PA-2010+

MAINBOARD MANUAL

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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:

- Wear a static wrist strap which fits around your wrist and is connected to a natural earth ground.
- Touch a grounded or anti-static surface or a metal fixture such as a water pipe.
- 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

Based on the new highly-integrated VIA 580VPX, the PA-2010+ combines blistering Pentium® processor performance with support for intelligent diagnostic and power management features to provide a powerful and versatile ATX-size platform for leading-edge PC '97 compliant systems.

With its switching voltage regulator, the PA-2010+ runs a complete range of Intel Pentium® processors, including the Intel Pentium processor with MMX™ technology, as well as the AMD-K5™ and Cyrix/IBM 6x86™, and is easily upgradable to the Cyrix/IBM M2 and the AMD-K6™. For added power and performance, the PA-2010+ takes up to 512KB Pipeline Burst Level II cache and up to 512MB DRAM via four-72 SIMM sockets and two 168-pin DIMM sockets which accept high-speed EDO, and lightning-fast SDRAM memory types.

The PA-2010+ comes with a full set of I/O features conveniently integrated on the rear I/O panel, including two USB connectors. The board also has an integrated PCI Bus Master Enhanced IDE controller with support for the new Ultra DMA/33 protocol, which doubles ATA-2 Hard Disk Drive data transfer rates to 33MB/s while maintaining full backwards compatibility with existing PIO Mode 3, PIO Mode 4 and DMA Mode 2 devices.

Fully compliant with the Microsoft PC'97 standard at both the hardware and BIOS levels, the PA-2010+ comes with support for intelligent Hardware Monitoring and DMI features which continuously check the thermal status of your system and reduce the cost of ownership through improved manageability.

Chapter 1 of this manual gives you a brief overview of the PA-2010+ mainboard, including its main components and features. Chapter 2 contains advice on how to upgrade and install key components on the mainboard, while Chapter 3 provides detailed information about the board's BIOS settings. For the most up-to-date information about your mainboard and the latest FAQs and BIOS updates, visit FIC Online at www.fic.com.tw.

Package Checklist

Please check that your package contains all the items listed below. If you discover any item is damaged or missing, please contact your vendor.

- The PA-2010+ mainboard
- This user manual
- One IDE HDD cable

- One floppy disk drive cable
- One printer and COM1 cable
- One COM2 cable
- One IR cable (optional)

Main Features

The PA-2010+ mainboard comes with the following high-performance features:

- **Easy Installation**
  Award BIOS with support for auto-detection of Hard Disk Drives, Plug and Play devices, and PS/2 keyboard and mouse, to facilitate the installation of HDDs, expansion cards and other peripheral devices.

- **Leading Edge Chipset**
  VIA 580VPX chipset with integrated DRAM and L2 cache controllers as well as support for Intel's new Dynamic Power Management Architecture (DPMA), Concurrent PCI (PCI 2.0), and USB.

- **Flexible Processor Support**
  Onboard 321-pin ZIF socket and switching voltage regulator support complete range of leading-edge processors:
  Intel Pentium® P55C with MMX™ technology 166/200/233 MHz.
  Intel Pentium® P54C/P54CS 90/100/120/133/150/166/200 MHz.
  AMD-K6™-166 (166 MHz) / K6-200 (200 MHz) / K6-233 (233 MHz).
  AMD-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).
  Cyrix M2 150/166/200/233 MHz.
  Cyrix 6x86™- PR133+ (110 MHz) / 6x86-PR150+ (120 MHz) / 6x86-PR166+ (133 MHz) / 6x86-PR200+ (150 MHz).
  IBM M2 150/166/200/233 MHz.
  IBM 6x86™- P133+ (110 MHz) / 6x86-PR150+ (120 MHz) / 6x86-PR166+ (133 MHz) / 6x86-PR200+ (150 MHz).

- **Ultra-fast Level II Cache**
  Supports 256/512KB onboard Pipeline Burst Level II direct-mapped write-back cache.

- **Versatile Main Memory Support**
  Accepts up to 512MB RAM using four SIMMs of 8, 16, 32, 64, 128MB with support for FPM and EDO DRAM and two DIMMs of 8, 16, 32, 64, 128MB with support for EDO DRAM and lightning-fast SDRAM.

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

- Enhanced PCI Bus Master IDE Controller with Ultra DMA/33 Support
  Integrated Enhanced PCI Bus Master IDE controller features two dual-channel connectors that accept up to four Enhanced IDE devices, including CD-ROM and Tape Backup Drives, as well as Hard Disk Drives supporting the new Ultra DMA/33 protocol which doubles data transfer rates to 33MB/sec. Standard PIO Mode 3, PIO Mode 4, and DMA Mode 2 devices are also supported.

- Super Multi I/O
  Integrated W83877F/TF/AF Plug and Play multi-I/O chipset features two high-speed 16550A compatible serial ports, one EPP/ECP capable parallel port, one IR port, and one FDD connector. COM2 can be configured as an SIR compliant port for infrared connections.

- USB Support
  Two USB ports integrated in the rear I/O panel allow convenient, high-speed Plug and Play connections to the growing number of USB compliant external peripheral devices on the market.

- Onboard IrDA Connector
  An IrDA connector for wireless infrared connections is available.

Advanced Features

This mainboard comes equipped with the most advanced new features that not only optimize the performance of the latest processors but also enhance the manageability, power management capabilities, and user-friendliness of your system. This section provides detailed information on these features, and how they are implemented on the mainboard.

- **Optimized Intel MMX™ Performance**

  The mainboard utilizes the advanced features of the VIA 580VPX to optimize the unrivaled performance of the Intel Pentium® processor with MMX™ technology, allowing you to enjoy a richer video, audio, digital imaging and communications experience from the latest generation of multimedia software. To provide you with additional flexibility, the mainboard also supports other leading-edge processors featuring Intel's MMX™ technology, including the AMD-K6™ processor.

- **Lightning-Fast SDRAM Performance**

  The mainboard supports the new generation of lightning-fast SDRAM (Synchronous Dynamic Random Access Memory) via its two onboard 168-pin DIMM sockets. SDRAM delivers an added boost to overall system performance by increasing the CPU-to-memory data transfer rate to 528MB/sec compared to 264MB/sec for conventional EDO DRAM. SDRAM performance on the PA-2010+ is further boosted by the board's integrated I^2C controller, which optimizes the memory timing settings.

Blistering Ultra DMA/33 HDD Performance

With its integrated Enhanced PCI Bus Master IDE controller that supports the new Ultra DMA/33 protocol, this mainboard doubles HDD data transfer rates to 33MB/sec, compared to 16MB/sec for conventional PIO Mode 3, PIO Mode 4, and DMA Mode 2 devices. By reducing the CPU's workload and increasing CPU utilization, Ultra DMA/33 significantly improves system performance when running applications under Windows® 95 and Windows® NT environments. The Ultra DMA/33 protocol is completely backward compatible with conventional ATA-2 HDD devices; so the mainboard also supports existing PIO Mode 3, PIO Mode 4 and DMA Mode 2 devices using the same cable.

With the integrated Enhanced PCI Bus Master IDE controller you can connect up to four Enhanced 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 optimum system performance.

Concurrent PCI Architecture

The mainboard's Concurrent PCI Architecture enables more efficient operation of CPU, PCI and ISA transactions for faster and smoother multimedia performance. It also allows the use of PCI 2.0 compatible add-in cards for long system life, built-in scalability and the flexibility to adapt your system to future applications.

PC '97 Compliant

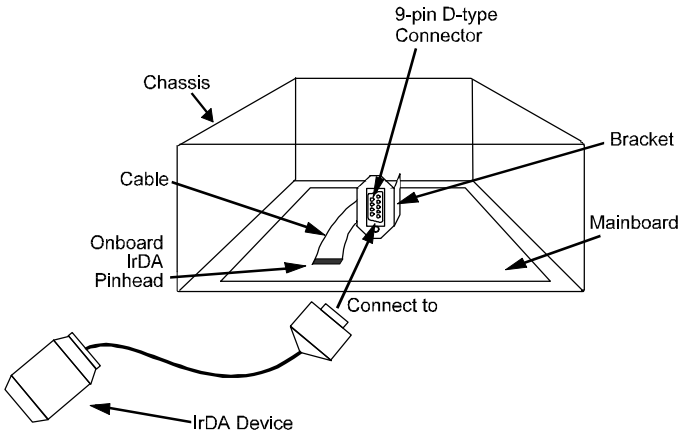
This mainboard is fully compliant with the new PC '97 standard at both the BIOS and hardware levels. PC '97 is a set of hardware, bus and device design requirements set by Microsoft in conjunction with other industry leaders aimed at making PCs easier to use by maximizing cooperation between the operating system and hardware.

The system design requirements under PC '97 support a synergy among PC hardware, Microsoft Windows® Operating Systems, and Windows®-based software. Key elements include support for Plug and Play compatibility and power management for configuring and managing all system components, and 32-bit device drivers and installation procedures for both Windows® 95 and Windows® NT.

Infrared (IR) Connections

This mainboard features support for highly-sophisticated IR 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 an IR interface that is fully compliant with the IrDA standard. An IrDA device can be installed via a 9-pin D-type 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.



