PTK-2110

MAINBOARD MANUAL

Handling Precautions

Warning :
1. Static electricity may cause damage to the integrated circuits on the mainboard.
   Before handling any mainboard outside of its protective packaging, ensure that there is no static electric charge in your body.
2. There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer.
3. Discard used batteries according to the manufacturer's instructions.

Observe the following basic precautions when handling the mainboard or other computer components:
- ν   Wear a static wrist strap which fits around your wrist and is connected to a natural earth ground.
- ν   Touch a grounded or anti-static surface or a metal fixture such as a water pipe.
- ν   Avoid contacting the components on add-on cards, boards and modules and with the "gold finger" connectors plugged into the expansion slot. It is best to handle system components by their mounting bracket.

The above methods prevent static build-up and cause it to be discharged properly.

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Overview

The PTK-2110 mainboard combines the advanced capabilities of the Intel 430HX PCIset® with such leading-edge features as USB support on an easily-expandable ATX form factor to provide the ultimate platform for high-performance Microsoft Windows 95 multimedia systems.

This highly-flexible mainboard is designed to run a full range of Intel Pentium®, Cyrix 6x86™, IBM 6x86™, and AMD-K5™ processors, and can be easily upgraded using its 321-pin ZIF socket. The processor's advanced performance is complemented by a second level write back Pipeline Burst SRAM cache of up to 512KB and main memory of up to 512MB DRAM. The main memory is installed using the board's four 72-pin SIMM sockets that accept an unrivaled choice of high-speed EDO and standard Fast Page Mode DRAM.

The PTK-2110 integrates a full set of I/O features onboard, including two 16550A UART compatible serial port, one EPP/ECP capable parallel port, and one Floppy Disk Drive controller. It also comes with a built in Enhanced IDE controller that provides convenient, high-speed PCI Bus Master connections with up to four IDE devices, including Hard Disk and CD-ROM drives. Three 16-bit ISA slots and four 32-bit PCI slots provide ample room for further expansion. The mainboard also features support for the state-of-the-art Universal Serial Bus (USB) that provides ease-of-use and high-speed Plug & Play connections to future USB compliant peripheral devices. The IrDA compliant serial port and onboard SIR support further enhance system I/O connectivity. Moreover, for advanced VGA functionality, the PTK-2110 features an onboard S3 325/ViRGE VGA subsystem that delivers resolutions of up to 1600x1200 in 256 colors. The board also features an onboard Creative Labs' ViBRA 16CL sound chip to deliver advanced audio performance.

This chapter gives you a brief overview of the PTK-2110 mainboard. In addition to basic information on the board's main components and features, it also provides advice on how to upgrade and expand it. For updated BIOS, drivers, or product release information, please visit FIC's home page at: http://www.fic.com.tw.

Congratulations on your decision to adopt the PTK-2110 mainboard. With its high-speed PCI local bus architecture and ultra-fast I/O connections, the PTK-2110 provides the ultimate solution for optimizing the performance of your high-end system.

Main Features

The PTK-2110 mainboard comes with the following high-performance features:

ν   Easy Installation
   ν   Award BIOS with support for Plug and Play, auto detection of Hard Drive
   ν   and IDE features, MS Windows 95, and Windows NT compatible.

ν   Flexible Processor Support
ν   The onboard 321-pin ZIF socket supports Intel Pentium (P54C) CPU speed
   75/90/100/120/133/150/166/200 MHz processors / P54CS / P54CTB / P55C (by use of optional Split Voltage Regulator).
   Cyrix 6x86-P120+ (100 MHz) / 6x86-P133+ (110 MHz) / 6x86-P150+ (120 MHz) / 6x86-P166+ (133 MHz) /and M2 seris processors.
   IBM 6x86-P120+ (100 MHz) / 6x86-P133+ (110 MHz) / 6x86-P150+ (120 MHz) / 6x86-P166+ (133 MHz) / seris processors.
   AMD K5-PR75 (75 MHz) / K5-PR90 (90 MHz) / K5-PR100 (100 MHz) / K5-PR120 (90 MHz) / K5-PR133 (100 MHz) / K5-PR150 (105 MHz) / K5-PR166 (116 MHz) / K5-PR200 (133 MHz) / processors.

ν   Leading Edge Chipset
ν   Intel 82430HX PCIset, including a CPU interface controller, advanced
ν   cache controller, integrated DRAM controller, synchronous ISA bus
ν   controller, PCI local bus interface, integrated power management unit.

ν   Ultra-fast Level II Cache
ν   Supports up to 512KB synchronous PBSRAM direct-mapped write-back
ν   cache memory.

ν   Versatile Main Memory Support
ν   Accepts up to 512MB RAM in two banks using 72-pin SIMMs of 1, 4, 8,
ν   16, 32, 64, 128MB standard Fast Page Mode or EDO memory.

ν   ISA & PCI Expansion Slots
ν   Three 16-bit ISA and four 32-bit PCI expansion slots provide all the room
ν   you need to install a full range of add-on cards.

ν   USB Support
ν   Two Universal Serial Bus connectors integrated into rear I/O panel.

ν   Serial Infrared (SIR) Support
ν   One SIR port is shared with the COM2 port; with a transmission speed of
up to 115200 BPS.

ν   Enhanced PCI Bus Master IDE Controller
ν   Integrated Enhanced PCI local bus IDE controller with two connectors
ν   supports up to four IDE devices such as Hard Disk, CD-ROM or Tape
Backup drives via two channels for high speed data throughput. This
controller supports PIO Modes 3 and 4, and DMA Mode 2 for optimized
system performance.

ν   Super Multi I/O
ν   Integrated NS PC87336 I/O chipset features two 16550A UART
ν   compatible serial ports, one EPP/ECP capable parallel port, one IR
port, and
ν   one Floppy Disk Drive connector.

ν   Compact Audio Onboard Subsystem
    ν   Integrated Creative Lab ViBRA 16CL onboard audio system controller
        and
    ν   Yamaha OPL3/4 FM music synthesizer fully compatible with Sound
    ν   Blaster, Sound Blaster Pro, Microsoft Windows® Sound System and
            Roland MPU401 standards; it utilizes three speakers, line-in and
        MIC   mini-jack external jacks, one game port, MIDI interfasce,
        joystick port and   external wavetable connector.

ν   High-Resolution Onboard VGA Subsystem
    Onboard S3 ViRGE VGA subsystem offers resolutions of up to 1600x
1200 in 256 colors.
ν

This User Manual

This manual is designed to guide you and facilitate your use of the PTK-2110 mainboard. It contains a description of the design and features of the mainboard, and also includes useful information for changing the configuration of the board and the system it is installed in. The manual is divided into three chapters:

ν   Chapter 1 - Overview
ν   gives an overview of the mainboard and describes its major components
ν   and features.

ν   Chapter 2 - Installation Procedures
ν   gives instructions on how to set up the mainboard, including jumper
ν   settings and CPU installation guides.

ν   Chapter 3 - Award BIOS Setup
ν   briefly explains the mainboard's BIOS system setup in general and tells you
ν   how to run it and change the system configuration settings.

NOTE : The material in this manual is for information only and is subject to change without notice. We reserve the right to make changes in the product design without reservation and without notification to its users. We shall not be liable for technical or editorial omissions made herein; nor for incidental or consequential damages resulting from the furnishing, performance, or use of this material.

Something Interesting

This section provides useful information that you will need to know should you decide to modify or upgrade the configuration of the mainboard and the system it is installed in. If you do not have the confidence to upgrade the mainboard yourself, we advise that you consult a qualified service technician for assistance.

The BIOS Setup Utility

The BIOS (Basic Input Output System) is the basic firmware that instructs the computer how to operate. For the BIOS to work properly, there must be a record of the computer's hardware and configuration settings for it to refer to. This record is created using the Setup Utility, a program that is stored permanently in the BIOS ROM chip on the mainboard.

The system configuration record created by the Setup Utility is also stored on the mainboard, but not permanently. This section of the memory is stored in the NVRAM.

When you buy your computer, the system configuration record will already be set and may in some cases differ from the basic defaults. The first time you use your computer or when you need to re-configure your system, you should run the Setup Utility and write down the settings.

IRQ Functionality

As you read through this manual, you will see the term IRQ on a number of occasions. It is important for you to know what this term means, particularly if you intend to upgrade your system.

IRQ stands for Interrupt Request, the process in which an input or output device tells the processor to temporarily interrupt its current task and immediately process something from the source of the interrupt. When it has completed this, the processor returns to the task it was already processing. Devices that need an IRQ line to operate sometimes need to have exclusive use of that line.

A large number of add-on cards, such as sound cards and LAN cards, require the use of an IRQ line to function. Some no. of IRQs may already be in use by components in the system such as the keyboard and mouse. Add-on cards that need to use an IRQ draw from the unused group of IRQs. When installing a card that uses an IRQ, it will have a default IRQ setting which you might have to change if that IRQ is already in use and cannot be shared.

Both ISA and PCI add-on cards may need to use IRQs. System IRQs are available to add-on cards installed on the ISA bus first; the remaining ones can be used by cards installed on the PCI bus. There are two categories of ISA add-on cards: so-called Legacy ISA cards, which need to be configured manually and then installed in any available ISA slot; and Plug and Play (PnP) ISA cards, which are configured automatically by the system. As a result, when you install Legacy ISA cards, you have to carefully configure the system to ensure that the installed cards do not conflict with each other by having the same IRQ. With PnP cards, on the other hand, IRQs are assigned automatically from the ones available in the system. In the case of PCI add-on cards, the BIOS automatically assigns an IRQ card to the PCI slot the card is installed in.

DMA Channels of ISA Cards

Some Legacy and PnP ISA add-on cards may also need to use a Direct Memory Access (DMA) channel. DMA assignments for this mainboard are handled in the same way as the IRQ assignment process outlined above. For more information, please refer to Chapter 3 of this manual.

Enhanced IDE

This mainboard features an integrated Enhanced IDE controller that provides convenient, high-speed connections with up to four IDE devices, such as Hard Disk, CD-ROM and Tape Backup Drives. Enhanced IDE is an upgrade of the original IDE specification and provides increased capabilities and performance in a number of areas, including support for Hard Disk Drives of over 1.2GB and faster data transfer rates utilizing the PIO Mode 4 timing scheme.

With the integrated IDE controller you can connect up to four IDE peripheral devices to your system. All devices are categorized in the same way that IDE Hard Disks were configured in the past, with one device set as the Master device and the other as the Slave device. We recommend that Hard Disk Drives use the Primary IDE connector and that CD-ROM drives utilize the Secondary IDE connector for improved system performance.

Serial Infrared (SIR) Connections

This mainboard features support for highly-sophisticated SIR technology, which allows bi-directional and cordless data transactions with other IrDA compliant computers and peripheral devices using infrared as a medium. This transmission is carried out in either Full Duplex Mode or Half Duplex Mode. The former allows simultaneous data transmission and reception, while the latter disables the reception when transmission occurs.

The I/O chipset on this mainboard features a SIR interface that is fully compliant with the IrDA standard. An IrDA device can be installed via a 9-pin D-SUB connector in the rear panel of the computer which is linked by a cable to the onboard IrDA pinhead, as shown in the illustration below.
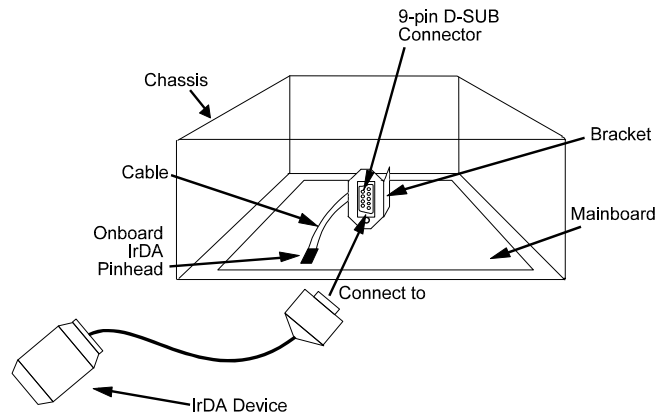
The serial port COM2 on this mainboard is designed to be an SIR compliant port. If you wish to install the SIR connection feature, you need to adjust the BIOS option for high-speed performance.

