SIMM) sockets that allow system memory expansion up to a maximum of 256MB. It also supports 256KB and 512KB pipelined-burst second-level cache.

One main feature of AP57 is the green power-management function that extends energy conservation from system components to display monitor. It complies with the power-saving standards of the U.S. Environmental Protection Agency (EPA) Energy Star program.

The AP57 board measures 220 mm x 250 mm.

1.1   Specifications

Form Factor	Baby AT
Board Size	220mm x 250mm
CPU	Intel Pentium Processor P54C, PP/MT (P55C), AMD K5 and Cyrix 6x86
System Memory	FPM (Fast Page Mode) or EDO (Extended Data Output) 72-pin SIMM x4, maximum 256MB.
Second-level Cache	256KB or 512KB pipelined-burst cache onboard
Chipset	SiS 5571 PCIset (480-pin BGA Package)
Expansion Slots	ISA x3 and PCI x4
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-inch drive with 720KB, 1.44MB or 2.88MB format or 5.25-inch drive with 360KB, 1.2MB format
IDE Interface	Dual-channel IDE interface supports a maximum of 4 IDE hard disks or CDROM. Mode 4 and bus master hard disk drives are also supported.
USB Interface (optional)	USB bracket that supports two USB ports . The BIOS also supports USB driver to simulate legacy keyboard.
PS/2 Mouse	Via PS/2 mouse bracket
Keyboard	Default: AT compatible keyboard Mini-DIN PS/2 keyboard connector is optional.
BIOS	Award Plug-and-Play Flash ROM BIOS
RTC	RTC build in chipset
Battery	Lithium (CR2032)

1.2   Board Layout
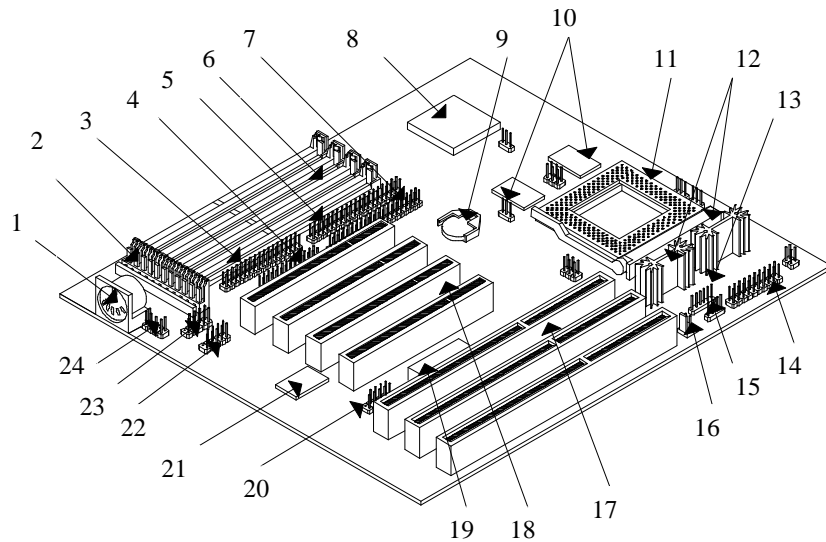
1	Keyboard connector:	The default is AT-compatible keyboard. The P/2-compatible mini-DIN keyboard connector is optional.
2	Power connector:	Provides mainboard power.
3	FDC connector:	Connects to 3.5-inch/5.25-inch floppy drives.
4	Printer connector:	Connects to parallel printer
5	IDE1 connector:	Primary channel for IDE hard disk or CDROM, accepts a maximum of two devices.
6	SIMM sockets:	Accepts 72-pin fast page mode or EDO DRAM module for system main memory.
7	IDE2 connector:	Secondary channel for IDE hard disk or CDROM, accepts a maximum of two devices.
8	SiS chipset:	SiS 5571 cache/memory controller in BGA package.
9	Battery:	CR2032-compatible
10	Pipelined-burst cache:	256/512KB secondary level cache. Cache is used to enhance memory performance.
11	CPU socket:	Accepts Intel Pentium P54C, PP/MT (P55C), AMD K5, and Cyrix 6x86 CPUs.

Overview

12	Voltage Regulators w/ Heatsink:	The regulator is used to supply CPU voltage.
13	IrDA connector:	Wireless Infrared connector, used as COM2.
14	Front-panel connector:	Connector for front panel power reset, suspend switches and power or green LED.
15	IDE LED connector:	For front panel IDE LED.
16	CPU fan connector:	+12V 2-pin connector for CPU fan.
17	ISA slots:	Accepts 8-MHz ISA bus expansion cards.
18	PCI slots:	Accepts 33-MHz PCI bus expansion cards
19	Keyboard controller:	Controls keyboard input/output functions.
20	USB connector (optional)	Universal Serial Bus (USB). The USB is a new 4-pin serial interface that allows easy installation and cascading of USB devices..
21	Super I/O controller:	SMC 669-compatible I/O control chip including two serial ports (COM1/COM2), one parallel port (printer), and floppy controller.
22	COM1 connector:	Serial port 1.
23	COM2 connector:	Serial port 2.
24	PS/2 mouse connector:	Connects to PS/2 mouse bracket or PS/2-compatible mouse. Unlike serial mouse from COM1/COM2, the PS/2 mouse signal is similar as the keyboard and is also controlled by the keyboard controller.

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:
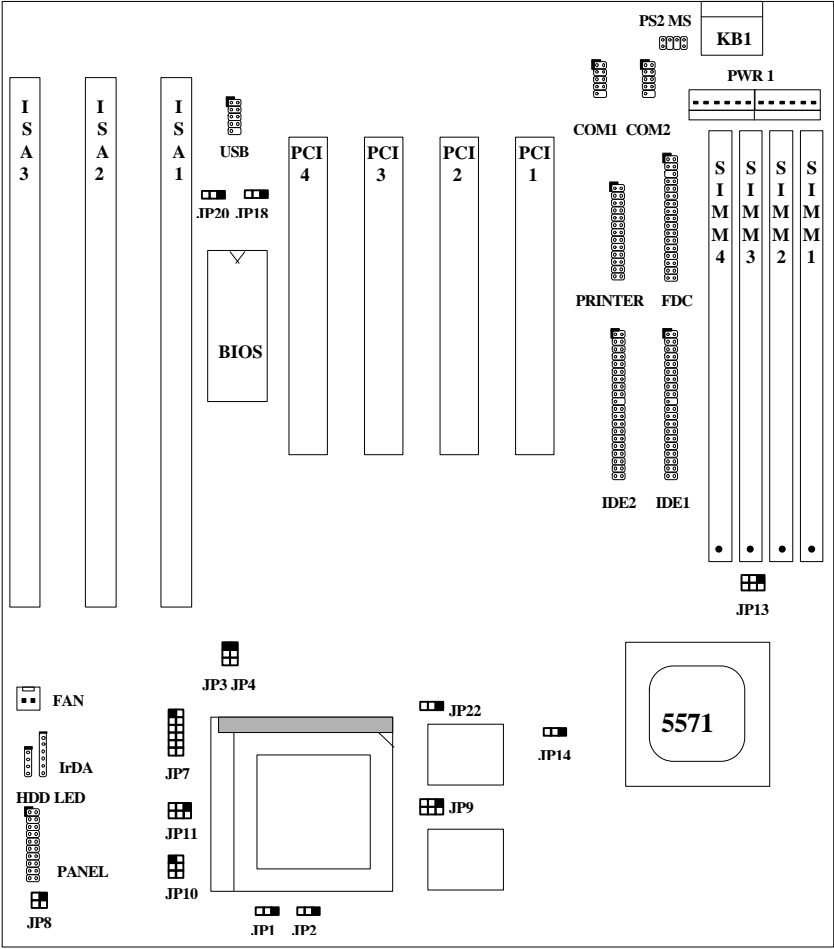
Jumpers:

JP1,JP2:	CPU frequency ratio
JP3,JP4,JP13:	CPU external (bus) clock
JP7:	CPU core voltage setting Vcore)
JP8:	I/O voltage setting Vio)
JP9,JP10,JP11:	CPU type (Single/Dual voltage Vcpuio source selection.)
JP22:	CPU Burst Mode (Linear for Cyrix, Toggle for Intel/AMD.)
JP14:	Clear CMOS
JP18:	Onboard Super I/O enable/disable
JP20:	Onboard PS/2 mouse enable/disable

Connectors:

KB1:	AT keyboard connector
PWR1:	AT (PS/2) power connector
PS2 MS:	PS/2 mouse connector
USB:	USB connector
COM1:	COM1 connector
COM2:	COM2 connector
FDC:	Floppy drive connector
PRINTER:	Printer connector
IDE1:	IDE1 primary channel
IDE2:	IDE2 secondary channel
FAN:	CPU fan connector
IrDA:	IrDA (Infrared) connector
HDD LED:	HDD LED connector
PANEL:	Front panel (Multifunction) connector