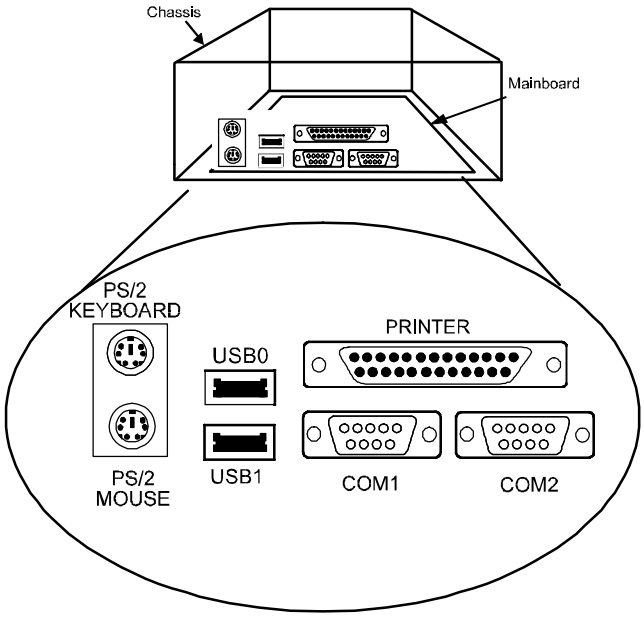
The serial port COM2 on this mainboard is designed to be a IR compliant port. If you wish to install the IR connection feature, you need to adjust the BIOS option for high-speed performance. Please read page 50 of this manual.

NOTE : Both SIR and FIR are supported only if Winbond W83877AF chip (optional) is onboard; otherwise, SIR is supported when Winbond W83877F/TF (optional) is onboard.

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 connections to the new generation of USB peripheral devices. PS/2 keyboard and PS/2 mouse connectors provide additional I/O connectivity.



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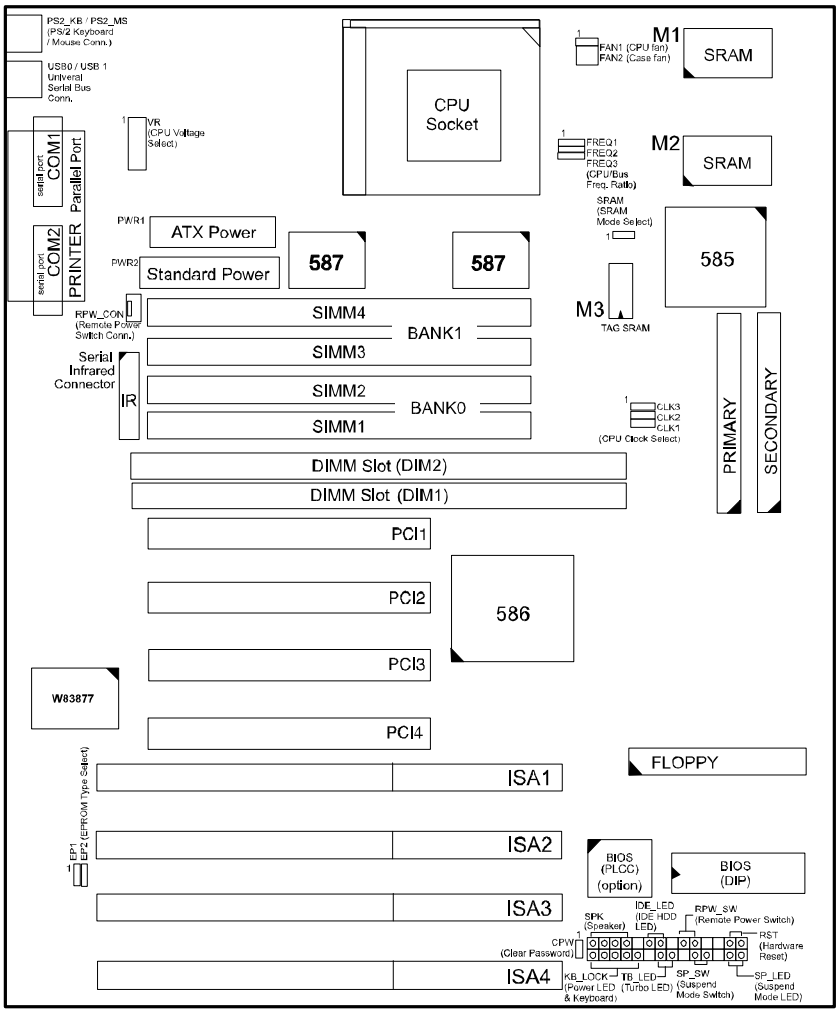
Installation Procedures

The PA-2010+ 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:

- Step 1 -
  Set system jumpers
- Step 2 -
  Install System RAM modules
- Step 3 -
  Install the CPU
- Step 4 -
  Install expansion cards
- Step 5 -
  Connect cables and power supply
- Step 6 -
  Set up BIOS feature (Please read Chapter Three.)

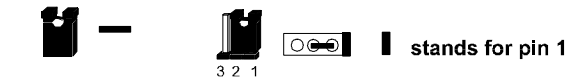
Mainboard Layout



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:



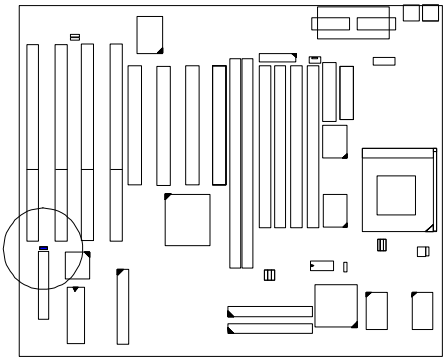
Jumper cap is shown as above

Jumpers in a Block

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.

Clear Password: CPW

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.

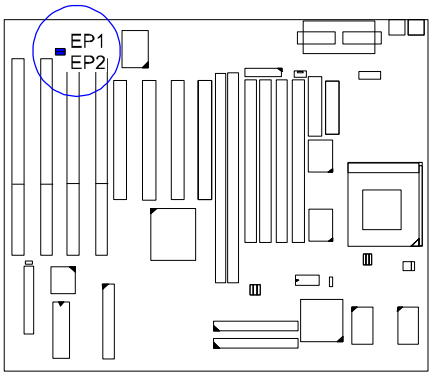


Enable

Disable
(Default)

Flash EPROM Type Selection: EP1, EP2

These two jumpers allow you to configure the Flash EPROM chip

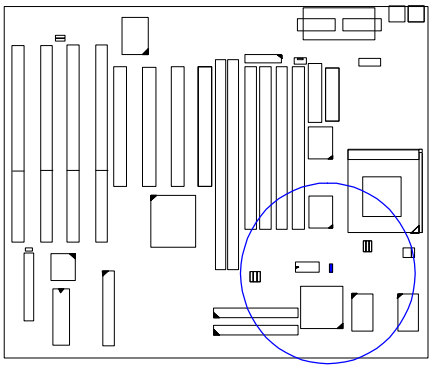


1M F-ROM	EP1	EP2
Intel 28F001	1	*Normal Default* 1 *Program Bootblk* 1
SST 29EE010	1	1

2M F-ROM	EP1	EP2
AMD AM29F002T	1	1
SST 29EE020	1	1
ATMEL AT29C020	1	1
MXIC MX28F2000P	1	1

CPU to SRAM Data Transacting Mode Selection: SRAM

This jumper allows you to select the CPU-to-SRAM data read/write mode.



Intel Burst (Default) For Intel Pentium CPUs, AMD CPUs, Cyrix CPUs, IBM CPUs

Linear Burst

For Cyrix CPUs, IBM CPUs

2). Install System RAM Modules

DRAM and SDRAM

The working space of the computer is the Random Access Memory (RAM). The system cannot act upon data unless it is loaded into RAM. When more memory is added, the working memory of the computer is larger, thereby increasing total performance.

The PA-2010+'s RAM is comprised of four industry standard 72-pin Single In-line Memory Modules (SIMMs) and two 168-pin Dual In-line Memory Modules (DIMMs). Each SIMM socket supports from 4 to 128MB FPM (Fast Page Mode) and high-speed EDO (Extended Data Out) DRAM. Each DIMM socket is able to support up to 64MB EDO DRAM and lightning-fast SDRAM (Synchronous DRAM).

SDRAM is an advanced new memory technology that boosts overall system performance with its ability to synchronize all operations with the processor clock signal. This makes the implementation of control interfaces easier, and speeds up column access time. SDRAM features an on-chip burst counter that can be utilized to increment column addresses for very fast burst access, which means that SDRAM allows new memory access to be initiated before the preceding access has been finished.

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

RAM Module Configuration

SIMMs and DIMMs in Bank 0 and Bank 1 can be installed in many combinations. Some of them are listed in the following table.

(Unit : MB)

TOTAL MEMORY	SIMM 1 & 2 (Bank 0)	SIMM 3 & 4 (Bank 1)	DIM1 (Bank 0)	DIM2 (Bank 1)
8	4 & 4			
			8	
16	8 & 8			
			16	
32	16 & 16			
			32	
64	32 & 32			
			64*	
128	64 & 64			
			64*	64*
256	64 & 64	64 & 64		
512	128* & 128*	128* & 128*		

NOTE :

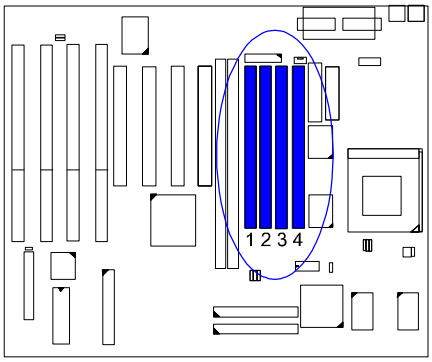
1. * A RAM module of this size was not available for testing at press time.
2. DIM1 and DIM2 only support 3.3V (unbuffered) EDO and SDRAM modules.
3. It is recommended that SIMMs and DIMMs are not installed at the same time on this mainboard to avoid unexpected failure.
4. DIM2 and SIMM 1&2 are shared. That is, It is not allowed to install RAM modules on DIM2 and SIMM 1 &2 at the same time.