Highly Convenient Integrated I/O Connectors

This mainboard features has an integrated rear I/O panel that incorporates a full set of I/O ports to allow simple and convenient connections to a complete selection of external peripheral devices.

In addition to two 16550A UART compatible serial ports and one EPP/ECP capable parallel port, the panel features two USB connectors that provide high speed connection to the next generation of USB devices. PS/2 keyboard and PS/2 mouse connectors provide additional I/O connectivity.
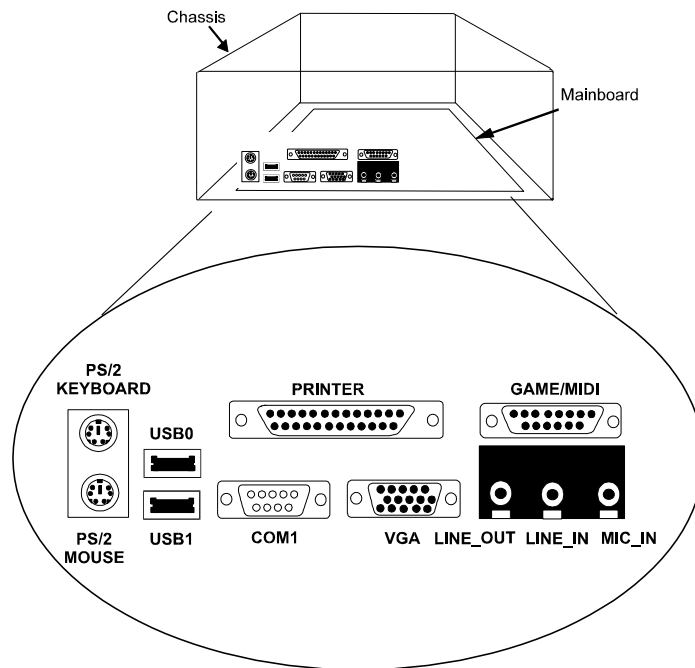
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Installation Procedures

The PTK-2110 has several user-adjustable jumpers on the board that allow you to configure your system to suit your requirements. This chapter contains information on the various jumper settings on your mainboard.

To set up your computer, you should follow these installation steps:

ν   Step 1 -
ν   Set system jumpers
ν
ν   Step 2 -
ν   Install RAM Modules

ν   Step 3 -
ν   Install the CPU

ν   Step 4 -
ν   Install expansion cards

ν   Step 5 -
ν   Connect cables and power supply
ν
ν   Step 6 -
ν   Set up BIOS feature (please read Chapter 3)

Mainboard Layout

RPW_CON
(Remote Power
Switch Conn.)

M3

SRAM

PS2_KBMS
(PS/2
keyboard
mouse conn.)

FAN
(CPU
Fan
Conn.)

POWER1
(Standard Power Conn.)

POWER2
(ATX Power Conn.)

CPU
Socket

M4

SRAM

USB
(Univeral
Serial Bus
Conn.)

COM2

Serial port

VR1
(CPU
Voltage
Select)

1 2
3 4
5 6
7 8
9 10

1 2
3 4
5 6
7 8

VR2
(CPU
Voltage
Select)

TXC

Serial port

COM1

Printer port

HARDWARE MPEG CONN.

FREQ1
FREQ2 (CPU/BUS Fruq. Ratio)

VGA port

VGA

LPT

VM1 VM2 VM3 VM4   VM6   VM8

Video DRAM Video DRAM Video DRAM Video DRAM   Video DRAM   Video DRAM

M1

LINE_OUT
(Audio
Output
Jack)

VM5   VM7

S3_86C325

Video DRAM   Video DRAM

BANK 1

SIMM4

SIMM3

LINE_IN (Audio Line In Jack)

GAME

Game port

SIMM2

BANK 0

SIMM1

MIC_IN
(Microphone
Jack)

CD_IN
(CD-ROM
Conn.)

PCI1

CFG1
(USB freq. select)

PCI2

CLK1
CLK2
(CPU Clock Select)

PIIX3

CT2508

PCI3

PCI4   PC87336

FLOPPY

(Wave Table
Conn.)

WAVE

(Flash ROM Select)
EP1
EP2
EP3

BIOS
(PLLC)
(option)

BIOS
(DIP)

PRIMARY

SECONDARY

(Infrared
Conn.)

IR

EP4 (Flash ROM Select)

ISA1

CPS
(Clear
Password)

IDE_LED
(IDE HDD
LED)

RPW_SW
(Remote
Power
Switch)

RST
(Hardware
Reset)

SPK
(Speaker)

VT82C416

ISA2

KB_LOCK
(Power LED &
Keyboard)

TB_LED
(Turbo
Speed
LED)

SP_SW
(Suspend
Mode Switch)

SP_LED
(Suspend
Mode LED)

ISA3

1). Set System Jumpers

Jumpers

Jumpers are used to select the operation modes for your system. Some jumpers on the board have three metal pins with each pin representing a different function. To "set" a jumper, a black cap containing metal contacts is placed over the jumper pin/s according to the required configuration. A jumper is said to be "shorted" when the black cap has been placed on one or two of its pins. The types of jumpers used in this manual are shown below:

Jumper Cap   **3-pin Jumper**   **2-pin Jumper**   **Jumper Block**
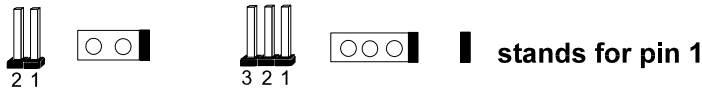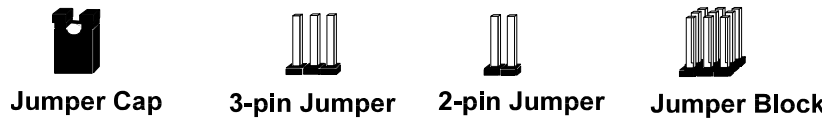
Jumpers are shown as above   ▌ **stands for pin 1**
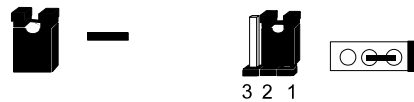
Jumper cap is shown as above

Jumpers in a Block   ▌ **stands for pin 1**

NOTE : Users are not encouraged to change the jumper settings not listed in this manual. Changing the jumper settings improperly may adversely affect system performance.

USB Frequecy Selection: CFG1

This jumper allows you to set the password configuration to "Enabled" or "Disabled". You may need to enable this jumper if you forget your password.

24 MHz

48 MHz
(Default)
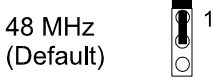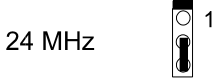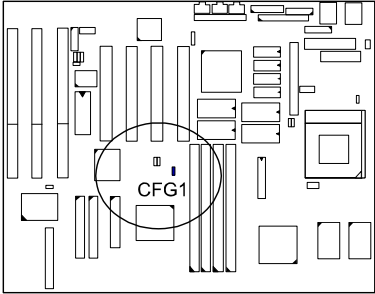
Clear Password: CPS

This jumper allows you to set the password configuration to "Enabled" or "Disabled". You may need to enable this jumper if you forget your password.

14
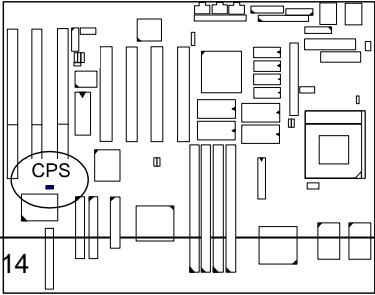
Enable

Disable
(Default)

Flash EPROM Type Selection: EP1, EP2, EP3, EP4

These four jumpers allow you to configure the Flash EPROM chip.
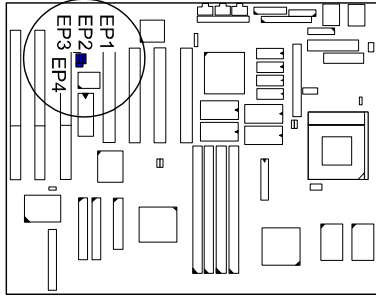
EPROM Size of 1MB :

Type	EP1	EP2	EP3	EP4
Intel 28F001BX-T	1	1	1	1
SST 29EE010 (Default)	1	1	1	1

EPROM Size of 2MB :

	EP1	EP2	EP3	EP4
SST	1	1	1	1
ATMIC	1	1	1	1
MIXC	1	1	1	1
AMD	1	1	1	1

2). Install RAM Modules

DRAM Memory

The working space of the computer is the Random Access Memory (RAM). The system cannot act upon data unless it is loaded into RAM. Occcasionally, the system must break apart data files because the entire file does not fit into the RAM area. Consequently, when the system needs data that is not in RAM, it must access the disk where the balance of the data is stored. Compared to the lightning speed access the system has to RAM, accessing a mechanical disk drive is a slow process. Therefore when more memory is added, total performance is increased.

The PTK-2110's RAM is comprised of four industry standard 72-pin Single In-line Memory Modules (SIMMs). The SIMM socket is able to support up to 128MB FPM (Fast Page Mode) and EDO (Extended Data Out) DRAM. The mainboard has two memory banks - Bank 0 and 1. Each bank has two SIMM sockets which can accept either a pair of 1, 4, 8, 16, 32, 64, 128MB SIMMs in each socket. Bank 0 and 1 may have different types of SIMMs (e.g. 4 or 16MB) in them; however, you must populate each memory bank with the same type of SIMM. For instance, Bank 0 may contain four 4MB SIMMs and Bank 1 may contain four 8MB SIMMs.

Before making DRAM upgrades you should verify the type and speed of the RAM currently installed by your dealer. Installing mixtures of RAM types other than those described in this manual will have unpredictable results.

RAM Modules Configuration

DRAM modules may be installed in a variety of configurations, as shown below:

(Unit : MB)

TOTAL MEMORY	SIMM 1 & 2 BANK0 (72-PIN X 2)	SIMM 3 & 4 BANK1 (72-PIN X 2)
8	4 & 4	
16	4 & 4	4 & 4
	8 & 8	
24	8 & 8	4 & 4
32	8 & 8	8 & 8
	16 & 16	
40	16 & 16	4 & 4
48	16 & 16	8 & 8
64	16 & 16	16 & 16
	32 & 32	
72	32 & 32	4 & 4
80	32 & 32	8 & 8
96	32 & 32	16 & 16
128	32 & 32	32 & 32
	64 & 64	
136	64 & 64	4 & 4
144	64 & 64	8 & 8
160	64 & 64	16 & 16
192	64 & 64	32 & 32
256	64 & 64	64 & 64
	128* & 128*	

(continued on next page)

| TOTAL MEMORY	SIMM 1 & 2 BANK0 (72-PIN X 2)	SIMM 3 & 4 BANK1 (72-PIN X 2)
264	128* & 128*	4 & 4
272	128* & 128*	8 & 8
288	128* & 128*	16 & 16
320	128* & 128*	32 & 32
384	128* & 128*	64 & 64
512	128* & 128*	128* & 128*

NOTE : * A SIMM of this size had not been tested when this manual was printed.

Install SIMMs

Complete the following procedures to install SIMMs:

CAUTION : Always turn the system power off before installing or removing any device; and see "Handling Precautions" at the start of this manual.