2.2   **Jumpers**

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

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

Open   Short

Jumper set at 1-2   Jumper set at 2-3
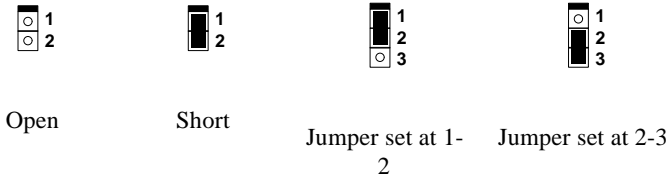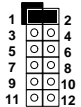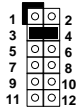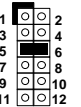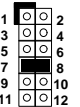
2.2.1 Setting the CPU Voltage

JP7	CPU Core Voltage (Vcore)
1-2	3.45V (default for P54C)
3-4	3.52V (Cyrix or AMD)
5-6	2.9V (AMD K6)
7-8	2.8V (PP/MT P55C)
9-10	2.7V
11-12	2.5V

JP7 is used to select CPU core voltage (Vcore), normally it is set to default 3.45V for INTEL Pentium P54C. It must be changed if you have CPU with different core voltage, such as INTEL PP/MT (P55C), AMD K5/K6 and Cyrix 6x86, refer to the CPU specification for more details.

JP7

3.45V

(default for P54C)

JP7

3.52V

(Cyrix 6x86 or AMD K5)

JP7

2.9V (AMD K6)

JP7

2.8V (PP/MT P55C)

JP8	I/O Voltage (Vio)
1-2	3.45V (default)
3-4	3.52V

JP8 is reserved for test only, which sets the voltage of onboard chipset and PBSRAM (Vio). When you are using dual voltage CPU, JP8 also provides CPU I/O voltage (Vcpuio).The default is 3.45V.

JP8

3.45V
(default)

JP8

3.52V

JP9	JP10	JP11	CPU Type (Vcpuio)
Close	Open	Close	Single voltage CPU Vcpuio = Vcore (default)
Open	Close	Open	Dual voltage CPU Vcpuio = Vio (PP/MT P55C)

Set the jumper **JP9, JP10** and **JP11** according to the type of CPU. They are actually the selection of CPU I/O Voltage (Vcpuio). Normally, for single voltage CPU, Vcpuio is equal to Vcore, but for CPU that needs dual voltage such as PP/MT (P55C), Cyrix 6x86L, Vcpuio must be set to Vio, and it is different from Vcore.

Single voltage
(Vcpuio = Vcore)

Dual voltage
(Vcpuio = Vio)

CPU Type	Vcore	Vio	Vcpuio	JP7	JP8	JP9	JP10	JP11
INTEL P54C	3.45V	3.45V	Vcore	1-2	1-2	Closed	Open	Closed
INTEL PP/MT	2.8V	3.45V	Vio	7-8	1-2	Open	Closed	Open
AMD K5 (Single voltage)	3.52V	3.45V	Vcore	3-4	1-2	Closed	Open	Closed
AMD K6	2.9V	3.45V	Vio	5-6	1-2	Open	Closed	Open
Cyrix 6x86	3.52V	3.45V	Vcore	3-4	1-2	Closed	Open	Closed
Cyrix 6x86L	2.8V	3.45V	Vio	7-8	1-2	Open	Closed	Open

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

2.2.2 Selecting the CPU Frequency

JP1	JP2	CPU Frequency Ratio
1-2	1-2	1.5x (3.5x)
2-3	1-2	2x
2-3	2-3	2.5x (1.75x)
1-2	2-3	3x

Intel Pentium, Cyrix 6x86 and AMD K5/K6 CPU are designed to have different Internal (Core) and External (Bus) frequency. The ratio of Core/Bus frequency is selected by **JP1** and **JP2**, which CPU is using to multiply external clock and produce internal frequency.

Core frequency = Ratio * External bus clock
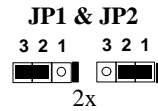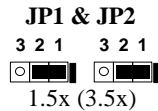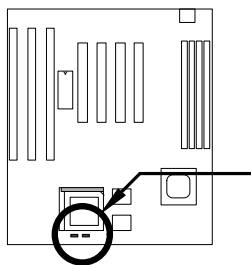
JP1 & JP2
3 2 1   3 2 1
1.5x (3.5x)

JP1 & JP2
3 2 1   3 2 1
2x

JP1 & JP2
3 2 1   3 2 1
2.5x (1.75x)

JP1 & JP2
3 2 1   3 2 1
3x

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

Note: The future CPUs have not been tested by AOpen Quality Test Department. It is possible that this mainboard can not support these future CPUs.

JP3	JP4	JP13	CPU External Clock
2-3	2-3	1-2 5-6	50MHz
1-2	2-3	1-2 3-4	60MHz
2-3	1-2	3-4	66MHz

JP3, JP4 and **JP13** are the selections of CPU external clock (bus clock), which is actually the clock from clock generator.

JP3 & JP4   **JP3 & JP4**   **JP3 & JP4**

JP13   **JP13**   **JP13**

50MHz   60MHz   66MHz
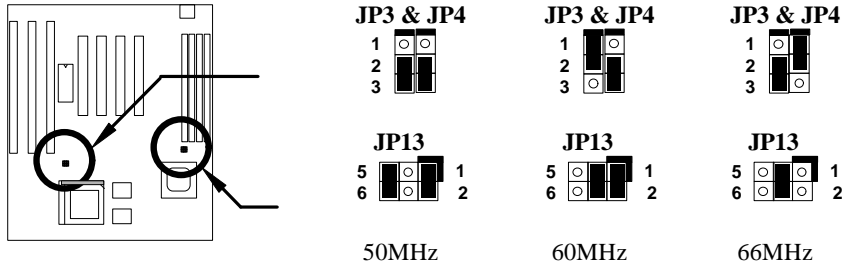
Caution: Following table are possible settings of current CPU available on the market. The correct setting may vary because of new CPU product, refer to your CPU specification for more details.
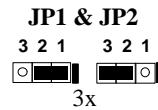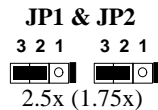
Intel Pentium	CPU Core Frequency	Ratio	External Bus Clock	JP1 & JP2	JP3 & JP4	JP13
P54C 75	75MHz =	1.5X	50MHz	1-2 & 1-2	2-3 & 2-3	1-2 & 5-6
P54C 90	90MHz =	1.5x	60MHz	1-2 & 1-2	1-2 & 2-3	1-2 & 3-4
P54C 100	100MHz =	1.5x	66MHz	1-2 & 1-2	2-3 & 1-2	3-4
P54C 120	120MHz =	2x	60MHz	2-3 & 1-2	1-2 & 2-3	1-2 & 3-4
P54C 133	133MHz =	2x	66MHz	2-3 & 1-2	2-3 & 1-2	3-4
P54C 150	150MHz =	2.5x	60MHz	2-3 & 2-3	1-2 & 2-3	1-2 & 3-4
P54C 166	166MHz =	2.5x	66MHz	2-3 & 2-3	2-3 & 1-2	3-4
P54C 200	200MHz =	3x	66MHz	1-2 & 2-3	2-3 & 1-2	3-4

Intel Pentium	CPU Core Frequency	Ratio	External Bus Clock	JP1 & JP2	JP3 & JP4	JP13
PP/MT 150	150MHz =	2.5x	60MHz	2-3 & 2-3	1-2 & 2-3	1-2 & 3-4
PP/MT 166	166MHz =	2.5x	66MHz	2-3 & 2-3	2-3 & 1-2	3-4
PP/MT 200	200MHz =	3x	66MHz	1-2 & 2-3	2-3 & 1-2	3-4
PP/MT 233	200MHz =	3.5x	66MHz	1-2 & 1-2	2-3 & 1-2	3-4

Cyrix 6x86	CPU Core Frequency	Ratio	External Bus Clock	JP1 & JP2	JP3 & JP4	JP13
P120+	100MHz	2x	50MHz	1-2 & 1-2	2-3 & 2-3	1-2 & 5-6
P150+	120MHz =	2x	60MHz	2-3 & 1-2	1-2 & 2-3	1-2 & 3-4
P166+	133MHz =	2x	66MHz	2-3 & 1-2	2-3 & 1-2	3-4

AMD K5	CPU Core Frequency	Ratio	External Bus Clock	JP1 & JP2	JP3 & JP4	JP13
PR90	90MHz =	1.5x	60MHz	1-2 & 1-2	1-2 & 2-3	1-2 & 3-4
PR100	100MHz =	1.5x	66MHz	1-2 & 1-2	2-3 & 1-2	3-4
PR120	90MHz =	1.5x	60MHz	1-2 & 1-2	1-2 & 2-3	1-2 & 3-4
PR133	100MHz =	1.5x	66MHz	1-2 & 1-2	2-3 & 1-2	3-4
PR166	116MHz =	1.75x	66MHz	2-3 & 2-3	2-3 & 1-2	3-4

AMD K6	CPU Core Frequency	Ratio	External Bus Clock	JP1 & JP2	JP3 & JP4	JP13
PR166	166MHz =	2.5x	66MHz	2-3 & 2-3	2-3 & 1-2	3-4
PR200	200MHz =	3x	66MHz	1-2 & 2-3	2-3 & 1-2	3-4

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

2.2.3 Disabling the Onboard Super I/O Controller

JP18	Onboard Super I/O
1-2	Enable (default)
2-3	Disable

The board is default to enable the onboard Super I/O controller. In case you wish to use an external I/O control card, you need to disable the onboard I/O before using the external I/O card. To disable it, set the jumper **JP18** to 2-3.