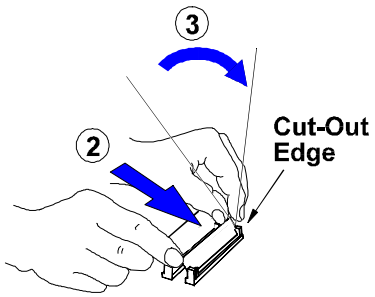
Install SIMMs

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.)





NOTE : SIMMs in each bank must be of the same type; and the BIOS automatically configures the memory size.

2. Carefully fit a SIMM at a 45 degree angle into each empty socket 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, as shown above.

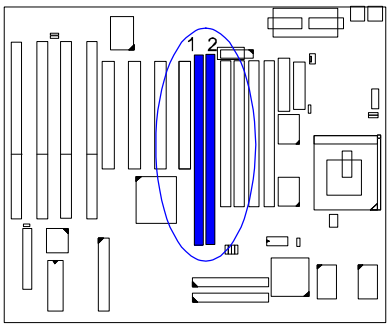
Remove SIMMs

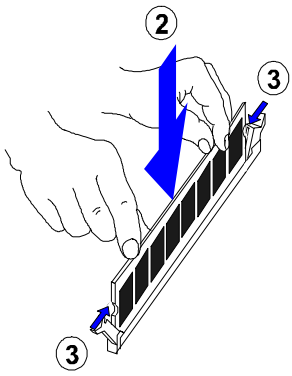
To remove the SIMMs, pull the retaining latch on both ends of the socket and reverse the procedure above.

Install DIMMs

Complete the following procedures to install DIMMs:

1. Locate the DIMM slots on the mainboard.





2. Install the DIMM straight down into the DIMM slot with both hands.

3. The clips of the slot will close up to hold the DIMM in place when the DIMM touches the slot's bottom.

Remove DIMMs

Press the clips with both hands to remove the DIMM.

Cache Memory

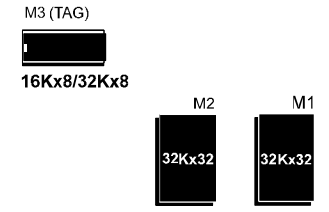
The mainboard comes with onboard 256KB (512KB is optional) synchronous 3V Pipeline Burst SRAMs. Cache memory access is very fast compared to main memory access. The cache holds data for imminent use. Since cache memory is from five to more than ten times faster than main memory, the CPU's access time is reduced, giving you better system performance.

Pentium mainboards may implement various types of L2 cache SRAMs. Pipeline Burst SRAM is one of them, delivering the best price performance ratio. They perform much better than asynchronous SRAMs.

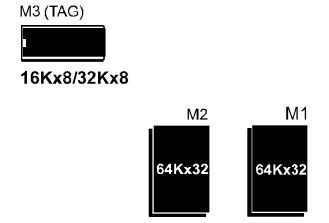
NOTE: The cache memory can not be upgraded by end users.

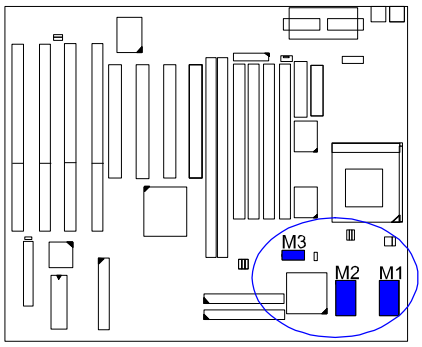
Onboard Cache RAM (256KB/512KB)

256KB



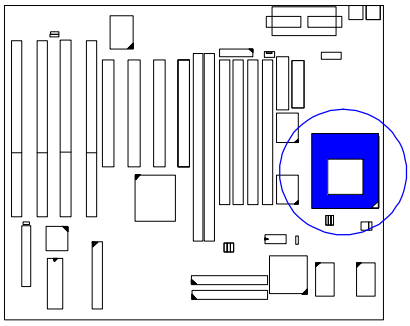
512KB





3). Install the CPU

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



CAUTION :

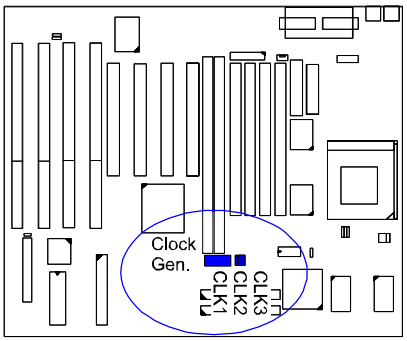
1. Always turn the system power off before installing or removing any device.
2. Always observe static electricity precautions.
   See “Handling Precautions” at the start of this manual.
3. Inserting the CPU chip incorrectly may damage the chip.

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 is located in the blank triangular 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, CLK3

The table below shows the jumper settings for the different CPU speed configurations.



For IMI Clock Generator

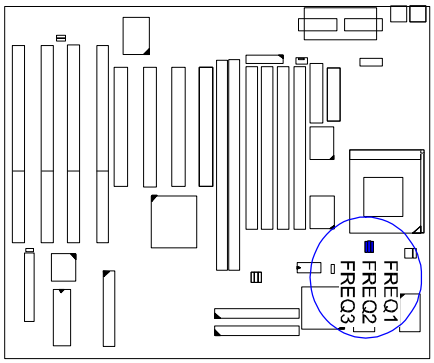
External (CPU/CLK)	CLK1	CLK2	CLK3
75 MHz			
66 MHz			
60 MHz			
55 MHz			

NOTE : There is one of three different types of clock generators onboard, either IMI, ICW, or PhaseLink, for CPU clock jumper settings. Please check your onboard clock generator before you set the CPU jumpers. The settings of ICW and PhaseLink are listed in Appendix B.

CPU to Bus Frequency Ratio: FREQ1, FREQ2, FREQ3

These three jumpers are used in combination to decide the ratio of the internal frequency of the CPU to the bus clock.

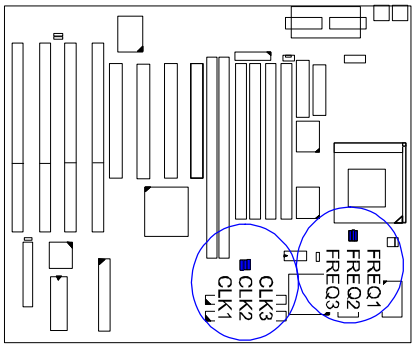
FREQ1	FREQ2	FREQ3	Ratio			
			P54C	P55C/ M2/K6	K5	M1
			3 x	3 x	2 x	4 x
			2.5 x	2.5 x	1.75 x	1 x
			2 x	2 x	---	2 x
			1.5 x	3.5 x	1.5 x	3 x



Intel Pentium CPUs

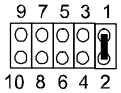
Frequency

CPU Speed (MHz)	External (CPU/CLK) (MHz)	CLK1	CLK2	CLK3	Internal	CPU Clock Rate		
						FREQ1	FREQ2	FREQ3
P55C								
233	66				3.5 x			
200	66				3 x			
166	66				2.5 x			
P54C								
200	66				3 x			
166	66				2.5 x			
150	60				2.5 x			
133	66				2 x			
120	60				2 x			
100	66				1.5 x			
90	60				1.5 x			

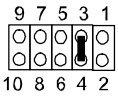


Voltage

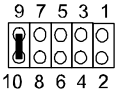
VR



Core : 3.5V
IO : Same
P54C VRE

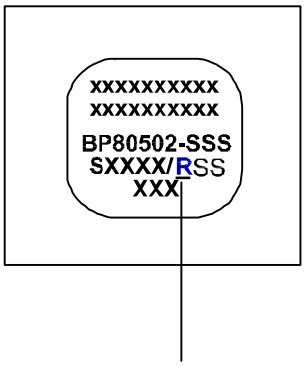


Core : 3.3V
IO : Same
P54C STD



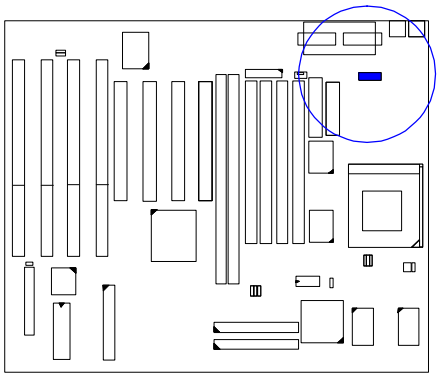
Core : 2.8V
IO : 3.3V
P55C

Intel Pentium CPU
Bottom Side Marking



R (Identifier for Voltage Range) :

V for VRE Voltage Range
or
S for Standard Voltage Range



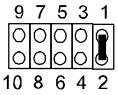
AMD-K5/K6 CPUs

Frequency

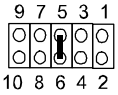
Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	IMI Clock Generator			Internal	CPU Clock Rate		
			CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
K6-233	233	66				3.5 x			
K6-200	200	66				3 x			
K6-166	166	66				2.5 x			
K5-PR200	133	66				2			
K5-PR166	116	66				1.75 x			
K5-PR150	105	60				1.75 x			
K5-PR133	100	66				1.5 x			
K5-PR120	90	60				1.5 x			
K5-PR100	100	66				1.5 x			
K5-PR90	90	60				1.5 x			