1. Locate the SIMM slots on the mainboard. (See figure below.)
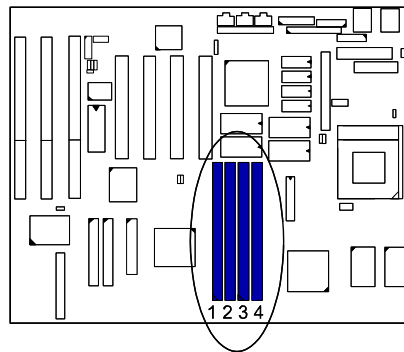
2. Carefully fit a SIMM at a 45 degree angle into each empty sockets to be populated. All the SIMMs must face the same direction.
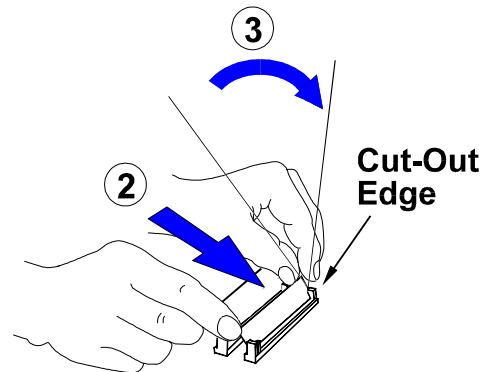
3. Swing each SIMM into its upright, locked position. When locking a SIMM in place, push on each end of the SIMM - do not push in the middle.

Remove SIMMs

To remove the SIMMs, pull the retaining latch on both ends of the socket and reverse the procedure above.

Cache Memory

The PTK-2110 comes with onboard 256/512KB synchronous 3V Pipeline Burst SRAMs.

Please note that for 256KB secondary cache, M3 and M4 should be mounted with 32Kx32 Pipeline Burst SRAM. (Please refer to your dealer for the 512KB cache upgrade and the appropriate SRAM type.)
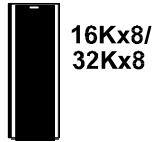
> **NOTE :** Use the correct chips for the amount of cache memory you want to add. Install the correct tag SRAM.

Onboard Cache RAM (256KB)
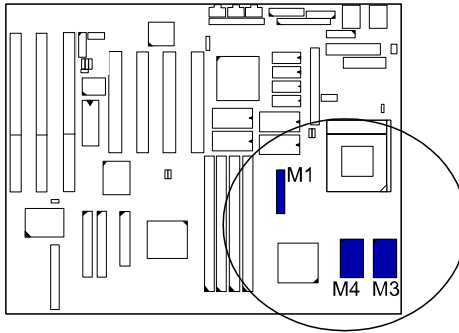
256KB

M1 (Tag)

16Kx8/ 32Kx8

M4   M3

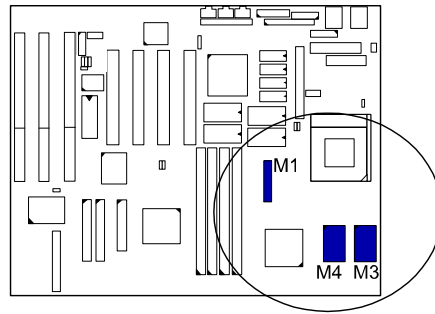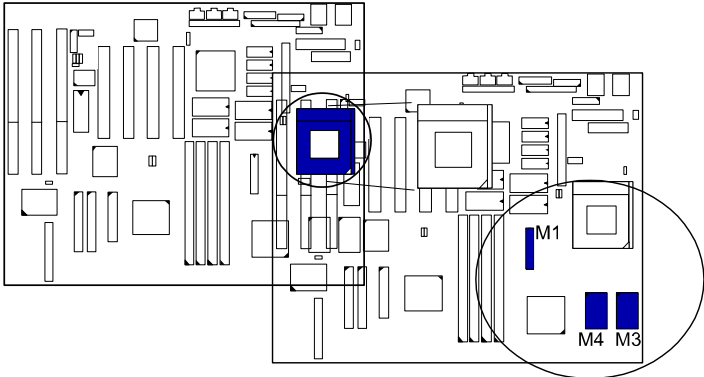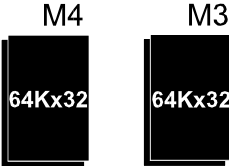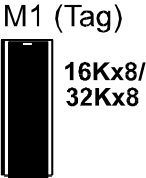**32Kx32**   **32Kx32**

Onboard Cache RAM (512KB)

512KB

3). Install the CPU

M1 (Tag)

**16Kx8/
32Kx8**

M4   M3

64Kx32   **64Kx32**
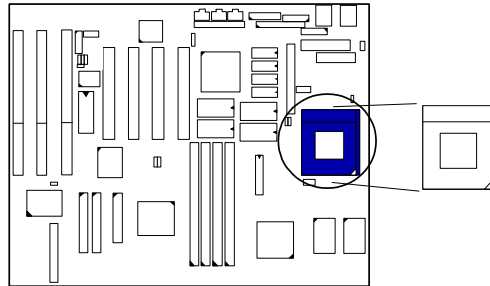
M1

M4 M3

The CPU module resides in the Zero Insertion Force (ZIF) socket on the mainboard.

```
CAUTION :
1.  Always turn the system power off before installing or removing any
      device.
2.  Always observe static electricity precautions.
    See "Handling Precautions" at the start of this manual.
3.  Inserting the CPU chip incorrectly may damage the chip.
```

To install the CPU, do the following:
1. Lift the lever on the side of the CPU socket.
2. Handle the chip by its edges and try not to touch any of the pins.
3. Place the CPU in the socket. The chip has a notch to correctly orientate the chip. Align the notch with pin one of the socket. Pin one locates around the triangular blank area. Do not force the chip. The CPU should slide easily into the socket.
4. Swing the lever to the down position to lock the CPU in place.
5. See the following sections for information on the CPU jumpers settings.

CPU External Clock (BUS) Frequency: CLK1, CLK2

The table below shows the jumper settings for the different CPU speed configurations.
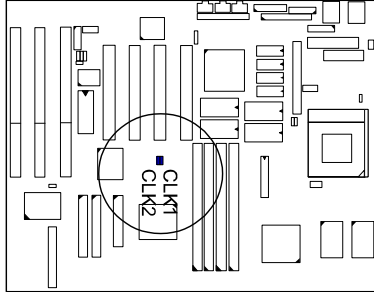
External (CPU/CLK)	CLK1	CLK2
66 MHz		
60 MHz		
55 MHz		
50 MHz		

CPU to Bus Frequency Ratio: FREQ1, FREQ2

These two jumpers are used in combination to decide the ratio of the internal frequency of the CPU to the bus clock.
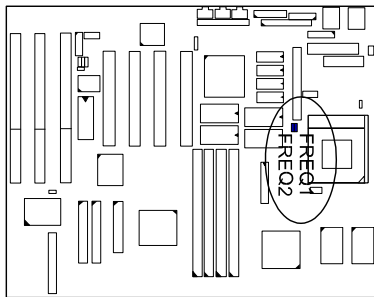
FREQ1	FREQ2	Ratio		
		Intel	Cyrix	AMD
		3 x	3 x	
		2.5 x	2.5 x	1.75 x
		2 x	2 x	2 x
		1.5 x	3.5 x	1.5 x

Intel Pentium CPUs

Frequency

CPU Speed	External (CPU/CLK)	CLK1	CLK2	CPU Clock Rate		
				Internal	FREQ1	FREQ2
200 MHz	66 MHz			3 x		
166 MHz	66 MHz			2.5 x		
150 MHz	60 MHz			2.5 x		
133 MHz	66 MHz			2 x		
120 MHz	60 MHz			2 x		
100 MHz	66 MHz			1 5 x		
90 MHz	60 MHz			1.5 x		
75 MHz	50 MHz			1.5 x		
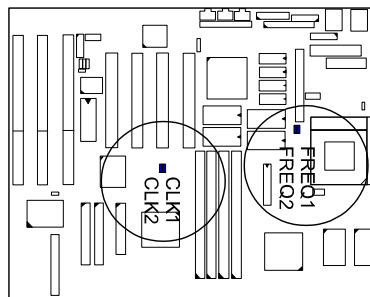
Voltage

AMD-K5 CPUs

VR1   VR2

Model Name	CPU Speed	External (CPU/CLK)	CLK1	CLK2	Internal	FREQ1	FREQ2	Remark
K5-PR200 *	133 MHz	66 MHz			2 x			Newly released models
K5-PR166 *	116 MHz	66 MHz			1.75 x			
K5-PR150	105 MHz	60 MHz			1.75 x			
K5-PR133	100 MHz	66 MHz			1.5 x			Currently available models
K5-PR120	90 MHz	60 MHz			1.5 x			
K5-PR100	100 MHz	66 MHz			1.5 x			
K5-PR90	90 MHz	60 MHz			1.5 x			
K5-PR75	75 MHz	50 MHz			1.5 x			

Intel Pentium CPU Bottom Side Marking

CPU Clock Rate

Core : 3.4V-3.6V
IO   : Same
P54C VRE

Core : 3.3V
IO   : Same
P54C STD

XXXXXXXXXXX
** XXXXXXXXXX

BP80502-SSS
** SXXXX/**RSS
XXX/

R (Identifier for Voltage Range) :
V for VRE Voltage Range
or
S for Standard Voltage Range
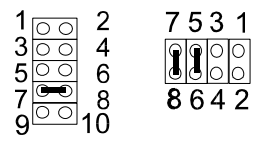
Core : 2.8V
IO   : 3.3V
P55C
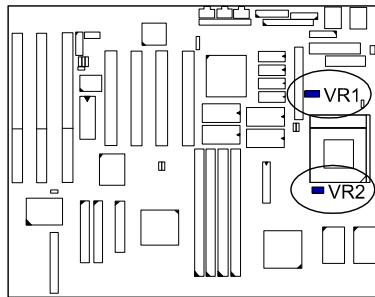
Frequency

NOTE :
* This CPU had not been tested when this manual was printed.
** For AMD CPUs only, jumper FREQ1/FREQ2 can be set for 1.75x bus ratio.

Voltage

VR1   VR2

```
1 [==] 2      7 5 3 1
3 [o o] 4     [o o][||][||]
5 [o o] 6     [o o][||][||]
7 [o o] 8      8 6 4 2
9 [o o] 10
```
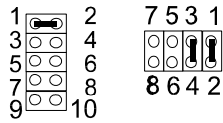
Core : 3.4V-3.6V
IO   : Same
AMD-K5 - B

```
1 [o o] 2      7 5 3 1
3 [==] 4      [o o][||][||]
5 [o o] 6     [o o][||][||]
7 [o o] 8      8 6 4 2
9 [o o] 10
```

Core : 3.3V
IO   : Same
AMD-K5 - C, F

```
1 [o o] 2      7 5 3 1
3 [o o] 4     [||][||][o o]
5 [==] 6     [||][||][o o]
7 [o o] 8      8 6 4 2
9 [o o] 10
```

Core : 2.9V
IO   : 3.3V
AMD-K5 - H

```
1 [o o] 2      7 5 3 1
3 [o o] 4     [||][||][o o]
5 [o o] 6     [||][||][o o]
7 [==] 8      8 6 4 2
9 [o o] 10
```

Core : 2.8V
IO   : 3.3V
AMD-K5 - J

```
1 [o o] 2      7 5 3 1
3 [o o] 4     [||][||][o o]
5 [o o] 6     [||][||][o o]
7 [==] 8      8 6 4 2
9 [o o] 10
```
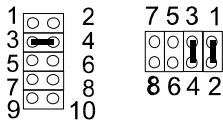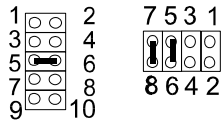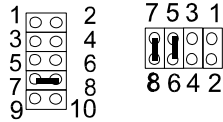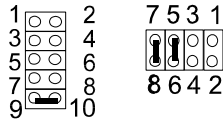
Core : 2.5V
IO   : 3.3V
AMD-K5 - K

AMD-K5 CPU
Top Side Marking

AMD-K5
AMD-K5-PRXXXA**V**Q
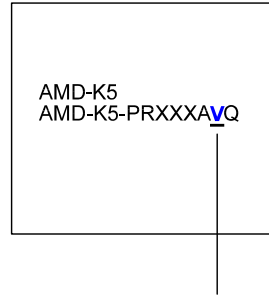
V (IdentIfIer for OperatIon Voltage) :

B
C
F   Please refer to
H   the left-hand-side table
J
K

Cyrix 6x86 CPUs

Frequency

Model Name	CPU Speed	External (CPU/CLK)	CLK1	CLK2	CPU Clock Rate		
					Internal	FREQ1	FREQ2
M2*	200 MHz	66 MHz			3.5 x**		
M2*	180 MHz	60 MHz			3 x		
M2*	166 MHz	66 MHz			2.5 x		
M2*	150 MHz	60 MHz			2.5 x		
6x86-P166+ 6x86L-P166+	133 MHz	66 MHz			2 x		
6x86-P150+ 6x86L-P150+	120 MHz	60 MHz			2 x		
6x86-P133+ 6x86L-P133+	110 MHz	55 MHz			2 x		
6x86-P120+ 6x86L-P120+	100 MHz	50 MHz			2 x		

NOTE :
* This CPU had not been tested when this manual was printed.
** For Cyrix/IBM CPUs only, jumper FREQ1/FREQ2 can be set for 3.5x bus ratio.

