

PA-2011



MAINBOARD MANUAL

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Part No. : 25-10738-06

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 590VP, the PA-2011 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-2011 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-2011 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-2011 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-2011 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-2011 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-2011 mainboard
- This user manual
- One IDE device cable
- One floppy disk drive cable

Main Features

The PA-2011 mainboard comes with the following high-performance features:

- **Easy Installation**
AMI 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 590VP chipset with integrated DRAM and LII cache controllers as well as support for Intel's new Dynamic Power Management Architecture (DPMA), Concurrent PCI (PCI 2.1), 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 processors.
Intel Pentium® P54C/P54CS 90/100/120/133/150/166/200 MHz processors.
AMD-K6™-166 (166 MHz) / K6-200 (200 MHz) / K6-233 (233 MHz) processors.
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) processors.
Cyrix M2 150/166/200/233 MHz processors.
Cyrix 6x86™- PR133+ (110 MHz) / 6x86-PR150+ (120 MHz) / 6x86-PR166+ (133 MHz) / 6x86-PR200+ (150 MHz) processors.
IBM M2 150/166/200/233 MHz processors.
IBM 6x86™- P133+ (110 MHz) / 6x86-PR150+ (120 MHz) / 6x86-PR166+ (133 MHz) / 6x86-PR200+ (150 MHz) processors.
- **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 SMC669/UMC8669 Plug and Play multi-I/O chipset features two high-speed 16550A compatible serial ports, one EPP/ECP capable parallel 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 590VP 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-2011 is further boosted by the board's integrated I²C 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 2.1 and 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

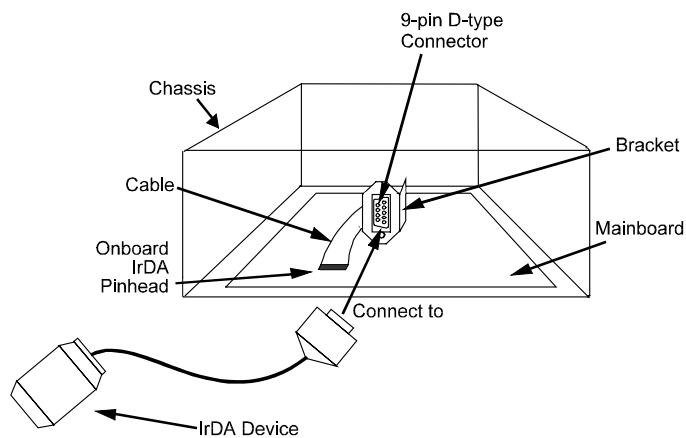
This mainboard is fully compliant with the new PC '97 standard at both the BIOS and hardware levels. PC '97 is a set of hardware, bus and device design requirements set by Microsoft in conjunction with other industry leaders aimed at making PCs easier to use by maximizing cooperation between the operating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

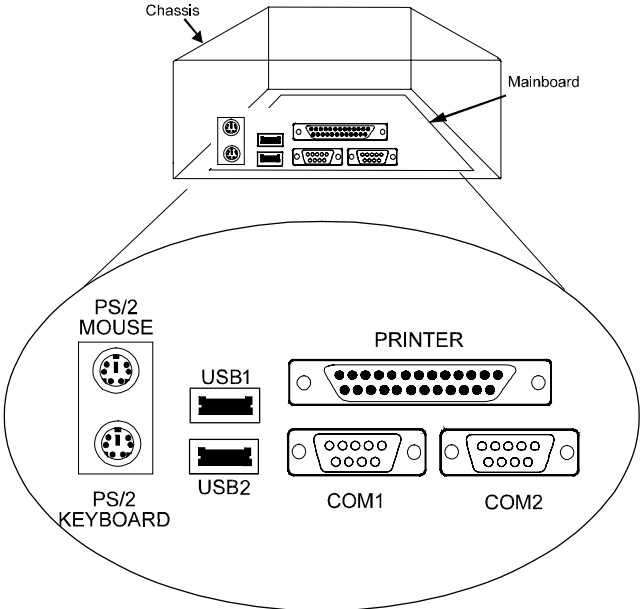


The serial port COM2 on this mainboard is designed to be a IR compliant port. If you wish to install the IR connection feature, you need to adjust the BIOS option for high-speed performance. Please read page 56 of this manual.

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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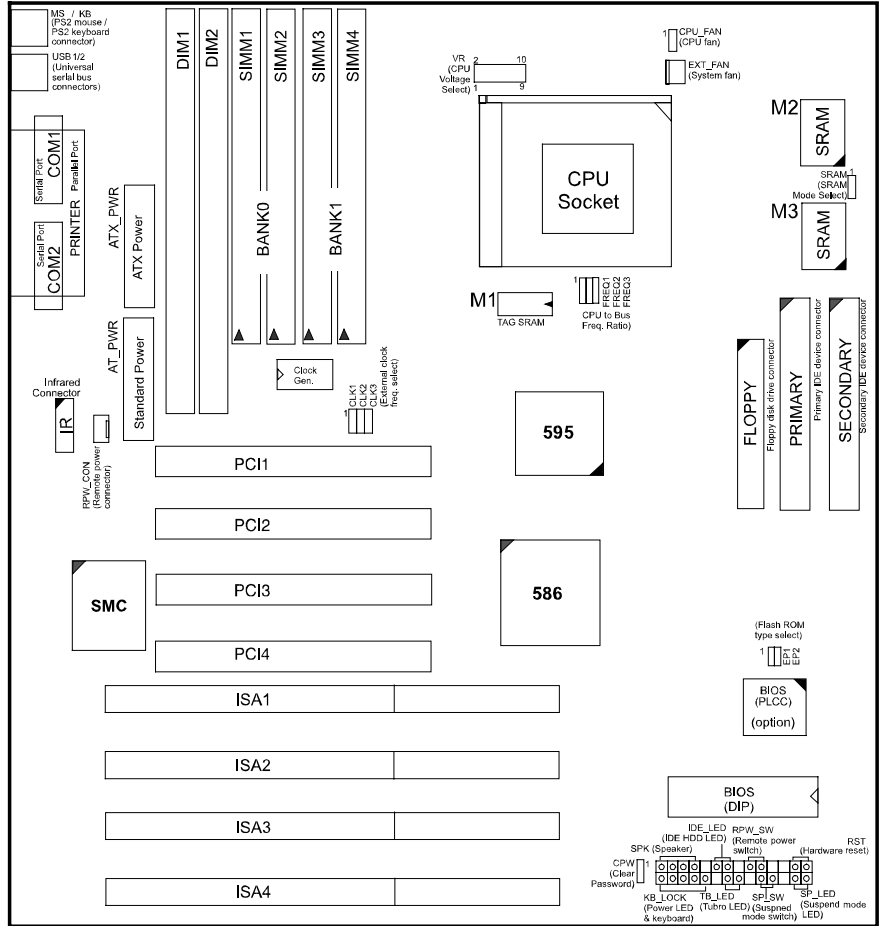
Installation Procedures

The PA-2011 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.)

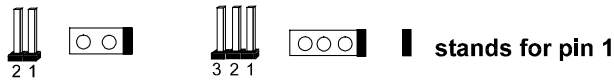
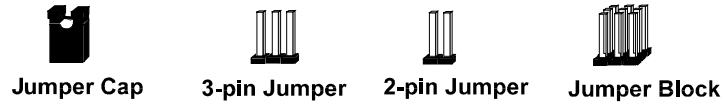
Mainboard Layout



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 pins 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:



Jumpers are shown as above



Jumper cap is shown as above

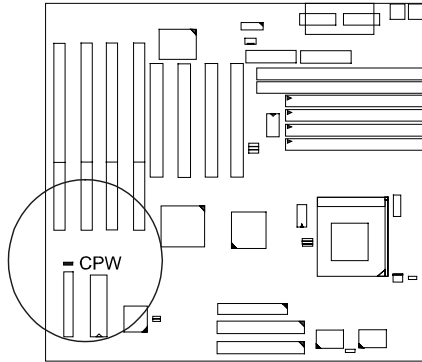


Jumpers in a Block

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.