JP18   JP18

3 2 1   **3 2 1**
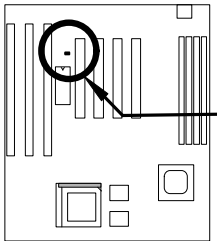
Enable   Disable
(default)

2.2.4 Disabling the PS/2 Mouse Function

JP20	PS/2 Mouse
1-2	Enable (default)
2-3	Disable

The PS/2 mouse function is normally enabled and occupies IRQ12. To reassign IRQ12 for other function, disable the PS/2 mouse function by setting the jumper **JP20** to 2-3**.**

JP20   JP20

3 2 1   **3 2 1**
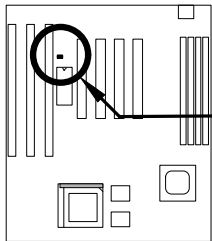
Enable   Disable
(default)

2.2.5 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

JP14

Normal Operation
(default)
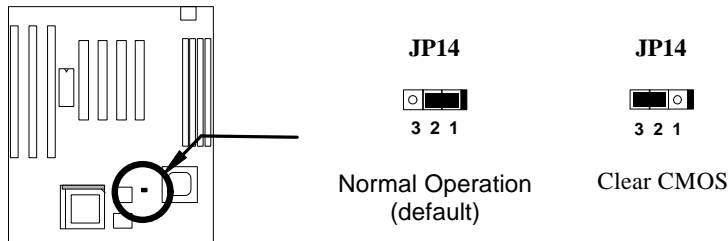
Clear CMOS

The procedure to clear CMOS:

1. Turn off the system power.

2. Locate **JP14** and short pins 2-3 for a few seconds.

3. Return **JP14** to its normal setting by shorting pins 1-2.

4. Turn on the system power.

5. Press ☐DEL☐ during bootup to enter the BIOS Setup Utility and specify a new password, if needed.

2.2.6 Selecting the CPU Burst Mode

JP22	CPU Burst Mode
1-2	Linear (Cyrix)
2-3	Toggle (Intel/AMD)

JP22 is used to select CPU burst mode of SIS chipset. For Cyrix CPU, JP22 must be set at 1-2 Linear Mode. For Intel and AMD CPU, JP22 must be set at 2-3 Toggle Mode.

JP22

JP22

Linear (Cyrix)

Toggle (Intel/AMD)
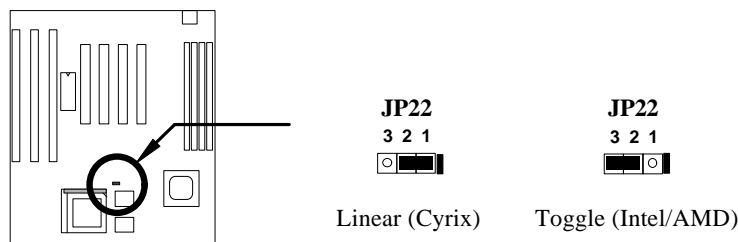
2.3 Connectors

2.3.1 Power Cable

A standard baby AT (PS/2) power supply has two cables with six wires on each. Plug in these cables to the onboard power connector in such a way that all the black wires are in the center. The power connector is marked as **PWR1** on the system board.

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

Black wire (GND)

Red wire (+5V)

PWR1
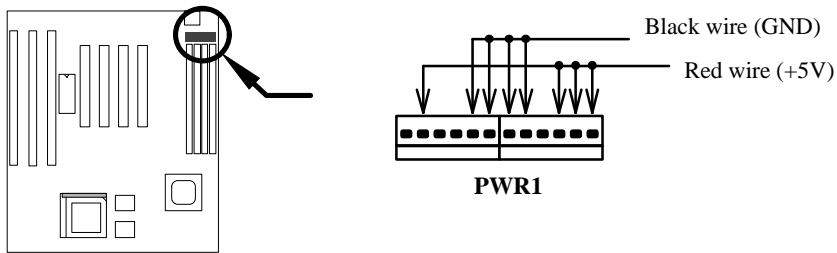
2.3.2 CPU Fan

Plug in the fan cable to the two-pin fan connector onboard. The fan connector is marked **FAN** on the system board.

GND

GND   +12V
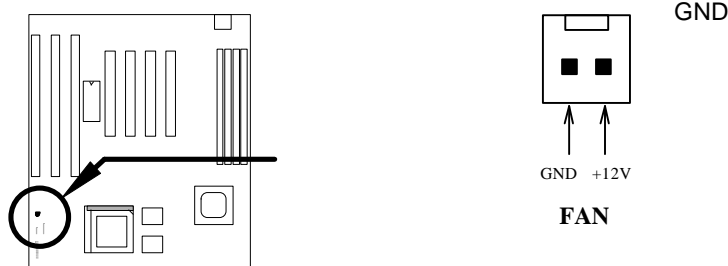
FAN

2.3.3 PS/2 Mouse

To connect a PS/2 mouse, insert the PS/2 mouse bracket connector to **PS2 MS** on the system board. Then plug in the PS/2 mouse cable to the mouse port on the bracket.

Pin	Description
1	MS DATA
2	NC
3	GND
4	+5V
5	MS CLK
6	NC

PS2 MS
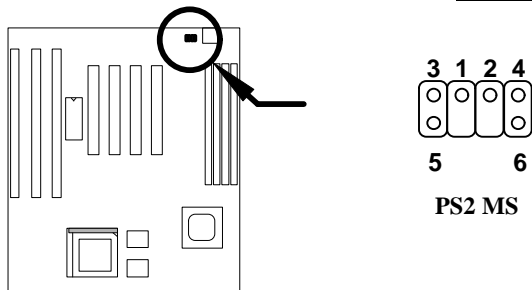
2.3.4 Serial Devices (COM1/COM2)

To support serial devices, insert the serial device connector into the serial port on the bracket. Plug in the 10-pin flat cable to the appropriate onboard connectors. The serial port 1 connector is marked as **COM1** and the serial port 2 connector is marked as **COM2** on the system board.

COM1   **COM2**
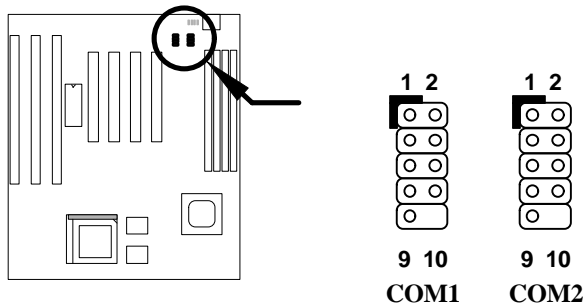
2.3.5 USB Device (optional)

You need a USB bracket to have your system to support additional USB device(s). To attach a USB bracket, simply insert the bracket cable to the onboard USB connector marked as **USB.**

Pin	Description	Pin	Description
1	V0	2	V1
3	D0-	4	D1-
5	D0+	6	D1+
7	GND	8	GND
9	NC	10	NC

USB
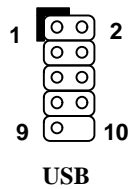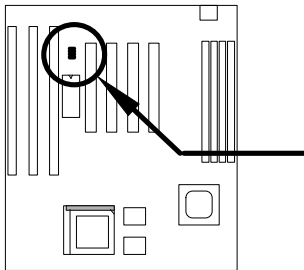
2.3.6 Floppy Drive

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

FDC
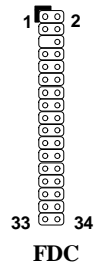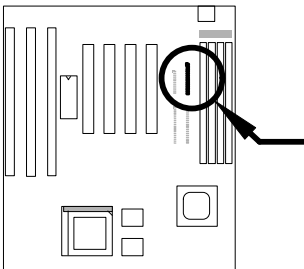
2.3.7 Printer

Plug in the 26-pin printer flat cable to the onboard parallel connector marked as **PRINTER** on the board.