Voltage

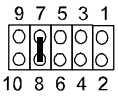
VR



Core : 3.5V
IO : Same
AMD-K5 - B

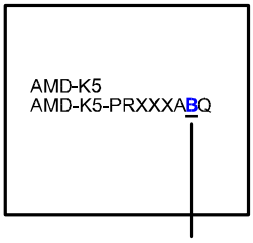


Core : 3.2V
IO : 3.3V
AMD-K6 (233 MHz)



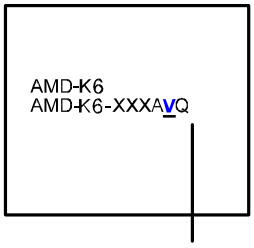
Core : 2.9V
IO : 3.3V
AMD-K6 (166, 200 MHz)

AMD-K5 CPU
Top Side Marking

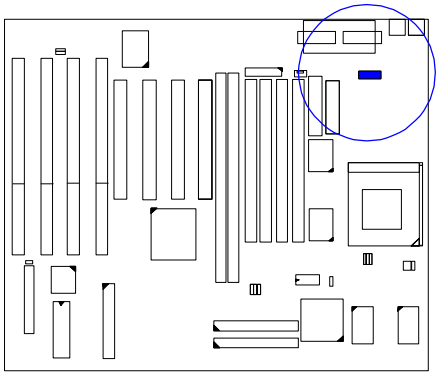


V (Identifier for Operation Voltage)

AMD-K6 CPU
Top Side Marking



V (Identifier for Operation Voltage) :
N 3.1-3.3V Core/3.135-3.6V I/O
L 2.755-3.045V Core/3.135-3.6V I/O

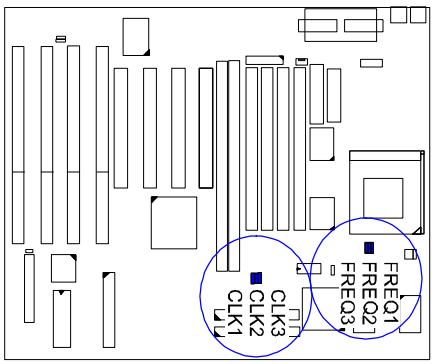


Cyrix 6x86 CPUs

Frequency

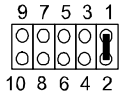
Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	IMI Clock Generator			Internal	CPU Clock Rate		
			CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
M2*	233	66				3.5 x			
M2*	225	75				3 x			
M2*	200	66				3 x			
M2*	187	75				2.5 x			
M2*	166	66				2.5 x			
M2*	150	60				2.5 x			
6x86-PR200+ 6X86L-PR200+	150	75				2 x			
6x86-PR166+ 6x86L-PR166+	133	66				2 x			
6x86-PR150+ 6x86L-PR150+	120	60				2 x			
6x86-PR133+ 6x86L-PR133+	110	55				2 x			

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

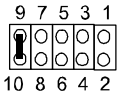


Voltage

VR



Core : 3.5V
IO : Same
Cryix 6x86-028

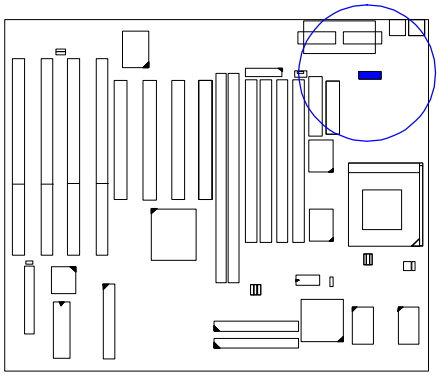


Core : 2.8V
IO : 3.3V
Cyrix 6x86L

Cyrix 6x86 CPU
Top Side Marking

6x86-PR166+GP
133 MHz
3.52V **(028)**

.

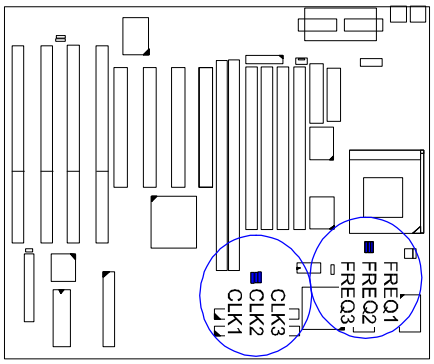


IBM 6x86 CPUs

Frequency

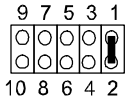
Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	IMI Clock Generator			Internal	CPU Clock Rate		
			CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
M2*	233	66				3.5 x			
M2*	225	75				3 x			
M2*	200	66				3 x			
M2*	187	75				2.5 x			
M2*	166	66				2.5 x			
M2*	150	60				2.5 x			
6x86-PR200+ 6X86L-PR200+	150	75				2 x			
6x86-PR166+ 6x86L-PR166+	133	66				2 x			
6x86-PR150+ 6x86L-PR150+	120	60				2 x			
6x86-PR133+ 6x86L-PR133+	110	55				2 x			

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

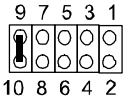


Voltage

VR



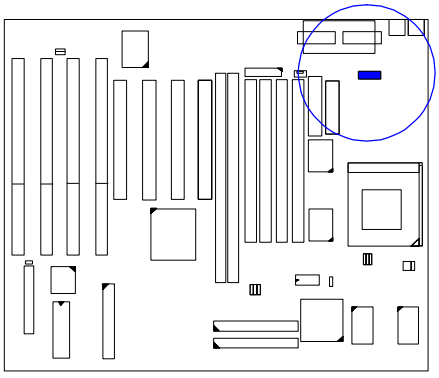
Core : 3.5V
IO : Same
IBM 6x86-028



Core : 2.8V
IO : 3.3V
IBM 6x86L

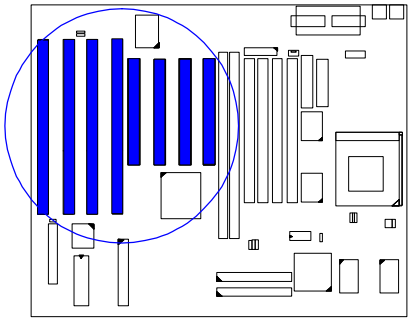
IBM 6x86 CPU
Top Side Marking

6x86-PR166+GP
133 MHz
3.52V **(028)**



4). Install Expansion Cards

Your mainboard features four 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 :

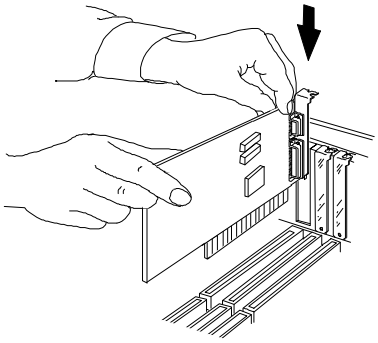
1. Always turn the system power off before installing or removing any device.

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.)

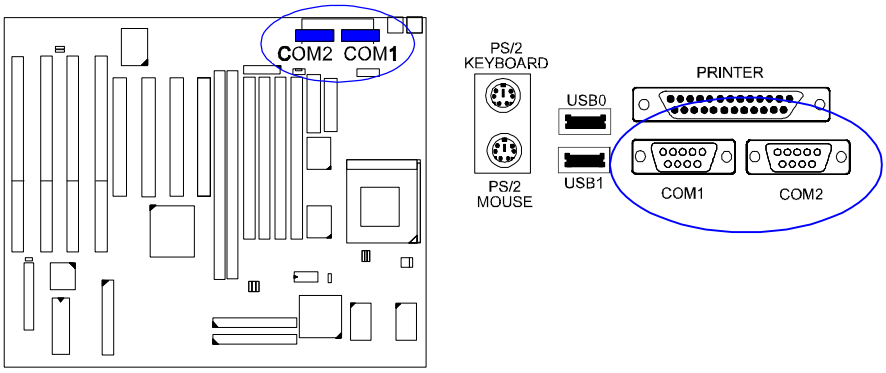


4. Push the card firmly into the slot. Push down on one end of the expansion card, then the other. Use this “rocking” motion until the add-in card is firmly seated inside the slot.
5. Secure the board with the mounting screw removed in Step 2. Make sure that the card has been placed evenly and completely into the expansion slot.

5). Connector Cables and Power Supply

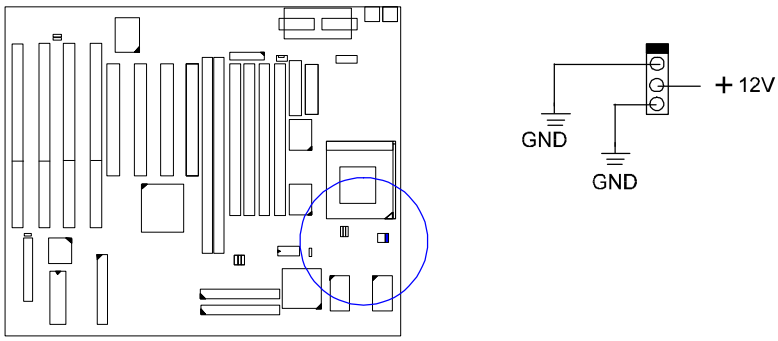
Serial Port Connectors: COM1, COM2

These two connectors allow you to connect with your devices that take serial ports, such as a serial mouse or a modem. Usually, it is recommended to connect your serial mouse to COM1 and your fax/modem to COM2. Because COM2 and IR utilizes the same IRQ, COM2 will not work if an IR device is connected to the IR connector. Please read page 50 of this manual for more information.