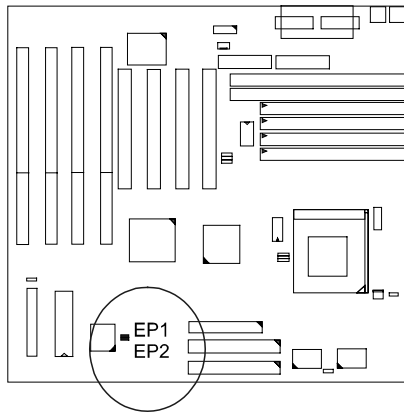
Enable











Disable
(Default)

Flash EPROM Type Selection: EP1, EP2

These two jumpers allow you to configure the Flash EPROM chip

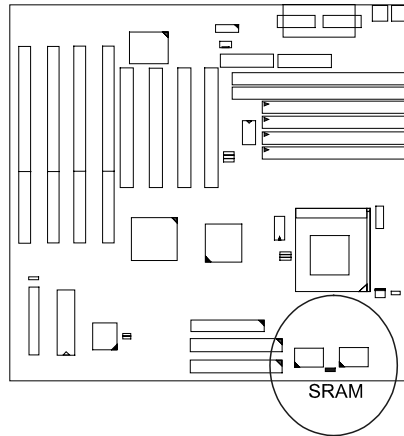


1M Flash ROM	EP1	EP2
INTEL / MX	 1	 1
AMD / ATMEL / SST	 1	 1

2M Flash ROM	EP1	EP2
INTEL / MX	 1	 1
AMD / ATMEL / SST	 1	 1

CPU to SRAM Data Transacting Mode Selection: SRAM

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



1
Intel Burst
(Default)
For
Intel Pentium CPUs,
AMD-K5 CPUs,
Cyrix CPUs,
IBM CPUs



1
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-2011'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 64MB FPM (Fast Page Mode) and high-speed EDO (Extended Data Out) DRAM. Each DIMM socket is able to support up to 64MB EDO DRAM or lightning-fast SDRAM.

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 :

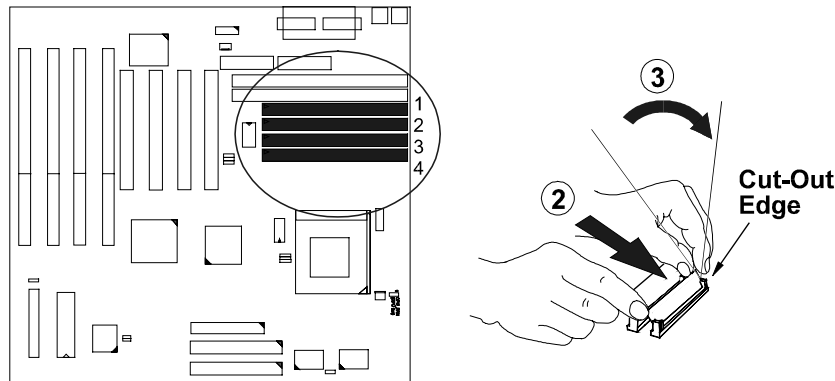
1. * A RAM module of this size was not available for testing at press time.
2. DIM1 and DIM2 only support 3.3V (unbuffered) EDO and SDRAM modules.
3. It is recommended that SIMMs and DIMMs are not installed at the same time on this mainboard to avoid unexpected failure.
4. DIM2 and SIMM 1&2 are shared.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

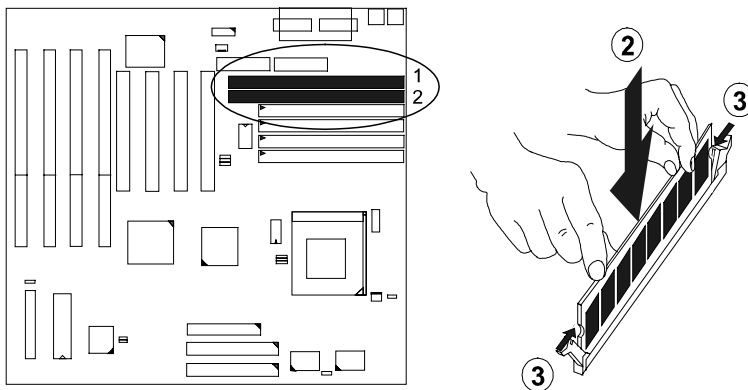
Remove SIMMs

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. (See figure below.)



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.

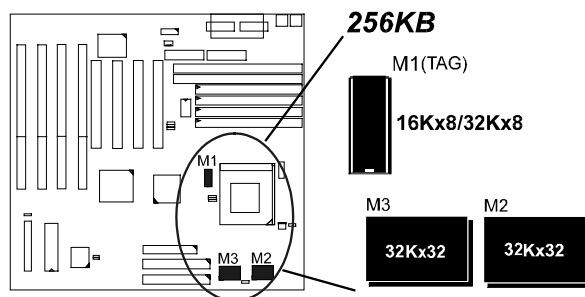
Remove DIMMs

Press the clips with both hands to remove the DIMM.

Cache Memory

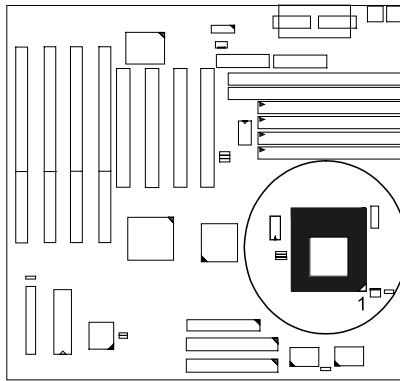
The PA-2011 comes with onboard 256KB (512KB is optional) synchronous 3V Pipeline Burst SRAMs. Cache memory access is very fast compared to main memory access. The cache holds data for imminent use. Since cache memory is from five to more than ten times faster than main memory, the CPU's access time is reduced, giving you better system performance.

Socket 7 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.



3). Install the CPU

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



CAUTION :

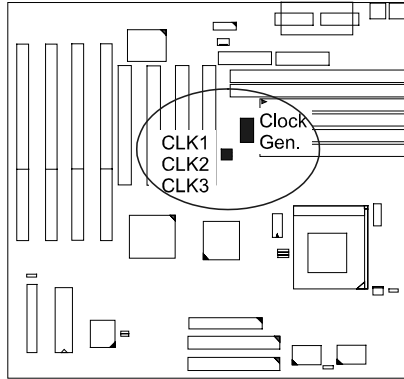
1. Always turn the system power off before installing or removing any device.
2. Always observe static electricity precautions.
See "Handling Precautions" at the start of this manual.
3. Inserting the CPU chip incorrectly may damage the chip.

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

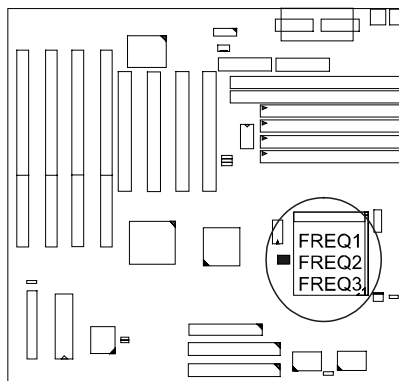
External (CPU/CLK)	CLK1	CLK2	CLK3
75 MHz	1	1	1
66 MHz	1	1	1
60 MHz	1	1	1
55 MHz	1	1	1

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.

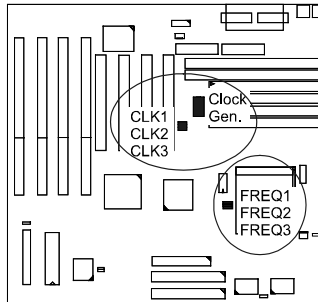
FREQ1	FREQ2	FREQ3	Ratio			
			P54C	P55C/ M2/K6	K5	M1
 1	 1	 1	3 x	3 x	2 x	4 x
 1	 1	 1	2.5 x	2.5 x	1.75 x	1 x
 1	 1	 1	2 x	2 x	---	2 x
 1	 1	 1	1.5 x	3.5 x	1.5 x	3 x



Intel Pentium CPUs

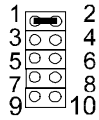
Frequency

CPU Speed (MHz)	External (CPU/CLK) (MHz)	IMI			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			
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			

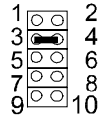


Voltage

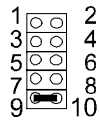
VR



Core : 3.5V
IO : Same
P54C VRE

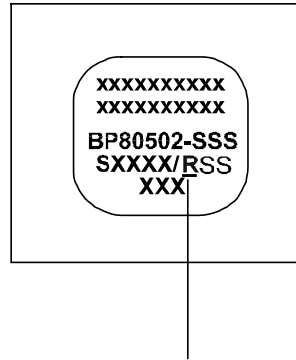


Core : 3.3V
IO : Same
P54C STD

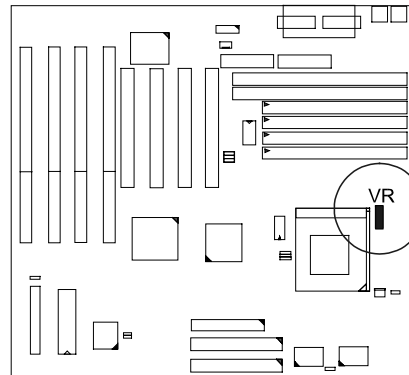


Core : 2.8V
IO : 3.3V
P55C

**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

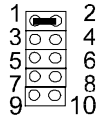
Frequency

The diagram shows the internal clock rate settings for AMD-K5/K6 CPUs. It includes labels for External (CPU/CLK) and Internal clock rates, and a section for CPU Clock Rate with jumpers for CLK1, CLK2, CLK3, and FREQ1, FREQ2, FREQ3. Multipliers are indicated for various models: 3.5x, 3x, 1.75x, and 1.5x.