Voltage

VR1   VR2

```
1 ☐☐ 2      7 5 3 1
3 ○○ 4      ○○▮▮
5 ○○ 6      ○○▮▮
7 ○○ 8      8 6 4 2
9 ○○ 10
```

Core : 3.4V-3.6V
IO   : Same
Cryix 6x86-028

```
1 ○○ 2      7 5 3 1
3 ☐☐ 4      ○○▮▮
5 ○○ 6      ○○▮▮
7 ○○ 8      8 6 4 2
9 ○○ 10
```

Core : 3.3 V
IO   : Same
Cyrix 6x86-016

```
1 ○○ 2      7 5 3 1
3 ○○ 4      ▮▮○○
5 ○○ 6      ▮▮○○
7 ○○ 8      8 6 4 2
9 ☐☐ 10
```
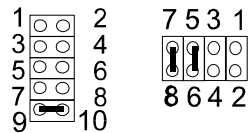
Core : 2.8 V
IO   : 3.3 V
Cyrix 6x86L *

Cyrix 6x86 CPU
Top Side Marking

```
┌─────────────────────┐
│                     │
│                     │
│ 6x86-P166⁺GP        │
│ 133 MHz             │
│ 3.52V  (028)        │
│         │           │
│         │           │
└─────────│───────────┘
          │
          │
    (016)  : 3.3V
    (028)  : 3.52V
```

6x86-P166$^+$GP
133 MHz
3.52V **(028)**
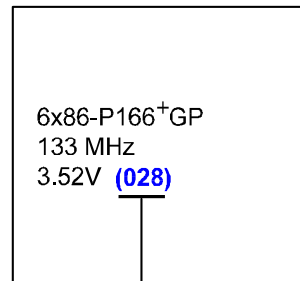
(016) : 3.3V
(028) : 3.52V

NOTE : * This CPU had not been tested when this manual was printed.

IBM 6x86 CPUs

Frequency

Model Name	CPU Speed	External (CPU/CLK)	CLK1	CLK2	CPU Clock Rate		
					Internal	FREQ1	FREQ2
M2*	200 MHz	66 MHz			3.5 x**		
M2*	180 MHz	60 MHz			3 x		
M2*	166 MHz	66 MHz			2.5 x		
M2*	150 MHz	60 MHz			2.5 x		
6x86-P166+ 6x86L-P166+	133 MHz	66 MHz			2 x		
6x86-P150+ 6x86L-P150+	120 MHz	60 MHz			2 x		
6x86-P133+ 6x86L-P133+	110 MHz	55 MHz			2 x		
6x86-P120+ 6x86L-P120+	100 MHz	50 MHz			2 x		

NOTE :
* This CPU had not been tested when this manual was printed.
** For Cyrix/IBM CPUs only, jumper FREQ1/FREQ2 can be set for 3.5x bus ratio.

Voltage

VR1   VR2

Core : 3.4V-3.6V
IO   : Same
IBM 6x86-028
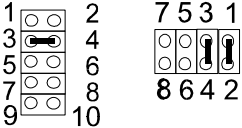
Core : 3.3V
IO   : Same
IBM 6x86-016
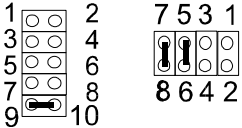
Core : 2.8V
IO   : 3.3V
IBM 6x86L*

IBM 6x86 CPU
Top Side Marking

6x86-P166$^+$GP
133 MHz
3.52V **(028)**
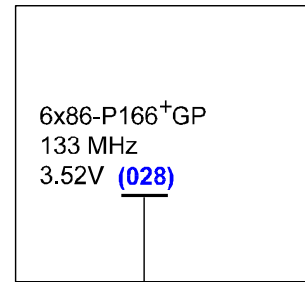
(016) : 3.3V

(028) : 3.52V

NOTE : * This CPU had not been tested when this manual was printed.
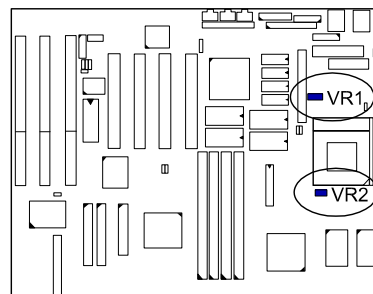
Installation of Cyrix (or IBM) 6x86 CPU Fan

CAUTION : When you install a Cyrix (or IBM) 6x86 CPU fan, please pay attention to the direction of the air flow. Make sure that it lower the temperature of the regulator. Otherwise, the system may overheat.

We recommended that you use one of the following two CPU fans for the Cyrix (or IBM) 6x86 CPU when install the fan on the mainboard.

1). Supplier : BIRCHTECK, Taiwan (Phone : 886-2-7935677)
    Model Number - BEC6x86B1.
2). Supplier : Cyrix (or IBM). The fan comes with the Cyrix (or IBM) 6x86
    CPU purchase. For the stable system performance, make sure
    that the air flow blow toward the regulator the temperature
    of the regulator.
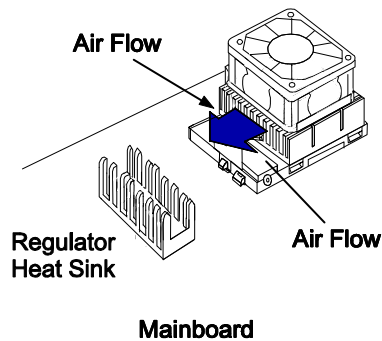
4). Install Expansion Cards

Your PTK-2110 features three 16-bit ISA Bus and four 32-bit PCI Bus expansion slots.
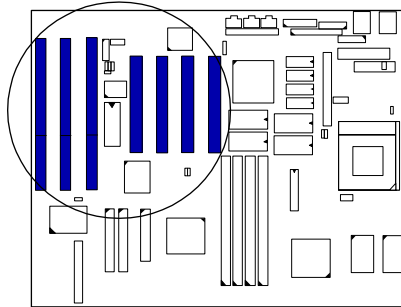
This section describes how to connect an expansion card to one of your system's expansion slots. Expansion cards are printed circuit boards that, when connected to the mainboard, increase the capabilities of your system. For example, expansion cards can provide video and sound capabilities.

CAUTION :
1. Always turn the system power off before installing or removing any device.
2. Always observe static electricity precautions.
     See "Handling Precautions" at the start of this manual.

To install an expansion card, do the following:
1. Remove the chassis cover and select an empty expansion slot.
2. Remove the corresponding slot cover from the chassis.
     Unscrew the mounting screw that secures the slot cover and pull the slot

cover out from the chassis. Keep the slot cover mounting screw nearby.

3. Holding the edge of the peripheral card, carefully align the edge connector with the expansion slot. (See figure below.)
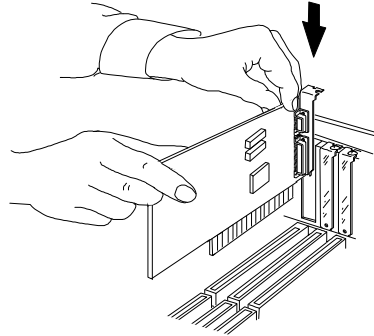
4. Push the card firmly into the slot. Push down on one end of the expansion card, then the other. Use this "rocking" motion until the add-in card is firmly seated inside the slot.
5. Secure the board with the mounting screw removed in Step 2. Make sure that the card has been placed evenly and completely into the expansion slot.

5). Connect Cables and Power Supply

Audio-In Connector: CD-IN

This 4-pin male connector is linked to the AUDIO-OUT port of your CD-ROM by a cable which comes with your CD-ROM drive. Please read the CD-ROM manual for detailed installation instructions.
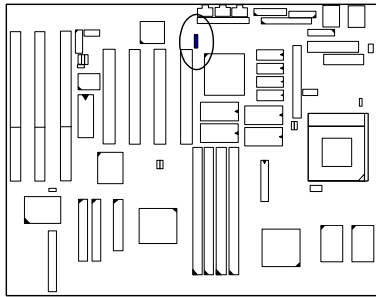
NOTE : The Right (Left) signal line of the CD-ROM drive must connect to the right pin "R" (left pin "L") of the CD-IN connector.

Serial Port Connector: COM1 and COM2

The COM1, a 9-pin D-Type connector, allows you to connect with the devices that take serial ports, such as a serial mouse or a modem. The COM2 port, a 10-pin male connector, on the mainboard can also be used as another IR Port. Usually, your serial mouse is attached to COM1. Your modem is linked to COM2. When you do not use the modem, you can set the BIOS to let COM2 be an IR port to save a dedicated SIR port.

CPU Fan Connector: FAN
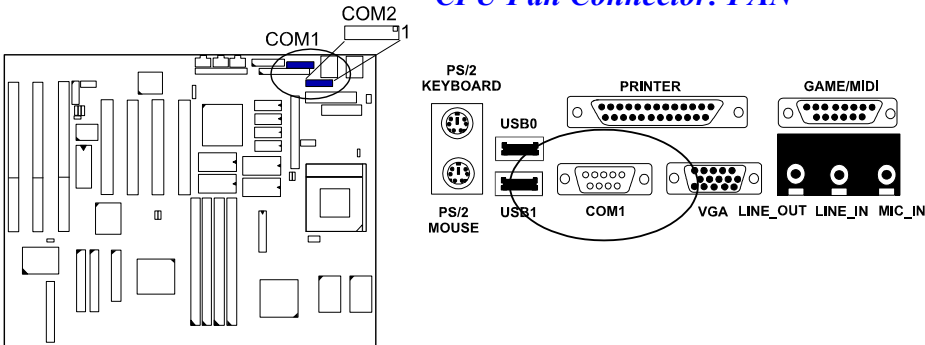
This connector is linked to the CPU fan.
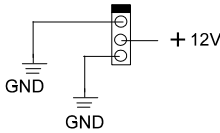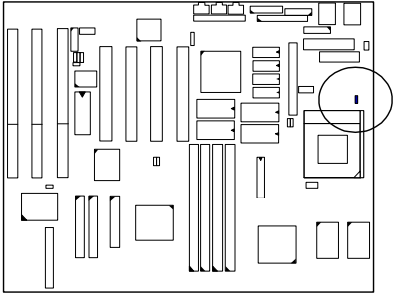
Floppy Diskette Drive Connector: FLOPPY