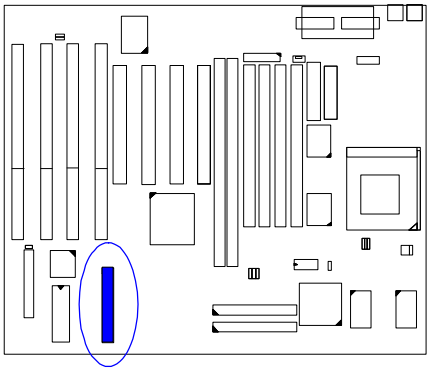
CPU Fan Connector: FAN

This connector is linked to the CPU fan.



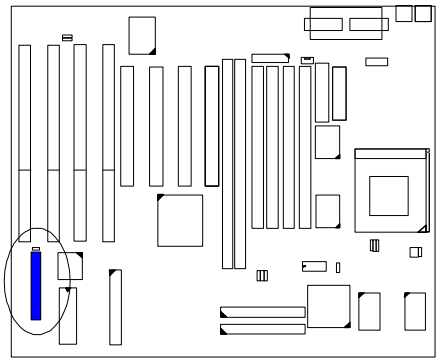
Floppy Diskette Drive Connector: FLOPPY

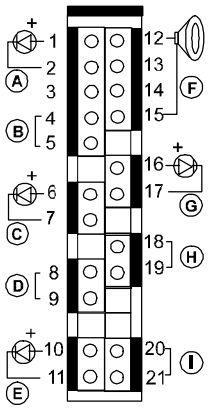
This 34-pin block connector connects to your floppy disk drive using the cable that is provided with this mainboard.



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.

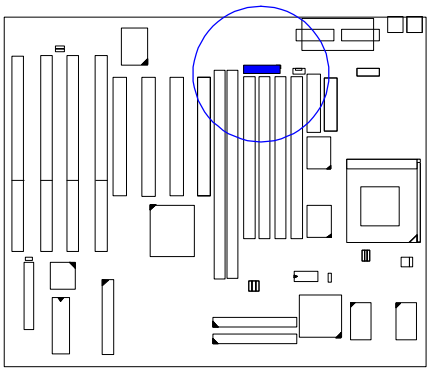




Item	Connector	Pin Type	Feature
A	PW_LED	2-pin male	indicates the system power status
B	KB_LOCK	2-pin male	allows the keyboard to access the system
C	TB_LED	2-pin male	indicates the system speed is in normal or turbo speed
D	SP_SW	2-pin male	Suspend Mode switch
E	SP_LED	2-pin male	indicates the system 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

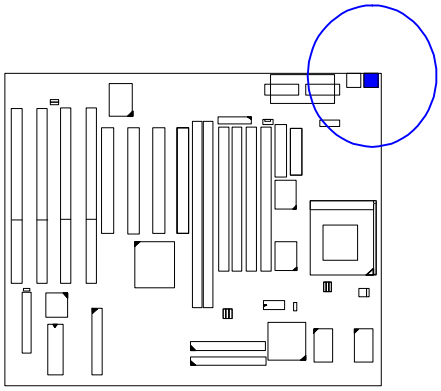
Infrared Connector: IR

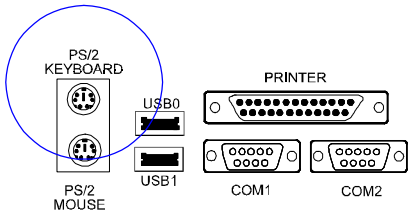
This 10-pin male connector is used for connecting to the infrared (SIR) port and allows transmission of data to another system which also supports the SIR feature.

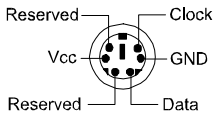


PS/2 Keyboard Connector: PS2_KB

This 6-pin female connector is used for your PS/2 keyboard.

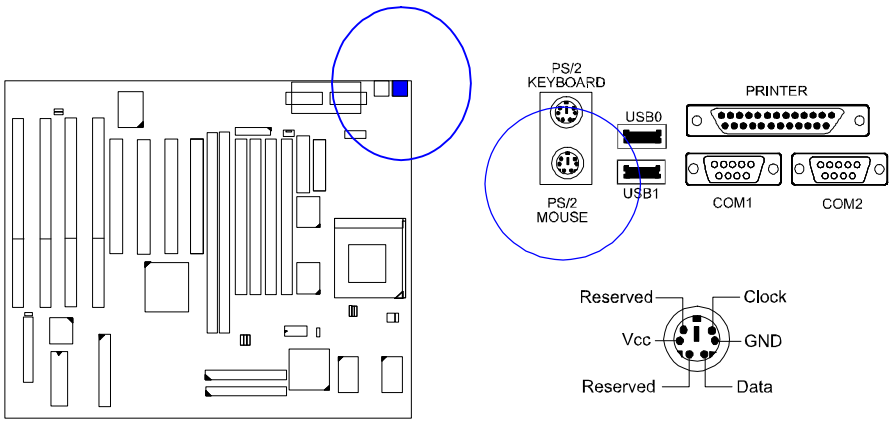






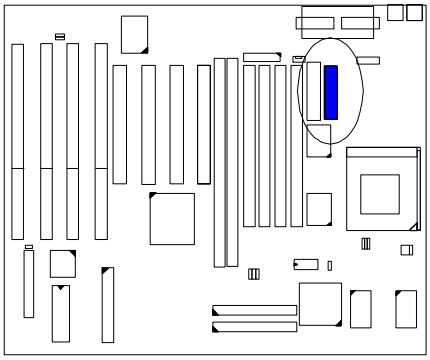
PS/2 Mouse Connector: PS2_MS

This connector is connected to the PS/2 mouse.



ATX Power Connector: PWR1

This 20-pin male block connector is connected to the ATX power supply.

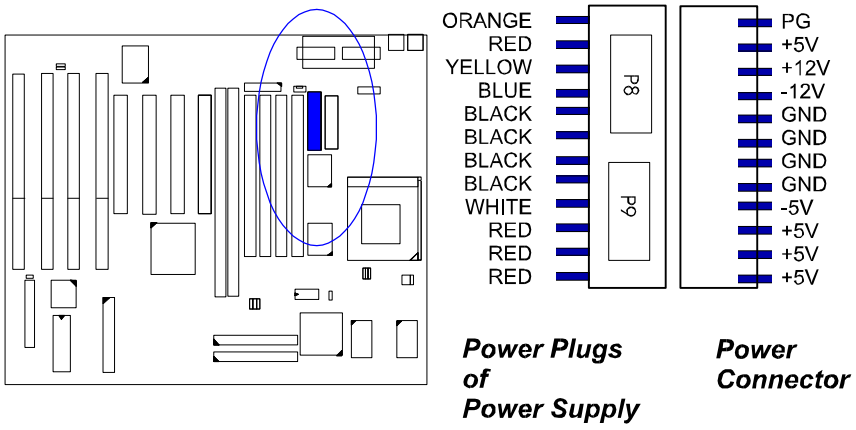


+12V	10	20	+5V
5V_VR	9	19	+5V
PWR_GOOD	8	18	-5V
GND	7	17	GND
+5V	6	16	GND
GND	5	15	GND
+5V	4	14	-PWR_ON
GND	3	13	GND
+3.3V	2	12	-12V
+3.3V	1	11	+3.3V

Standard Power Connector: PWR2

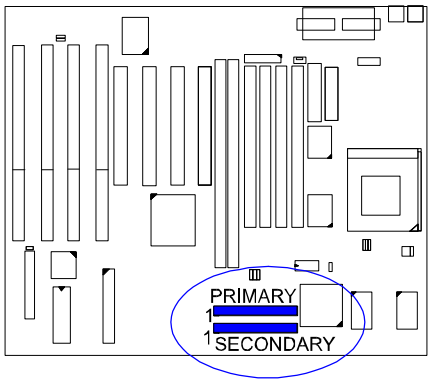
This 12-pin block connector is used for connecting to the standard 5V power supply. In the picture below, notice that, in most cases, there are two marks “P8” and “P9” on the surface

of the connector. You have to insert the “P8”plug into the “P8” section of the connector, and so forth for “P9”. Two black wires must be in the middle.



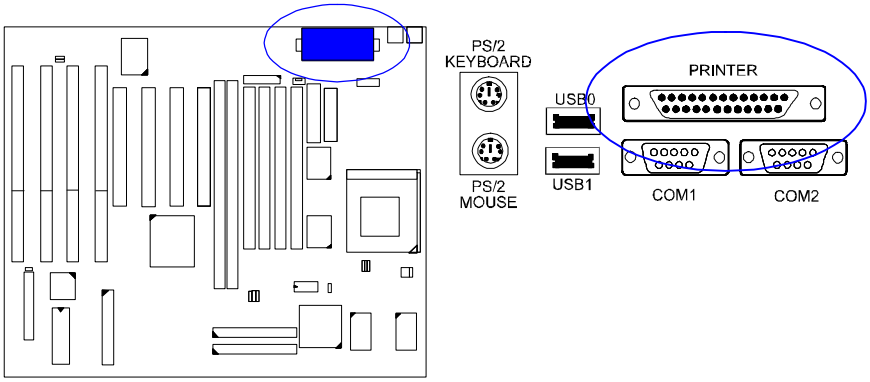
IDE HDD Device Connector: PRIMARY and SECONDARY

These two 40-pin block connectors are used for your IDE hard disks. If 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.