PRINTER
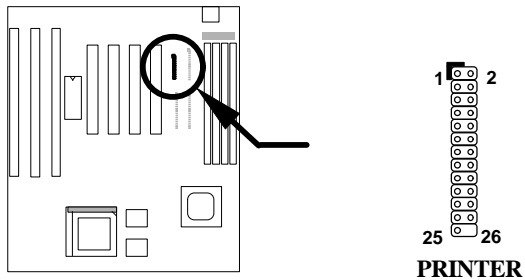
2.3.8   IDE Hard Disk and CD ROM

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

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

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

Hardware Installation

IDE 2   **IDE 1**
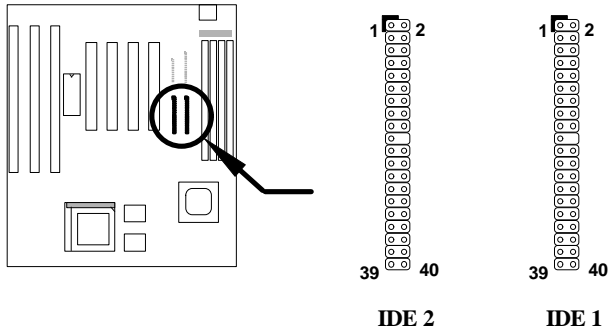
⚠ **Caution**: *The specification of IDE cable is maximum 46cm (18 inches), make sure your cable does not excess this length.*

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

Primary Channel

Slave (2nd)   **Master (1st)**

Secondary Channel

Slave (4th)   **Master (3rd)**
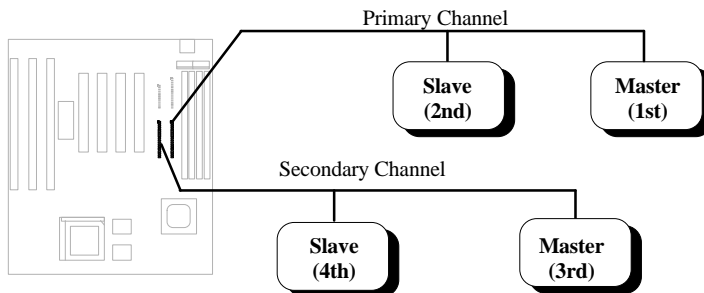
2.3.9 Hard Disk LED

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

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

HDD LED	**HDD LED**	**HDD LED**
4-pin connector	2-pin connector at pin 1-2	2-pin connector at pin 3-4
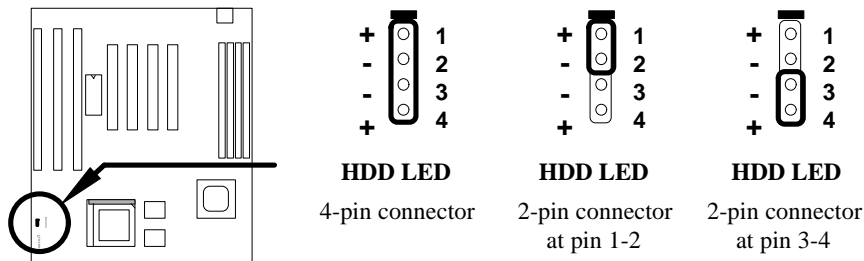
2.3.10 Panel Connector

The Panel (multifunction) connector is a 20-pin connector marked as **PANEL** on the board. Attach the power LED, keylock, speaker, reset switch, suspend switch, and green mode LED connectors 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.

PANEL pin layout:

```
           1   11
GND      [ o  o ]  +5V
KEYLOCK  [ o  o ]  GND
GND      [ o  o ]  GREEN LED
RESET    [ o  o ]  GND
POWER LED[ o  o ]  SUSPEND SW
SPEAKER  [ o  o ]  SUSPEND SW
+5V      [ o  o ]  GND
GND      [ o  o ]  NC
NC       [ o  o ]  RESET
SPEAKER  [ o  o ]  GND
           10  20
           PANEL
```
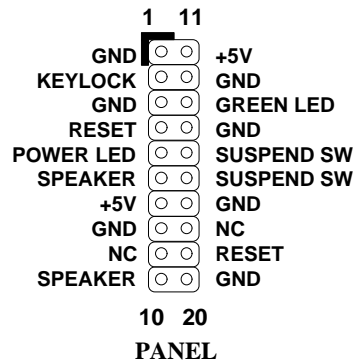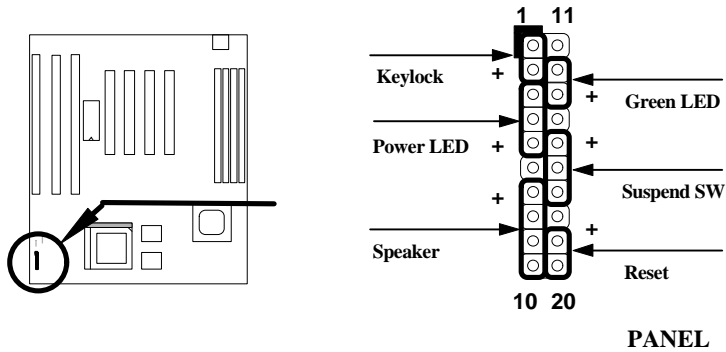
PANEL

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

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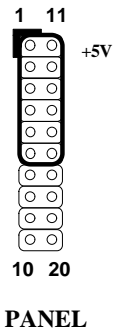
Note: *If your housing comes with Turbo switch and Turbo LED connectors, you may use these connectors for Suspend switch and Green mode LED functions, respectively.*

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

2.3.11 Keyboard

The onboard keyboard connector is a five-pin AT-compatible connector marked as **KB1**. The view angle of drawing shown here is from back panel of the housing.

Note: The mini DIN PS/2 keyboard connector is optional.

PCB

KB1
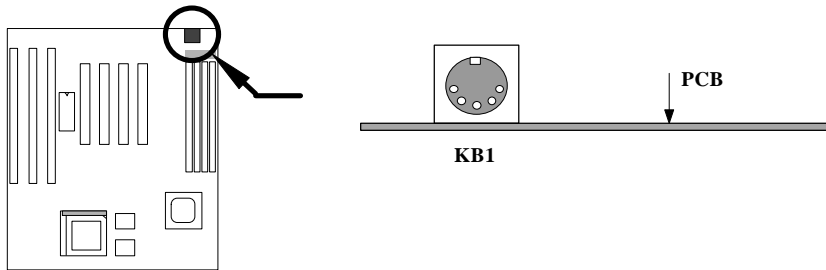
2.3.12 IrDA Connector

Serial port 2 can be configured to support wireless infrared module, with this module and application software such as Laplink, user can transfer files to or from laptops, notebooks, PDA and printers. This mainboard supports IrDA (115Kbps, 1 meter) as well as ASK-IR (19.2Kbps).

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	+3.3V

Note: Onboard serial port 2 (COM2) will not be available afterIrDA connector is enabled.
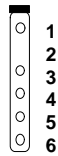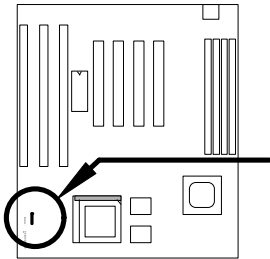
IrDA

2.4 Configuring the System Memory

Pin 1 of SIMM
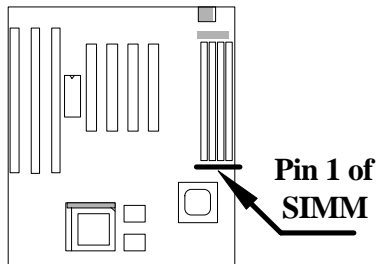
This mainboard has four 72 pin SIMM sockets (Single-in-line Memory Module) that allow you to install system memory from minimum 4MB up to maximum 256MB.

The SIMM supported by this mainboard can be identified by 4 kinds of factors:

♦ Size: single side, 1Mx32 (4MB), 4Mx32 (16MB), 16Mx32 (64MB), and double side, 1Mx32x2 (8MB), 4Mx32x2 (32MB), 16Mx32x2 (128MB).

♦ Speed: 60ns or 70ns access time

♦ Type: FPM (Fast page mode) or EDO (Extended data output)

♦ Parity: without parity (32 bit wide) or with parity (36 bit wide).