This 34-pin block connector connects to your floppy diskette drive (FDD) using the cable that is provided with this mainboard.
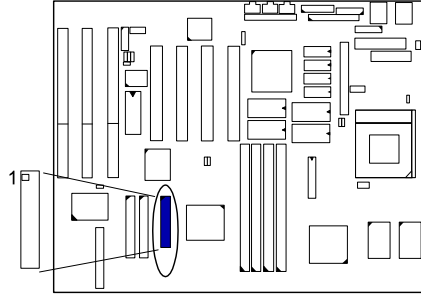
Front Panel Block Connector: F_PNL

This block connector concludes : PW_LED, KB_LOCK, TB_LED, SP_SW, SPK, SP_LED, IDE_LED, RPW_SW, and RST connectors.
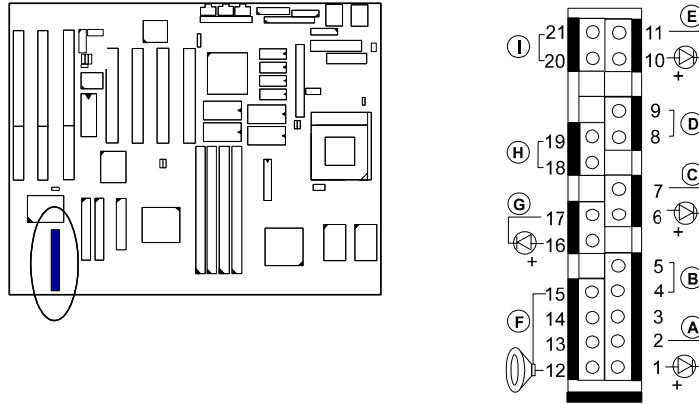
Item	Connector	Pin Type	Feature
A	PW_LED	2-pin male	indicates the system power status
B	KB_LOCK	2-pin male	allows the keyboard to access the system
C	TB_LED	2-pin male	indicates the system speed is in normal or turbo speed
D	SP_SW	2-pin male	Suspend Mode switch
E	SP_LED	2-pin male	indicates the system into Suspend Mode when LED lit
F	SPK	4-pin male	connects to speaker
G	IDE_LED	2-pin male	indicates the IDE HDD I/O access LED lit
H	RPW_SW	2-pin male	Remote Power switch
I	RST	2-pin male	allows you to reset the system

Game/MIDI Connector: GAME

The game port is a standard MIDI break out port which readily accepts a joystick, keyboard or synthesizer. It can support any analog joystick with a 15-pin D-sub female connector, and all standard PC joystick-compatible software. In addition, this port also functions as a MIDI port.
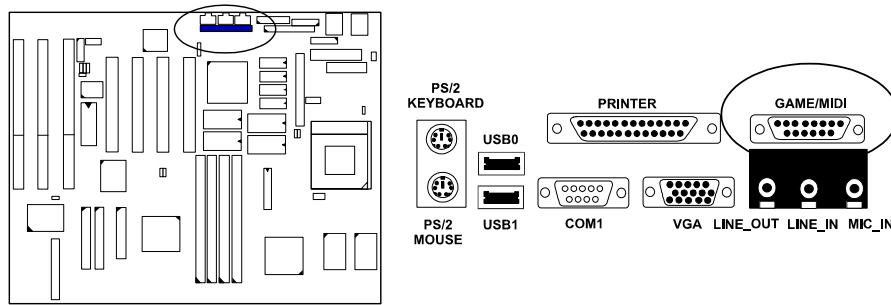
Infrared Connector: IR

This 10-pin male connector is used for connecting to the infrared (SIR) port and allows transmission of data to another system which also supports the SIR feature.
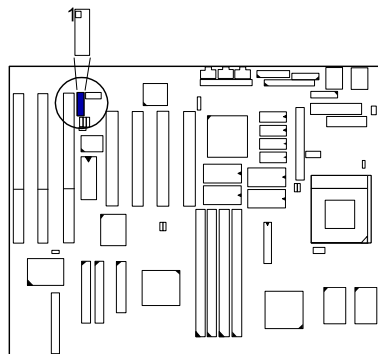
Hardware MPEG Card Connector: MPEG

An optional 1stGrafx-CP3® MPEG Card can be installed onto an available PCI slot on the mainboard to improve the visual quality. Please refer to the MPEG card user manual for detail installing instructions.

MPEG Flat Cable
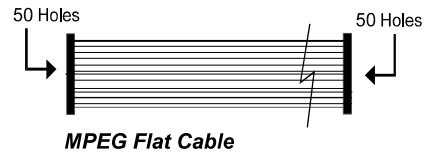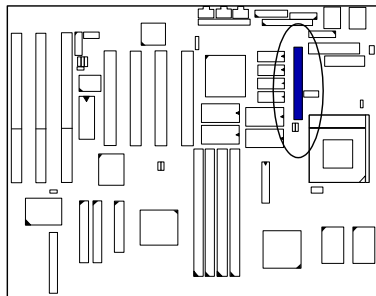
Standard Power Connector: POWER1
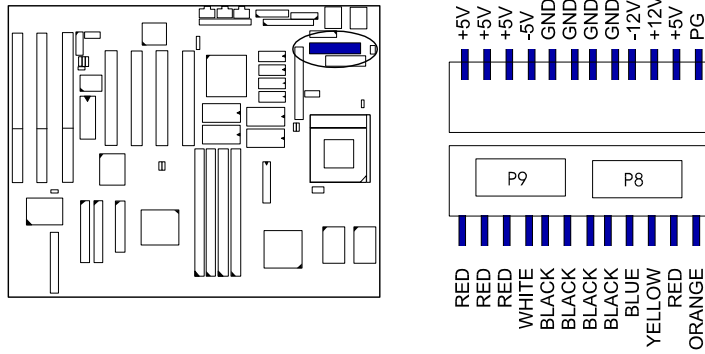
This 12-pin block connector is used for connecting to the standard 5V power supply. In the picture below, notice that, in most cases, there are two marks "P8" and "P9" on the surface of the connector. You have to insert the "P8"plug into the "P8" section of the connector, and so forth for "P9". The two black wires must be in the middle.

ATX Power Connector: POWER2
This 20-pin male block connector is connected to the ATX power supply.
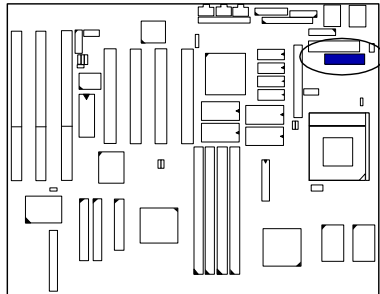
IDE HDD Device Connector: PRIMARY and SECONDARY

These two 40-pin block connectors are used for your IDE hard disks. It you have one IDE hard disk, connect it to the PRIMARY connector using the IDE HDD flat cable provided with the mainboard. The BIOS auto detection sets it to be a "Primary Master" disk. If you want to install another IDE hard disk or CD-ROM, please use the SECONDARY connector. If two hard disks are connected to the PRIMARY connector using the same cable, one of them is the master drive, the other one is the slave drive. You may need to set jumpers for the slave drive; please refer to the HDD manual for details.
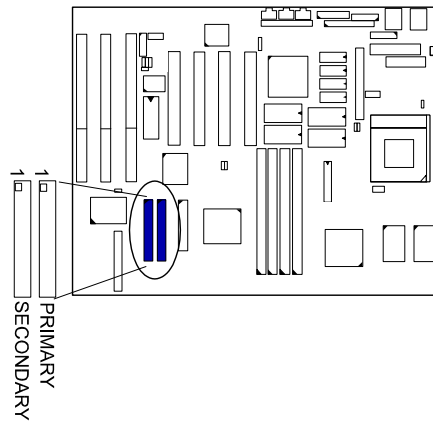
Printer Connector: PRINTER

This 25-pin D-Sub printer port is attached to your printer via a cable. When inserting the cable, please be sure that the red line is always on the same side as pin 1 of this connector.
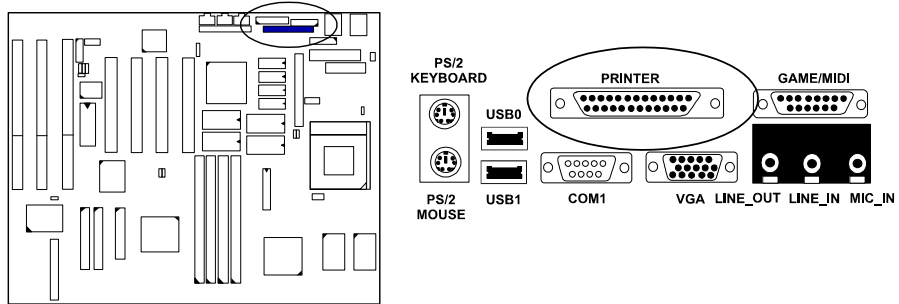
PS/2 Keyboard Connector: PS2_KB

This 6-pin female connector is used for your PS/2 keyboard.
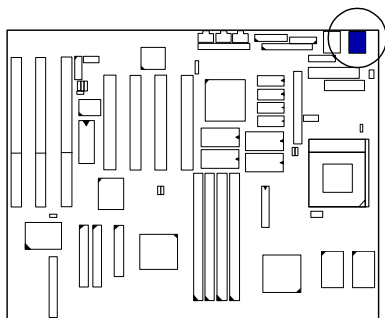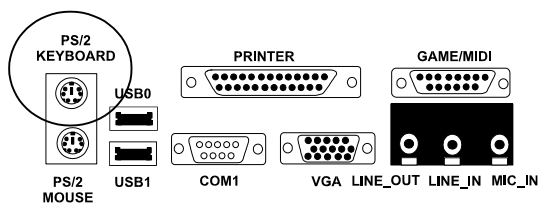
PS/2 Mouse Connector: PS2_MS

This 6-pin female connector is used for your PS/2 mouse.
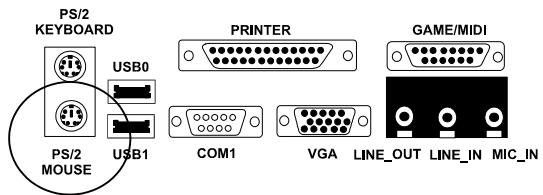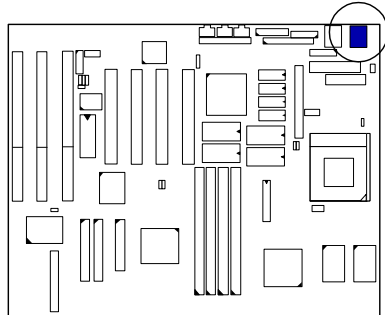
Universal Serial Bus Connectors: USB0 and USB1

These two connectors are linked with a USB hub or other devices that have USB features.
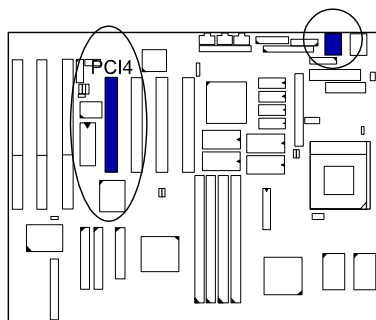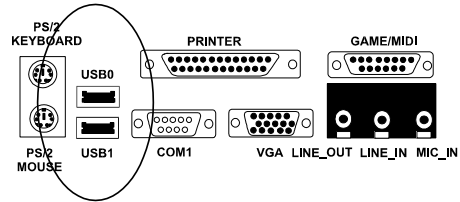
Note : If the USB feature is enabled, the PCI4 Slot will be utilized by the USB function; in such a case, no add-on card is allowed at PCI4 Slot, since PCI4 Slot is dedicated to the USB function.