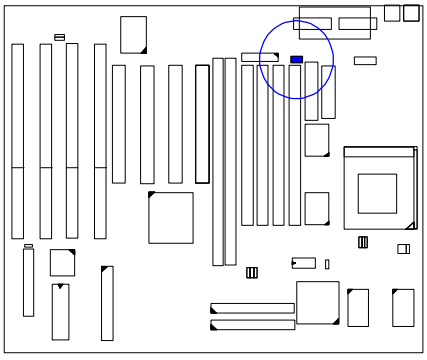
Printer Connector: PRINTER

This 25-pin D-Sub female connector is attached to your printer.



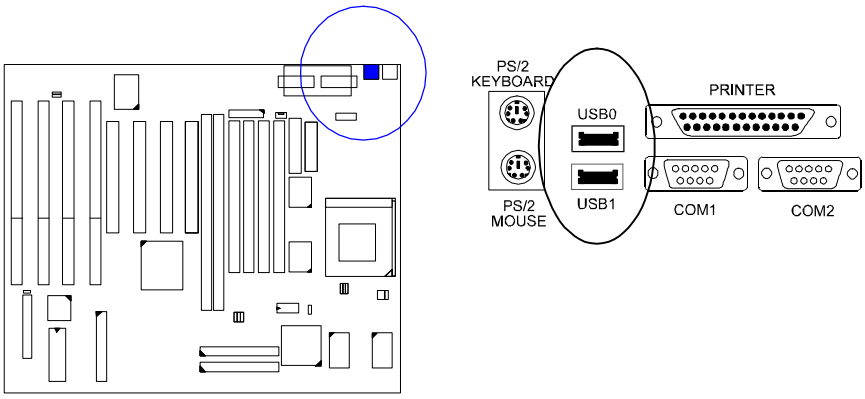
Remote Power Supply Connector: RPW_CON

This 3-pin male connector allows you to enable (or disable) the system power if the RPW_SW is on (or off).



Universal Serial Bus Connectors: USB0, USB1

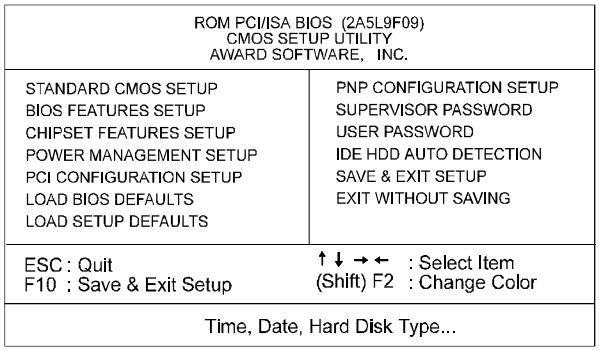
These two connectors are featured to link with the USB peripheral devices.



Award BIOS Setup

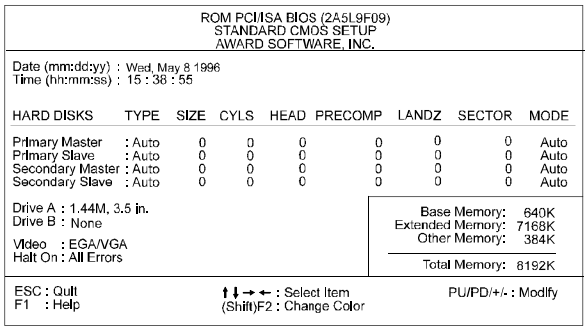
The mainboard comes with the Award BIOS chip that contains the ROM Setup information of your system. This chip serves as an interface between the processor and the rest of the mainboard's components. This chapter explains the information contained in the Setup program and tells you how to modify the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

CMOS Setup Utility



A Setup program, built into the system BIOS, is stored in the CMOS RAM that allows the configuration settings to be changed. This program is executed when the user changes system configuration; the user changes system backup battery; or the system detects a configuration error and asks the user to run the Setup program. At power-on RAM testing, the message **Press DEL to enter Setup** appears. Use the arrow keys to select and press Enter to run the selected program.

Standard CMOS Setup



The Standard CMOS Setup screen is displayed above. System BIOS automatically detects memory size, thus no changes are necessary. It has a few items for setting. Each item may have one or more option settings. It allows you to change the system Date and Time, IDE hard disk, floppy disk drive types for drive A: and B:, boot up video display mode, and POST error handling selection. 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.

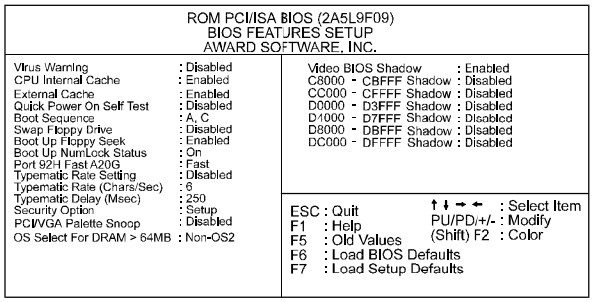
SECTOR:
The sector number of each track defined on the hard disk. The range is from 1 to 64.

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.
Please read page 59 for more information.

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



Moving around the BIOS and Chipset Features (refer to the next section) Setup programs shown works the same way as moving around the Standard CMOS Setup program. Users are not encouraged to run the BIOS and Chipset Features Setup programs. Your system should have been fine-tuned before shipping. Improper Setup may cause the system to fail, consult your dealer before making any changes.

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 enbled, improves the system performance. Disable this item when testing or trouble-shooting.

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

When enabled, 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.

Port 92H Fast A20G

When enabled, allows the A20G bus line signal generated from the chipset 82C586 PC/AT to directly pass to port 92H, instead of the keyboard controller. It will speed up the system performance.
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.

PCI/VGA Palette Snoop

When enabled, allows you install an enhanced graphics adapter card. If your graphics adapter card does not support the Pallete Snoop function, please set at Disable to avoid system malfunctions.
The options are: Enabled, Disabled (Default).

OS Select For DRAM > 64MB

If your operating system (OS) is OS2, select the options OS2; otherwise, stay with the default setting Non-OS2.
The options are: Non-OS2 (Default), OS2.

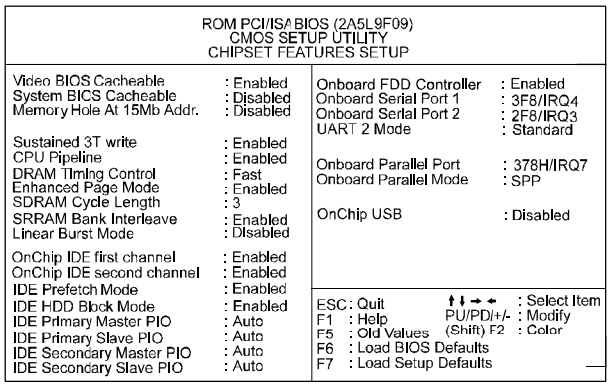
Video BIOS Shadow

When enabled, 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

When enabled, 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



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.

System BIOS Cacheable

When enabled, allows the ROM area F000H-FFFFH to be cacheable when cache controller is activated. The recommended setting is Disabled especially for high speed CPUs (200 MHz and above).

Memory Hole At 15MB Addr.

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.

The options are: Enabled, Disabled (Default).

Sustained 3T Write

When enabled, allows the CPU to compele the memory writes in 3 clocks.

The options are: Enabled (Default), Disabled.

CPU Pipeline

When enabled, allows the CPU to execute the pipeline function.
The options are: Enabled (Default), Disabled.

DRAM Timing Control

Allows you to speed up the data access of 82C586.
The options are: Normal, Fast (Default), Turbo.

Enhanced Page Mode

When enabled, it allows the system BIOS to pre-determine the next access is on or off page. This leads the start of precharge time if off page.
The options are: Enabled (Default), Disabled.

SDRAM Cycle Length

This feature appears only when SDRAM DIMM/s is installed (BIOS auto dection). If the CAS latency of your SDRAM DIMM is 2, set at 2 to enhance the system performance. If the CAS latency of your SDRAM DIMM is 3, stay with the default setting, 3.
The options are: 2, 3 (Default).

SDRAM Bank Interleave

This feature appears only when SDRAM DIMM/s is installed (BIOS auto dection). When the bank interleave fucntion of the SDRAM is enabled, its the data transacting performance is better than when it is disabled.
The options are: Enabled (Default), Disabled.

Linear Burst Mode

When enabled, allows you to configure the CPU to SRAM data read/wirte mode. If you use a Cyrix CPU, select Enabled; if you use an Intel CPU or AMD-K5 CPU, please stay with the default value, Disabled. Please refer to page 14, SRAM.

OnChip IDE First Channel

When enabled, allows the IDE drive to use the first channel of the primary IDE.
The options are: Enabled (Default), Disabled.

OnChip IDE Second Channel

When enabled, allows the IDE drive to use the second channel of the primary IDE.
The options are: Enabled (Default), Disabled.

IDE Prefetch Mode

When enabled, allows the system BIOS to utilize the prefetch buffer of the onboard IDE controller to prefetch the next sequential data of the current access.

The options are: Enabled (Default), Disabled.

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.

IDE Primary Master PIO

Allows you to select first PCI IDE channel of the primary master hard disk mode or to detect it by the BIOS.