Because Pentium processor has 64 bit bus width, the four SIMM sockets are arranged in two banks of two sockets each, they are Bank0 and Bank1. Both SIMMs in each bank must be in the same size and type. It is allowed to have different speed and type in different bank, for example, 70ns FPM in one bank and 60ns EDO in another bank, in such case, each bank is independently optimized for maximum performance. The memory timing requires at least 70ns fast page mode DRAM chip, but for optimum performance, 60ns EDO DRAM is recommended.

Warning: The default memory timing setting is 60ns to obtain the optimal performance. Because of the specification limitation, 70ns SIMM is recommended to be used only for CPU external clock 60MHz.

Tip: EDO DRAM is designed to improve the DRAM read performance. Unlike traditional fast page mode, that tri-states the memory output data to start the precharge activity, EDO DRAM holds the memory data valid until the next memory access cycle, which is similar to pipe-line effect and reduces one clock state.

Hardware Installation

There is no jumper setting required for the memory size or type. It is automatically detected by the system BIOS. You can use any single side SIMM combination list below for, and the total memory size is to add them together, the maximum is 256MB.

SIMM1	SIMM2	Subtotal of Bank0
None	None	0MB
4MB	None	4MB
8MB	None	8MB
16MB	None	16MB
32MB	None	32MB
64MB	None	64MB
4MB	4MB	8MB
8MB	8MB	16MB
16MB	16MB	32MB
32MB	32MB	64MB
64MB	64MB	128MB
128MB	128MB	256MB

SIMM3	SIMM4	Subtotal of Bank1
None	None	0MB
4MB	4MB	8MB
8MB	8MB	16MB
16MB	16MB	32MB
32MB	32MB	64MB
64MB	64MB	128MB
128MB	128MB	256MB

Total Memory Size = Subtotal of Bank0 + Subtotal of Bank1

> **Caution:** *Make sure that you install the same SIMM type and size for each bank.*

The driving capability of new generation chipset is limited because the lack of memory buffer (to improve performance). This makes DRAM chip count an important factor to be taking into consideration when you install SIMM. Unfortunately, there is no way that BIOS can identified the correct chip count, you need to calculate the chip count by yourself. The simple rule is: By visual inspection, use only SIMM with chip count less than 24 chips.

2-22

Warning: *Do not install any SIMM that contains more than 24 chips. SIMMs contain more than 24 chips exceed the chipset driving specification. Doing so may result in unstable system behavior.*

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

1. *For 32 bit non-parity SIMM using 1M by 4 bit DRAM chip, 32/4=8 chips.*

2. *For 36 bit parity SIMM using 1M by 4 bit DRAM chip, 36/4=9 chips.*

3. *For 36 bit parity SIMM using 1M by 4 bit and 1M by 1 bit DRAM, the chip count will be 8 data chips(8= 32/4) plus 4 parity chips(4=4/1), total is 12 chips.*

Following table list the recommended DRAM combinations:

SIMM Data chip	SIMM Parity chip	Bit size per side	Single/ Double side	Chip count	SIMM size	Recommended
1M by 4	None	1Mx32	x1	8	4MB	Yes
1M by 4	None	1Mx32	x2	16	8MB	Yes
1M by 4	1M by 1	1Mx36	x1	12	4MB	Yes
1M by 4	1M by 4	1Mx36	x1	9	4MB	Yes
1M by 4	1M by 4	1Mx36	x2	18	8MB	Yes
1M by 16	None	1Mx32	x1	2	4MB	Yes
1M by 16	None	1Mx32	x2	4	8MB	Yes
1M by 16	1M by 4	1Mx36	x1	3	4MB	Yes
1M by 16	1M by 4	1Mx36	x2	6	8MB	Yes
4M by 4	None	4Mx32	x1	8	16MB	Yes
4M by 4	None	4Mx32	x2	16	32MB	Yes
4M by 4	4M by 1	4Mx36	x1	12	16MB	Yes
4M by 4	4M by 1	4Mx36	x2	24	32MB	Yes

SIMM Data chip	SIMM Parity chip	Bit size per side	Single/ Double side	Chip count	SIMM size	Recommended
16M by 4	None	16Mx32	x1	8	64MB	Yes, but not tested.
16M by 4	None	16Mx32	x2	16	128MB	Yes, but not tested.
16M by 4	16M by 4	16Mx36	x1	9	64MB	Yes, but not tested.
16M by 4	16M by 4	16Mx36	x2	18	128MB	Yes, but not tested.

Warning: 64MB SIMMs using 16M by 4 bit chip (64M bit technology) are not available in the market and are not formally tested by AOpen quality test department yet. However they are supported by design specification of chipset and they will be tested as soon as they are available. Note that 64MB SIMMs using 16M by 1 bit chip (16M bit technology) have chip count exceed 24 and are strongly not recommended.

Tip: 8 bit = 1 byte, 32 bit = 4 byte. The SIMM size is represented by number of data byte (whether with or without parity), for example, the size of single side SIMM using 1M by 4 bit chip is 1Mx32 bit, that is, 1M x 4 byte = 4MB. For double side SIMM, simply multiply it by 2, that is, 8MB.

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

SIMM Data chip	SIMM Parity chip	Bit size per side	Single/ Double side	Chip count	SIMM size	Recommended
1M by 1	None	1Mx32	x1	32	4MB	No
1M by 1	1M by 1	1Mx36	x1	36	4MB	No
1M by 4	1M by 1	1Mx36	x2	24	8MB	No
4M by 1	None	4Mx32	x1	32	16MB	No
4M by 1	4M by 1	4Mx36	x1	36	16MB	No
16M by 1	None	16Mx32	x1	32	64MB	No
16M by 1	16M by 1	16Mx36	x1	36	64MB	No

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. These changes are
implemented to further enhance system
performance.*

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.

```
            ROM PCI/ISA BIOS (XXXXXXXX)
                 CMOS SETUP UTILITY
               AWARD SOFTWARE, INC.

┌──────────────────────────────────────────────────────────────┐
│ STANDARD CMOS SETUP          │ INTEGRATED PERIPHRALS           │
│ BIOS FEATURES SETUP          │ PASSWORD SETTING                │
│ CHIPSET FEATURES SETUP       │ IDE HDD AUTO DETECTION          │
│ POWER MANAGEMENT SETUP       │ SAVE & EXIT SETUP               │
│ PNP/PCI CONFIGURATION SETUP  │ EXIT WITHOUT SAVING             │
│ LOAD SETUP DEFAULTS          │                                 │
│ LOAD TURBO DEFAULTS          │                                 │
├──────────────────────────────┴─────────────────────────────────┤
│  ESC  :  Quit                 ↑ ↓ → ←  :  Select Item          │
│  F10  :  Save & Exit Setup   (Shift) F2  :  Change Color       │
├──────────────────────────────────────────────────────────────┤
│ Description of each function                                   │
└──────────────────────────────────────────────────────────────┘
```

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

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

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

3.2   Standard CMOS Setup

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

```
                   ROM PCI/ISA BIOS (XXXXXXXX)
                      STANDARD CMOS SETUP
                      AWARD SOFTWARE, INC.

 ┌──────────────────────────────────────────────────────────────────┐
 │ Date (mm:dd:yy)  :  Wed.  Mar  6  1996                            │
 │ Time (hh:mm:ss)  :  00:00:00                                      │
 │                                                                    │
 │ HARD DISK        TYPE    SIZE   CYLS   HEAD   PRECOMP   LANDZ   SECTORS   MODE │
 │ Primary Master  : Auto    0      0      0       0        0        0     AUTO  │
 │ Primary Slave   : Auto    0      0      0       0        0        0     AUTO  │
 │ Secondary Master: Auto    0      0      0       0        0        0     AUTO  │
 │ Secondary Slave : Auto    0      0      0       0        0        0     AUTO  │
 │                                                                    │
 │ Drive A :  1.44M, 3.5 in     ┌──────────────────────────────────┐ │
 │ Drive B :  None              │                                  │ │
 │                              │   Base Memory :     640 K        │ │
 │                              │   Extended Memory:  15360 K      │ │
 │ Video   :  EGA/VGA           │     Other Memory :    384 K      │ │
 │ Halt On :  All Errors        │   Total Memory :   16384 K       │ │
 ├──────────────────────────────┴──────────────────────────────────┤ │
 │  ESC  :  Quit                ↑ ↓ → ← :  Select Item              │
 │  F10  :  Save & Exit Setup   (Shift) F2  :  Change Color         │
 └──────────────────────────────────────────────────────────────────┘
```

Standard CMOS→ Date

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

Standard CMOS→ Time

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

Award BIOS

Standard CMOS→ Primary Master→ Type
Standard CMOS→ Primary Slave → Type
Standard CMOS→ Secondary Master→ Type
Standard CMOS→ Secondary Slave→ Type

Type
Auto
User
None
1
2
...
45

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

The IDE CDROM is always automatically detected.