VGA Connector: VGA

VGA Subsystem

The PTK-2110 has a built-in S3 ViRGE™ VGA controller that supports resolutions of up to 1600x1200 in 256 colors. Related data about resolution is listed on the next page. To upgrade the onboard video DRAM to 4 MB, insert four 256K x 16Bit - 5 (SOJ-type) DRAMs in the VM5, VM6, VM7, and VM8 sockets.
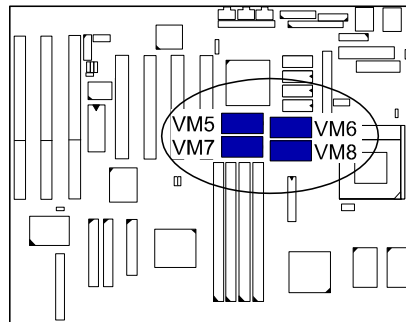
The instructions in this chapter assume that you understand elementary concepts of MS-DOS. Before running any utilities or installing any drivers, an understanding of the MS-DOS directory structure and operations is needed to perform functions like formatting of diskettes, copying and deletion of files, and so on.

The PTK-2110 supplies drivers for DOS and Windows-based programs. These drivers will help you utilize and enhance your system's video subsystem. The driver diskette contains a READ.ME file that is accessible through any word processor using the ASCII or non-document mode.

NOTE :
1. You should have made backup copies of the original diskettes and should be using the backup ones.
2. Be sure to use the correct chips for the amount of DRAM you want to add. Always observe static electricity precautions.
3. Please refer to the READ.ME file on the driver diskette for installation instructions and news of more recent updates. Software drivers for other Operating Systems may be available in the future or upon request.

S3 ViRGE Graphics

The mainboard is available with S3 ViRGE SVGA graphics controller. The supported video resolutions are listed below.

Resolution	2MB DRAM	4MB DRAM	Refresh Rate (Hz)
640x480x4	X	X	60
640x480x8	X	X	60, 70, 72, 75, 85

640x480x16	X	X	60, 72, 75, 85
640x480x24	X	X	60, 72, 75, 85
800x600x4	X	X	60, 72, 75, 85
800x600x8	X	X	60, 72, 75, 85
800x600x16	X	X	60, 72, 75, 85
800x600x24	X	X	60, 72, 75, 85
1024x768x4	X	X	43(L), 60, 70, 75, 85
1024x768x8	X	X	43(L), 60, 70, 75, 85
1024x768x16	X	X	43(L), 60, 70, 75, 85
1024x768x24	X*	X*	43(L)
1152x864x8	X	X	60
1280x1024x4	X*	X*	43(IL), 60
1280x1024x8	X	X	43(IL), 60, 75
1280x1024x16(IL)	X	X	43(L)
1600x1200x4	X	X	50(L)
1600x1200x8(IL)	X	X	43(L)

NOTE :
1. Color Bits - 4 = 16 colors; 8 = 256 colors; 16 = 64K colors; 32 = 16.7 millions colors.
2. IL = Interlaced
3. * Non-accelerated mode

The Connector

This 15 D-Sub female connector is linked to the VGA monitor via a cable.
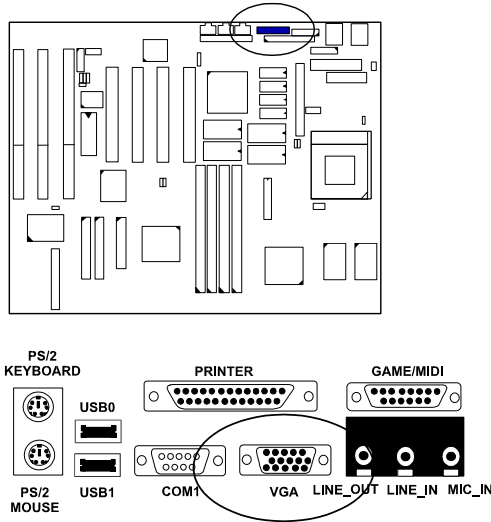
Wave Table Connector: WAVE

The onboard audio system controller, CT2508™, and FM synthesizer together with an optional wave table card CT1920™ contribute to even better audio effect. The wave table card is installed onto an available ISA slot. Use a ribbon cable to link J1 Connector on the wave table card with WAVE (8-pin male) connector on the mainboard.

CT1920 Wave Table Card

J1

61

8 Holes   8 Holes

Wave Table Flat Cable
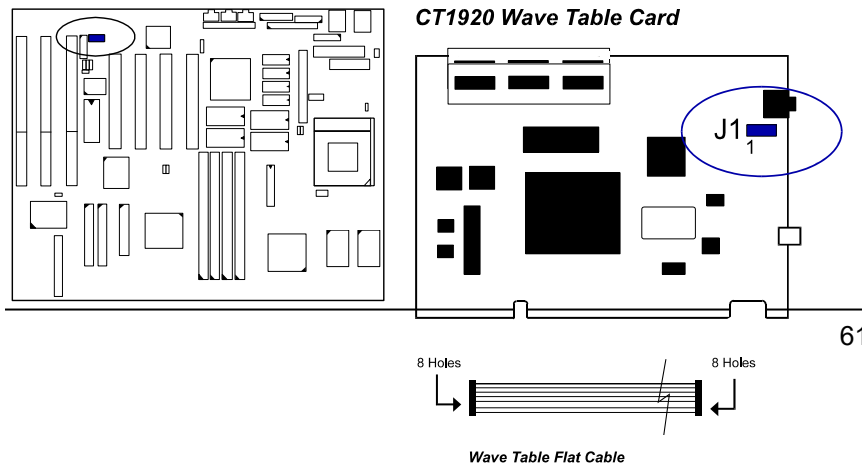
Audio I/O Jacks: MIC_IN, LINE_IN, LINE_OUT

Three 1/8" mini-jack external connectors MIC_IN, LINE_IN, LINE_OUT provide the interfaces to consumer electronic equipment. When setting up the audio software environment, please refer to your audio subsystem user manual for details.

63
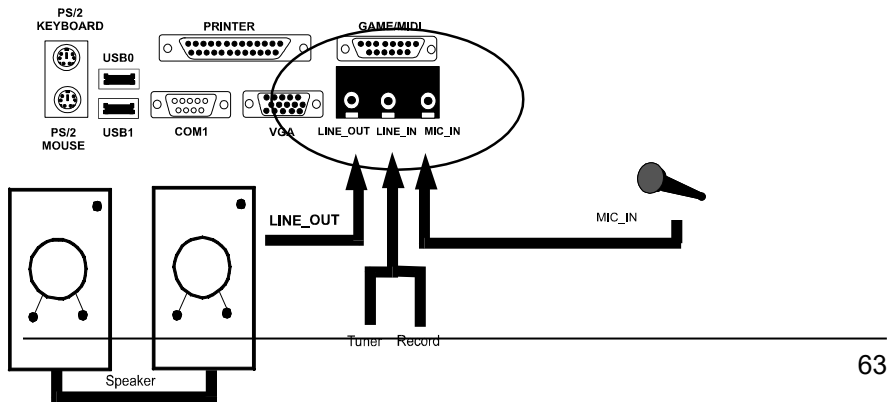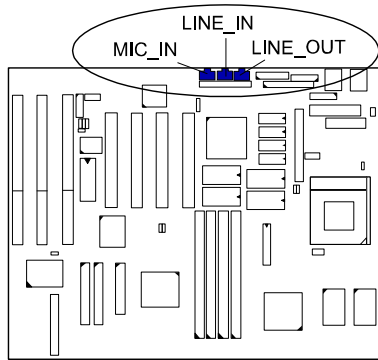
Award BIOS Setup

The mainboard comes with the Award BIOS chip that contains the ROM Setup information of your system. This chip serves as an interface between the processor and the rest of the mainboard's components. This chapter explains the information contained in the Setup program and tells you how to modify the settings according to your system configuration.

CMOS Setup Utility

```
                    ROM PCI/ISA BIOS  (2A59GF09)
                         CMOS SETUP UTILITY
                       AWARD SOFTWARE,   INC.
  ┌──────────────────────────────────┬──────────────────────────────────┐
  │  STANDARD CMOS SETUP              │  INTEGRATED PERIPHERALS           │
  │  BIOS FEATURES SETUP              │  SUPERVISOR PASSWORD              │
  │  CHIPSET FEATURES SETUP           │  USER PASSWORD                    │
  │  POWER MANAGEMENT SETUP           │  IDE HDD AUTO DETECTION           │
  │  PNP/PCI CONFIGURATION            │  SAVE & EXIT SETUP                │
  │  LOAD BIOS DEFAULTS               │  EXIT WITHOUT SAVING              │
  │  LOAD SETUP DEFAULTS              │                                  │
  ├──────────────────────────────────┼──────────────────────────────────┤
  │  ESC : Quit                       │  ↑ ↓ → ←   : Select Item         │
  │  F10 : Save & Exit Setup          │  (Shift) F2  : Change Color       │
  ├──────────────────────────────────┴──────────────────────────────────┤
  │              Time, Date, Hard Disk Type...                           │
  └─────────────────────────────────────────────────────────────────────┘
```

A Setup program, built into the system BIOS, is stored in the CMOS RAM. This Setup utility program allows changes to the mainboard configuration settings. It is executed when the user changes system configuration; user changes system backup battery; or the system detects a configuration error and asks the user to run the Setup program. Use the arrow keys to select and press Enter to run the selected program.

Standard CMOS Setup

```
                   ROM PCI/ISA BIOS (2A59FF0B)
                       STANDARD CMOS SETUP
                       AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Wed, May 8 1996
Time (hh:mm:ss) : 15 : 38 : 55

HARD DISKS        TYPE  SIZE  CYLS  HEAD PRECOMP  LANDZ  SECTOR  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.                    Base Memory:    640K
Drive B : None                          Extended Memory:  7168K
                                           Other Memory:    384K
Video   : EGA/VGA                        _____
Halt On : All Errors
                                            Total Memory:  8192K

ESC : Quit            ↑ ↓ → ← : Select Item        PU/PD/+/- : Modify
F1   : Help           (Shift)F2 : Change Color
```

The Standard CMOS Setup screen is displayed above. Each item may have one or more option settings. The system BIOS automatically detects memory size, thus no changes are necessary. Use the arrow keys to highlight the item and then use the PgUp or PgDn keys to select the value you want in each item.

Hard Disk Configurations

TYPE:
Select from 1 to 45 to fill remaining fields with predefined values of disk drives. Select User to fill the remaining fields. Select Auto to detect the HDD type automatically.

SIZE:
The hard disk size. The unit is Mega Bytes.

CYLS:
The cylinder number of the hard disk.

HEAD:
The read/write head number of hard disk. The range is from 1 to 16.

PRECOMP:
The cylinder number at which the disk drive changes the write timing.

LANDZ:
The cylinder number that the disk drive heads (read/write) are seated when the disk drive is parked.

SECTOR:
The sector number of each track defined on the hard disk.

MODE:
Select Auto to detect the mode type automatically. If your hard disk supports the LBA mode, select LBA or Large. However, if your hard disk cylinder is more than 1024 and does not support the LBA function, you have to set at Large.
Select Normal if your hard disk supporting cylinders is below 1024.

Software Turbo Speed

The BIOS supports Software Turbo Speed feature. Instead of pressing the Turbo Speed Button on the front panel, simply press the **Alt, Ctrl, and +** keys at the same time to enable the Turbo Speed feature; and press the **Alt, Ctrl, and -** keys at the same time to disable the feature.