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

Voltage

VR

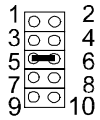


Core : 3.5V
 IO : Same
 AMD-K5 - B

AMD-K5 CPU
 Top Side Marking



V (Identifier for Operation Voltage)

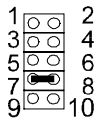


Core : 3.2V
 IO : 3.3V
 AMD-K6 (233 MHz)

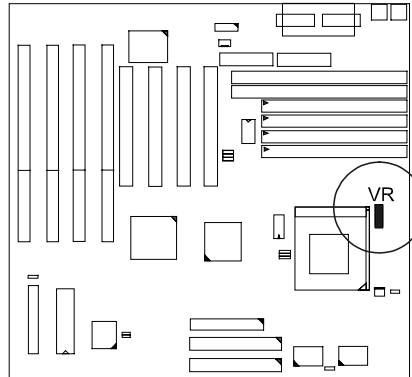
AMD-K6 CPU
 Top Side Marking



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



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

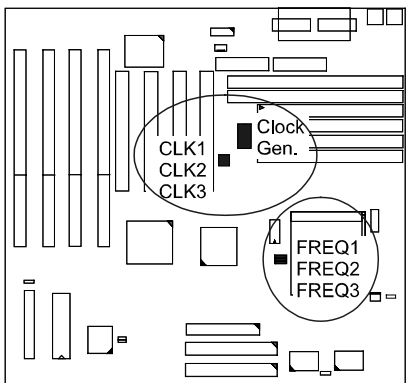


Cyrix 6x86 CPUs

Frequency

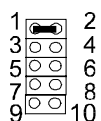
Model	CPU Speed (MHz)	External (CPU/CLK) (MHz)	IMI			Internal	CPU Clock Rate		
			CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
M2*	233	66				3.5 x			
M2*	225	75				3 x			
M2*	200	66				3 x			
M2*	188	75				2.5 x			
M2*	166	66				2.5 x			
M2*	150	60				2.5 x			
6x86-PR200+ 6x86L-PR200+	150	75				2 x			
6x86-PR166+ 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.

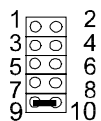


Voltage

VR

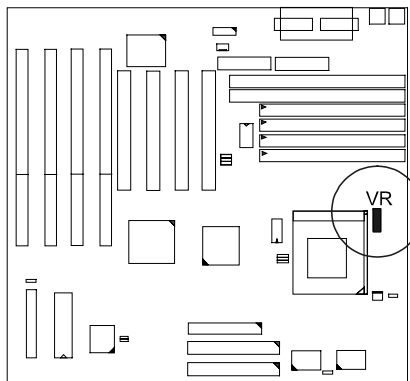
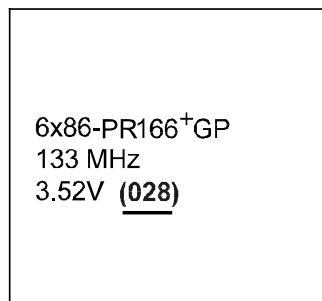


Core : 3.5V
IO : Same
Cyrix 6x86-028



Core : 2.8V
IO : 3.3V
Cyrix 6x86L

Cyrix 6x86 CPU
Top Side Marking

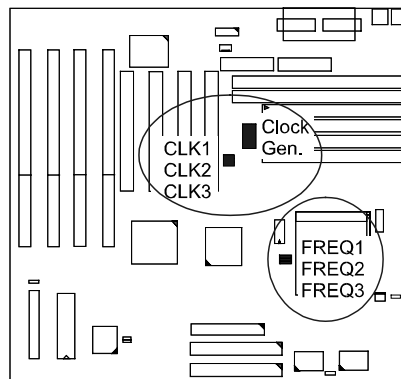


IBM 6x86 CPUs

Frequency

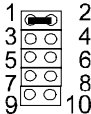
Model	CPU Speed (MHz)	External (GPU/CLK) (MHz)	IMI			Internal	CPU Clock Rate		
			CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
M2*	233	66				3.5 x			
M2*	225	75				3 x			
M2*	200	66				3 x			
M2*	188	75				2.5 x			
M2*	166	66				2.5 x			
M2*	150	60				2.5 x			
6x86-PR200+ 6x86L-PR200+	150	75				2 x			
6x86-PR166+ 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.

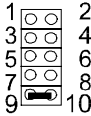


Voltage

VR

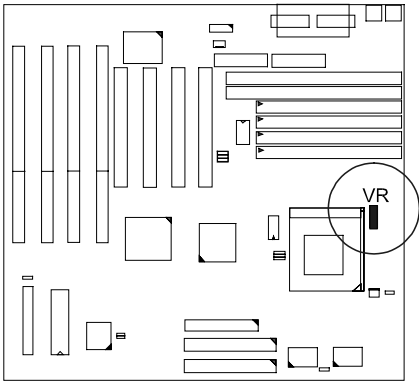
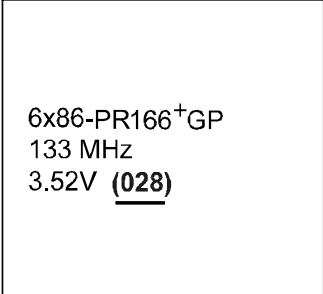


Core : 3.5V
IO : Same
IBM 6x86-028



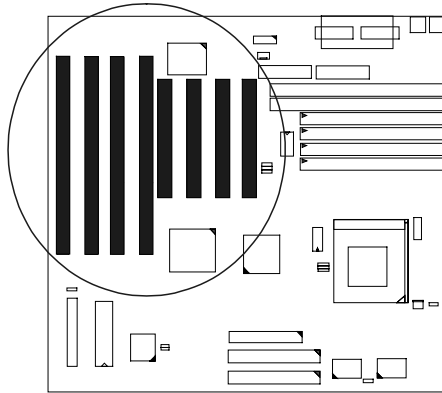
Core : 2.8V
IO : 3.3V
IBM 6x86L

**IBM 6x86 CPU
Top Side Marking**



4). Install Expansion Cards

Your PA-2011 features four 16-bit ISA Bus and four 32-bit PCI Bus expansion slots.



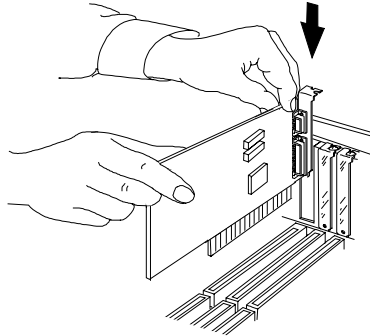
This section describes how to connect an expansion card to one of your system's expansion slots. Expansion cards are printed circuit boards that, when connected to the mainboard, increase the capabilities of your system. For example, expansion cards can provide video and sound capabilities.

<p>CAUTION :</p> <ol style="list-style-type: none">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.)

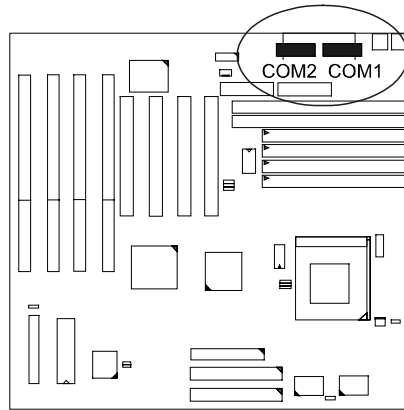


4. Push the card firmly into the slot. Push down on one end of the expansion card, then the other. Use this “rocking” motion until the add-in card is firmly seated inside the slot.
5. Secure the board with the mounting screw removed in Step 2. Make sure that the card has been placed evenly and completely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

5). Connector Cables and Power Supply

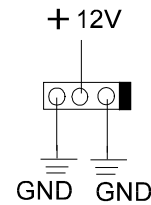
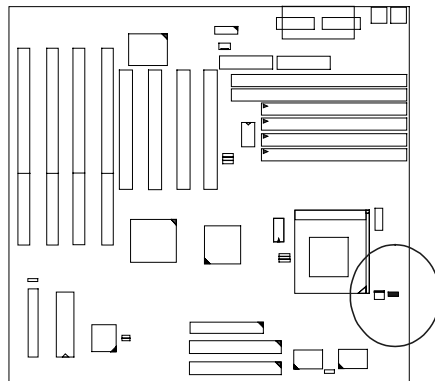
Serial Port Connectors: COM1 and COM2

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 56 of this manual for more information.



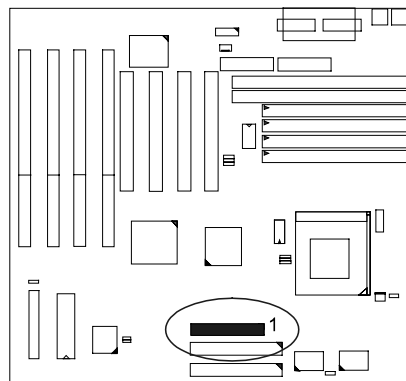
CPU Fan Connector: CPU_FAN

This connector is linked to the CPU fan.