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

Standard CMOS→ Primary Master→ Mode
Standard CMOS→ Primary Slave → Mode
Standard CMOS→ Secondary Master→ Mode
Standard CMOS→ Secondary Slave→ 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→ Drive A
Standard CMOS→ 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→ 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→ 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.

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

 Virus Warning            : Disabled    Video BIOS Shadow  :  Enabled
 External Cache           : Enabled     C8000-CBFFF Shadow :  Disabled
 Quick Power On Self Test : Enabled     CC000-CFFFF Shadow :  Disabled
 Boot Sequence            : A,C,SCSI    D0000-D3FFF Shadow :  Disabled
 Swap Floppy Drive        : Disabled    D4000-D7FFF Shadow :  Disabled
 Boot Up Floppy Seek      : Disabled    D8000-DBFFF Shadow :  Disabled
 Boot Up NumLock Status   : ON          DC000-DFFFF Shadow :  Disabled
 Boot Up System Speed     : High
 Typematic Rate Setting   : Disabled
 Typematic Rate (Chars/Sec) : 6         ESC: Quit         ↑↓→← : Select Item
 Typematic Delay (Msec)   : 250         F1 : Help          PU/PD/+/-  : Modify
 Security Option          : Setup       F5 : Old Values   (Shift) F2 : Color
 PCI/VGA Palette Snoop    : Disabled    F6 : Load Setup Defaults
 OS Select for DRAM > 64MB : Non-OS/2   F7 : Load Turbo Defaults
```

BIOS Features→ Virus Warning

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

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

BIOS Features→ External Cache

External Cache	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.
Enabled	
Disabled	

BIOS Features→ Power-On Self-Test

Quick Power-on Self-test	This parameter speeds up POST by skipping some items that are normally checked.
Enable	
Disabled	

BIOS Features→ Boot Sequence

Boot Sequence	This parameter allows you to specify the system boot up search sequence. The hard disk ID are listed below:
A,C,SCSI	
C,A,SCSI	C: Primary master
C,CDROM,A	D: Primary slave
CDROM,C,A	E: Secondary master
D,A,SCSI	F: Secondary slave
E,A,SCSI	
F,A,SCSI	
SCSI,A,C	
SCSI,C,A	
C only	

BIOS Features→ Swap Floppy Drive

Swap Floppy Drive	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.
Enabled	
Disabled	

BIOS Features→ Boot-up Floppy Seek

Award BIOS

Boot-up Floppy Seek Enabled Disabled	When enabled, the BIOS issues the seek command to the floppy drive during POST to move floppy drive head forward and backward.

BIOS Features→ 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→ Boot-up System Speed

Boot-up System Speed High Low	Select High or Low system speed after boot.

BIOS Features→ Typematic Rate Setting

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

BIOS Features→ Typematic Rate

Typematic Rate 6 8 10 12 15 20 24 30	This item allows you to control the speed of repeated keystrokes. The default is 30 characters/sec .

BIOS Features→ Typematic Delay

Typematic Delay
250
500
750
1000

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

BIOS Features→ 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→ 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→ 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.

Award BIOS

BIOS Features→ 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→ C800-CBFF Shadow
BIOS Features→ CC00-CFFF Shadow
BIOS Features→ D000-D3FF Shadow
BIOS Features→ D400-D7FF Shadow
BIOS Features→ D800-DBFF Shadow
BIOS Features→ 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 (XXXXXXXX)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.
```

```
Auto Configuration        : Enabled


Refresh Cycle time (us)    : 15.6
RAS Pulse Width (Refresh)  : 3T
RAS Precharge Time         : 3T
RAS to CAS Delay           : 3T
ISA Bus Clock Frequency    : PCICLK/4
System BIOS Cacheable      : Enabled
Video BIOS Cacheable       : Enabled
Memory Hole At 15M-16M     : Disabled

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

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

Chipset Features→ Auto Configuration

| **Auto Configuration** |
| Enabled |
| Disabled |

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

Award BIOS

Chipset Features→ Refresh Cycle Time (us)

Refresh Cycle Time (us)
15.6
62.4
124.8
187.2

This option lets you set the cycle time for the chipset to refresh DRAM to avoid losing data.

Chipset Features→ RAS Pulse Width (Refresh)

RAS Pulse Width (Refresh)
3T
4T
5T
6T

This parameter specifies the number of clocks required to assert the DRAM row address strobe (RAS) signal for refresh cycles.

Chipset Features→ RAS Precharge Time

RAS Precharge Time
2T
3T
4T

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

Chipset Features→ RAS to CAS Delay

RAS to CAS Delay
2T
3T
4T

This option allows you to set the wait state between the start of RAS and column address strobe (CAS) signals. The available settings are. To calculate the exact ISA bus clock, take the PCICLK/3 setting as an example. For a 66MHz CPU with 33MHz PCI bus clock, the ISA bus clock is calculated as follows: 33MHz/4 = 8.25MHz.

Chipset Features→ System BIOS Cacheable

System BIOS Cacheable Enabled Disabled

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

Chipset Features→ Video BIOS Cacheable

Video BIOS Cacheable Enabled Disabled

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

Chipset Features→ 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.

3.5   Power Management Setup

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

```
                    ROM PCI/ISA BIOS (XXXXXXXX)
                    POWER MANAGEMENT SETUP
                    AWARD SOFTWARE, INC.