BIOS Features Setup

```
                    ROM PCI/ISA BIOS (2A59FF0B)
                         BIOS FEATURES SETUP
                         AWARD SOFTWARE, INC.

Virus Warning              : Disabled      Video BIOS Shadow       : Enabled
CPU Internal Cache         : Enabled       C8000 - CBFFF Shadow : Disabled
External Cache             : Enabled       CC000 - CFFFF Shadow : Disabled
Quick Power On Self Test   : Disabled      D0000 - D3FFF Shadow : Disabled
Boot Sequence              : A, C          D4000 - D7FFF Shadow : Disabled
Swap Floppy Drive          : Disabled      D8000 - DBFFF Shadow : Disabled
Boot Up Floppy Seek        : Enabled       DC000 - DFFFF Shadow : Disabled
Boot Up NumLock Status     : On
Boot System Speed          : High
Gate A20 Option            : Fast
Typematic Rate Setting     : Disabled
Typematic Rate (Chars/Sec) : 6
Typematic Delay (Msec)     : 250           ESC : Quit      ↑ ↓ → ←   : Select Item
Security Option            : Setup         F1   : Help      PU/PD/+/- : Modify
PS/2 mouse function control : Enabled      F5   : Old Values (Shift) F2 : Color
                                           F6   : Load BIOS Defaults
OS Select For DRAM > 64MB  : Non-OS2       F7   : Load Setup Defaults
```

Virus Warning

When enabled, assigns the BIOS to monitor the master boot sector and the DOS boot sector of the first hard disk drive.
The options are: Enabled, Disabled (Default).

CPU Internal Cache

When enabled, improves the system performance. Disable this item when testing or troubleshooting.
The options are: Enabled (Default), Disabled.

External Cache

When enabled, supports an optional cache SRAM.
The options are: Enabled (Default), Disabled.

Quick Power On Self Test

When enabled, allows the BIOS to bypass the extensive memory test.
The options are: Enabled, Disabled (Default).

Boot Sequence

Allows the system BIOS to first try to boot the operating system from the selected disk drive.
The options are: A, C (Default); C, A; C, CDROM, A; CDROM, C, A.

Swap Floppy Drive

Allows you to switch the order in which the operating system accesses the floppy drives during boot up.

The options are: Enabled, Disabled (Default).

Boot Up Floppy Seek

When enabled, assigns the BIOS to perform floppy diskette drive tests by issuing the time-consuming seek commands.

The options are: Enabled (Default), Disabled.

Boot Up Numlock Status

When set to On, allows the BIOS to automatically enable the Num Lock Function when the system boots up.

The options are: On (Default), Off.

Boot Up System Speed

Allows you to adjust the system speed when the system boots up.

The options are: High (Default), Low.

Gate A20 Option

When set at Fast, allows a faster access response under Protected mode.

The options are: Fast (Default), Normal.

Typematic Rate Setting

The term typematic means that when a keyboard key is held down, the character is repeatedly entered until the key is released. When this item is enabled, you may change the typematic repeat rate.

The options are: Disabled (Default), Enabled.

Typematic Rate (Chars/Sec)

Sets the rate of a character repeat when the key is held down.

The options are: 6 (Default), 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (Msec)

Sets the delay time before a character is repeated.

The options are: 250 (Default), 500, 750, 1000 millisecond.

Security Option

Allows you to set the security level of the system.

The options are: Setup (Default), System.

PS/2 Mouse Function Control

When enabled, allows you to release IRQ12 for using the PS/2 mouse.
The options are: Enabled, Disabled (Default).

OS Select For DRAM 64MB

If your operating system (OS) is OS2, MS Windows NT, or MS Windows 95, select the option OS2. Otherwise, stay with the default setting Non-OS2.
The options are: Non-OS2 (Default), OS2.

Video BIOS Shadow

Allows the BIOS to copy the video ROM code of the add-on video card to the system memory for faster access.
The options are: Enabled (Default), Disabled.

C8000-CBFFF to DC000-DFFFF Shadow

Allows the BIOS to copy the BIOS ROM code of the add-on card to system memory for faster access. It may improve the performance of the add-on card.

Some add-on cards will not function properly if its BIOS ROM code is shadowed. To use these options correctly, you need to know the memory address range used by the BIOS ROM of each add-on card.
The options are: Enabled, Disabled (Default).

Chipset Features Setup

```
              ROM PCI/ISA BIOS(2A59FF0B)
                  CMOS SETUP UTILITY
                CHIPSET FEATURES SETUP

Auto Configuration          : Enabled    DRAM ECC/PARITY Select : Parity
DRAM Timing                 : 60 ns      Memory Parity/ECC Check : Auto
DRAM Leadoff Timing         : 6:5/3:4    Single Bit Error Report  : Enabled
Turbo Read Pipling          : Enabled    L2 Cache Caheable Size   : 64MB
Fast RAS# To CAS# Delay     : 2          Delayed Transaction      : Disabled
DRAM Read Burst (EDO/FPM)   : x222/x333
DRAM Write Burst Timing     : x222
DRAM Speculative Leadoff    : Enabled
Turn-Around Insertion       : Disabled

System BIOS Cacheable       : Enabled
Video BIOS Cacheable        : Enabled
8 Bit I/O Recovery Time     : 1          ESC : Quit          ↑↓→←    : Select Item
16 Bit I/O Recovery Time    : 1          F1  : Help          PU/PD/+/- : Modify
Memory Hole At 15M-16M      : Disabled   F5  : Old Values    (Shift) F2 : Color
Peer Currency               : Enabled    F6  : Load BIOS Defaults
                                         F7  : Load Setup Defaults
```

Auto Configuration

When set at Enabled, it allows you to configure the features from the third one, Fast RAS To CAS Delay, to the eighth one, Refresh RAS# Assertion.
The options are: Enabled (Default), Disabled.

DRAM Timing

Allows you to select the speed of data access to EDO DRAM.
The options are: 60 ns (Default), 70 ns.

DRAM Leadoff Timing

Allows you to select the DRAM leadoff timings. Slower leadoffs may be required in some system designs to support loose layouts or slower memories.
The optins are: 6:5/3:4 (Default), 7:6/4:5.

Turbo Read Pipeling

Allows you to disable the turbo read pipeline function.
The options are: Enabled (Default), Disabled.

Fast RAS To CAS Delay

Allows you to set the delay time from DRAM RAS# active to CAS# active.
The options are: 3, 2. Unit: Clock T.

DRAM Read Burst (EDO/FP)

Allows you to define DRAM read burst timing.

The options are: x222/x333, x444/x444, x333/x444.

DRAM Write Burst Timing

Allows you to define DRAM write burst timing.
The options are: X-3-3-3, X-2-2-2, X-4-4-4.

DRAM Speculative Leadoff

Allows you to disable the DRAM specutlative leadoff so that the DRAM controller is not presented before the final memory target (cache/DRAM/PCI) has been decoded by the TXC. This results in a 1 HCLK pull-in for all read leadoff latencies. Not that if the cycle does not actually target DRAM, the DRAM cycle, the DRAM cyhlce is later terminated.
The options are: Enabled (Default), Disabled.

Turn-Around Insertion

When set at Enabled, the TXC inserts one extra clock of turn-around of the MD lines after asserting MWE# before enabling the TXC MD buffers. If set at Disabled, the TXC controls back-to-back DRAM cycles just like the 82430FX PCIset.
The options are: Disabled (Default), Enabled.

System BIOS Cacheable

When enabled, allows the ROM area F000H-FFFFH to be cacheable when cache controller is activated.
The options are: Disabled (Default), Enabled.

Video BIOS Cacheable

When enabled, allows the system to use the video BIOS codes from SRAMs, instead of the slower DRAMs or ROMs.
The options are: Enabled (Default), Disabled.

8 Bit I/O Recovery Time

Allows you to set the 8-bit ISA I/O recovery time.
The options are: 1 (Default), 2, 3, 4, 5, 6, 7, NA, 8. Unit: Bus clock.

16 Bit I/O Recovery Time

Allows you to set the 16-bit ISA I/O recovery time.
The options are: 1 (Default), 2, 3, NA, 4. Unit: Bus clock.

Memory Hole At 15M-16M

When enabled, the memory hole at the 15MB address will be relocated to the 15~16MB address range of the ISA cycle when the processor accesses the 15~16MB address area.
When disabled, the memory hole at the 15MB address will be treated as a DRAM cycle when the processor accesses the 15~16MB address area.
The options are: Enabled, Disabled (Default).

Peer Concurrency

Enable this item to allow the processor to continue its operation while another PCI Bus is active.
The options are: Enabled (Default), Disabled.

DRAM ECC/PARITY Select

Allows you to select the DRAM ECC or Parity check.
The options are: Parity (Default), ECC.

Memory Parity/ECC Check

Set at Auto, the BIOS automatically detects if the DRAMs support ECC or Parity check and starts it. Set at Enable, the BIOS starts the memory Parity/ECC check. Set at Disable to skip the check.
The options are: Auto (Disabled), Disable, Enable.

Single Bit Error Report

Enable it to start the single bit error report, instead of the single bit detection and correction.
The opiont are: Enabled (Disabled), Disabled.

L2 Cache Caheable Size

Allows you to select the shadow range of the DRAM at L2 cache cacheable size. If the DRAM size is large than 64MB, select the 512MB.
The options are: 64MB (Default), 512MB.

Delayed Transaction

Enable this item to allow the PIIX3 chip to abort the current PCI master cycle and to accept the new PCI master request; after it services the new PCI master request, it reaccepts the original PCI master and returns the PCI data phase to the original PCI master. It usually enhances the system performance.
The options are: Enabled, Disabled (Default).

Power Management Setup

```
                    ROM PCI/ISA BIOS (2A59FF0B)
                         CMOS SETUP UTILITY
                      POWER MANAGEMENT SETUP

 Power Management : Disable      **  Power Down & Resume Events  **
 PM Control by APM : Yes         IRQ3    (COM 2)        : ON
 Video Off Method  : DPMS Support IRQ4   COM 1)         : ON
 MODEM Use IRQ     : NA          IRQ5    (LPT 2)        : OFF
                                 IRQ6    (Floppy Disk)  : OFF
 Doze Mode         : Disable     IRQ7    (LPT 1)        : OFF
 Standby Mode      : Disable     IRQ8    (RTC Alarm)    : OFF
 Suspend Mode      : Disable     IRQ9    (IRQ2 Redir)   : OFF
 HDD Power Down    : Disable     IRQ10   (Reserved)     : OFF
                                 IRQ11   (Reserved)     : OFF
 ** Wake Up Events In Doze & Standby ** IRQ12 (PS/2 mouse) : ON
                                 IRQ13   (Coprocessor)  : OFF
 IRQ3   (Wake-Up Event) : ON     IRQ14   (Hard Disk)    : ON
 IRQ4   (Wake-Up Event) : ON     IRQ15   (Reserved)     : OFF
 IRQ3   (Wake-Up Event) : OFF
 IRQ12 (Wake-Up Event) : ON      ESC : Quit        ↑↓→←      : Select Item
                                 F1   : Help      PU/PD/+/- : Modify
                                 F5   : Old Values  (Shift) F2  : Color
                                 F6   : Load BIOS Defaults
                                 F7   : Load Setup Defaults
```

Power Management

This item allows you to adjust the power management features. Select Disable for disabling global power management features. Select User Defined for configuring your own power management features. MIN Saving initiates all predefined timers in their minimum values. MAX Saving, on the other hand, initiates maximum values.

The options are: Disable (Default), User Defined, MIN Saving, MAX Saving.

PM Control by APM

The option No allows the BIOS to ignore the APM (Advanced Power Management) specification. Selecting Yes will allow the BIOS wait for APM's prompt before it enters Doze mode, Standby mode, or Suspend mode.

If the APM is installed, it will prompt the BIOS to set the system into power saving mode when all tasks are done.

The options are: No, Yes (Default).

Video Off Method

The option V/H SYNC+Blank allows the BIOS to blank off screen display by turning off the V-Sync and H-Sync signals sent from add-on VGA card. DPMS Supported allows the BIOS to blank off screen display by your add-on VGA card which supports DPMS (Display Power Management Signaling function). Blank Screen allows the BIOS to blank off screen display by turning off the red-green-blue signals.

The options are: V/H SYNC+Blank, DPMS (Default), Blank Screen.