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

IDE Primary Slave PIO

Allows you to select the first PCI IDE channel of the primary slave hard disk mode or to detect it by the BIOS.

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

IDE Secondary Master PIO

Allows you to select first PCI IDE channel of the primary master hard disk mode or to detect it by the BIOS.

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

IDE Secondary Slave PIO

Allows you to select the first PCI IDE channel of the primary slave hard disk mode or to detect it by the BIOS.

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

Onboard FDD Controller

When enabled, the floppy diskkette drive (FDD) controller 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: 3F8/IRQ4 (Default), 3F8/IRQ4, 2E8/IRQ3, 2F8/IRQ3, 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: 2F8/IRQ3 (Default), 3E8/IRQ4, 2E8/IRQ3, 3F8/IRQ4, Disabled.

UART 2 Mode

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, instead as an IR port.
The options are: HPSIR, ASKIR, Standard (Default).

IR Function Duplex

If the option ASKIR of UART 2 Mode is selected, this feature will be shown in your monitor for allowing you to select the infrared transmaction modes.
The options are: Half (Default), Full.

RxD , TxD Active

If the option ASKIR of UART 2 Mode is selected, this feature will be shown in your monitor for allowing you to select the active level of the reception end (RxD) and tranmission end (TxD). The Hi stands for Active, the Lo stands for Non-active.
The options are: Hi, Hi (Default); Hi, Lo; Lo, Hi; Lo, Lo.

Onboard Parallel Port

Allows you to select from a given set of parameters if the parallel port uses the onboard I/O controller.
The options are: 378H/IRQ7 (Default), 278H/IRQ5, 3BCH/IRQ7, Disabled.

Onboard Parallel Mode

Allows you to connect with an advanced printer I/O mode.
The options are: SPP (Default), EPP/SPP, ECP, ECP/EPP.

ECP Mode Use DMA 3

Allows you to select the DMA channel number 3 or 1 for the ECP printer mode.

The optoions are: 1, 3 (Default).

Parallel Port EPP Type

Allows you to select the EPP version.
The options are: EPP1.7, EPP1.9 (Default).

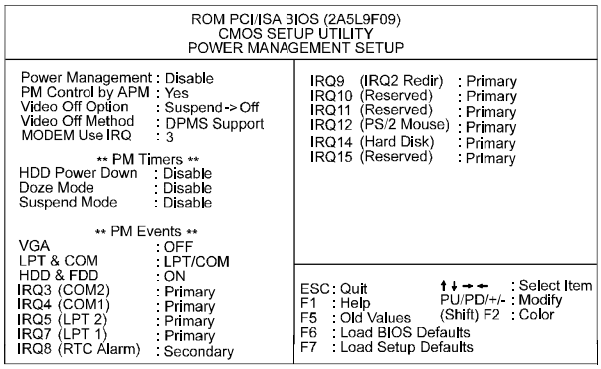
OnChip USB

If you connect an external USB device, please set at Enabled.
The options are: Disabled (default), Enabled.

BIOS Support USB Keyboard

This item appears after the above item is set at Enabled. If your USB keyboard cannot be detected automatically by the system BIOS or some driver diskettes came with your USB keyboard, please set at DOS for allowing your to install the driver.
The options are: Setup (default), DOS.

Power Management Setup



Power Management

When enabled, allows you to use Power Management features.
The options are: Enabled, Disabled (Default).

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 the power saving mode after all tasks are done.
The options are: Yes (Default), No.

Video Off Option

This feature provides the selections of the video display power saving mode. The option Suspend - Off allows the video display to go blank if the system enters Suspend mode. The option All Modes - Off allows the video display to go blank if the system enters Doze mode or Suspend mode. The option Always On allows the video display to stay in Standby mode even when the system enters Doze or Suspend mode.
The options are: Suspend - Off (Default), All Modes - Off, Always On.

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 Support 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 screen display by turning off the red-green-blue signals.

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

MODEM Use IRQ

This feature allows you to select the IRQ# to meet your modem's IRQ#.

The options are: NA, 3 (Default), 4, 5,7, 9, 10, 11.

HDD Power Management

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

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

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

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), 10, 20, 30, 40 sec, 1, 2, 4, 6, 8, 10, 20, 30, 40 min, 1h.

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), 10, 20, 30, 40 sec, 1, 2, 4, 6, 8, 10, 20, 30, 40 min, 1h.

VGA

Selecting ON will enable the power management timers when a no activity events is detected in the VGA. Selecting OFF to disable the PM timer even if a no activity event is detected.
The options are: OFF (Default), ON.

LPT & COM

Selecting LPT & COM will enable the power management timers when a no activity event is detected in the LPT and COM ports. Selecting LPT (COM) will enable the power management timers when a no activity event is detected in the LPT (COM) ports. Selecting NONE to disable the PM timer even if a no activity event is detected.
The options are: LPT & COM (Default), LPT, COM, NONE.

HDD & FDD

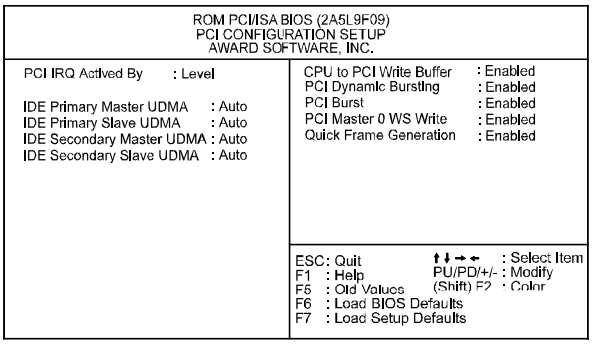
Selecting ON will enable the power management timers when a no activity event is detected in the hard disk drive and floppy disk drive. Selecting OFF to disable the PM timer even if a no activity event is detected.
The options are: OFF, ON (Default).

IRQ# Activity

After the time period which you set at in Suspend Mode Feature, the system advances from Doze Mode to Suspend Mode in which the CPU clock stops and the screen display is off. At this moment, if the IRQ activity which is defined as Primary occurs, the system goes back to Full-on Mode directly.
If the IRQ activity which is defined as Secondary takes place, the system enters another low power state, Dream Mode, in which the system will act as Full-on Mode except that the screen display remains off until the corresponding IRQ handler finishes, then back to Suspend Mode.
For instance, if the system connects to a LAN and receives an interruption from its file server, the system will enter the dreaming mode to execute the corresponding calling routine.
The options are: Primary, Secondary.
The default values of IRQ3, 4, 5, 7, 9, 10, 11, 12, 14, 15 are: Primary.
The default value of IRQ8 is: Secondary.

NOTE : Under certain operating system such as Windows NT 4.0 (Build 1381), the CD auto-insertion feature might have some effect on the power management. It is recommended that the CD-ROM drive to use the secondary channel, and set the following features in the feature Power Management Setup. - HDD & FDD : Off ; IRQ15 (Reserved) : Secondary

PCI Configuration Setup



PCI IRQ Actived By

If your IDE card is triggered by edge, set it at Edge.
The options are: Level (Default), Edge.

IDE Primary Master UDMA

Allows you to select the first PCI IDE channel of the first master hard disk mode or to detect it by the BIOS if the hard disk supports UDMA (Ultra DMA, faster than DMA).
The options are: Auto (Default), Disabled.

IDE Primary Slave UDMA

Allows you to select the first PCI IDE channel of the first slave hard disk mode or to detect it by the BIOS if the hard disk supports UDMA (Ultra DMA, faster than DMA).
The options are: Auto (Default), Disabled.

IDE Secondary Master UDMA

Allows you to select the second PCI IDE channel of the secondary master hard disk mode or to detect it by the BIOS if the hard disk supports UDMA (Ultra DMA, faster than DMA).
The options are: Auto (Default), Disabled.

IDE Secondary Slave UDMA

Allows you to select the second PCI IDE channel of the secondary slave hard disk mode or to detect it by the BIOS if the hard disk supports UDMA (Ultra DMA, faster than DMA).
The options are: Auto (Default), Disabled.

CPU to PCI Write Buffer

When enabled, allows data and address access to the internal buffer of 82C586 so the processor can be released from the waiting state.
The options are: Enabled (Default), Disabled.

PCI Dynamic Bursting

When enabled, the PCI controller allows Bursting PCI transfer if the consecutive PCI cycles come with the address falling in same 1KB space. This improves the PCI bus throughput.
The options are: Enabled (Default), Disabled.

PCI Burst

When enabled, data transfer on PCI Buses will improve. Disable this item during trouble-shooting.
The options are: Disabled, Enabled (Default).

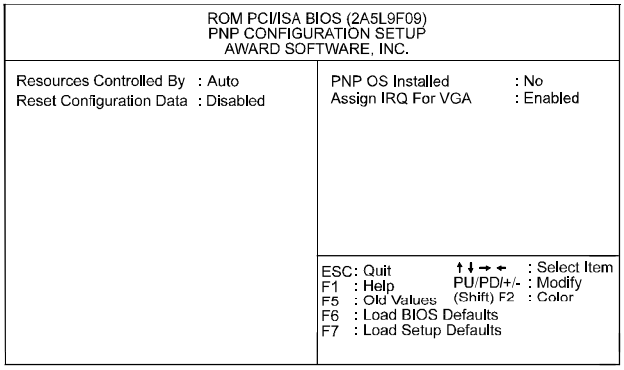
PCI Master 0 WS Write

When enabled, allows a zero-wait-state-cycle delay when the PCI master drive writes data to DRAM.
The options are: Enabled (Default), Disabled.