┌─────────────────────────────────────────────────────────────────────────┐
│ Power Management    : Disabled      IRQ3  (COM2)      :  Enabled          │
│ PM Control by APM   : Yes           IRQ4  (COM1)      :  Enabled          │
│ Video Off Option    : Susp,Stdby->Off IRQ5 (LPT2)     :  Enabled          │
│ Video Off Method    : V/H SYNC+Blank IRQ6 (Floppy Disk): Enabled          │
│ Doze Speed (div by) : 2             IRQ7  (LPT1)      :  Enabled          │
│ Stdby Speed (div by) : 3            IRQ8  (RTC Alarm) :  Disabled         │
│ Modem Use IRQ       : 3             IRQ9  (IRQ2 Redir) : Enabled          │
│                                     IRQ10 (Reserved)  :  Enabled          │
│     **PM Timers**                   IRQ11 (Reserved)  :  Enabled          │
│ HDD Off After       : Disabled      IRQ12 (PS/2 Mouse) : Enabled          │
│ Doze Mode           : Disabled      IRQ13 (Coprocessor): Enabled          │
│ Standby Mode        : Disabled      IRQ14 (Hard Disk) :  Enabled          │
│ Suspend Mode        : Disabled      IRQ15 (Reserved)  :  Enabled          │
│                                                                           │
│     **PM Events**                                                         │
│ COM Ports Activity  : Enabled       ESC: Quit      ↑↓→← : Select Item     │
│ LPT Port Activity   : Enabled       F1 : Help   PU/PD/+/- : Modify        │
│ HDD Port Activity   : Enabled       F5 : Old Values  (Shift) F2 : Color   │
│ VGA Activity        : Disabled      F6 : Load TURBO Defaults              │
│                                     F7 : Load Setup Defaults              │
└─────────────────────────────────────────────────────────────────────────┘
```

Power Management→ Power Management

Power Management
Max Saving
Mix Saving
User Defined
Disabled

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

Mode	Doze	Standby	Suspend
Min Saving	40 min	40 min	40 min
Max Saving	20 sec	20 sec	20 sec

Power Management→ 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→ Video Off Option

Video Off Option	To turn off video monitor at which power down mode.
Always On	
All Modes→ Off	
Suspend→ Off	
Susp, Standby→ Off	

Power Management→ 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.
Blank Screen	
V/H SYNC+Blank	
DPMS	

Power Management→ Doze Speed (div by)
Power Management→ Stdby Speed (div by)

Doze Speed (div by)	These items let you set the system speed divisor to specify the rate at which the system speed will slow down once it enters the **Doze Mode** or **Standby Mode**. The options are from 1 to 8. To determine the exact rate of the system in Doze mode, take 2 as the divisor and 133MHz as the normal system speed. 133MHz/2 = 66MHz - this is the system speed in Doze mode.
1	
2	
3	
4	
5	
6	
7	
8	

Award BIOS

Power Management→ Modem Use IRQ

Modem Use IRQ
NA
3
4
5
6
7
9
10
11

This item tells BIOS/Chipset the IRQ of your modem. This allows BIOS/Chipset to monitor the activities of the modem connected to your system.

Power Management→ HDD Off After

HDD Off After
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 described in this section (Standby and Suspend).

Power Management→ Doze Mode

Doze Mode
Disabled
20 Sec
1 Min
5 Min
10 Min
15 Min
20 Min
30 Min
40 Min

This item lets you set the period of time after which the system enters into Doze mode. In this mode, the CPU clock slows down. The ratio is specified in the "Throttle Duty Cycle". Any activity detected returns the system to full power. The system activity (or event) is detected by monitoring the IRQ signals.

Power Management→ Standby Mode

Standby Mode
Disabled
20 Sec
1 Min
5 Min
10 Min
15 Min
20 Min
30 Min
40 Min

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

Power Management→ Suspend Mode

Suspend Mode
Disabled
20 Sec
1 Min
5 Min
10 Min
15 Min
20 Min
30 Min
40 Min

This item lets you set the period of time after which the system enters into Suspend mode. In this mode, CPU clock stops, all other devices will be shut off. Any activity detected returns the system to full power. The system activity(or event) is detected by monitoring the IRQ signals.

Power Management→ COM Ports Activity
Power Management→ LPT Ports Activity
Power Management→ HDD Ports Activity
Power Management→ VGA Activity

COM Ports Activity
Enabled
Disabled

To enable or disable the detection of COM port, LPT, HDD, VGA activities for power down state transition.

Award BIOS

Power Management→ IRQ3 (COM2)
Power Management→ IRQ4 (COM1)
Power Management→ IRQ5 (LPT2)
Power Management→ IRQ6 (Floppy Disk)
Power Management→ IRQ8 (RTC Alarm)
Power Management→ IRQ9 (IRQ2 Redir)
Power Management→ IRQ10 (Reserved)
Power Management→ IRQ11 (Reserved)
Power Management→ IRQ12 (PS/2 Mouse)
Power Management→ IRQ13 (Coprocessor)
Power Management→ IRQ14 (Hard Disk)
Power Management→ IRQ15 (Reserved)

IRQ2 (COM2) Enabled Disabled	To enable or disable the detection of IRQ event for power down state transition. Note that OS2 has periodically IRQ8 (RTC) interruptions, If IRQ8 is not set to **Disabled**, OS/2 may fail to go into Doze/Standby/Suspend mode.

3.6   PNP/PCI Configuration Setup

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

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

 ┌─────────────────────────────────┬─────────────────────────────────┐
 │ Resources Controlled By :  Manual │ PCI IDE IRQ Map To    :  PCI-Auto │
 │ Reset Configuration Data :  Disabled │ Primary IDE INT#      :  A      │
 │                                 │ Secondary IDE INT#    :  B      │
 │ IRQ 3 assigned to    :  PCI/ISA PnP │ Used MEM base addr    :  N/A    │
 │ IRQ 4 assigned to    :  PCI/ISA PnP │ Used MEM Length       :  8K     │
 │ IRQ 5 assigned to    :  PCI/ISA PnP │                                 │
 │ IRQ 7 assigned to    :  PCI/ISA PnP │                                 │
 │ IRQ 9 assigned to    :  PCI/ISA PnP │                                 │
 │ IRQ 10 assigned to   :  PCI/ISA PnP │                                 │
 │ IRQ 11 assigned to   :  PCI/ISA PnP │                                 │
 │ IRQ 12 assigned to   :  PCI/ISA PnP │                                 │
 │ IRQ 14 assigned to   :  PCI/ISA PnP │                                 │
 │ IRQ 15 assigned to   :  PCI/ISA PnP │                                 │
 │ DMA 0 assigned to    :  PCI/ISA PnP ├─────────────────────────────────┤
 │ DMA 1 assigned to    :  PCI/ISA PnP │ ESC: Quit      ↑↓→←   : Select Item │
 │ DMA 3 assigned to    :  PCI/ISA PnP │ F1 : Help      PU/PD/+/- : Modify │
 │ DMA 5 assigned to    :  PCI/ISA PnP │ F5 : Old Values   (Shift) F2 : Color │
 │ DMA 6 assigned to    :  PCI/ISA PnP │ F6 : Load Setup Defaults         │
 │ DMA 7 assigned to    :  PCI/ISA PnP │ F7 : Load Turbo Defaults         │
 └─────────────────────────────────┴─────────────────────────────────┘
```

PNP/PCI Configuration→ Resources Controlled By

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

PNP/PCI Configuration→ 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.
Enabled	
Disabled	

PNP/PCI Configuration→ IRQ3 (COM2) **assigned to**
PNP/PCI Configuration→ IRQ4 (COM1) **assigned to**
PNP/PCI Configuration→ IRQ5 (Network/Sound) **assigned to**
PNP/PCI Configuration→ IRQ7 (Printer or Others) **assigned to**
PNP/PCI Configuration→ IRQ9 (Video or Others) **assigned to**
PNP/PCI Configuration→ IRQ10 (SCSI or Others) **assigned to**
PNP/PCI Configuration→ IRQ11 (SCSI or Others) **assigned to**
PNP/PCI Configuration→ IRQ12 (PS/2 Mouse) **assigned to**
PNP/PCI Configuration→ IRQ14 (IDE1) **assigned to**
PNP/PCI Configuration→ IRQ15 (IDE2) **assigned to**

IRQ 3 assigned to	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	

PNP/PCI Configuration→ DMA 0 assigned to
PNP/PCI Configuration→ DMA 1 assigned to
PNP/PCI Configuration→ DMA 3 assigned to
PNP/PCI Configuration→ DMA 5 assigned to
PNP/PCI Configuration→ DMA 6 assigned to
PNP/PCI Configuration→ DMA 7 assigned to

DMA 0 assigned to	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.
Legacy ISA	
PCI/ISA PnP	

PNP/PCI Configuration→ PCI IRQ Actived By

PCI IRQ Actived By
Level
Edge

This option lets the user set when to activate the PCI IRQ. The available settings are Edge and Level. The Edge is the start of the signal and Level is the point at which the signal is high. The default is Level.

PNP/PCI Configuration→ PCI IDE 2nd Channel

PCI IDE 2nd Channel
Enabled
Disabled

Enable this option if you installed an IDE controller board into one of the PCI slots on the system board, and assign it as your secondary IDE controller. Otherwise, set this parameter to Disabled.

PNP/PCI Configuration→ 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→ Primary IDE INT#
PNP/PCI Configuration→ 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

3.7   Load Setup Defaults

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

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

3.8   Load Turbo Defaults

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

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

3.9   Integrated Peripherals

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

```
                     ROM PCI/ISA BIOS (XXXXXXXX)
                        INTEGRATED PERIPHERALS
                        AWARD SOFTWARE, INC.

 ┌─────────────────────────────────────────┬──────────────────────────────────┐
 │ Internal PCI/IDE          : Enabled      │                                  │
 │ IDE Primary Master PIO    : Auto         │                                  │
 │ IDE Primary Slave PIO     : Auto         │                                  │
 │ IDE Secondary Master PIO  : Auto         │                                  │
 │ IDE Secondary Slave PIO   : Auto         │                                  │
 │ IDE HDD Block Mode:       : Enabled      │                                  │
 │ USB Legacy Support        : Disabled     │                                  │
 │ USB IRQ Released          : No           │                                  │
 │ Onboard FDC Controller    : Enabled      │                                  │
 │ Onboard UART 1            : AUTO         ├──────────────────────────────────┤
 │ Onboard UART 2            : AUTO         │ ESC: Quit      ↑↓→←   : Select Item│
 │ Onboard UART 2 Mode       : Standard     │ F1 : Help      PU/PD/+/- : Modify │
 │ IR Duplex Mode            : Half         │ F5 : Old Values   (Shift) F2 : Color│
 │ Onboard Parallel Port     : 378/IRQ7     │ F6 : Load Setup Defaults          │
 │ Parallel Port Mode        : Normal       │ F7 : Load Turbo Defaults          │
 │ ECP Mode Use DMA          : 3            │                                  │
 │ Parallel Port Type        : EPP1.7       │                                  │
 └─────────────────────────────────────────┴──────────────────────────────────┘
```

Integrated Peripherals→ Internal PCI IDE

Internal PCI IDE	This parameter lets you enable or disable the on-chip primary or secondary IDE device.
Disabled	
Primary	
Secondary	
Both	

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

IDE Primary Master PIO
Auto
Mode 1
Mode 2
Mode 3
Mode 4

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

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

Integrated Peripherals→ IDE HDD Block Mode

IDE HDD Block Mode
Enabled
Disabled

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

Integrated Peripherals→ USB Legacy Support

USB Legacy 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→ USB IRQ Released

| **USB IRQ Released** |
| Yes |
| No |

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

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

Integrated Peripherals→ 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→ Onboard UART 1
Integrated Peripherals→ Onboard UART 2

| **Onboard UART 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→ Onboard UART 2 Mode

Onboard UART 2 Mode
Standard
HPSIR
ASKIR

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

- Standard **-** Sets serial port 2 to operate in normal mode. This is the default setting.