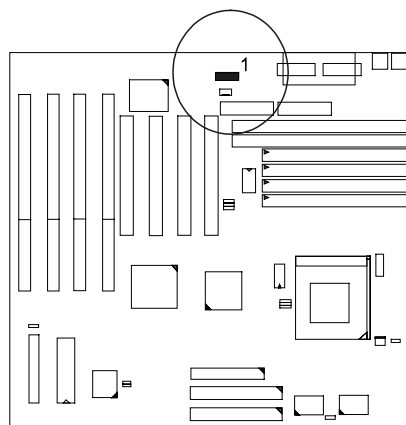
Floppy Diskette Drive Connector: FLOPPY

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



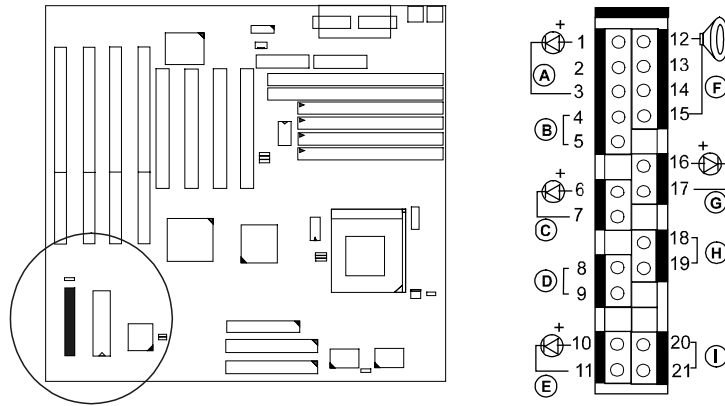
Infrared Connector: IR

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.



Front Panel Block Connector: F_PNL

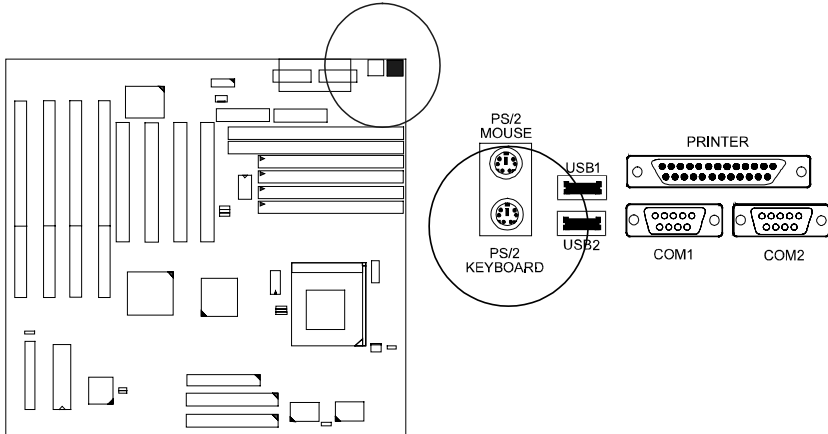
This block connector concludes : PW_LED, KB_LOCK, TB_LED, SP_SW, SPK, SP_LED, IDE_LED, RPW_SW, and RST connectors.



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

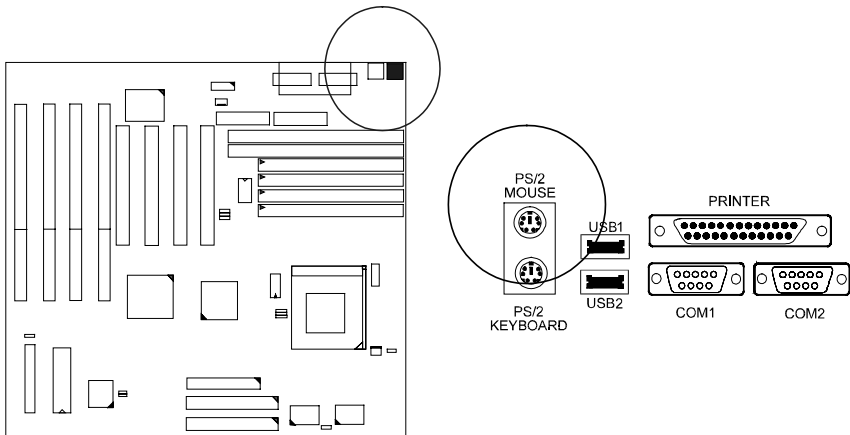
PS/2 Keyboard Connector: PS2_KB

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



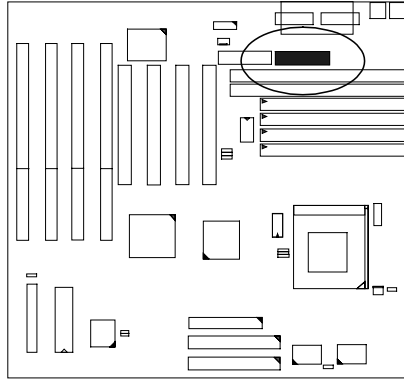
PS/2 Mouse Connector: PS2_MS

This connector is connected to the PS/2 mouse.



ATX Power Connector: ATX_PWR

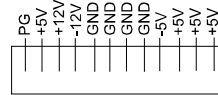
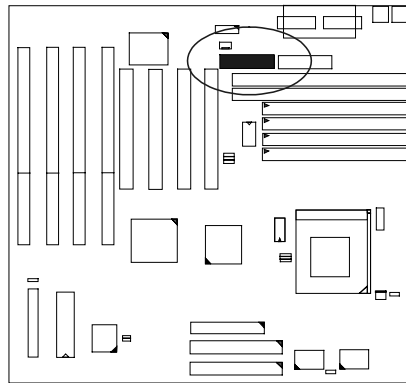
This 20-pin male block connector is connected to the ATX power supply.



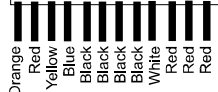
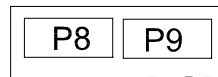
											+3.3V	+3.3V	GND	+5V	GND	+5V	GND	PWR_GOOD	5V_VR	+12V	
1	2	3	4	5	6	7	8	9	10												
11	12	13	14	15	16	17	18	19	20	+3.3V	-12V	GND	-PWR_ON	GND	GND	GND	-5V	+5V	+5V		

Standard Power Supply Connector: AT_PWR

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.



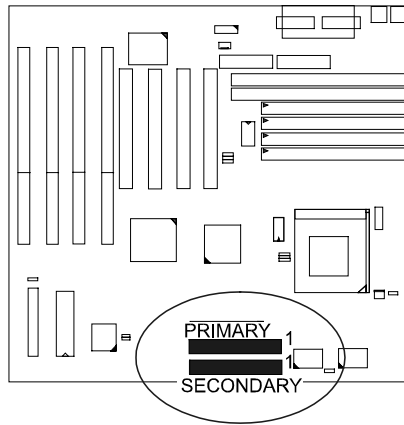
Power Connector



Power Plugs of Power Supply

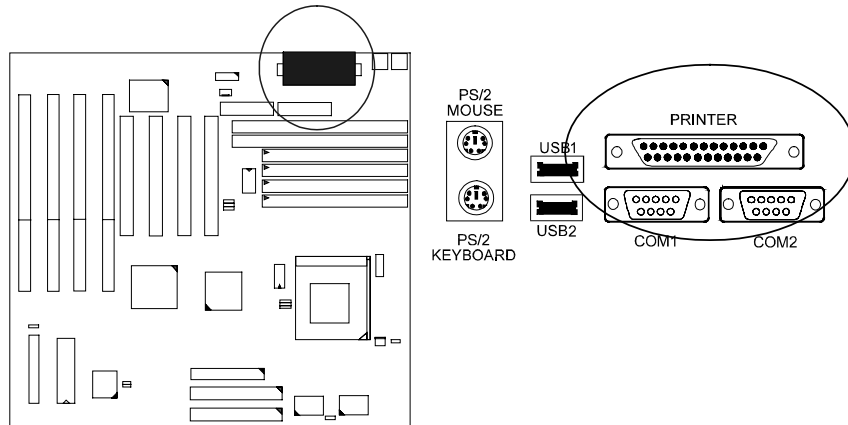
IDE HDD Device Connectors: PRIMARY and SECONDARY

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. 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.