Quick Frame Generation

When enabled, allows the system to start the PCI Bus (by asserting frame) as soon as possible when the bus cylce is going to forward to the PCI Bus.
The options are: Disabled, Enabled (Default).

PnP Configuration Setup



Resources Controlled By

If you set at Auto, the BIOS automatically arranges all system resources for you. If there are conflicts 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, this feature allows the system to clear the last BIOS configration data and reset them with the default BIOS configuraton data.

The options are: Enabled, Disabled (default).

PNP OS Installed

If the operating system (OS) you installed supports PNP (Plug-and-Play), such as Windows 95, please select Yes; otherwise, stay with the default value, Disabled.

The options are: No, Yes (default).

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

The 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.

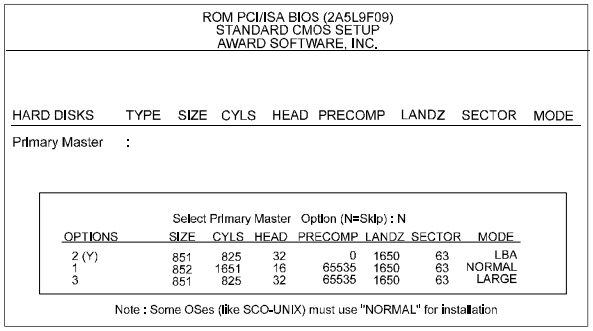
Supervisor/User Password

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.

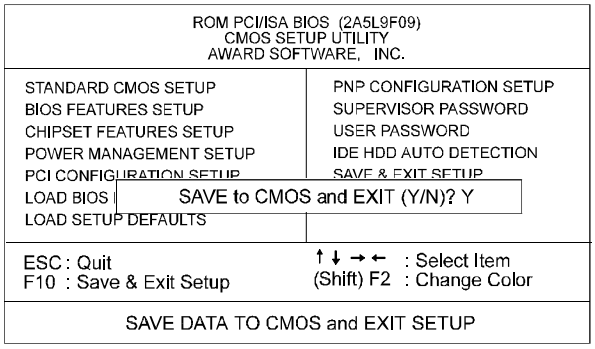
Under the BIOS Feature Setup, if System is selected under the Security Option field and the Supervisor Password is enabled, you will be prompted for the Supervisor Password every time you try to enter the CMOS Setup Utility. If System is selected and the User Password is enabled, you will be requested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

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)** is recommended by the system BIOS. You may also key 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



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 be the same ones shown on your screen.

BIOS Update Instruction

Flash Process

The mainboard provides a Flash BIOS. If you have any question about the BIOS updage, please contact your local dealer for more information. The follwoing insturctions are introduced when the upgrade is needed.

1. Create a Bootable Floppy (in DOS) -
   with a non-fomatted diskette, type **format a:/s**
   With a fomatted diskette, type **sys a:**

2. Download the BIOS File -
   Download the correct BIOS file via FTP, by clicking on the file name of the BIOS you wish to download.

   Save the BIOS file and the Flash Utility file in the boot disk you have created.

   Unzip the BIOS file and the Flash Utility file.
   There are two files after extraction: Flash BIOS utility, (e.g. flash531.exe), and BIOS file (e.g. 615J900.bin). Use the standard Flash BIOS utility (flash531.exe), unless othewise specified.

   Place the bootable floppy disk containing the BIOS file and the Flash Utility in drive a:, and reboot the system in MS-DOS, preferably Ver. 6.22

   At the A: > prompt, type the corresponding Flash BIOS utility and the BIOS file with its extension. For example, **flash531 615j900.bin**

   From the Flash Memory Write menu, select **Y** to **Do you want to save BIOS?** If you want to save your current BIOS, then type the current BIOS name and the extension after **FILE NAME TO SAVE:** . e.g. 613J900.bin
   Alternatively, select **N** if you do not want to save your current BIOS.

   Select **Y** to **Are you sure to program?**
   Wait until it displays **Message: Power Off or Reset the system.**

Once the BIOS has been loaded successfully, remove the floppy diskette and reboot the system holding the END key prior to power on until you enter CMOS setup. If you do not do this the first time booting up after upgrading the BIOS, the system will hang.

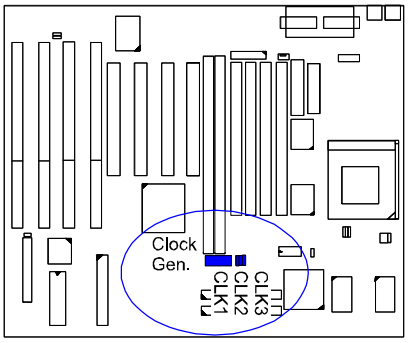
NOTE : Do not turn off or reset the computer during the flash process. It will corrupt the BIOS data.

ICW/PhaseLink Clock Generator

If your mainboard clock generator is ICW or PhaseLink onboard, please following the tables listed in this appendix for correct jumper settings.

CPU External Clock (BUS) Frequency: CLK1, CLK2, CLK3

The table below shows the jumper settings for the different CPU speed configurations.



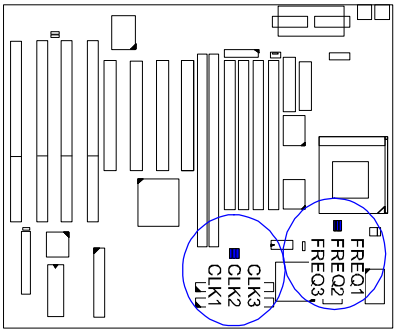
For ICW / PhaseLink Clock Generator

External (CPU/CLK)	CLK1	CLK2	CLK3
75 MHz			
66 MHz			
60 MHz			
55 MHz			

Intel Pentium CPUs

Frequency

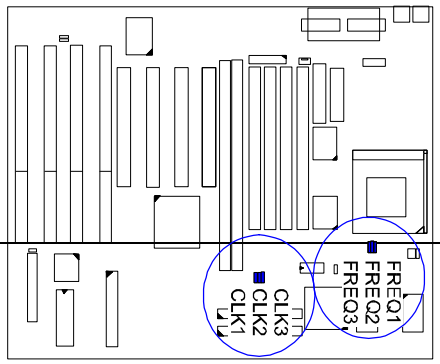
CPU Speed (MHz)	External (CPU/CLK) (MHz)	ICW/PhaseLink			Internal	CPU Clock Rate		
		CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
P55C								
233	66				3.5 x			
200	66				3 x			
166	66				2.5 x			
150	60				2.5 x			
P54C								
200	66				3 x			
166	66				2.5 x			
150	60				2.5 x			
133	66				2 x			
120	60				2 x			
100	66				1.5 x			
90	60				1.5 x			



AMD-K5/K6 CPUs

Frequency

Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	ICW/PhaseLink			Internal	CPU Clock Rate		
			CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
K6-233	233	66				3.5x			
K6-200	200	66				3 x			
K6-166	166	66				2.5x			
K5-PR200	133	66				2 x			
K5-PR166	116	66				1.75x			
K5-PR150	105	60				1.75x			
K5-PR133	100	66				1.5 x			
K5-PR120	90	60				1.5 x			
K5-PR100	100	66				1.5 x			
K5-PR90	90	60				1.5 x			

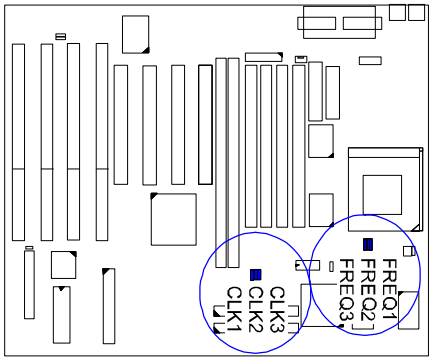


Cyrix 6x86 CPUs

Frequency

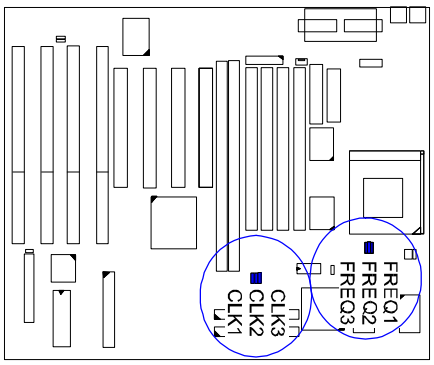
Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	ICW/PhaseLink			Internal	CPU Clock Rate		
			CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
M2*	233	66				3.5 x			
M2*	225	75				3 x			
M2*	200	66				3 x			
M2*	188	75				2.5 x			
M2*	166	66				2.5 x			
M2*	150	60				2.5 x			
6x86-PR200+ 6X86L-PR200+	150	75				2 x			
6x86-PR166+ 6x86L-PR166+	133	66				2 x			
6x86-PR150+ 6x86L-PR150+	120	60				2 x			
6x86-PR133+ 6x86L-PR133+	110	55				2 x			

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



IBM 6x86 CPUs

Frequency

Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	ICW/PhaseLink			Internal	CPU Clock Rate		
			CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
M2*	233	66				3.5 x			
M2*	225	75				3 x			
M2*	200	66				3 x			
M2*	188	75				2.5 x			
M2*	166	66				2.5 x			
M2*	150	60				2.5 x			
6x86-PR200+ 6X86L-PR200+	150	75				2 x			
6x86-PR166+ 6x86L-PR166+	133	66				2 x			
6x86-PR150+ 6x86L-PR150+	120	60				2 x			
6x86-PR133+ 6x86L-PR133+	110	55				2 x			

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