- HPSIR **-** Select this setting if you installed an Infrared module in your system via IrDA connector (refer to section 2.3 "Connectors"). This setting allows infrared serial communication at a maximum baud rate of 115K baud.

- ASKIR **-** Select this setting if you installed an Infrared module via IrDA connector (refer to section 2.32.3 "Connectors "). This setting allows infrared serial communication at a maximum baud rate of 19.2K baud.

Integrated Peripherals→ IR Duplex Mode

IR Duplex Mode
Full
Half

This item lets you set the duplex mode for the IR communication. Full - Allows IR communication in bidirectional mode. Half - Allows IR communication in single direction only.

> **Note:** *This option appears only if the IR function is activated and the Onboard UART 2 Mode parameter is NOT set to Standard.*

Integrated Peripherals→ Onboard Parallel Port

Onboard Parallel Port	This item controls the onboard parallel port address and interrupt.
3BC/IRQ7	
378/IRQ7	
278/IRQ7	
Disabled	

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

Integrated Peripherals→ Parallel Port Mode

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

Integrated Peripherals→ ECP Mode Use DMA

ECP Mode Use DMA	This item lets you set the DMA channel of ECP mode.
3	
1	

Integrated Peripherals→ ECP Mode Use Type

Parallel Port Type	This item selects the EPP protocol.
EPP1.7	
EPP1.9	

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 HDD Low-level Format

The HDD Low-level Format function is designed as a tool to save your time formatting your hard disk. This automatically sets the necessary information of the selected drive. It also searches for the bad tracks and lists them for your reference.

HDD Low-level Format→ Select Drive

Select an installed hard disk drive (either C, D, E, or F). The bottom of the screen displays the drive automatically detected by the BIOS.

HDD Low-level Format→ Bad Track List

The following options are available for this function:

● Auto scan bad track - Automatically scans and lists the bad tracks in the window located at the right side of the screen.

● Add bad track - Allows you to manually enter the information of the known bad track in the window located at the right side of the screen.

● Modify bad track - Allows you to modify the information of the added bad track in the window located at the right side of the screen.

● Delete bad track - Deletes the added bad tracks.

● Clear bad track table - Clears the whole bad track list in the window located at the right side of the screen.

HDD Low-level Format→ Preformat

The following options are available for this function:

● Interleave - Allows you to manually set the interleave number of the hard disk drive selected for low-level formatting. You may enter any number from 1 to 8. Before setting, check the documentation that comes with the drive for the correct interleave number, or select 0 for automatic detection.

- Auto scan bad track - Allows the utility to scan first then format. Formatting is done by tracks.

- Start - Allows you to begin the low-level format by typing Y.

3.13 Save & Exit Setup

This function automatically saves all CMOS values before leaving Setup.

3.14 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.

3.15 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.

3.16 AWARD BIOS Flash Utility

The AWARD Flash utility allows you to upgrade the system BIOS. To get the AWARD Flash utility and the upgrade BIOS file, contact your local distributor or visit our homepage at **http://www.aopen.com.tw** The filename of the AWARD Flash utility is AWDFLASH.EXE. Run this program under DOS and follow the instructions on the screen. After running the program, reboot your system for the new BIOS to take effect

Appendix A

Jumper Table Summary

Setting the CPU Voltage

JP7	CPU Core Voltage (Vcore)
1-2	3.45V (default for P54C)
3-4	3.52V (Cyrix or AMD)
5-6	2.9V (AMD K6)
7-8	2.8V (PP/MT P55C)
9-10	2.7V
11-12	2.5V

JP8	I/O Voltage (Vio)
1-2	3.45V (default)
3-4	3.52V

JP9	JP10	JP11	CPU Type (Vcpuio)
Close	Open	Close	Single Voltage CPU, Vcpuio = Vcore, (default).
Open	Close	Open	Dual Voltage CPU, Vcpuio = Vio, (PP/MT P55C).

CPU Type	Vcore	Vio	Vcpuio	JP7	JP8	JP9	JP10	JP11
INTEL P54C	3.45V	3.45V	Vcore	1-2	1-2	Closed	Open	Closed
INTEL PP/MT	2.8V	3.45V	Vio	7-8	1-2	Open	Closed	Open
AMD K5 (Single voltage)	3.52V	3.45V	Vcore	3-4	1-2	Closed	Open	Closed
AMD K6	2.9V	3.45V	Vio	5-6	1-2	Open	Closed	Open
Cyrix 6x86	3.52V	3.45V	Vcore	3-4	1-2	Closed	Open	Closed
Cyrix 6x86L	2.8V	3.45V	Vio	7-8	1-2	Open	Closed	Open

Selecting the CPU Frequency

JP1	JP2	CPU Frequency Ratio
1-2	1-2	1.5x (3.5x)
2-3	1-2	2x
2-3	2-3	2.5x (1.75x)
1-2	2-3	3x

JP3	JP4	JP13	CPU External Clock
2-3	2-3	1-2 5-6	50MHz
1-2	2-3	1-2 3-4	60MHz
2-3	1-2	3-4	66MHz

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

Note: *The future CPUs have not been tested by AOpen Quality Test Department. It is possible that this mainboard can not support these future CPUs.*

Intel Pentium	CPU Core Frequency	Ratio	External Bus Clock	JP1 & JP2	JP3 & JP4	JP13
P54C 75	75MHz =	1.5X	50MHz	1-2 & 1-2	2-3 & 2-3	1-2 & 5-6
P54C 90	90MHz =	1.5x	60MHz	1-2 & 1-2	1-2 & 2-3	1-2 & 3-4
P54C 100	100MHz =	1.5x	66MHz	1-2 & 1-2	2-3 & 1-2	3-4
P54C 120	120MHz =	2x	60MHz	2-3 & 1-2	1-2 & 2-3	1-2 & 3-4
P54C 133	133MHz =	2x	66MHz	2-3 & 1-2	2-3 & 1-2	3-4
P54C 150	150MHz =	2.5x	60MHz	2-3 & 2-3	1-2 & 2-3	1-2 & 3-4
P54C 166	166MHz =	2.5x	66MHz	2-3 & 2-3	2-3 & 1-2	3-4
P54C 200	200MHz =	3x	66MHz	1-2 & 2-3	2-3 & 1-2	3-4

Intel Pentium	CPU Core Frequency	Ratio	External Bus Clock	JP1 & JP2	JP3 & JP4	JP13
PP/MT 150	150MHz =	2.5x	60MHz	2-3 & 2-3	1-2 & 2-3	1-2 & 3-4
PP/MT 166	166MHz =	2.5x	66MHz	2-3 & 2-3	2-3 & 1-2	3-4
PP/MT 200	200MHz =	3x	66MHz	1-2 & 2-3	2-3 & 1-2	3-4
PP/MT 233	200MHz =	3.5x	66MHz	1-2 & 1-2	2-3 & 1-2	3-4

Cyrix 6x86	CPU Core Frequency	Ratio	External Bus Clock	JP1 & JP2	JP3 & JP4	JP13
P120+	100MHz	2x	50MHz	1-2 & 1-2	2-3 & 2-3	1-2 & 5-6
P150+	120MHz =	2x	60MHz	2-3 & 1-2	1-2 & 2-3	1-2 & 3-4
P166+	133MHz =	2x	66MHz	2-3 & 1-2	2-3 & 1-2	3-4

AMD K5	CPU Core Frequency	Ratio	External Bus Clock	JP1 & JP2	JP3 & JP4	JP13
PR90	90MHz =	1.5x	60MHz	1-2 & 1-2	1-2 & 2-3	1-2 & 3-4
PR100	100MHz =	1.5x	66MHz	1-2 & 1-2	2-3 & 1-2	3-4
PR120	90MHz =	1.5x	60MHz	1-2 & 1-2	1-2 & 2-3	1-2 & 3-4
PR133	100MHz =	1.5x	66MHz	1-2 & 1-2	2-3 & 1-2	3-4
PR166	116MHz =	1.75x	66MHz	2-3 & 2-3	2-3 & 1-2	3-4

AMD K6	CPU Core Frequency	Ratio	External Bus Clock	JP1 & JP2	JP3 & JP4	JP13
PR166	166MHz =	2.5x	66MHz	2-3 & 2-3	2-3 & 1-2	3-4
PR200	200MHz =	3x	66MHz	1-2 & 2-3	2-3 & 1-2	3-4

Jumper Table Summary

Disabling the Onboard Super I/O

JP18	Onboard Super I/O
1-2	Enable (default)
2-3	Disable

Disabling the PS/2 Mouse

JP20	PS/2 Mouse
1-2	Enable (default)
2-3	Disable

Clear CMOS

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

Selecting the CPU Burst Mode

JP22	CPU Burst Mode
1-2	Linear (Cyrix)
2-3	Toggle (Intel/AMD)