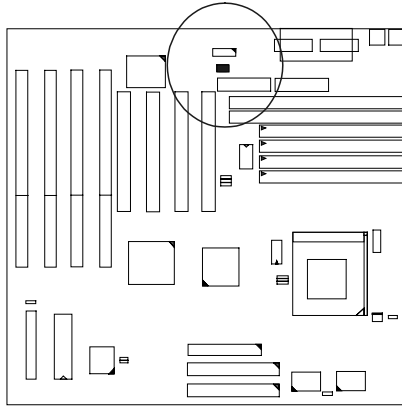
Printer Connector: PRINTER

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



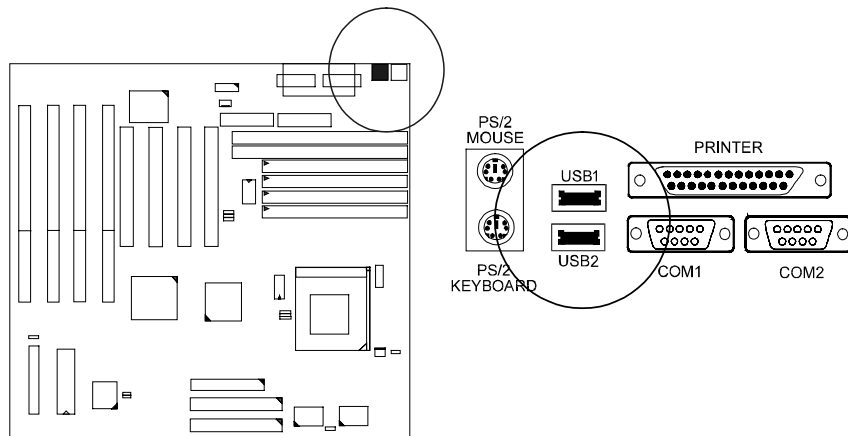
Remote Power Supply Connector: RPW_CON

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: USB1 and USB2

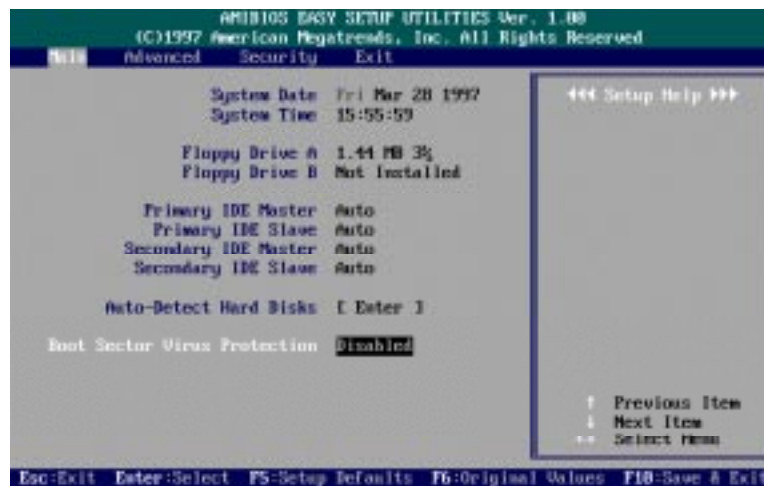
These two connectors are for linking with the peripherals devices that support Universal Serial Bus connection.



AMI BIOS Setup

The mainboard comes with an AMI 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.

Main Setup



The Main Setup screen is displayed above. 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:.

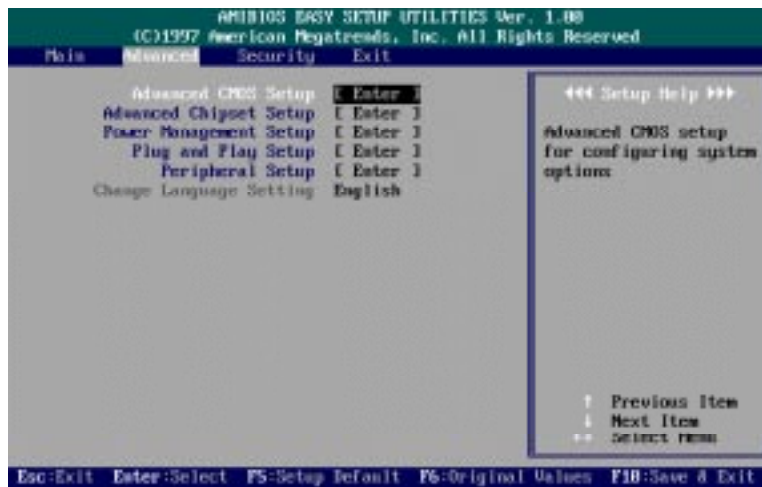
Auto-Detect Hard Disks

Allows the system BIOS to detect all hard disk parameters automatically.

Boot Sector Virus Protection

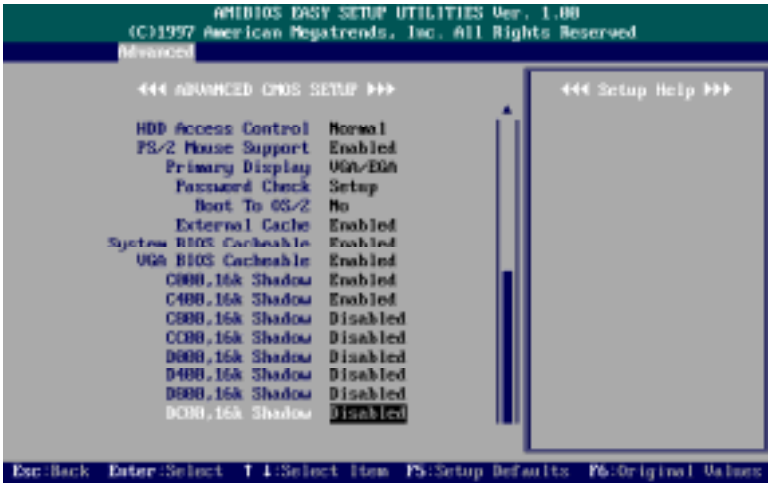
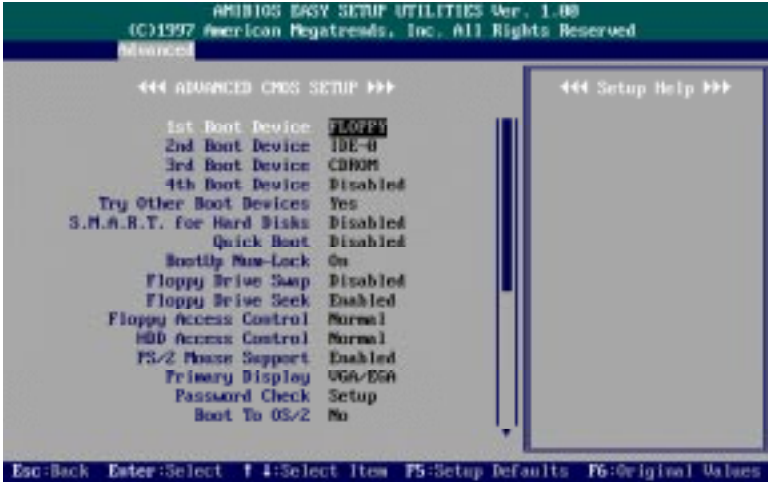
When Enabled, a warning will be given when any program or virus sends a Disk Format command or tries to write to the boot sector of a hard disk drive.

Advanced Setup



Advanced Setup options are displayed by choosing item from the AMI BIOS Setup main menu. All Advanced Setup options are described in this section.

Advanced CMOS Setup



1st Boot Device

This item allows you to select the first drive for booting up the system. The settings are Disabled, IDE-1, IDE-2, IDE-3, FLOPPY, FLOPTICAL, SCSI, or NETWORK. The default setting is FLOPPY.

2nd Boot Device

This item allows you to select the second drive for booting up the system. The settings are Disabled, IDE-0, or FLOPTICAL. The default setting is IDE-0.

3rd Boot Device

This item allows you to select the third drive for booting up the system. The settings are Disabled, FLOPTICAL, CDROM. The default setting is CDROM.

4th Boot Device

This item allows you to select the fourth drive for booting up the system. The settings are Disabled or FLOPTICAL. The default setting is Disabled.

Try Other Boot Devices

If you select Yes, the BIOS will try to boot up the system from other boot devices if all selected boot devices failed to boot. If No selected, the BIOS will try to boot up the system from only the selected devices. The settings are Yes or No. The default setting is Yes.

S.M.A.R.T. for Hard Disks

“S.M.A.R.T” stands for “Self-Monitoring, Analysis and Reporting Technology”. To enable it will assist you in preventing some (but not all) system down time due to hard disk drive failure. The settings are Disabled or Enabled. The default setting is Disabled.

Quick Boot

Set this option to Enabled to instruct AMI BIOS to boot quickly when the computer is powered on. This option replaces the old 1MB Memory Test Advanced Setup option. The settings are Disabled or Enabled. The default setting is Disabled.

BootUp Num-Lock

Set this option to Off to turn the Num Lock key off when the computer is booted so you can use the arrow keys on both the numeric keypad and the keyboard.

The settings are On or Off. The default setting is On.

Floppy Drive Swap

Set this option to Enabled to permit drives A: and B: to be swapped.

The settings are Disabled or Enabled. The default setting is Disabled.

Floppy Drive Seek

Set this option to Enabled to specify that floppy drive A: will perform a Seek operation at system boot.

The settings are Disabled or Enabled. The default setting is Enabled.

Floppy Access Control

It is effective only if the floppy diskette drive is accessed through BIOS INT40H function.

The settings are Normal or Read Only. The default setting is Normal.