MODEM Use IRQ

This feature allows you to select the IRQ# of the system that is the same IRQ# as the modem use.

The options are: NA (Default), 3, 5, 7, 9, 10, 11.

Doze Mode

When disabled, the system will not enter Doze mode. The specified time option defines the idle time the system takes before it enters Doze mode.

The options are: Disabled(Default), 1, 2, 4, 6, 8, 10, 20, 30, 40 Min, 1 Hr.

Standby Mode

When disabled, the system will not enter the Standby mode. The specified time option defines the idle time the system takes before it enters Standby mode.

The options are: Disabled (Default), 1, 2, 4, 6, 8, 10, 20, 30, 40 Min, 1 Hr.

Suspend Mode

When disabled, the system will not enter Suspend mode. The specified time option defines the idle time the system takes before it enters Suspend mode.

The options are: Disabled (Default), 1, 2, 4, 6, 8, 10, 20, 30, 40 Min, 1 Hr.

HDD Power Down

Selecting Disable will turn off the hard disk drive (HDD) motor. Selecting 1 Min..15 Min allows you define the HDD idle time before the HDD enters the Power Saving Mode. The option When Suspend lets the BIOS turn the HDD motor off when system is in Suspend mode.

The options 1 Min..15 Min and When Suspend will not work concurrently. When HDD is in the Power Saving Mode, any access to the HDD will wake the HDD up.

The options are: Disable (Default), 1 Min..15 Min, When Suspend.

IRQ3, 4, 8, 12 (Wake-Up Event)

Selecting OFF allows the BIOS to refrain from waking up the system. Selecting ON allows the BIOS to wake up the system from Doze mode, Standby mode, or Suspend mode.

The options are: OFF, ON.

The default of IRQ3, 4, 12 (Wake-Up Event): ON.

The default of IRQ8 (Wake-Up Event): OFF.

Power Down Activities / IRQ3 - IRQ15

Selecting ON will enable the power management timers when a no activity event is detected in the specified I/O port or component.

Selecting OFF will disable the PM timer even if a no activity event is detected.

The options are: ON, OFF.

The default value of IRQ3 (COM2), IRQ4 (COM1), IRQ12 (PS/2 Mouse), IRQ14 (Hard Disk) : ON.

The default setting of other IRQs: OFF.

PNP/PCI Configuration Setup

```
                    ROM PCI/ISA BIOS (2A59FF0B)
                        CMOS SETUP UTILITY
                     POWER MANAGEMENT SETUP

 Resources Controlled By  : Auto       PCI IRQ Actived By   : Level
 Reset Configuration Data : Disabled   Assign IRQ For VGA : Disabled




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

Resources Controlled By

If you set at Auto, the BIOS automatically arranges all system resources for you. If there exists conflict or you are not satisfy with the configuration, simply set all the resources listed in the above figure by selecting Manual.

The options are: Auto (default), Manual. The manual options of **IRQ- / DMA- assigned to** are: Legacy ISA, PCI/ISA PnP.

Reset Configuration Data

When enabled, allows the system to clear the last BIOS configuration data and reset them with the default BIOS configuration data.

The options are: Enabled, Disabled (default).

PCI IRQ Actived By

We suggest that you set this to its default configuration unless you are a qualified technician.

The options are: Level (Default), Edge.

Assign IRQ For VGA

If your PCI VGA card does not need an IRQ, select Disabled; therefore, an IRQ can be released for the system use.

The options are: Enabled (Default), Disabled.

Load BIOS Defaults

BIOS defaults contain the most appropriate values of the system parameters that allow minimum system performance. The OEM manufacturer may change the defaults through MODBIN before the binary image burns into the ROM.

Load Setup Defaults

Selecting this field loads the factory defaults for BIOS and Chipset Features which the system automatically detects.

Integrated Peripherals

```
                    ROM PCI/ISA BIOS (2A59FF0B)
                     INTEGRATED PERIPHERALS
                      AWARD SOFTWARE,  INC.

 IDE HDD Block Mode          : Enabled
 On-Chip Primary    PCI IDE  : Enabled
 On-Chip Secondary  PCI IDE  : Enabled
 IDE Primary Master  PIO     : Auto
 IDE Primary Slave    PIO    : Auto
 IDE Secondary Master PIO    : Auto
 IDE Secondary Slave  PIO    : Auto

 USB Controller              : Disabled

 Onboard FDC Controller      : Enabled
 Onboard Serial Port 1       : COM1/3F8
 Onboard Serial Port 2       : COM2/2F8
 UART-2 Mode (COM/IR)        : Std (COM)   ESC: Quit          ↑↓→←       : Select Item
                                          F1  : Help          PU/PD/+/- : Modify
 Onboard Parallel Port       : 378/IRQ7   F5  : Old Values    (Shift) F2 : Color
 Parallel Port Mode          : Compatible F6  : Load BIOS Defaults
                                          F7  : Load Setup Defaults
```

IDE HDD Block Mode
When enabled, allows the system to execute read/write requests to hard disk in block mode.
The options are: Enabled (Default), Disabled.

On-Chip Primary PCI IDE
When enabled, allows you to use the onboard primary PCI IDE.
The options are: Enabled (Default), Disabled.

On-Chip Secondary PCI IDE
When enabled, allows you to use the onboard secondary PCI IDE.
The options are: Enabled (Default), Disabled.

IDE Primary Master PIO
Allows an automatic or a manual configuration of the PCI primary IDE hard disk (master) mode.
The options are: Auto (Default), Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary Slave PIO
Allows an automatic or a manual configuration of the PCI primary IDE hard disk (slave) mode.
The options are: Auto (Default), Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Secondary Master PIO

Allows an automatic or a manual configuration of the PCI secondary IDE hard disk (master) mode.

The options are: Auto (Default), Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Secondary Slave PIO

Allows an automatic or a manual configuration of the PCI secondary IDE hard disk (slave) mode.

The options are: Auto (Default), Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

USB Controller

If you do not use the onboard USB feature, it allows you to disable it.

The options are: Enabled, Disabled (Default).

BIOS Support USB Keyboard

This feature appears if the previous feature is set at Enabled. Set at DOS only if the operating system is DOS.

The options are: Setup (Default), DOS.

Onboard FDC Controller

When enabled, the floppy diskette drive controller (FDC) is activated.

The options are: Enabled (Default), Disabled.

Onboard Serial Port 1

If the serial port 1 uses the onboard I/O controller, you can modify your serial port parameters. If an I/O card needs to be installed, COM3 and COM4 may be needed.

The options are: COM1/3F8 (Default), COM2/2F8, COM3/3E8, COM4/2E8, Disabled.

Onboard Serial Port 2

If the serial port 2 uses the onboard I/O controller, you can modify your serial port parameters. If an I/O card needs to be installed, COM3 and COM4 may be needed.

The options are: COM2/2F8 (Default), COM3/3E8, COM4/2E8, COM1/3F8, Disabled.

UART-2 Mode (COM/IR)

Allows you to select the IR modes if the serial port 2 is used as an IR port. Set at Standard, if you use COM2 as the serial port as the serial port, instead as an IR port.

The options are: std (Default); IrDA-1; IrDA-2; ASK-IR, 1; ASK-IR, 2; ASK-IR, 3; ASK-IR, 4.

InfraRed Duplex Type

This feature appears if any opton, except the std, of the previous feature is selected. It allows you to select the infrared data transaction way.

The options are: Half (Default), Full.

Onboard Parallel Port

Select from a given set of parameters if the parallel port uses the onboard I/O controller.

The options are: Disabled, 278/IRQ5, 3BC/IRQ7, 378/IRQ5, 378/IRQ7 (Default).

Parallel Port EPP Type

Allows you to connect with an advanced printer.

The options are: Compatible (Default), Extended, EPP, ECP.

ECP Mode Use DMA

This feature appears if Parallel Port EPP Type is set at ECP. It allows you to select Direct Memory Access (DMA) channel.

The options are: 0 (Default), 1.

EPP Version

This feature appears if Parallel Port EPP Type is set at ECP. It allows you to select the EPP type version.

The options are: EPP1.7 (Default), EPP1.9.

Supervisor/User Password

To enable the Supervisor/User passwords, select the item from the Standard CMOS Setup. You will be prompted to create your own password. Type your password up to eight characters and press Enter. You will be asked to confirm the password. Type the password again and press Enter. You may also press Esc to abort the selection and not enter a password. To disable password, press Enter when you are prompted to enter password. A message appears, confirming the password is disabled.

Under the BIOS Feature Setup, if System is selected under the Security Option field and the Supervisor Password is enabled, you will be prompted for the Supervisor Password every time you try to enter the CMOS Setup Utility. If System is selected and the User Password is enabled, you will be requested to enter the User Password every time you reboot the system. If Setup is selected under the Security Option field and the User Password is enabled, you will be prompted only when you reboot the system.

IDE HDD Auto Detection

```
                    ROM PCI/ISA BIOS (2A5L9F09)
                       STANDARD CMOS SETUP
                       AWARD SOFTWARE, INC.


HARD DISKS      TYPE   SIZE   CYLS   HEAD  PRECOMP   LANDZ   SECTOR   MODE
Primary Master     :



              Select Primary Master   Option (N=Skip) : N
    OPTIONS        SIZE    CYLS   HEAD   PRECOMP   LANDZ   SECTOR    MODE
      2 (Y)         851    825     32         0     1650      63        LBA
      1             852   1651     16     65535     1650      63     NORMAL
      3             851    825     32     65535     1650      63      LARGE

       Note : Some OSes (like SCO-UNIX) must use "NORMAL" for installation
```

The IDE Hard Disk Drive Auto Detection feature automatically configures your new hard disk. Use it for a quick configuration of new hard drives. This feature allows you to set the parameters of up to four IDE HDDs. The option with (Y) are recommended by the system BIOS. You may also keys in your own parameters instead of setting by the system BIOS. After all settings, press Esc key to to return the main menu. For confirmation, enter the Standard CMOS Setup feature.

Save and Exit Setup

```
                 ROM PCI/ISA BIOS  (2A59GF09)
                      CMOS SETUP UTILITY
                    AWARD SOFTWARE,   INC.
┌──────────────────────────────┬──────────────────────────────┐
│ STANDARD CMOS SETUP          │ INTEGRATED PERIPHERALS        │
│ BIOS FEATURES SETUP          │ SUPERVISOR PASSWORD           │
│ CHIPSET FEATURES SETUP       │ USER PASSWORD                 │
│ POWER MANAGEMENT SETUP       │ IDE HDD AUTO DETECTION        │
│ PNP/PCI CONFIGURATION        │ SAVE & EXIT SETUP             │
│ LOAD BIOS    SAVE to CMOS and EXIT (Y/N)? Y                  │
│ LOAD SETUP DEFAULTS          │                               │
├──────────────────────────────┼──────────────────────────────┤
│ ESC : Quit                   │ ↑ ↓ → ←   : Select Item       │
│ F10  : Save & Exit Setup     │ (Shift) F2  : Change Color    │
├──────────────────────────────┴──────────────────────────────┤
│          SAVE DATA TO CMOS and EXIT SETUP                    │
└─────────────────────────────────────────────────────────────┘
```

After you have made changes under Setup, press Esc to return to the main menu. Move cursor to Save and Exit Setup or press F10 and then press Y to change the CMOS Setup. If you did not change anything, press Esc again or move cursor to Exit Without Saving and press Y to retain the Setup settings. The following message will appear at the center of the screen to allow you to save data to CMOS and exit the setup utility:

SAVE to CMOS and EXIT (Y/N)?

Exit without Saving

If you select this feature, the following message will appear at the center of the screen to allow you to exit the setup utility without saving CMOS modifications:

Quit Without Saving (Y/N)?

Note Default values of the various Setup items on this chapter may not necessarily be the same ones shown on your screen.

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