HDD Access Control

It is effective only if the hard disk drive is accessed through BIOS INT40H function.

The settings are Normal or Read Only. The default setting is Normal.

PS/2 Mouse Support

When this option is set to Enabled, AMI BIOS supports a PS/2-type mouse.

The settings are Enabled or Disabled. The default setting is Enabled.

Primary Display

This option specifies the type of display monitor and adapter in the computer.

The settings are Absent, VGA/EGA, CGA40x25, CGA80x25, or Mono. The default setting is VGA/EGA.

Password Check

This option enables password checking every time the computer is powered on or every time AMI BIOS Setup is executed. If Always is chosen, a user password prompt appears every time the computer is turned on.

If Setup is chosen, the password prompt appears if AMI BIOS is executed. The settings are Setup or Always. The default setting is Setup.

Boot To OS/2

It allows you to enable the system BIOS to run with the IBM OS/2.
The settings are Yes or No. The default setting is No.

External Cache

This feature allows you to disable the external cache function.
The settings are Disabled or Enabled. The default setting is Enabled.

System BIOS Cacheable

Enable it to allow the contents of the F0000h memory segment to be read from or written to the L2 cache memory. The contents of the F0000h memory segment are always copied from the BIOS ROM to system RAM for faster execution.
The settings are Disabled or Enabled. The default setting is Enabled.

VGA BIOS Cacheable

When enabled, allows the system to use the video BIOS codes from SRAMs, instead of the slower DRAMs or ROMs. The settings are Disabled or Enabled. The default setting is Enabled.

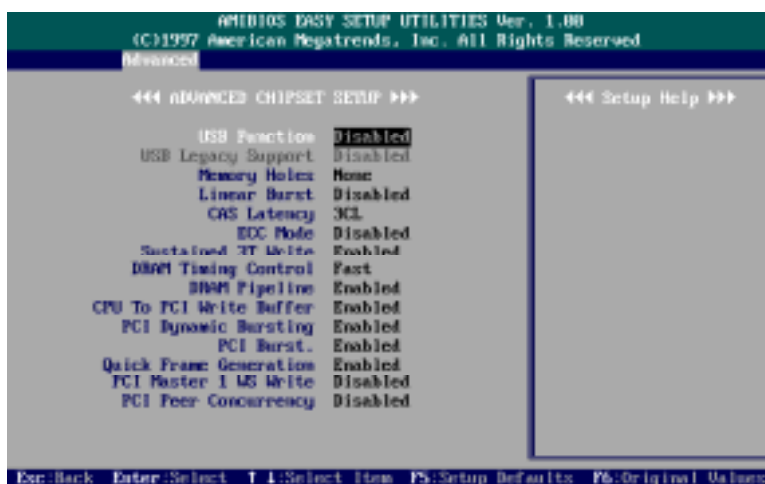
C000,16K Shadow; C400,16K Shadow;
C800,16K Shadow; CC00,16K Shadow;
D000,16K Shadow; D400,16K Shadow;
D800,16K Shadow; DC00,16K Shadow

These options control the location of the contents of the ROM beginning at the specified memory location. If no adapter ROM is using the named ROM area, this area is made available to the local bus.

[Disabled] The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

[Enabled] The contents of C0000h - DC00h are written to the same address in system memory (RAM) for faster execution. The settings are Disabled, Enabled, Cached. The default setting of "C000, 16K Shadow; C400, 16K Shadow" is Enabled; the others are Disabled.

Advanced Chipset Setup



USB Function

This option allows you to enable the Universal Serial Bus (USB) feature. The settings are Disabled or Enabled. The default setting is Disabled.

USB Legacy Support

This feature enables your system to use your USB peripheral devices. The options are Disabled or Enabled. The default setting is Disabled.

Memory Hole

When enabled, the memory hole at the 15MB address will be reserved for 512-640KB, 15-16MB, or 14-16MB address range of the ISA add-on cards that request this memory area.

The options are None, 15M-16M (1M), or 14-16MB (2M). The default setting is None.

Linear Burst

When enabled, allows you to configure the CPU to SRAM data read/write 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 17, **SRAM**.

CAS Latency

If DIMMs are installed, this feature allows you to select CAS Latency (CL) different DIMM types.

The options are: 2CL, 3CL (Default).

ECC Mode

Set at Enabled, if the RAM modules support ECC function.

The options are: Enabled, Disabled (Default).

Sustained 3T Write

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

The options are: Enabled (Default), Disabled.

DRAM Timing Control

Allows you to speed up the data access of 82C595.

The options are: Normal, Fast (Default), Medium, Turbo.

DRAM Pipeline

When enabled, allows DRAMs to execute the pipeline function.

The options are: Enabled (Default), Disabled.

CPU to PCI Write Buffer

When enabled, allows data and address access to the internal buffer of 82C595 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).

Quick Frame Generation

When enabled, allows the system to start the PCI Bus (by asserting frame) as soon as possible when the bus cycle is going to forward to the PCI Bus.

The options are: Disabled, Enabled (Default).

PCI Master 1 WS Write

When enabled, allows a zero-wait-state-cycle delay when the PCI master drive writes data to DRAM.

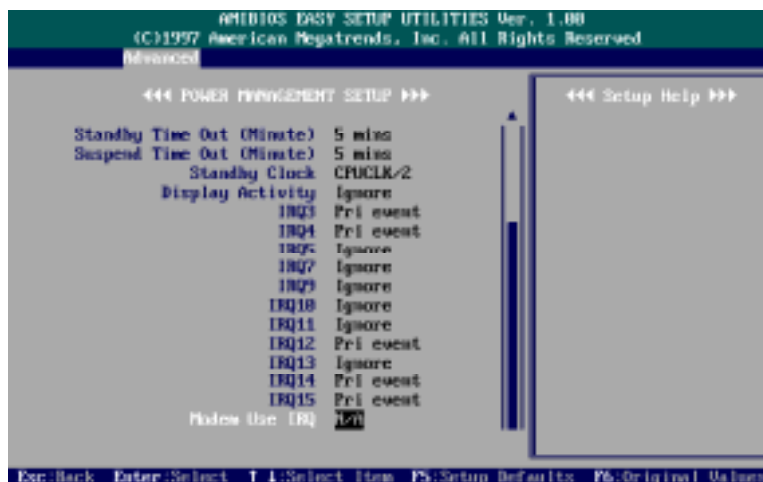
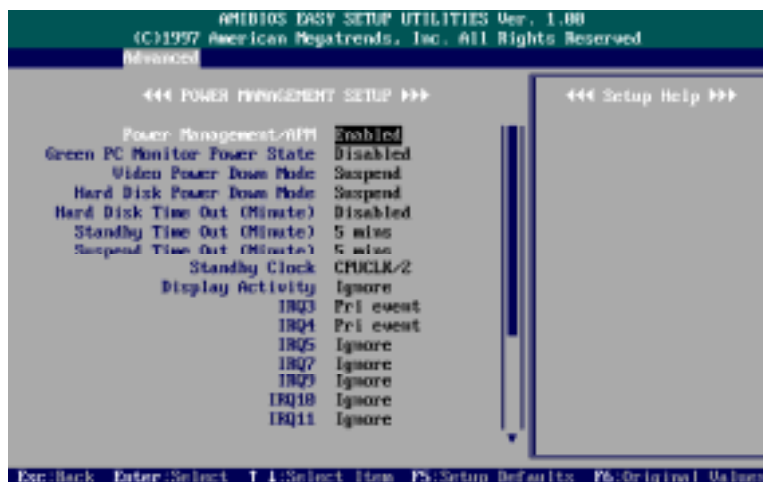
The options are: Enabled, Disabled (Default).

PCI Peer Concurrency

Enable this item to allow the CPU to continue its operation when another PCI bus is active.

The options are: Enabled, Disabled (Default).

Power Management Setup



Power Management/APM

Set this option to Enabled to enable the power management and APM (Advanced Power Management) features.

The settings are Enabled or Disabled. The default setting is Disabled.

Green PC Monitor Power State

This option specifies the power management state that the Green PC-compliant video monitor enters after the specified period of display inactivity has expired.

The settings are: Disabled (Default), Suspend, Off, or Stand By.

Video Power Down Mode

This option specifies the power management state that the video subsystem enters after the specified period of display inactivity has expired.

The settings are: Disabled, Stand By, Suspend (Default).

Hard Disk Power Down Mode

This option specifies the power management state that the hard disk drive enters after the specified period of display inactivity has expired.

The settings are: Disabled, Stand By, Suspend (Default).

Hard Disk Time Out (Minute)

This option specifies the length of a period of hard disk inactivity. When this period expires, the hard disk drive enters the power-conserving mode specified in the Hard Disk Power Down Mode option described above.

The settings are Disabled, 1 minute, and all one minute intervals up to and including 15 min. The default setting is Disabled.

Stand By Time Out (Minute)

This option specifies the length of the period of system inactivity when the computer is in Full-On mode before the computer is placed in Stand By mode. In Stand By mode, some power use is curtailed.

The settings are: Disabled, 1, 2, 5 (Default), 10, 15, 30, 60 mins.

Suspend Time Out (Minute)

This option specifies the length of the period of system inactivity when the computer is already in Stand By mode before the computer is placed in Suspend mode. In Suspend mode, nearly all power use is curtailed.

The settings are Disabled, 1, 2, 5 (Default), 10, 15, 30, 60 mins.

Standby Clock

This feature allows you to set the system clock in Stand By mode.
The settings are: CPUCLK/2 (Default), CPUCLK/4.

Display Activity, IRQ3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 15

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 Event (Pri-event)** occurs, the system goes back to Full-on Mode directly.

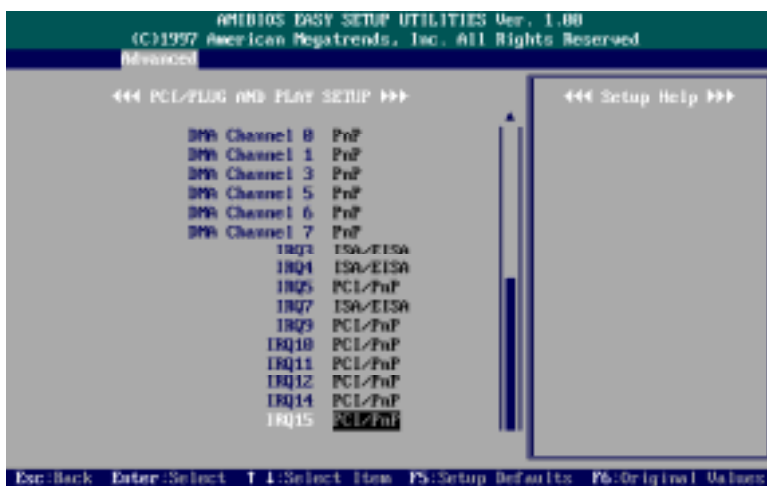
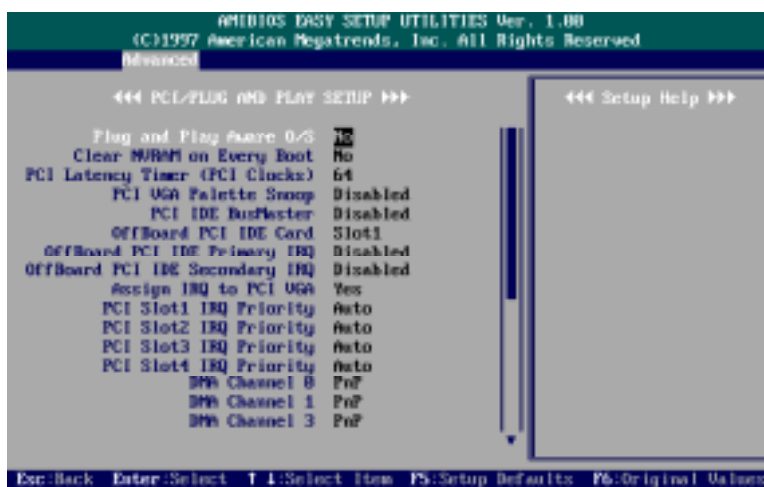
If the IRQ activity which is defined as **Secondary Event (Sec-event)** takes place, the system enters another low power state, Dream Mode, in which the system will act as Full-on Mode except that the screen display remains off until the corresponding IRQ handler finishes, then back to Suspend Mode. 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: Ignore, Pri-event, Sec-event. The default values of IRQ3, 4, 12, 14, 15 are: Pri-event.

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.

Plug and Play Setup



Plug and Play Aware OS

Set this option to Yes if the operating system installed in the computer is Plug and Play-aware. AMI BIOS only detects and enables PnP ISA adapter cards that are required for system boot. The Windows 95 operating system detects and enables all other PnP-aware adapter cards. Windows 95 is PnP-aware. Set this option to No if the operating system (such as DOS, OS/2, Windows 3.x) does not use PnP. You must set this option correctly or PnP-aware adapter cards installed in the system will not be configured properly. The settings are No or Yes. The default setting is No.

Clear NVRAM on Every Boot

When set at Yes, it allows the system to clear NVRAM when every booting. The settings are No or Yes. The Default setting is No.

PCI Latency Timer (PCI Clocks)

This option sets latency of all PCI devices on the PCI bus. The settings are in units equal to PCI clocks. The settings are 32, 64 (Default), 96, 128, 160, 192, 224, 248.

PCI VGA Palette Snoop

This option must be set to Enabled if any ISA adapter card installed in the computer requires VGA palette snooping. The settings are Disabled or Enabled. The default setting is Disabled.

PCI IDE BusMaster

Set this option to Enabled to specify that the IDE controller on the PCI local bus has bus mastering capability. The settings are Disabled or Enabled. The default setting is Disabled.

OffBoard PCI IDE Card

The option specifies if an offboard PCI IDE controller adapter card is used in the computer. You must also specify the PCI slot on the mainboard where the offboard PCI IDE controller card is installed. If an offboard PCI IDE controller is used, the onboard IDE controller on the mainboard is automatically disabled. The settings are Auto (Default), Slot1, Slot2, Slot3, Slot4.

OffBoard PCI IDE Primary IRQ

This options allow you to select the IRQs if you use an offboard primary PCI IDE card. The settings are Disabled, INTA, INTB, INTC, INTD, Hardwired. The default setting is Disabled.

OffBoard PCI IDE Secondary IRQ

This options allow you to select the IRQs if you use an offboard secondary PCI IDE card. The settings are Disabled, INTA, INTB, INTC, INTD, Hardwired. The default setting is Disabled.

Assign IRQ to PCI VGA Card

If your VGA card supports hardware MPEG, please set at Yes to enable the BIOS to assign an available IRQ to the card.

The settings are No or Yes. The default setting is Yes.

PCI Slot 1 IRQ Priority,

PCI Slot 2 IRQ Priority,

PCI Slot 3 IRQ Priority,

PCI Slot 4 IRQ Priority

This option allows you to specify the IRQs for the add-on cards.

The settings are Auto, 3, 4, 5, 7, 9, 10, 11, 12. The default setting is Auto.

DMA Channel 0, 1, 3, 5, 6, 7

This option allows you to specify the bus type that the named DMA channels are used on.

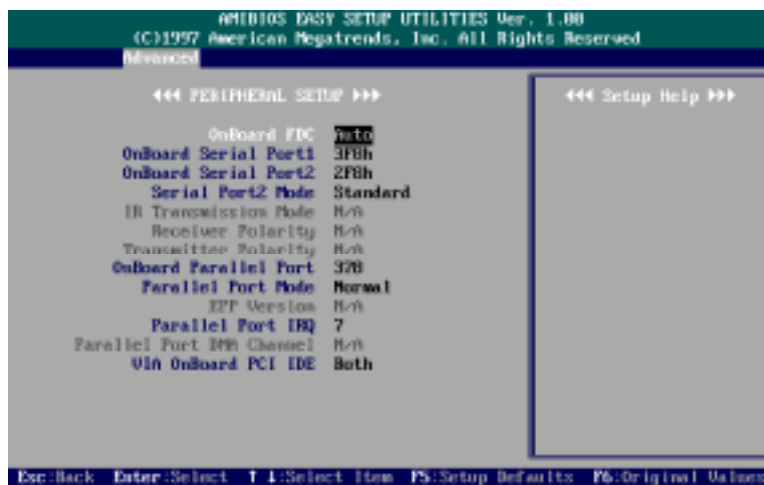
The settings are PnP or ISA/EISA. The default setting is PnP.

IRQ3, 4, 5, 7, 9, 10, 11, 12, 14, 15

These options specify the bus that the named interrupt request lines (IRQs) are used on. These options allow you to specify IRQs for use by legacy ISA adapter cards. These options determine if AMI BIOS should remove an IRQ from the pool of available IRQs passed to BIOS configurable devices. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these PCI/PnP Setup options to remove the IRQ by assigning the option to the ISA/EISA setting. Onboard I/O is configurable by AMI BIOS. The IRQs used by onboard I/O are configured as PCI/PnP.

The settings are PCI/PnP or ISA/EISA. The default setting of IRQ5, 9, 10, 11, 12, 14, 15 is PCI/PnP; the default setting of IRQ3, 4, 7 IS ISA/EISA.

Peripheral Setup



Onboard FDC

This option enables the floppy drive controller on the mainboard. The settings are Auto, Enabled, or Disabled. The default setting is Auto.

Onboard Serial Port1

This option enables serial port 1 on the mainboard and specifies the base I/O port address for serial port 1. The settings are 3F8h (Default) , 2F8h, 3E8h, 2E8h, Disabled.

Onboard Serial Port2

This option enables serial port 2 on the mainboard and specifies the base I/O port address for serial port 2. The settings are 3F8h, 2F8h (Default), 3E8h, 2E8h, Disabled.

Serial Port2 Mode

This option enables serial port 2 on the mainboard and specifies the base I/O port address for serial port 2. The settings are Standard, IrDA, ASK IR. The default setting is Standard.

IR Transmission Mode

This feature allows you to select IR transmission mode.
The settings are Full Duplex or Half Duplex. The default setting is Full Duplex.

Receiver Polarity

This feature allows you to set the receiver polarity if your IR device is used as a receiver.
The settings are Non Inverted or Inverted. The default setting is Non Inverted.

Transmitter Polarity

This feature allows you to set the transmitter polarity if your IR device is used as a transmitter.
The settings are: Non Inverted (Default), Inverted.

OnBoard Parallel Port

This option enables the parallel port on the mainboard and specifies the parallel port base I/O port address.
The settings are: 378 (Default), 278, 3BC, Auto, Disabled.

Parallel Port Mode

This option allows you to select the IRQs of the parallel port.
The settings are Normal, EPP, ECP. The default setting is Normal.

EPP Version

This option allows you to select the EPP version.
The settings are 1.9, 1.7. The default setting is 1.9.

Parallel Port IRQ

This option allows you to select the parallel port IRQ.
The default setting is 5 or 7. The default setting is 7.

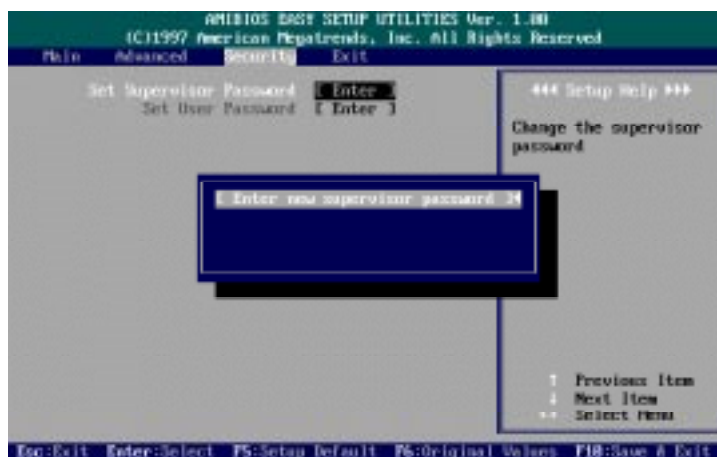
Parallel Port DMA Channel

This option allows you to select the parallel port DMA channel.
The settings are 0, 1, or 3. The default setting is 3.

VIA OnBoard PCI IDE

This option allows you to enable the primary and secondary onboard IDE features. The settings are: Disabled, Primary, Secondary, Both (Default).

Security Setup



Set Supervisor and User Passwords

AMI BIOS Password Support AMI BIOS Setup has a password feature. The system can be configured so that all users must enter a password every time the system boots or when AMI BIOS Setup is executed. You can set either a Supervisor password or a User password. If you do not use a password, Just press **Enter** when the password prompt appears. The password check option is enabled in Advanced Setup by choosing either Always (the password prompt appears every time the system is powered on) or Setup (the password prompt appears only when AMI BIOS is run). The password is stored in CMOS RAM.

You can enter a password by typing the password on the keyboard. When you select Supervisor or User, AMI BIOS prompts for a password. You must set the Supervisor password before you can set the User password. Enter a 1 to 6 character password. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, please read Clear Password Section on the next page.

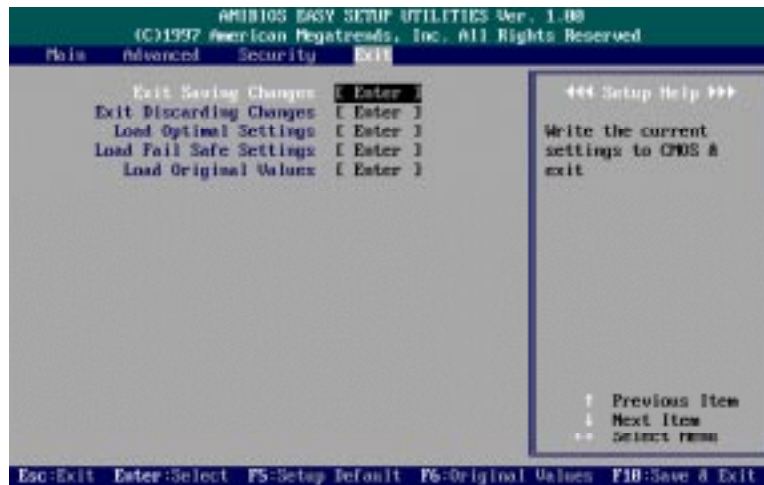
Changing a Password

Enter the password and press **Enter**. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press **Enter**. If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press to return to the AMI BIOS Main Menu. The password is stored in CMOS RAM after AMI BIOS completes. The next time the system boots, you are prompted for the password if the password function is present and is enabled.

Clear Password

If you forget your password, turn off the system power first and remove the system unit cover. Locate Jumper CPW and cap it. Remove Jumper CPW and reset the system. At this point, you will not be asked for the password to enter Setup.

Exit Setup



Exit Saving Changes

This item allows you to write the current settings to CMOS and exit.

Exit Discarding Changes

This item allows you to exit without writing the current settings to CMOS.

Load Optimal Settings

This item is selected for settings which provide the best system performance.

Load Fail Safe Settings

This item is for settings that provide a more efficient computer. If the computer will not boot, select this option and try to diagnose the problem after the computer boots. These settings do not give optimal performance.

Load Original Values

This item recalls your last set of previous settings. This option is convenient if you change settings and decide you wish to return to the previous settings.

BIOS Update Instruction

Flash Process

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

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

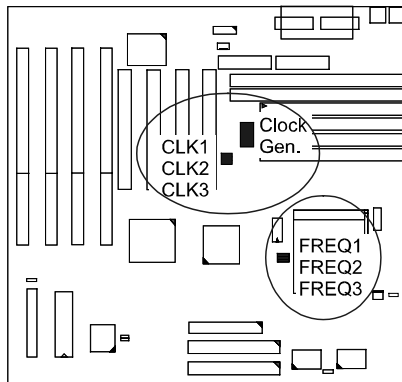
NOTE : Do not turn off or reset the computer during the flash process. It will corrupt the BIOS data.

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.



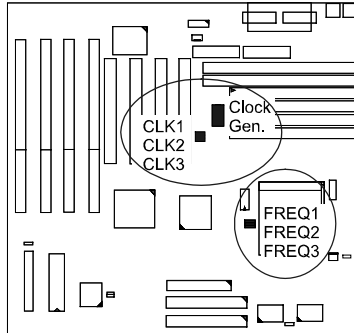
For ICW / PhaseLink Clock Generator

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

Intel Pentium CPUs

Frequency

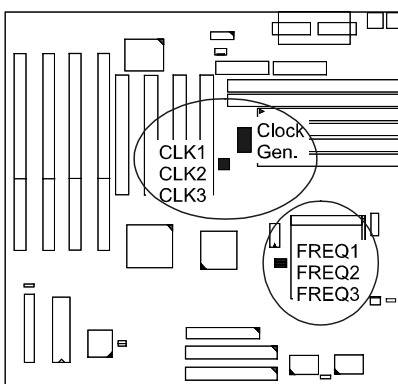
CPU Speed (MHz)	External (CPU/CLK) (MHz)	ICW/PhaseLink			Internal	CPU Clock Rate		
		CLK1	CLK2	CLK3		FREQ1	FREQ2	FREQ3
P55C								
233	66				3.5 x			
200	66				3 x			
166	66				2.5 x			
P54C								
200	66				3 x			
166	66				2.5 x			
150	60				2.5 x			
133	66				2 x			
120	60				2 x			
100	66				1.5 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				3.5 x			
K6-200	200	66				3 x			
K6-166	166	66				2.5 x			
K5-PR200	133	66				2 x			
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			

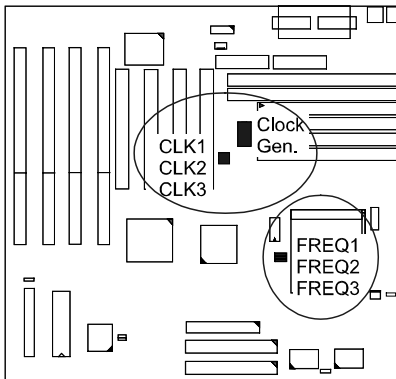


Cyrix 6x86 CPUs

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.

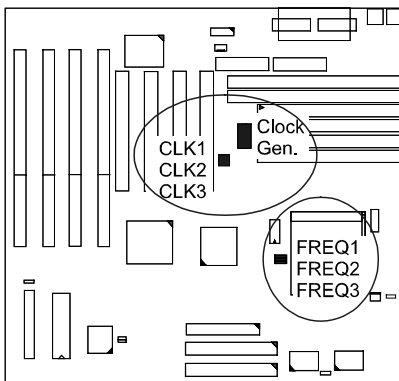


IBM 6x86 CPUs

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.



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